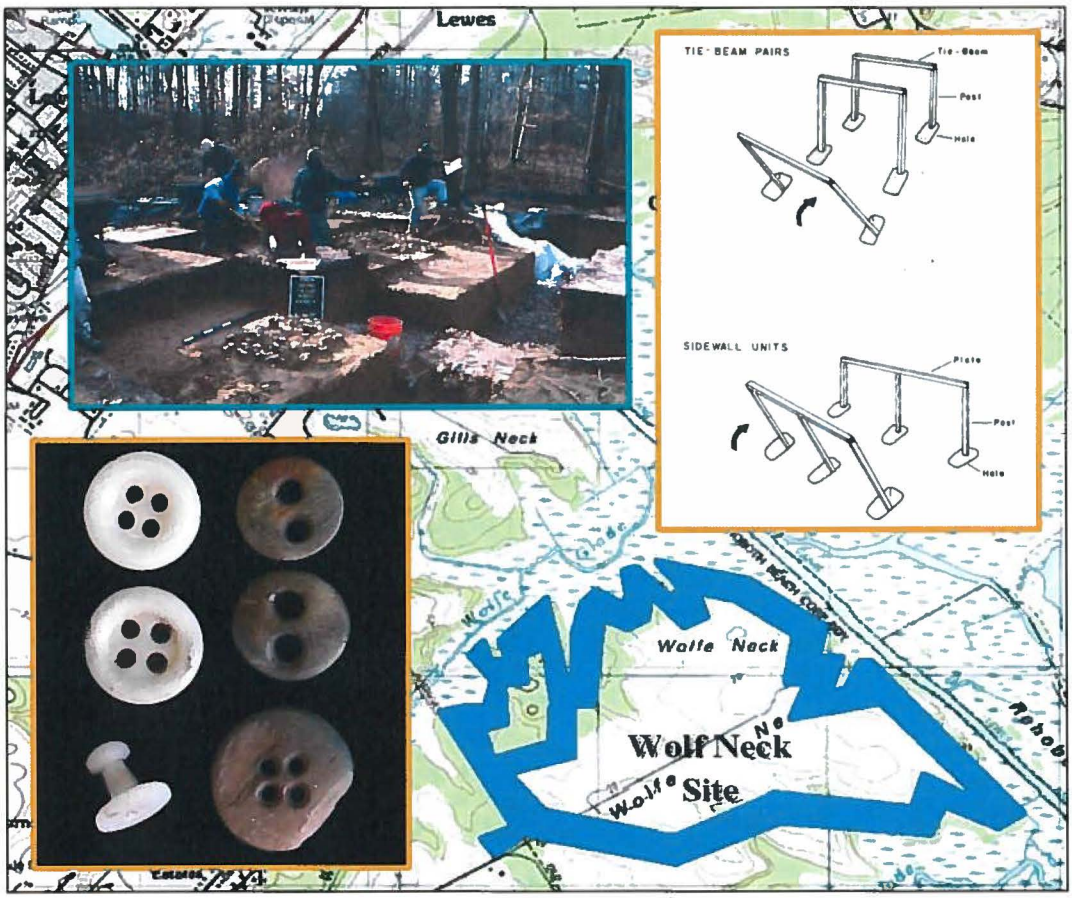
The Bulletin of the Archaeological Society of Delaware



Number Fifty,
New Series

2013

On the Cover: Background: Location of Wolfe Neck Site (Mellin and Truitt); Clockwise from bottom left: Buttons from Site 7K-C-460 (Crowder and O'Toole), Excavation Block at 7NC-J-227 (Knepper, Bowen and Egghart), and Post-In-Ground Framed Building Construction (Krofft).

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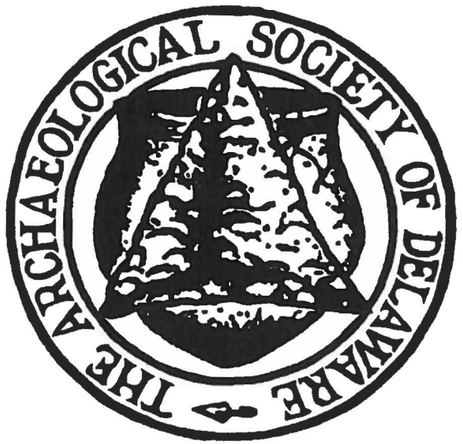

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EARTHFAST ARCHITECTURE AS EVIDENCE OF EARLY OCCUPATION AT AVERY'S REST

Heidi E. Krofft
Delaware Department of Transportation

Archaeological excavations and documentary research over the past 50 years have shed much light on the tradition of earthfast construction in the Mid-Atlantic region. Extensive work has been conducted in the Chesapeake region, particularly in tidewater Virginia and along the Chesapeake Bay in Maryland (Carson et al. 1981; Cofield 2007; Stone 2004). More recently, scholars have also begun to look at evidence of earthfast construction in New Jersey and Delaware (Bedell 2002; Gall et al. 2011). Research excavations conducted by the Archaeological Society of Delaware (ASD) at Avery's Rest in Sussex County, Delaware, have revealed the remains of such a building that helps further the examination of earthfast architecture outside of the traditional Chesapeake region.

Avery's Rest is located approximately 4 miles (6.4 km) from present-day Lewes in Sussex County, Delaware. This area was first settled by the Dutch in 1631 at a small settlement called Swanendael. Delaware changed hands several times between the Dutch, Swedes and English until 1674 when the English firmly gained control of the area including Whorekill (present-day Lewes) (Bedell 2002). While the site shows some indication of an early occupation, documentary research has identified the first known occupant as Captain John Avery. Avery was granted 300 acres (121.4 ha) of land called "Avery's Choice" in 1673 located between Roades Creek (today the Lewes and Rehoboth Canal) on the east and King's Creek (today White Oak Creek) on the west (Figure 1) (Sellers 1898).

The following year, John moved his family from their farm, near the Menokin River in Maryland, to "Avery's Choice" in Delaware. He was granted an additional 500 acres (202.3 ha) of land for transporting several individuals to the new colony as indentured servants (Sellers 1898). Before Avery could move his wife Sarah and their five children to Delaware, he needed to set up the new plantation. It is likely that Avery spent the year between 1673 when the land was granted and 1674 when it is assumed that the family moved to Delaware clearing the land, constructing a house for the family, and getting an initial crop in the ground. Assisting Avery in this endeavor were the two African American slaves that he owned and likely one or more individuals indentured to his service.

When Avery moved to the area in the 1670s, southern Delaware was sparsely settled despite nearly 40 years of European control and expansion. In this environment, Avery had fairly limited choices about the type of dwelling and outbuildings he could erect. Scholars have cited various reasons why earthfast architecture was the preferred choice for early settlers. Factors such as the scarcity of skilled labor, questionable land tenure, availability of materials, and knowledge of traditional medieval construction practices have been presented (Gall et al. 2011:41; Stone 2004).

Figure 1: Augustine Herman's Map of Virginia and Maryland, 1673 (Herman 1673). Approximate locations of John Avery's land in Maryland and Delaware are highlighted in red.

As a Captain with large land grants in both Maryland and Delaware, Avery was certainly one of the wealthier members of society. However, given the lack of stone in southern Delaware and the cost of producing brick, earthfast construction was an economic choice and the material was readily available. Perhaps just as important was the ability for the house to be constructed in a short period of time. An earthfast house could be constructed in a matter of weeks, versus the lengthy time it would have taken to erect a more substantial house of brick (Carson et al. 1981). Even with the added labor of the enslaved and possible servants, Avery had a busy year constructing a dwelling and outbuildings and producing a crop for sale.

Further, Avery, his servants, and any additional hired laborers were familiar with earthfast construction practices. Europeans brought traditional building practices with them from their homeland. Archaeological and architectural evidence in Delaware and the Mid-Atlantic region shows that earthfast construction is not unique to a particular period of settlement or a specific ethic group. Instead, earthfast buildings have been identified across the Mid-Atlantic and New England regions dating from the early-seventeenth century through the late-eighteenth century and are associated with English, Dutch, Swede, French, and German settlements (Gall et al. 2011:40).

Earthfast Construction at Avery's Rest

Research excavations have been ongoing at Avery's Rest since 2006 when a portion of the site was threatened by development. These early excavations identified two wells, a daub pit, and a plank-lined cellar initially interpreted as a warehouse. Additional excavations on the southwest portion of the site have uncovered evidence of two buildings, 11 burials, and a possible well.

The earthfast building that is the focus of this paper is located approximately 100 feet (30.5 m) west from two wells and a plank-lined cellar that have been associated with the John and Jemimah Avery occupations. At least 13 features can be confidently associated with this building, which measures 14 feet (4.3 m) wide by 30 feet (9.1 m) long set in three bays (Figure 2). This includes nine post holes and puncheon set trenches between four of the posts. Evidence of a doorway is present near the center of the west side of the structure by a separate structural post (Feature 153) approximately 2.7 feet (0.8 m) from a paired post (Figure 3). This post and post hole were similar in size and shape as the other structural posts. Additional posts and possible storage pits in the northeast bay of the structure may also be related to its occupation.

The north bay of the building is unique in its architecture because it resembles puncheon or stud-in-ground construction. The puncheon trenches ran between and connected the corner structural posts (Figure 4). Smaller posts were identified within the trenches at regular 1.75-foot (53.3-cm) intervals (Figure 5). Similar patterns have been identified archaeologically in the Chesapeake region as evidence of a puncheon or stud-in-ground means of construction (Carson et al. 1981:148). These types of structures were very simplistic in their construction and were quick to erect. The building was framed directly onto the posts with boards nailed directly onto the puncheons. These buildings were often used as temporary structures while a more permanent house was being built (Carson et al. 1981). At Avery's Rest, this crude

14 by 10 foot (4.3 by 3 m) structure was likely the first building erected and may have sheltered Avery along with his slaves and indentured servants while they planted the first crop and built a more permanent house for the family.

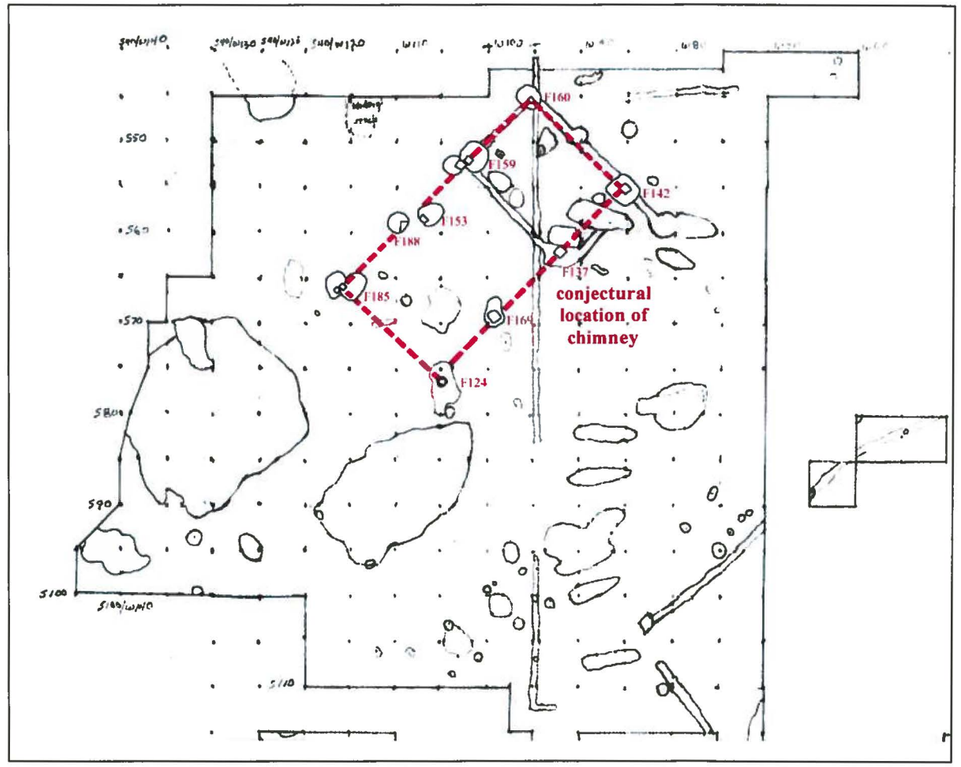


Figure 2: Plan of Southwest Half of the Site Showing Features and Layout of the Northwest Earthfast Structure. Door is located on the center of the northwest wall.

The remaining two bays are uniform and represent a more formally framed building. The posts and post holes that are associated with these two bays are consistent in size and shape and form regular 10-foot (3-m) wide bays with a building width of 14 feet (4.3 m). The post stains were square and measured 0.75 by 0.75 feet (22.9 by 22.9 cm). The post holes were generally square or oval in shape and measured approximately 2.5 feet (76.2 cm) plus or minus 0.7 feet (21.3 cm). The depth of the post holes varied only slightly in depth and ranged between 1.5 and 1.9 feet (45.7 and 57.9 cm) deep. The depth between pairs of posts was generally consistent with a minimal difference of only 0.08 to 0.16 feet (2.4 to 4.9 cm).

The similar depths and consistent measurement between pairs of posts indicates that the building was carefully planned and portions prefabricated on the ground before it was erected. Buildings were assembled in several different ways, and archaeologists can use the excavated features to tell which method of construction was used (Carson et al. 1981;

Morrison 1985; Stone 2004). Posts could be individually set, raised as tie-beam pairs into pre-excavated holes, or preassembled sidewalls erected as a unit into pre-excavated holes (Figure 6). Early frontier buildings were often raised as individual posts or in bent frames since it took less people to raise the smaller frames versus a larger sidewall (Stone 2004:320). If Avery was adding on to the original puncheon structure to make a larger, more permanent house for his family, the likely means of construction would have been in tie-beam pairs.

Figure 3: Profile of Door Post (Feature 153).

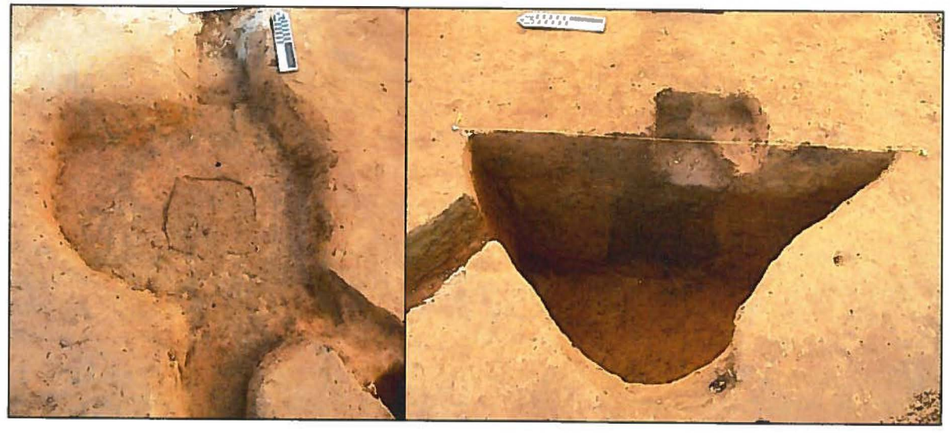


Figure 4: Images of the Northernmost Pair of Structural Posts. Left: Plan view of Feature 160; Right: Profile view of Feature 142.

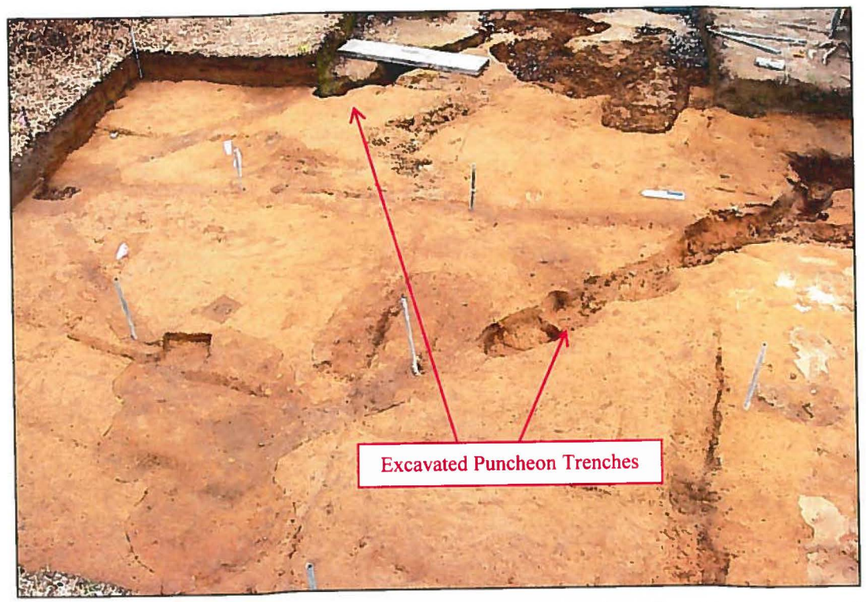


Figure 5: Plan of the Northern Bay of the Building Highlighting the Puncheon Trenches Between the Four Structural Posts.

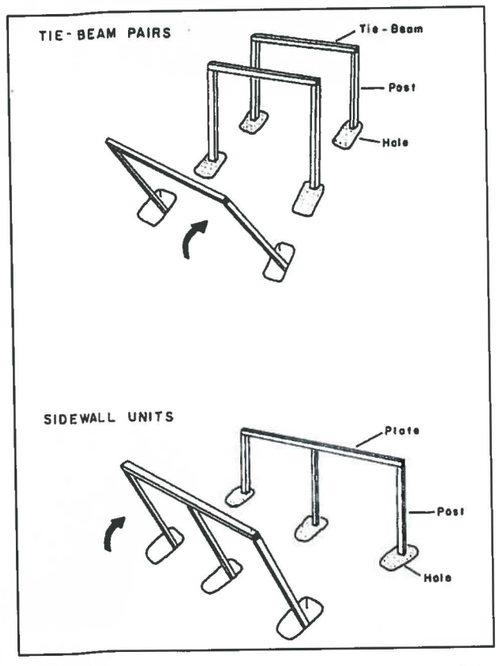


Figure 6: Methods of Post-In-Ground Framed Building Construction (Morrison 1985:125).

To aid in the structural support, framed buildings either had ground-set studs or interrupted sills (Carson et al. 1981:149). Often, as in the case at Avery's Rest, evidence of the sills has been plowed away, and all that is visible in the archaeological record are the post holes. After they were framed, the walls and roof of post-in-ground buildings were covered with oak clapboards (Stone 2004:320). Once they arrived in Delaware, the Avery family could have inhabited the two newly built bays, while the slaves/servants lived in the puncheon bay until separate quarters were built.

The archaeological evidence points to several interesting features that provide us with greater insight into the home the Avery's lived in. Although the puncheon bay was likely the first, hastily erected part of the house, it had dressed posts. All four of the corner structural posts were squared the entire length. Early earthfast buildings often had undressed posts on the portion below ground (Carson et al. 1981; Cofield 2007). This was for two reasons: it took less time and money to leave the bottom portion of the post undressed, and it provided a stronger base that was more rot resistant. Although he chose to quickly erect a puncheon structure, Avery spent the time and had a slave or servant with the skills to dress the timbers for the house.

Although the dressed timbers show that Avery had access to skilled labor for constructing his house, one downside to the dressed posts were that they were more susceptible to rot. Two of the posts (Feature 159 and Feature 185) on the western wall showed evidence of repairs (Figure 7). For both of these features, the repair was identified archaeologically as an immediately adjacent post to the original structural post. The repair posts were the same dimensions as the original posts at 0.75 feet (22.9 cm) square and were placed at similar depths. Earthfast structures could typically last 10 years without repair and, if kept in good condition, could remain standing for over a century (Carson et al. 1981). These two posts indicate one, if not two, repair episodes and provide evidence that the building was standing for at least a decade. It is possible that the dressed posts were more susceptible to rot and required repair while the family lived in the house from 1674 until at least Avery's death in 1682 or 1684 when Sarah remarried and moved to her second husband's plantation. It is also possible that the repairs occurred when Avery's daughter Jemima and her husband John Morgan occupied the site from 1698 until 1715.

In addition to the archaeological features, artifact data can also add to our interpretations. Artifact distributions from the plowzone show a concentration of window glass above the building with little window glass elsewhere across the site. This indicates that there was at least one window on the building (Figure 8). Not only did Avery have access to, but he chose to, spend money on glazed windows for his house.

There is little evidence of a hearth or chimney associated with the house; however, one would have existed as a source of heat and light. Given the close proximity of the quarter or kitchen to the south and the location of the door on the west wall of the building, the chimney was likely located at the north end of the structure. It is possible that the chimney was located on the southeast wall and would have served the original puncheon structure and later the entire home. A small concentration of daub was recovered from the shovel test pits at the north end of the building, suggesting the location of the chimney.

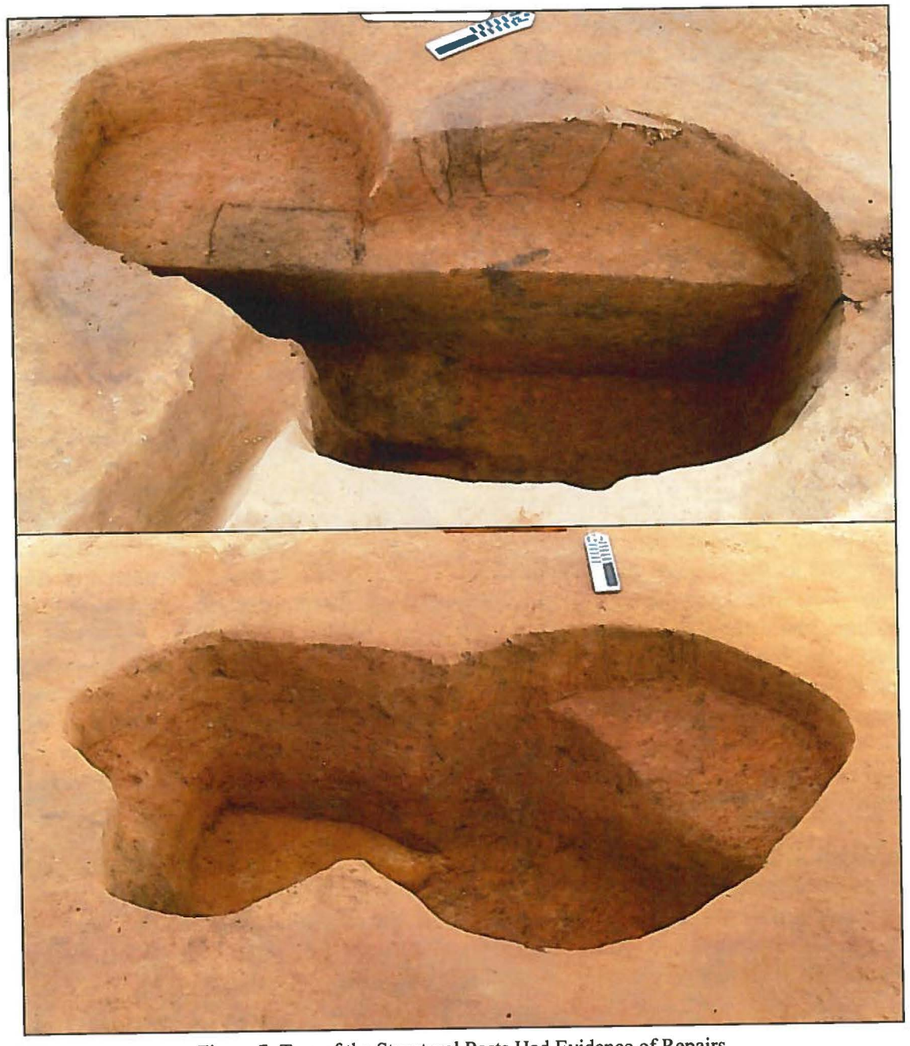
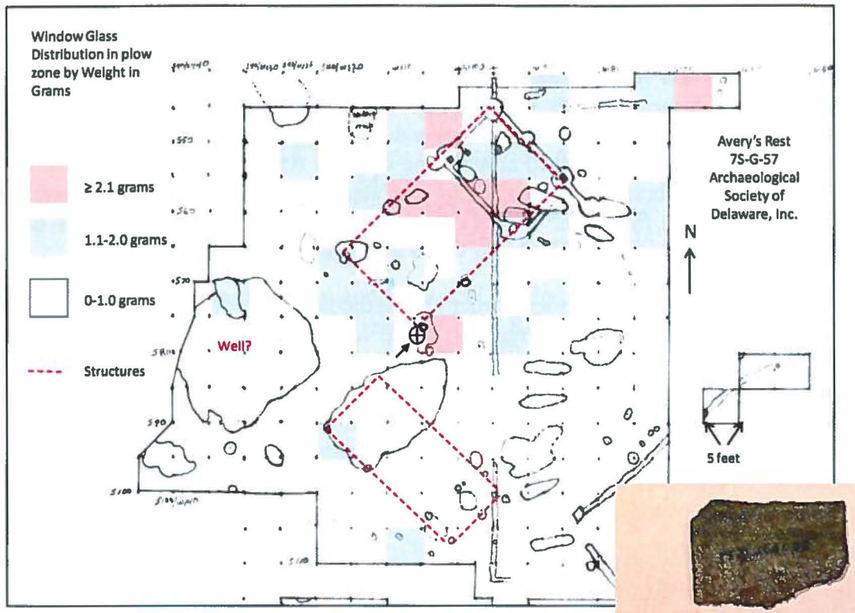


Figure 7: Two of the Structural Posts Had Evidence of Repairs.
Top: Feature 159 in progress profile of repair post; the original structural post has been fully excavated. Bottom: Feature 185 after excavation;
the original post hole is on the right. The repair post hole is on the left.



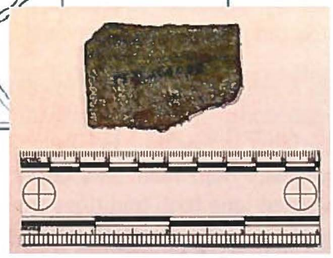


Figure 8: Plowzone Distribution of Window Glass.
Right: Fragment of window glass recovered above the southeast post at the base of plowzone.

Further, we can compare the construction and layout of this building to another earthfast building directly to the south which was likely contemporaneous (see Figure 8). This second building measured 12 by 24 feet (3.7 by 7.3 m) with a chimney on the east end. Given the lack of structural post holes present, this building was likely constructed with ground sills or raised on wooden piers. This evidence has since been plowed away and is not seen archaeologically. The posts for the chimney were set with no large post holes. A full plank-lined cellar was located on the far west end of the building. If the building to the north was the primary dwelling, it is likely that this building was a kitchen or quarter for the slaves or servants.

Identifying and Defining Earthfast Architecture in Delaware: Conclusion

Excavations at Avery's Rest and initial interpretations of earthfast buildings at the site have begun to inform us not only of the Avery family but about life in early southern Delaware. The structural components of the building as evidenced in the archaeological record lead us to conclude that this was the primary dwelling for the Avery family. Overall, the building measures 14 feet (4.3 m) wide with three 10-foot (3-m) bays and had a door present near the center of the west wall. The northern bay has evidence of a puncheon or stud-in-ground

construction technique and was likely the first structure built on the site while Avery began setting up the plantation. There were very few artifacts within the posts, and post holes providing evidence that this was the first building on the site. Early structures on sites have very few artifacts within their features because there are few or no artifacts on the ground surface that would be deposited into the post holes during construction. Plowzone artifact data indicates that the building contained at least one window with a chimney located at the north end. Repairs to the building tell us that it was standing for a substantial amount of time. Although there is no full cellar or root cellar in the building, the presence of a heat source and window indicates that this building was a dwelling.

Earthfast techniques were common construction methods during the seventeenth and eighteenth centuries in the Mid-Atlantic region. There was a long-term tradition of timber-framed architecture practiced in England and in the Low Countries of Sweden, Netherlands, and Germany in the seventeenth century and these practices carried over to early settlements in the New World (Carson et al. 1981:158). This traditional form of architecture was adapted to meet the settler's needs and available materials. While several seventeenth-century earthfast structures have been excavated in Virginia and Maryland, few early structures have been excavated in Delaware.

As a long term research excavation project by the ASD, Avery's Rest provides a unique opportunity to gain information on early-seventeenth-century sites in Delaware and on earthfast architecture beyond the Chesapeake. Archaeological evidence illustrates how early colonists built their new landscapes using available resources of materials and labor and adapted long term traditions from their home country. As additional excavations and artifact analysis occur, interpretations will continue to evolve and provide a better understanding of this early period of settlement in Delaware.

Acknowledgements

Many thanks to DelDOT and David Clarke for permitting me to spend time at Avery's Rest over the past year. Many thanks also to the entire Avery's Rest crew for their warm welcome and willingness to share this amazing site with me. And a special thank you to Dan Griffith who put up with my constant questions, crazy theories, and at times outright skepticism but who shared in my enthusiasm and provided me with a wealth of information on Delaware archaeology. Any errors herein are those of the author.

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REGIONAL SITE DISTRIBUTION IN SOUTH-CENTRAL NEW CASTLE COUNTY AS SEEN FROM THE SANDOM BRANCH SITE COMPLEX

Dennis Knepper (Versar), **Chris Bowen** (Versar)
and Chris Egghart (Virginia Department of Environmental Quality)

INTRODUCTION

Planning and construction of the State Route 1 corridor connecting Wilmington and Dover resulted in almost 20 years of archaeological investigations in central and northern Delaware. Prior to construction activity in the segment between Smyrna and Pine Tree Corners, data recovery excavations were conducted by Parsons at the Sandom Branch Site Complex, 7NC-J-227 and 7NC-J-228. A technical report of the investigations was later produced by Versar (Versar 2011).

The archaeological sites were situated on terraces overlooking a low-order tributary of Sandom Branch above its confluence with Blackbird Creek (Figure 1). Both sites were well preserved, being situated in unplowed contexts and characterized by large, fire-cracked rock features representing discarded stone probably resulting from a form of indirect heating such as stone boiling (Figure 2). Temporal data from the sites included artifacts that spanned most of the Archaic and Woodland Periods (Figure 3). The most intensive occupations, however, and those associated with the heated rock features in particular, appeared to have occurred at 7NC-J-228 in the Early to Middle Woodland Period (or the latter part of the Woodland I) and in the Late Woodland Period at 7NC-J-227.

The regional contexts of the sites were assessed though examination of site settlement data as documented in Cultural Resource Survey (CRS) files managed by the Delaware State Historic Preservation Office (DE SHPO). This study further provided an opportunity to examine settlement patterning through time in interior, streamside settings such as those represented by sites like the Sandom Branch locales, comparing them with contexts in lower-lying estuarine areas. Standard archaeological models of settlement in Delmarva developed by researchers such as Thomas et al. (1975) and Custer (1989) describe an increase in sedentism near the end of the Woodland I Period, culminating in the Late Woodland with intensified use of major floodplain settings associated with the somewhat limited introduction of horticulture (Table 1). These models hold that interior, streamside areas important in Woodland I systems continued to be used throughout the Late Woodland for specific resource collection.

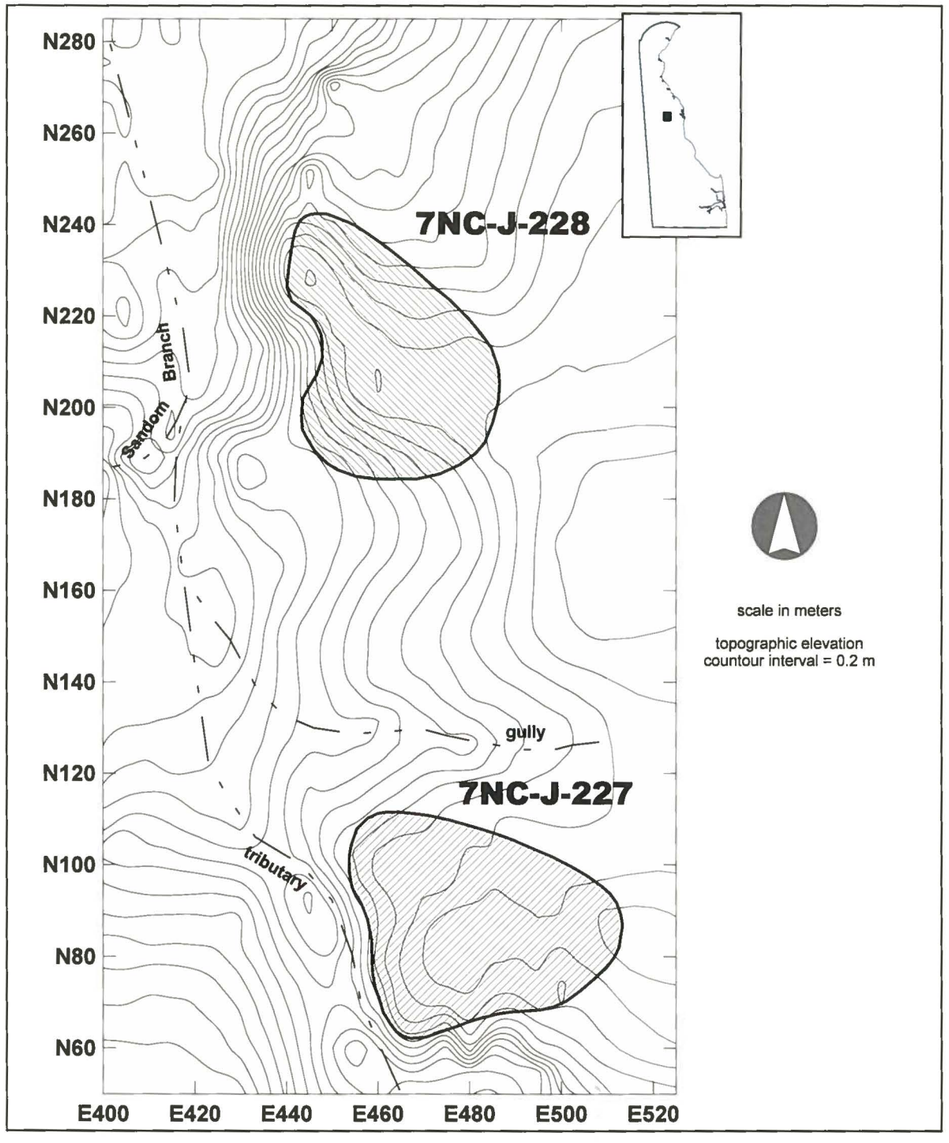

Figure 1: Location of the Archaeological Sites on Terraces above Sandom Branch Separated by a Swale or Gully.

Figure 2: Excavation Block at 7NC-J-227, with Fire-Cracked Rock Features in Foreground and Background.

Figure 3: Sample of Projectile Points from 7NC-J-227.
Top row: stemmed points from Woodland I; bottom row, triangles from Late Woodland.

Table 1: Comparison of Prehistoric Chronologies with Climatic Episodes.

	TRADITIONAL MIDDLE ATLANTIC CHRONOLOGY	CUSTER'S DELMARVA CHRONOLOGY
1600	LATE WOODLAND	WOODLAND II
1000	MIDDLE WOODLAND	WOODLAND I
	EARLY WOODLAND	
AD		
BC	LATE ARCHAIC	
1000	MIDDLE ARCHAIC	ARCHAIC
	EARLY ARCHAIC	PALEO-INDIAN
3000		
	PALEO-INDIAN	
6500		

METHODS

To assess the regional context of the Sandom Branch sites, locational data for known prehistoric site components were plotted on maps of the southern part of New Castle County. Since modern political boundaries typically have little relevance to prehistoric settlement patterns, major watersheds were used as geographic bounds for the study. The Blackbird Creek watershed, within which the Sandom Branch Site Complex was situated, was the central focus of the study, while data for sites in watersheds to the north (the Appoquinimink River) and to the south (the northern half of the Smyrna River Valley) were included, increasing the sample size (Figure 4). Digitized site data in the CRS database are grouped by Hundreds, the original, seventeenth-century administrative subdivisions of the state's counties, and thus the samples are not necessarily aligned with physiographic zones. After examining the spread of data points, it appeared that the Blackbird Creek watershed was adequately represented in the sample, while the Appoquinimink Creek and Smyrna River watersheds were not. Thus, while basic analyses within the valleys were conducted, comparisons between the valleys were not attempted.

Site attribute data were transcribed from hard-copy site forms in the DE SHPO site files, and the attribute data were correlated through CRS numbers with the locational database for spatial analysis. The site data were from a variety of sources, including both avocational and professional researchers, and ranged from selective, non-systematic investigations to

systematic surveys. The level of reporting and detail included on the site forms was therefore mixed in terms of attributes such as chronology or physiographic context, a situation that effectively limited the extent of distribution analyses that could be undertaken. Nevertheless, we have assumed that there are enough data points in the study overall so that biases may be minimized and general inferences drawn.

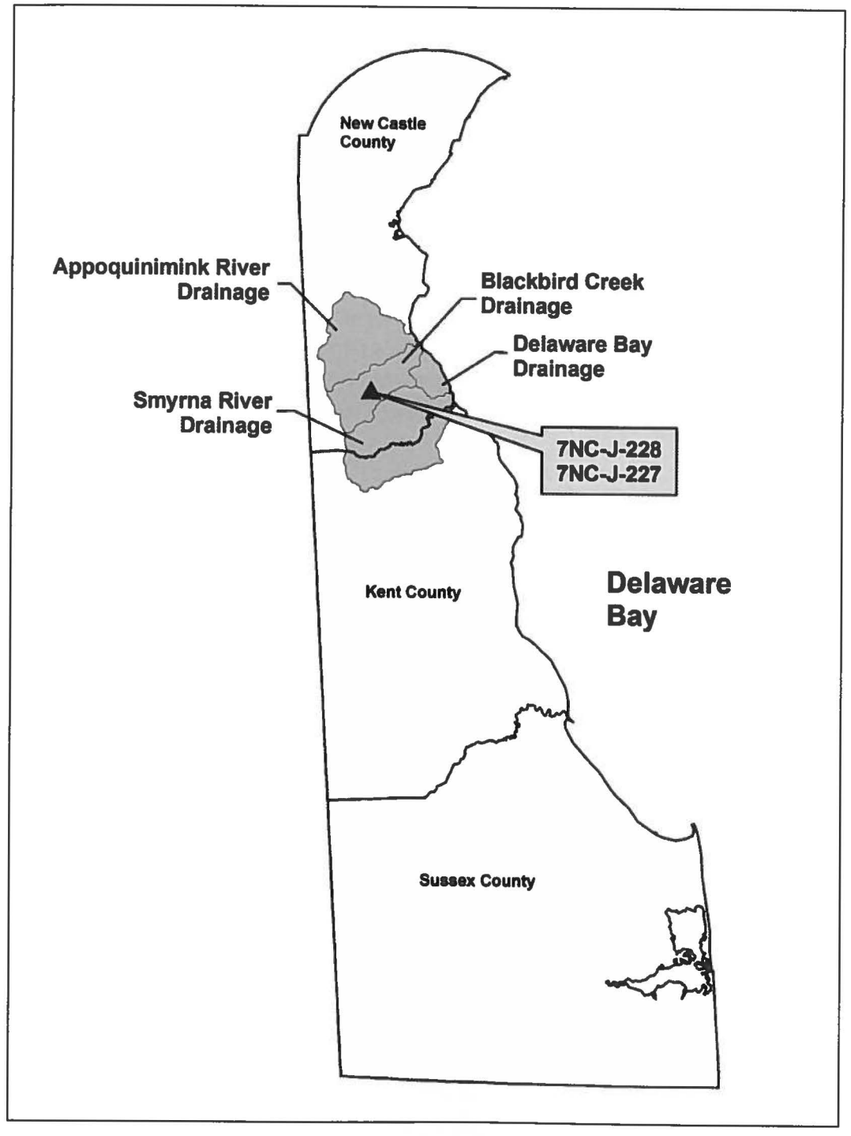

Figure 4: Three Major Drainage Basins in Southern New Castle County Were Used as Geographic Bounds.

Watershed maps used in the study were obtained from the Watershed Delineation Project, posted by the Spatial Analysis Lab of the University of Delaware (UDEL) (Mackenzie 1999), and from the Delaware Department of Natural Resources and Environmental Control (DNREC) (DNREC 2008). The hydrology (stream location) dataset was composed of hydrographic linear features originating from United States Geological Survey (USGS) 1:24,000-scale digital line graphs for the counties of Delaware, obtained through the Delaware Data Mapping and Integration Laboratory, also located at UDEL (UDEL 2002). The data were projected in NAD 1983 UTM Zone 18N.

RESULTS

In total, 424 prehistoric sites were recorded in the database within the portions of the three watersheds mapped in the study. Distinguishing temporal components among the recorded sites proved to be somewhat problematical. The chronology employed throughout on CRS site forms is the system proposed for Delmarva by Custer (1989). This chronology does not distinguish sub-periods between the start of the Late Archaic and the end of the Middle Woodland, grouping them instead under a single term, Woodland I. The chronology does, in fact, use regional complexes, such as Barker's Landing, Carey, or Webb, to subdivide the Woodland I. But these divisions were not reported consistently in the site files, and thus only the two wider temporal distinctions—Woodland I and Late Woodland—could be identified.

Breaking down the total number of sites by temporal component, 95 sites were identified as having Woodland I components while 41 sites were characterized by Late Woodland components (Table 2). These data were used in distribution plots (Figure 5 and Figure 6) and in the ensuing analyses.

Table 2: Distribution of Prehistoric Site Components in the Major Watersheds near the Sandom Branch Sites.

Watershed	Prehistoric Sites	Archaic-Middle Woodland sites (Woodland I)	Late Woodland Sites
Blackbird Creek	243	62	14
Smyrna River (north)	88	10	7
Appoquinimink River	93	23	20
Total	*424*	*95*	*41*

The most obvious difference in the distributions was the seemingly lower frequency of sites overall containing Late Woodland components in comparison with earlier site components. This variation may be in part a result of the way in which the data were grouped, since two very different time ranges are represented. The earlier, Woodland I distribution includes occupations spanning three conventional sub-periods—the Late Archaic, Early Woodland,

and Middle Woodland—and represents a time range of as much as 2,500 years. The Late Woodland data, in contrast, represent a single sub-period comprising the last 600–700 years of regional prehistory, less than one-quarter of the time encompassed by the Woodland I period.

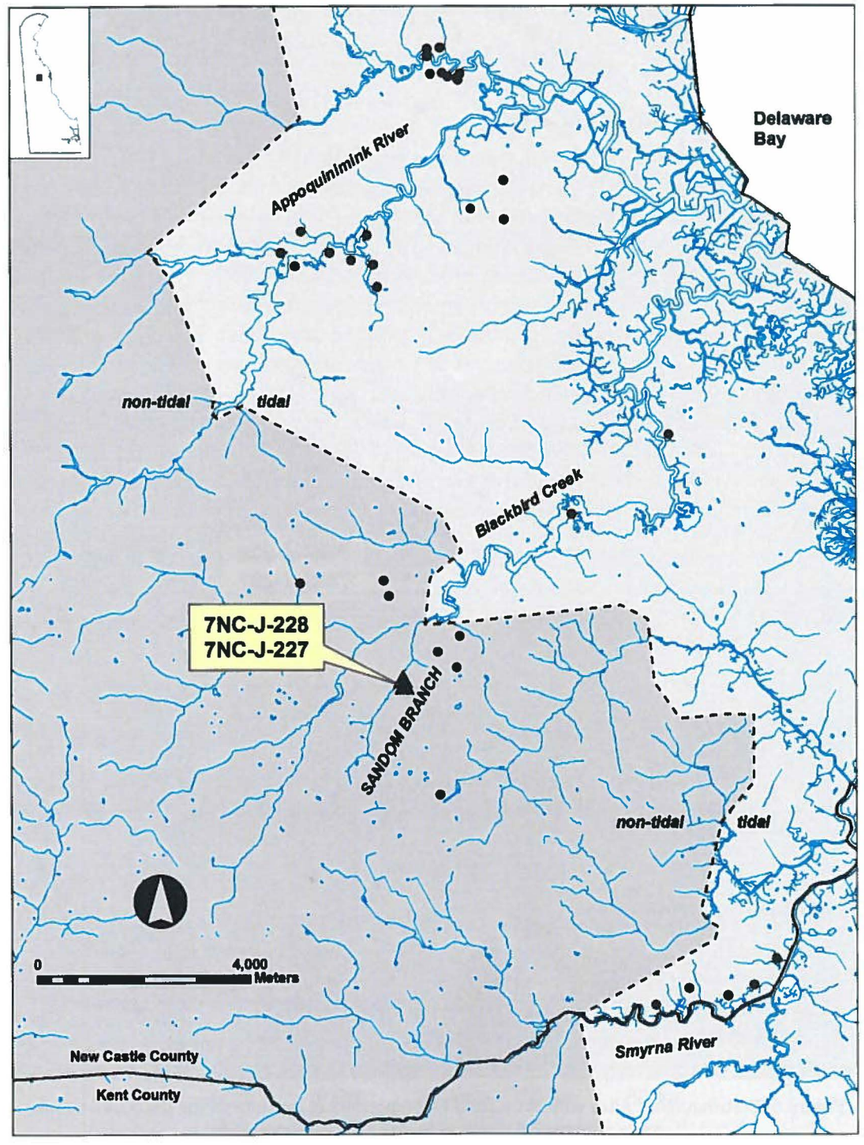

Figure 5: Distribution of Sites with Late Woodland Components in Portions of the Blackbird Creek, Appoquinimink River, and Smyrna River Watersheds.

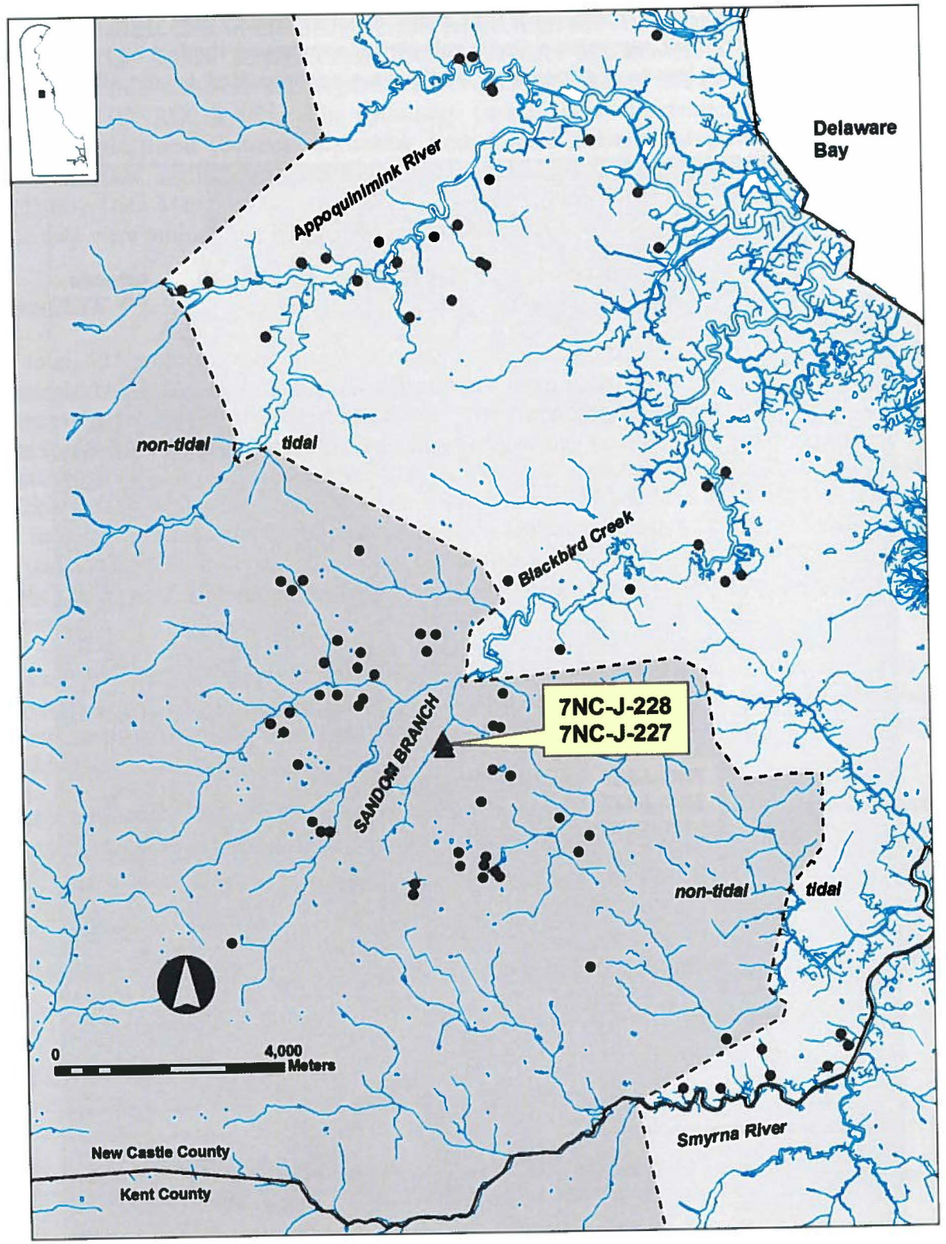

Figure 6: Distribution of Sites with Woodland I Components in Portions of the Blackbird Creek, Appoquinimink River, and Smyrna River Watersheds.

In addition to general frequencies, other variations were noted in the distributions, including differences in the numbers of site components between the three watersheds—for example, more than twice the number of sites were documented in the Blackbird Creek watershed in comparison with the Appoquinimink River watershed. As noted, however, these differences may have been a factor of grouping the data by historical political units rather than geographic units and of sampling bias, since survey coverage within the three regions has not necessarily been comparable.

Distance to Streams

The major environmental variable that was reported consistently and thus could be mapped throughout the region was surface water in the form of streams. Using the USGS hydrology data noted above, the distance to streams was calculated for each site component from the Woodland I and Late Woodland groups. The results were plotted as cumulative frequency distributions (Figure 7). The charts compare the proportion of sites lying at progressively distant intervals from streams during the two periods. Given confidence that the data are representative of actual settlement patterns, the analysis suggested minor differences over time in the focus of site location with respect to streams. Specifically, components tended to be situated close to water sources more frequently in later periods. For example, 60 percent of the Late Woodland sites occurred within 328.1 feet (100 m) of streams, in contrast to 40 percent of the earlier sites. The difference narrowed at greater distances: the points in the two line charts converged at 984.3 feet (300 m), where more than 90 percent of the sites from each period were at least 984.3 feet (300 m) from streams, while all sites were located within 2,132.5 feet (650 m) of streams.

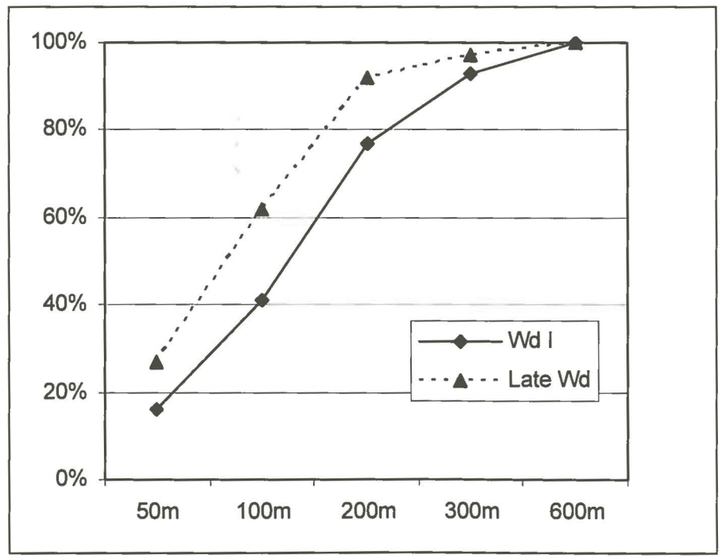

Figure 7: Cumulative Frequency Distributions for Distance to Streams among Woodland I and Late Woodland Components.

Tidal vs. Non-Tidal Locations

The Sandom Branch sites were located in a physiographic zone known as the Mid-Drainage zone, an area that straddles tidal and non-tidal environments. The approximate tidal limit is indicated in Figures 5 and 6 by shading and a heavy dotted line. Sandom Branch is situated above the tidal zone of Blackbird Creek, and sites 7NC-J-227 and 7NC-J-228 occur within 164 feet (50 m) of the stream. To determine how common such site locations might have been and whether the location of sites in similar, non-estuary environments accounted for any variation in regional site distribution, the spatial analysis (distance to water) was re-run for subsets of the settlement data based on the tidal limits of regional streams.

In tidal areas, Woodland I and Late Woodland components were proportionally distributed in terms of distance to streams (Figure 8). The frequency curves showed little variation at any distance interval, the differences generally being less than 10 percent. In contrast, site components in non-tidal areas displayed a greater degree of variation (Figure 9). In the interval nearest streams (164 feet [50 m]), site frequency was higher among Late Woodland components than among Woodland I components, but fell below the Woodland I line at greater distances, suggesting lower proportions of sites at those intervals. While sample sizes for Late Woodland sites were small, rendering inferences more difficult to make, the analysis results may suggest that in non-tidal areas, Late Woodland settlement was more frequently focused on streams and their immediate resource bases while in tidal areas, water may have been a less consistent factor in site location selection, with a wider range of resources providing motivation for site selection.

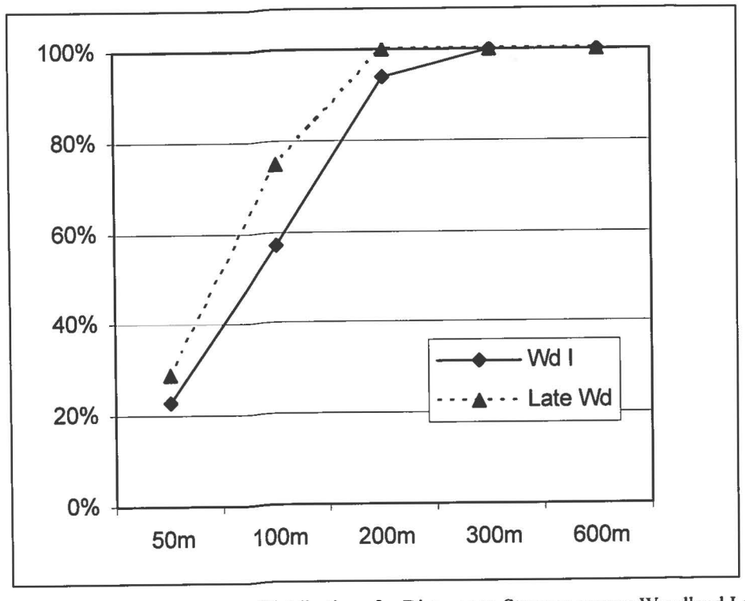

Figure 8: Cumulative Frequency Distributions for Distance to Streams among Woodland I and Late Woodland Components in Tidal Areas.

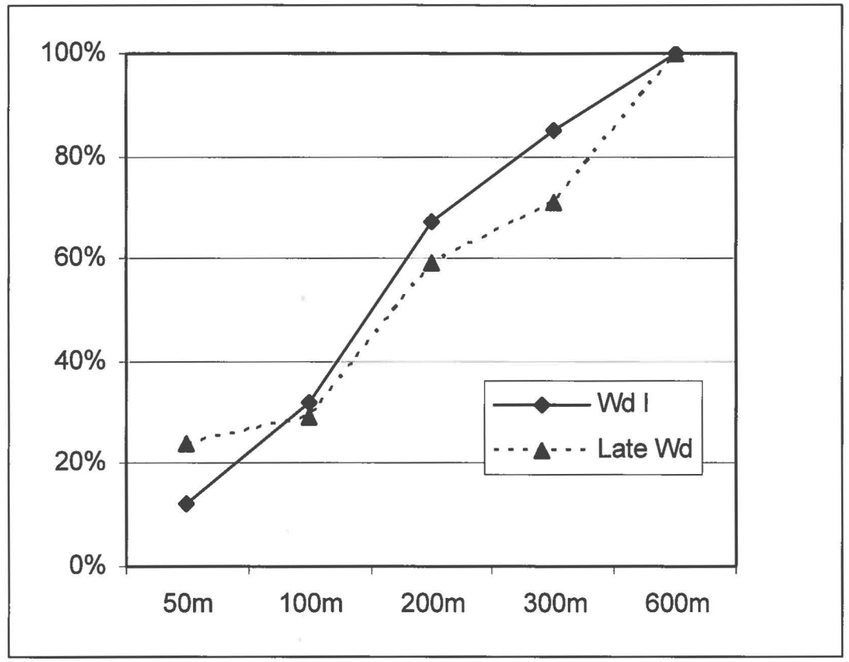

Figure 9: Cumulative Frequency Distributions for Distance to Streams among Woodland I and Late Woodland Components in Non-Tidal Areas.

These findings—including a greater focus on near-stream settings in non-tidal areas during the Late Woodland—conform in part to existing models of Late Woodland settlement in central Delmarva. As noted, these models propose an increase in sedentism during the period, seen especially in the intensified use of major floodplain settings and the sporadic introduction of horticulture. The models hold that non-tidal, upland areas continued to be used for specific resource collection. The exploitation of wild resources was an enduring practice in all time periods and was particularly important in Delmarva, where reliance on cultigens does not seem to have developed to the extent that it did in other parts of the Middle Atlantic. In fact, Custer (1996) has suggested that little significant change in upland landscape use can be demonstrated in central and northern Delmarva throughout the Woodland sub-periods. He noted that Late Woodland base camps in the region lack evidence such as house patterns, storage pits, or middens, that would imply long-term habitation—no large village sites are known and little if any evidence occurs of agriculture and, in particular, maize cultivation, which is often considered a hallmark of Late Woodland land use. Late Woodland settlement appears to have been dispersed and characterized by continuity from previous times as expressed in both physical site locations and resource focus. That is, Late Woodland sites tend to be located directly over Woodland I sites, indicating little change in settlement patterning. The results from Sandom Branch similarly suggest that in non-tidal, upland areas, a varied resource focus during the Late Woodland prevailed from earlier periods.

Conclusions

The data set used in this analysis, while limited in terms of systematic coverage and the extent of the environmental variables recorded, provided indications of both continuity and variability in site settlement patterning in the region based on occupation period and location with respect to estuarine/non-estuarine environments. The initial observation was that intensively occupied Late Woodland sites do indeed occur regularly in interior, non-tidal streamside locales, as do earlier, Woodland I occupations. As exemplified by the Sandom Branch findings, Late Woodland settlement systems appear to have been diverse, with upland and lowland settings important throughout the region. Temporal variations were also noted, however. Late Woodland sites, for example, tended to be located closer to non-tidal streams more often than did Woodland I sites. Further analyses conducted with larger, probabilistic samples might be able to elicit more significant trends in the data and likewise determine the sources of some of the variation observed. By broadening the depth of the database to include consideration of other variables, such as site size, artifact assemblage characteristics, or landform attributes, additional context for interpretation of the analytical results should be possible.

Acknowledgements

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FINDING ANSWERS IN THE ASHES: AN ANALYSIS OF A LATE-NINETEENTH TO EARLY-TWENTIETH CENTURY DOMESTIC SITE IN KENT COUNTY, DELAWARE

Alexandra Crowder and Kathleen O'Toole
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INTRODUCTION

Located in Little Creek Hundred in Kent County, Delaware, site 7K-C-460 originally appeared to be little more than an old chimney fall and some pipes protruding from the ground. But a Phase I archaeological survey and a Phase II evaluation during the summer of 2013 quickly revealed that the site was the location of a catastrophic house fire that took place sometime in the early- to mid-twentieth century. The survey and evaluations were conducted by Dovetail Cultural Resource Group (Dovetail) on behalf of Geo-Technology Associates, Inc. (GTA) in compliance with Section 106 of the National Historic Preservation Act (NEPA) of 1966 (36 CFR 800). The project involved coordination with Federal Energy Regulation Commission (FERC), the lead federal agency, and was initiated by the Eastern Shore Natural Gas (ESNG). The goals of the project were to identify all cultural resources within the project's Area of Potential Effect (APE) and determine if any resources were potentially eligible for listing on the National Register of Historic Places (NRHP).

The sudden abandonment of the dwelling by its occupants during the fire left behind a multitude of personal, architectural, and domestic artifacts. Analysis and preliminary interpretation of these artifacts, as well as an examination of the taphonomic processes involved in the burning of the building, allows for a more cohesive analysis of activities and changes that took place at the site over time. This information assists in situating the site within the landscape of late-nineteenth- to early-twentieth-century Delaware and highlights the value of archaeological burn contexts and their role in providing a more complete understanding of the archaeological record.

HISTORY OF THE PROPERTY

First settled in the early-eighteenth century, Kent County, Delaware quickly became a large farming area. Settlers took advantage of the regions level topography and rich soils to establish large farmsteads across the county. The county had utilized its trading relationship with Philadelphia to sell tobacco as a cash crop. Around 1770, tobacco farming had taken its toll on the soil and farmers turned to a variety of grains to sustain themselves and maintain a profit (Kee 2007:7). Farming continued in the state well into the twentieth century, with wheat and corn constituting the staple crops into the 1940s (Kee 2007:8).

Site 7K-C-460 is situated in the Little Creek Hundred area of Kent County, along Dyke Branch Road (Figure 1). It is located within a small wooded area between the road and an

open field. Large amounts of English and poison ivy cover the extent of the site (Figure 2). The general area was farmed up until the early-twentieth century and, except for some surface variability due to tree roots, the ground fits the level description of a plowed field. The surrounding area is now divided into several suburban-esque neighborhoods spread out along Route 13.

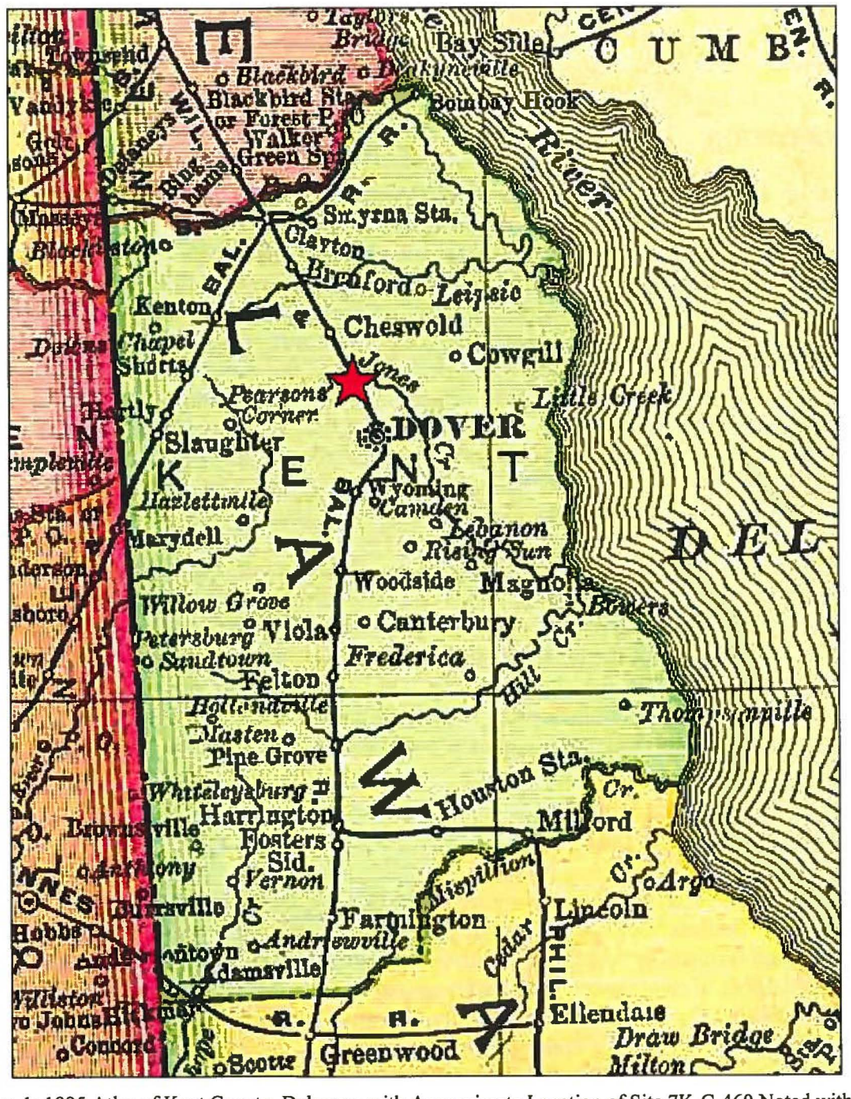

Figure 1: 1895 Atlas of Kent County, Delaware with Approximate Location of Site 7K-C-460 Noted with Red Star (Livingston County Michigan Historical & Genealogical Project 1895).

Figure 2: Photograph of the Site Prior to Clearing and Excavation.
(Image courtesy of Dovetail Cultural Resource Group)

Documents collected during background research by Dovetail's Kathleen Hughes outline the history of the parcel. Records show that the site is located within what was once a 110-acre (44.5-ha) tract of land owned by Philip Denney at the beginning of the nineteenth century. Denney died intestate July 13, 1819, and orphans court records indicate that on February 19, 1821, the land was split between his surviving wife, daughter, and two sons (Hatch et al 2014:139; Kent County Orphans Court Records [KCOC] 1821:RG3840.006). In 1838, Margaret Dunophin (Philip Denney's daughter) sold her mother's 31 acres (12.5 ha), known as the "Mary Denney Farm", to John Husbands (KCDB N3:110). Census data points to the land being primarily farmed by the families residing on the property as well as tenant farmers. John Husbands Sr.'s will left the 31-acre (12.5-ha) tract to his grandson, James Barcus, who then further split the parcel by selling 24 acres (9.7 ha) to Francis Brown, and 1 acre (0.4 ha) to James Reese (Hatch et al 2014:140; Kent County Deed Book [KCDB] M6:445; M6:233; Kent County Will Book [KCWB] S:335). The acre purchased by James Reese is considered to be the location of site 7K-C-460. James Reese is believed to be the individual who erected the dwelling on site 7K-C-460, as this land was used primarily for farming prior to his ownership. Not much is known about Reese, but according to 1910 census data, he was a widowed, 60-year-old African American male farm laborer with one housekeeper, Alden Benson (U.S. Census 1910). Upon his death intestate in 1921, the property went to an heir and relative, Lydia Selby. Selby was named administrator to his debts and became the owner of the property in the same year for $503. The deed indicates a home on the property, "thereon being a frame dwelling and outbuildings", which matches a topographic map showing a building on the lot (Hatch et al 2014:141; KCDB C12:122; My Topo Historical Maps 1931) (Figure 3).

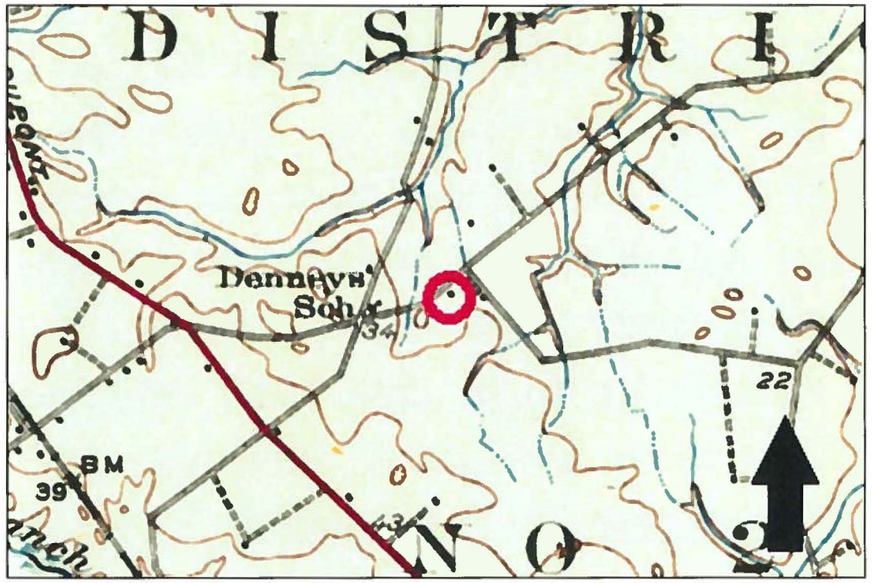

Figure 3: 1931 Topographic Map with Possible Location of the Selby property Circled in Red (ESRI 1931).

In 1937, the property was taken and sold by the state at auction by means of a sheriff's sale to Henry Ridgely for $200 to satisfy Selby's debts to a Mary Lasher (KCDB C15:473). Two years later, Selby was able to buy back the property from Henry Ridgely and his wife for $260 (KCDB O15:202). A dwelling was still said to occupy the lot, but by 1956 there is no building listed on the property, and this is later confirmed in a 1961 aerial photograph (Hatch et al 2014:141). This means that the home burned some time between 1939 and 1956. Selby continued to own the property, but most likely lived elsewhere during her entire ownership until her death in 1968 (U.S. Census 1910). Upon Selby's death intestate, with no immediate family, the property went to her relative and only heir, Perry Reese (KCDB D41:203). Reese sold the land in 1985 to Wayne and Donna Hartnett who owned an abutting 2.3-acre (0.9-ha) tract of land. The current owners, Paul and Eleanor Hesler, bought the property in 2002 (Hatch et al 2014:142; KCDB O498:0243). No other buildings have been constructed on the site since its destruction, allowing for the tree and ivy growth to occur. This has created a natural barrier between the field and the road, and in turn has protected the site from further disturbance (Hatch et al. 2014:139–143).

Archaeological Excavation

Site 7K-C-460 was investigated through two different archaeological surveys during the summer of 2013. The Phase I survey was completed in April and May of that year, and the Phase II in July and August. This work was completed by Dovetail. The Phase I survey consisted of approximately 14 shovel test pits (STPs) and one 3- x 3-foot (0.9- x 0.9-m) test unit (TU). The STPs were placed at 50-foot (15.2-m) intervals parallel to Dyke Branch Road along one transect, with radials placed in cardinal directions. The TU was placed to augment

the STPs and showed the presence of an ashy layer in the first strata, consistent with the later belief of a burned building on the site. The STPs and TUs yielded a domestic historic scatter from the mid- to late-nineteenth century. It was recommended that a Phase II evaluation be conducted to further investigate the site and its potential for information about the area (Hatch et al. 2014:68–72).

The Phase II evaluation consisted of close-interval STPs and 15 3- x 3-foot (0.9- x 0.9-m) TUs. While much of the ground surface was obscured by English ivy during the Phase I survey, the Phase II removed this covering, showing the surface remains of a chimney fall, protruding plumbing pipes, and evidence of a burned building (Figure 4 and Figure 5*)*. The STPs were placed to determine the boundary of the site. The TUs were located primarily on the eastern portion of the property to examine the archaeological deposits and to investigate the presence of the burned building. The Phase II evaluation yielded 7,178 artifacts, which were almost entirely historic, with the majority being architectural remains (Hatch et al. 2014:139).

Figure 4: Photograph of the Site Prior to Excavation.
(Images courtesy of Dovetail Cultural Resource Group)

Analysis

The artifacts uncovered during the Phase II evaluation ranged from architectural to domestic to personal in use, with large amounts of glass and metal present. Ceramics recovered consisted primarily of ironstone (1842–1930) and whiteware (1805–present), suggesting occupation occurring no earlier than the mid-nineteenth century (Hatch et al. 2014:149). Both cut nails, which span the majority of the nineteenth century, and ungalvanized wire nails that date from 1890–1945 were found in large numbers, signifying an original

construction and then later maintenance and improvements to the dwelling and its outbuildings (Hatch et al. 2014:148). The presence of glass vessels used for storage purposes as well as several bottles containing screw-top finishes (1858–present) and Owen's suction scars (1903–1940) corroborates the late-nineteenth and early-twentieth century occupation of the site (Miller et al. 2000:8).

Figure 5: Photograph of the Site Prior to Excavation.
(Images courtesy of Dovetail Cultural Resource Group)

Based on the archaeological evidence, the house appeared to have been of timber frame construction with a brick chimney. Maps created by Dovetail after the Phase II excavations illustrate the original location of the chimney as well as the current chimney fall. Units 12 and 4 on either side of the chimney base are believed to have been placed in the location of the hearth. Artifact deposition and large stones suggest that the original structure was most likely parallel with Dyke Road, with an outbuilding located around TUs 13, 8, and 7 (Figure 6).

Figure 6: Site Plan of 7K-C-460 (Hatch et al. 2014:145).

Documentary evidence, primarily the deed from Lydia Selby's first acquisition of the house, suggests the presence of multiple outbuildings. This is further supported by the current landowner's recollection of there being both a house and garage on the site. Archaeological excavations point to some type of detached shed or garage located directly adjacent to the eastern side of the house. Similar to the main dwelling, the outbuilding appears to have also been of frame construction and may have been a pre-fabricated made-to-order garage. The presence of asphalt shingles within the units associated with the garage/shed structure suggest that the outbuilding may have been constructed or had maintenance completed sometime after the original dwelling was built.

The lack of other outbuildings identified during excavation does not preclude their existence. If the property did belong to a farmer, then it is highly likely that a formal equipment shed existed on the property at some point during its occupation. Based on the changing ownership of land over time and frame construction of the main dwelling, it is possible that any outbuildings would have been of earthfast or frame construction. After the destruction of the main dwelling, the outbuilding would have most likely been destroyed in order to use the land for farming again, and the chances of locating this building without archaeological testing are not likely. The artifacts found during excavation provide a rich history to the lives of the burned dwelling's inhabitants, from stylistic choices to day-to-day

activities. The large amount of personal items recovered, as well as the sheer volume of the number of artifacts recovered during excavation, suggest that the fire took place while the house was occupied or still furnished. Because the context appears to have been the casualty of a catastrophic burn, many if not most of the occupants' belongings were left behind to burn in the fire. There have yet to be any documentary resources found that reference a fire taking place at the property.

Burn Context

In-depth archaeological analyses of structural fires are not common, but the information that these considerations can yield is invaluable (Harrison 2013:955). Scientific investigations and case studies have narrowed down several different methodological techniques that can be utilized in archaeological fire analysis including macroscopic examinations of fire-related features, and various examinations of magnetic properties with the use of a magnetometer (Bellomo 1993:525). These investigative techniques can be employed to identify how the building may have burned and potential origin points of the fire (Harrison 2013:957). This information can be further explored to inform the design of the building, and the layout and size of rooms (Harrison 2013:957).

In the case of site 7K-C-460, archaeological evidence shows different areas that may represent either origins of the fire, or locations of intense burning. Glass, which begins to soften at approximately 1000 degrees Fahrenheit and flows at approximately 1300 degrees Fahrenheit, aids in locating areas with more intense burning (Doroszenko 2013:42). At 7K-C-460, melted glass is located in substantial numbers within TUs 12 and 3, which are the units closest to the hearth. Melted glass also occurs in lower numbers within TUs 4, 7, 8, 9, 10, and 13 (Figure 7). This, combined with a lower ash content, suggests that the outbuildings presumed to be located in or around these test units were not burned, but demolished at a later time. Similarly to glass, melted metal can also be indicative of high temperatures. Instances of melted metal occurred in TUs 3, 12, and 13. Based on the melted materials and lenses of ash uncovered during excavation, it is highly likely that the fire began or encountered a substantial fuel source either at or within the proximity of the hearth.

Figure 7: Example of Melted Glass Recovered from Site 7K-C-460.
(Image Courtesy of Dovetail Cultural Resource Group)

In many cases, the directionality of fire debris may indicate the way in which the building collapsed. With that being said, the cleanup of the materials after the fire can obscure the building collapse (Doroszenko 2013:42). The lack of larger pieces of architectural material (besides the chimney) and overall flat surface of the area suggests that after the fire subsided, valuable materials that could be recycled were removed and the remnants of the building were most likely demolished so that the area could be reused (White and Kardulias 1985:70–74). Processes that involved moving the wreckage during demolition provides reasons as to why there is a high artifact scatter across the site. Based on the stratigraphy of the soil and decreasing artifact counts, it is likely that the actual dwelling did not extend to the south/west further than TU 3 (Figure 8 and Figure 9).

Figure 8: Representative Soil Profile from TU 3 (Hatch et al. 2014:146).

Figure 9: Representative Soil Profile from TU 9 (Hatch et al. 2014:147).

The demolition of the house post-fire raises many questions and can complicate the archaeological record. The concentration of artifacts around the house and their general grouping by activity type suggest that they were left in-situ after the fire; but because there is a good chance that debris was moved across the site, true depositional location of artifacts is questionable, and activity locations within the site can be obscured. With that being said, the lack of a specific location of materials does not detract from the wealth of knowledge they can add to the history of the home. Site 7K-C-460 contains a large number of personal materials that aid in the understanding of what was happening on the site close to the time of the fire.

TU 12 contained the highest number of artifacts recovered during excavation of the site. While the test unit is believed to be located within the interior of the house, it contained a large number of tools and metal materials, suggesting that a small shed or lean-to may have been located along the wall on the exterior of the house. The presence of objects such as a garden hose sprayer and a sickle show inhabitants' concern with the appearance of their home and suggest that the property may have included a garden or manicured lawn. A large collection of buttons were found as well, including both brass alloy and prosser buttons, as well as parts of suspender hardware (Figure 10 and Figure 11). Was someone mending clothes by the hearth in the evenings? Or do these represent items of clothing stored in a bedroom either above or adjacent to the hearth that went down in flames with the rest of the home?

Figure 10: Examples of Buttons Recovered from the Site.
(Images courtesy of Dovetail Cultural Resource Group)

Another intriguing group of artifacts was the array of jewelry found on site. The site is believed to have burned during Lydia Selby's ownership, and while it has yet to be determined if she was in fact occupying the site at the time of the fire, the artifacts of personal adornment recovered provide tantalizing evidence to a strong female presence. Mostly uncovered in TU 3, the items ranged from necklaces and pendants to finger rings (Figure 12). Many of the items exhibited floral motifs and glass beading. Several pieces of a rosary were recovered, as well as one finger ring that features three snakes and closely

resembles a style of finger rings advertised for gentlemen during the Victorian era (Figure 13). Who did these pieces of jewelry belong to? Was it landowner Lydia Selby? Or were they inherited items from previous inhabitants James Reese and Alden Benson? Whoever they belonged to did not have time to collect them during their escape from the fire.

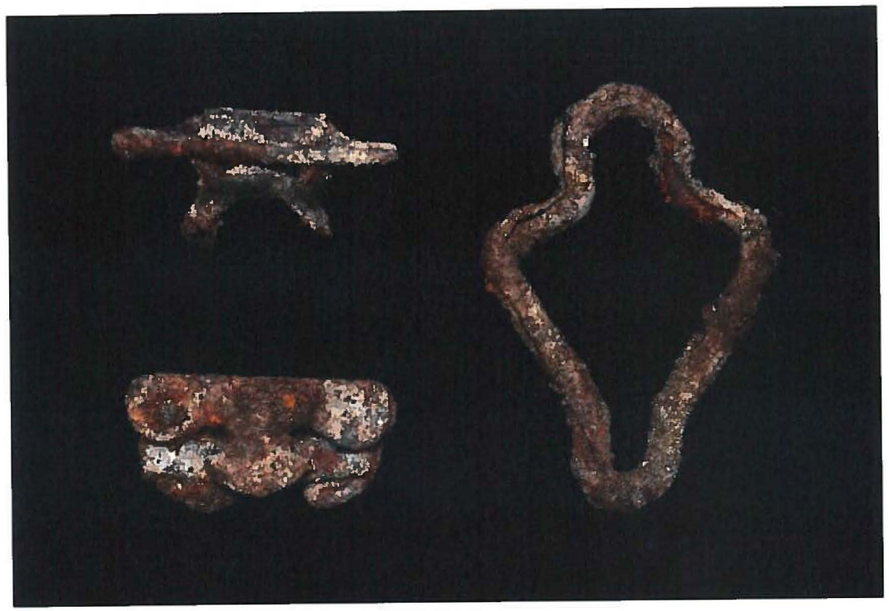

Figure 11: Examples of Suspender Hardware Recovered from the Site.
(Images courtesy of Dovetail Cultural Resource Group)

Figure 12: Several Artifacts of Personal Adornment Recovered Primarily from TU 3.
(Images courtesy of Dovetail Cultural Resource Group)

Figure 13: Close-Up of Finger Ring with Three Snakes Motif.
(Images courtesy of Dovetail Cultural Resource Group)

Archaeological findings not only show evidence of maintenance of the property and personal belongings, but foodway practices as well. The test units located within the presumed shed/garage area show evidence of both storage and canning activities. Several Ball canning jars were located in this area, as well as other jelly and fruit jars, and enameled pots, which may have been utilized in the canning process. The canned goods may have simply been used by the homeowner for their own consumption, but they could also represent an interaction with the community through the selling of preserved fruits and vegetables. The units located in this area also contained a large number of hardware-type metal artifacts, including parts of a chain, barbed wire, an almost complete bucket, hinge and latch parts. Similarly to how sheds and garages accumulate odds and ends today, the space was probably utilized to store pieces of projects and materials used in the upkeep of the property.

Interpretations of the artifacts uncovered during excavation are far from conclusive. With that being said, the robust nature of the assemblage as a result of the fire provides an opportunity to situate the inhabitants within their immediate landscape as well as the community around them. Items such as gardening tools and canning materials indicate their interaction and visibility in the community. The wide variety of sewing materials and artifacts of personal adornment showcase their personal preferences in terms of style and dress. At the time of the fire, the individuals that occupied site 7K-C-460 left behind a wealth of information that gives clues to their identity and role within the community.

Contribution To The Area

Following excavations of site 7K-C-460, the site was given a Cultural Resource Survey (CRS) number and an archaeological site number. It was also determined that the site was

potentially eligible for listing on the National Register of Historic Places based on its ability to yield information important on area history (Criterion D). The ESNG pipeline proposed for this area was modified from its original plans to avoid this site; the pipeline was bored deep underground to avoid all significant archaeological deposits.

An examination of site 7K-C-460 not only aids in understanding the site's former residents, but of the greater area as well. The property was the homeplace of generations of families living in the Kent County area. The area occupied by site 7K-C-460 supported the families farming the property as well as aided the local economy by providing both goods and employment for tenant farmers. Documents suggest that much of the tenant farming near the site took place during the ownership of the Barcus family, who allowed people to live and work on the farm in exchange for the labor and goods produced.

When the land was sold and divided, the site occupied a 1-acre (0.4-ha) tract, allowing for small amounts of farming to take place. Later on as the land was sold, the division of parcels provided more living space and economic opportunities for new inhabitants in the area. Over time population growth has led to an increase in economic development and opportunity in the area. The period of time represented by the occupation of site 7K-C-460 represents an era of change, characterized as a period of growth in transportation and manufacturing (Hatch et al. 2014:153). This is especially notable by an evaluation of the material goods left behind by Jane Selby or her tenants at the time of the disastrous fire that destroyed the dwelling in the early- to mid-twentieth century. The changing ownership and land use that took place at the site is representative of greater economic and cultural trends taking place not only in Kent County, but in the state of Delaware as well.

A fire take place on the property provides both an opportunity and a complication. Because of the large amount of artifacts left behind, it is believed that the fire was a catastrophic one and not an intentional razing by the homeowners. Having the archaeological record be relatively unaffected by the surrounding area's changes post fire suggests that data recovery excavations would be fruitful. The ability to orient the artifacts spatially allows for them to be attributed to certain use areas and provide an in-depth understanding of how the occupants lived their daily lives through one of the most intimate perspectives: within the home. The analysis of 7K-C-460 is far from complete. But having so many personal effects left behind offers a more complete perspective on what the lives of the dwelling's occupants consisted of. This information in turn can contribute to the history of Kent County and agricultural life at the turn of the twentieth century. A typical archaeological site can provide things thrown away, left behind, and forgotten. A burn context affords a more nuanced understanding of past lives and practices.

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THE CLAM GARDENS ON POT HOOK CREEK (SOUTH OF CAPE HENLOPEN, DELAWARE)

Glen Mellin and Lenny Truitt

The dimming of the light makes the picture clearer
Its just an old photograph, theres nothing to hide
When the world was just beginning.
(Brian Eno and David Byrne 2008)

INTRODUCTION

This essay is the result of our ethnoecological survey of a portion of the Pot Hook Creek drainage located southeast of Lewes, Delaware (Figure 1). During the fall of 2014, we assessed the environs about Pot Hook Creek in order to identify, record, and better understand the immediately available species of plants and animals, which may have contributed to the benefit of various ancestral Native Americans who resided at two associated National Register of Historic Places (NRHP)-listed sites. Both of these sites exhibit extensive shell middens, which accumulated as food processing debris from about 2600 B.P. through about 350 B.P.

Our overall interpretation in this ethnoecological assessment is the illumination of the former clam gardens on Pot Hook Creek as a fully developed food production system. This system supported large human populations through at least seasonal cycles, in this tidal, brackish water, back-bay locale. When these clam gardens are viewed through social and cultural lenses, we see very highly developed economic systems. From planning through harvest, their cultivation likely included physical divisions of labor in marking parameters, cleaning, suppression of predators, selective harvesting, reseeding, and storing preserved meats. We also envision advanced community organization tactics through ownership, defense, and planned generational inheritance of the clam garden food production system.

At this Pot Hook Creek locale in eastern Sussex County, we view these clam gardens as cultural keystone economic properties. They were likely the focus of integrated and durable economic, social, spiritual, and ceremonial processions that continued for over 2,000 years. These clam gardens seem to have been inherited through time by definable and successive populations. We think the yield of this durable economic program supported successive ceramic technologies, from Wolfe Neck to Coulbourne to Mockley, through a series of changing techno-environmental landscapes.

Figure 1: Map of Lewes, Delaware.

The storable yield of these clam gardens on Pot Hook Creek probably offered enough spare time for communities to engage in elaborate trade and exchange systems resulting in local cultural manifestations often referred to as "Delmarva Adena." Additionally, our research indicates periods of definable social friction. While the above populations likely owned and inherited the clam gardens, an immigrant ethnic group who made Hell Island ceramics, did not have access to these clam gardens. And finally, another likely immigrant group who made Rappahannock series ceramics seems to have taken over, or seized and supervised, the clam gardens on Pot Hook Creek until the unsettlement associated with European contact.

For a half-century, we have seen the bright light of archaeology having a laser focus on the remaining terrestrial shell middens and trash heaps on Pot Hook Creek, obviously important physical features that demand both preservation and refined explanation. But, just as Eno and Byrne suggested in their song, "Home," by dimming the light, we see a clam garden food production system on Pot Hook Creek becoming visible—appearing out of the cultural ecological shadows. Clam gardening is an ethnoecological explanation. We propose that in

seizing control, owning, and improving specific aspects of their local environment, specific ethnic groups of ancestral Native Americans were able to design, improve, and manage resources according to their worldview. Clearly, people who owned and managed this clam garden economic system on Pot Hook Creek were not only able to defend their territory, they were able to define their neighbors. In this essay, we make the argument that the clam gardens and the clam garden economic program on Pot Hook Creek is certainly worthy of recognition and protection as Delaware's first Traditional Land and Resource Management area.

Background Information

We conducted our ethnoecological survey of the Pot Hook Creek area on three different days—September 22 and 23, and on November 2, 2014. Examples of candidate ethnoecological species were observed, recorded, and assessed. In particular, our assessment involved where and how plants and animals were clustered, and if those clusters might have been originated or managed by the ancestral Native Americans living in the immediate area. Evidence of ancestral Native American use of the immediate area is well documented in the Townsend Site and Wolfe's Neck Site NRHP nomination forms.

The Townsend Site (7S-G-2) is located on the west side of Pot Hook Creek, and the Wolfe's Neck Site (7S-D-10) is located on the east side of the creek (Figure 2 and Figure 3) (Thomas 1974, 1976). Our survey identified four species that we determined to be significant to the cultures who lived at the above sites as follows: 1) A botanical cluster of Jimson Weed (*Datura stramonium*); 2) Botanical clusters of non-native (historic) Wineberry (*Rubus phoenicolasius*); 3) Extensive botanical clusters of Skunk Cabbage (*Symplocarpus foetidus*); and 4) Extensive cultural shellfish debris indicating previous clusters of clam (Mercenaria mercenaria). Each of these resource clusters will be addressed. Each of the species and the location of each clusters present opportunities for new and significant ethnoecological interpretations.

What is not of general public knowledge is that a Phase II survey of the Townsend Site's "rectangle" was conducted in 2004 by Heite Consulting. In that survey, Heite completed a shovel test pit program in the wooded "far east" portion of the Townsend Site rectangle in the vicinity of GPS 0488745–4288759. That survey identified a massive clamshell scatter associated with likely Mockley ceramics. Heite also conducted a shovel test pit program in the wooded "far west" portion of the rectangle in the vicinity of GPS 0487856–4288988. That survey identified a clamshell scatter associated with likely Coulbourne ceramics.

Results Of Ethnoecological Survey

Our Pot Hook Creek survey produced a wide range of interesting and significant results. We identified a number of plant species and one animal species. Many of these species have been documented elsewhere as having been ecological assets to ancestral Native Americans. These assets range from fuel, raw materials for tool and craft construction, of spiritual and ceremonial focus, foodstuffs and/or medicines.

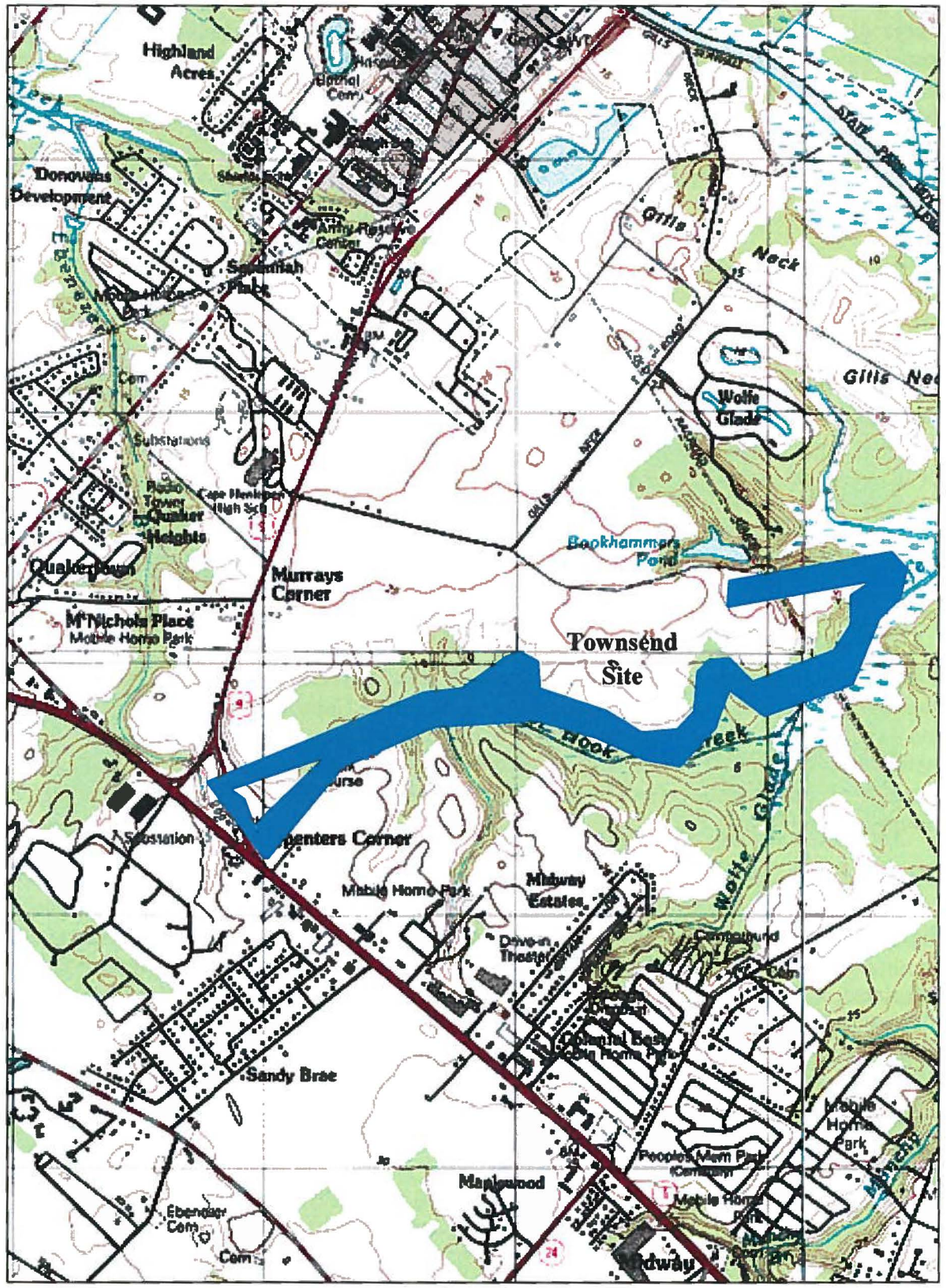

Figure 2: Pot Hook Creek (West Side) Sites and Survey Area. The survey area is in blue.

Figure 3: Pot Hook Creek (East Side) Sites and Survey Area. The survey area is in blue

Many examples of these identified species along Pot Hook Creek seem to appear randomly, to varying degrees, in the immediate locale. However, we found four species occurring in dense clusters, which we determined significant not only to our survey, but significant to the people who used this locale as their home. Focusing on these clusters allowed us to offer new and interesting interpretations of the everyday activities of the Colonials and the ancestral Native Americans who resided and prospered on these lands and waters. It is our hope that the living descendants of these former residents will appreciate the efforts and extraordinary accomplishments their ancestors made for themselves and to the human species.

A wealth of documentation exists for individual species itemized in this essay. For Delaware, we suggest referring to Mellin and Truitt (2014a)—our spreadsheet showing Moerman's (2009) medicinal plants used by Native Americans cross-referenced with McAvoy's (2013) list of plants found in Delaware. Additionally, one may use our archaeobotanical (archaeologically recovered) synthesis for Delaware (Mellin and Truitt 2013). The above synthesis may also be viewed on the Delaware Department of Transportation website at (http://www.deldot.gov/public.ejs?command=Public ArchaeologySearch).

As stated earlier, we offer interpretations based on the plants and an animal found during our survey of the Pot Hook Creek locale. We organized the species we found into groups following long-standing, professional management models, such as the methods used in the ethnoecological subsets, ethnobotany and ethnobiology, which are regarded as the living elements of the ecological landscape that ancestral Native Americans lived in, and manipulated for their benefit.

Identifying Plants Of Interest

The ancestral Pot Hook Creek was likely a mosaic of wetlands and drains with an ocean formed dune field separating it from the Atlantic Ocean. Three thousand years ago, the Pot Hook Creek estuary likely resembled a recently drowned stream channel and flood plain system feeding the newly formed, shallow back-bay lagoon located west of the northward migrating Cape Henlopen.

Today, one ubiquitous estuary plant is Phragmites (*Phragmites* ssp.), an invasive plant that is known to delineate a transition zone where freshwater mixes with brackish water. Currently, this delineation in Pot Hook Creek is located where open marsh transitions to wooded canopy cover, or about GPS 0488707–4288682. This location also appears to be the limit of daily tidal influence. We could characterize the current upstream portion of Pot Hook Creek as a freshwater, wooded swamp in a generally deeply incised stream valley fed by various landscape runoff traces, in addition to multiple slope seeps. The downstream portion of Pot Hook Creek is currently brackish water and salt marsh—a likely result of recent and Historic siltation.

Excluding the ferns, we found higher frequency of all the plants listed in Table 1 and Table 2 upstream from this brackish/fresh transition zone. Several things could be in play here. On the one hand, is this an indication that the persistence of these plants is inhibited by brackish water? Or, on the other hand, are we witnessing the remains of cultural botanical arrangements that have escaped their cultural location? A third possibility is that these examples of these culturally beneficial plants as found, simply cannot be meaningfully interpreted.

Let us use the ferns we found as an additional example. The varieties of ferns found appear nearly everywhere there is shaded moist soil. The quantity of ferns observed increased and diminished with no discernable regularity. We could have been observing the escaped remains of cultural fern gardens, whose limits have decayed beyond spatial recognition, or, this seemingly random fern pattern may simply be just that—a random pattern.

Table 1: Identified Plants of Interest.

Common Name	Scientific Name	Status	Medicinal	Edible
Bracken Fern	*Pteridium aquilinum*	Common	Yes	Yes
Broad-leaved Arrowhead	*Sagittaria latifolia*	Common	No	No
Catalpa	*Catalpa* spp.	Adventive	No	No
Crested Wood-Fern	*Dryopteris cristata*	Common	Yes	Yes
Fern (Unidentified)	*Dryopteris* spp.	?	?	?
Mint	*Mentha* spp. *(canadensis?)*	Uncertain	Yes	Yes
Persimmon	*Diospyros*	Common	Yes	Yes
Raspberry	*Rubis* spp.	Rare-Uncommon	Yes	Yes
Red Mulberry	*Morus Rubra*	Uncommon	Yes	Yes
Trillium	*Trillium* spp.	Rare-Uncommon	Yes	Yes
Wild Calla or Water-Arum	*Calla palustris*	Uncertain	Yes	Yes
Wild Strawberry	*Fragaria virginiana*	Common	Yes	Yes

Table 2: Significant Animal and Plants Found in Clusters.

Common Name	Scientific Name	Status	Medicinal	Edible
Clam (Quahog)	*Mercenaria mercenaria*	Common	No	Yes
Japanese Wineberry	*Rubus phoenicolasius*	Non-Native	No	Yes
Jimson weed	*Datura stramonium*	Adventive	Yes	Yes
Skunk Cabbage	*Symplocarpus foetidus*	Common	Yes	Yes

Table 1 is a list of interesting plants of cultural benefit we found in our survey of the greater Pot Hook Creek area. Examples of each of these species were found in varying populations at varying habitat locations. It is very likely that local sea level rise has had a dramatic effect on salinity regimes in this shallow, back-bay locale. This rise in sea level would have resulted in a net movement, or transgressive relocation of the brackish/fresh transition zone moving up the Pot Hook Creek valley. Currently, extensive areas of salt marsh are indicators that these ancestral tidal back-bay locales have accumulated extensive silt deposits. All of these changes have produced the mosaic tidal stream—salt marsh complex we see today.

Significant Animal And Plants Found In Clusters

Our Pot Hook Creek survey produced four species that we determined to be significant in relation to the two known archaeological site complexes, The Townsend Site and the Wolfe's Neck Site. The four species we found are listed alphabetically in Table 2. We will discuss these species individually, in two sets: the first set is Jimson Weed and Japanese Wineberry. These species are addressed in this essay as physical living indicators of human activity or identifying the location of Culturally Modified Soils (CMSs). The second set is Skunk Cabbage and Clam. These species are addressed in this essay as descriptor species of ancestral Native American economic importance.

Set One: Jimson Weed and Japanese Wineberry

Jimson Weed

In Delaware, Jimson Weed is listed as an Adventive species (McAvoy 2013), thought to have arrived here within the past 5,000 years—likely a direct result of ancestral Native American efforts. Moerman (2009) discusses various Native American usage of Jimson Weed as having medicinal and ceremonial importance and is an edible herb. It is noted that Jimson Weed grows best in full light on well drained, sandy soils that have experienced intense cultural activity. We view Jimson Weed as a cultural keystone plant in Delaware.

During our ethnoecological survey, we observed a large patch of Jimson Weed (*Datura stramonium*) growing in the Lima bean field immediately north of where the flattish agricultural field begins its slope down to the Pot Hook Creek floodplain (Figure 4). About 200 Jimson Weeds comprise this dense cluster, which measured about 150 feet (45.7 m) north to south and about 200 feet (61 m) east to west with a center point of GPS 0487111–4288958 (see Figure 4). The surface soil at this location is noticeably darker than the surrounding soils. We deduced some sort of intense cultural activity at this location had formed this soil—cultural activity that would have been much more intensive than simply the surrounding soils which are a product of mechanized agriculture. This location is likely to be a historic site location of the Colonial Period.

Japanese Wineberry

Japanese Wineberry is not listed on McAvoy's (2013) list of plants found in Delaware. Nevertheless, Wineberry is described elsewhere as having been introduced to Delaware early in the twentieth century in an attempt to hybridize varieties of Raspberry. Apparently, these attempts at crossbreeding Wineberry did not work out as expected. Wineberry has since escaped and may be found growing along field edges at various locations in Sussex County, Delaware. Wineberry thrives in loosened sandy, and windblown soils along the edges of agricultural fields.

Our ethnoecological survey discovered three dense clusters of Japanese Wineberry (*Rubus phoenicolasius*): two growing on the west side of Pot Hook Creek and one growing on the east side of Pot Hook Creek (see Figure 4 and Figure 5). These three large clusters of

Wineberry are found growing in sheltered areas within fully canopied woodlots, which are very odd locations for any members of the Rubus genus to thrive.

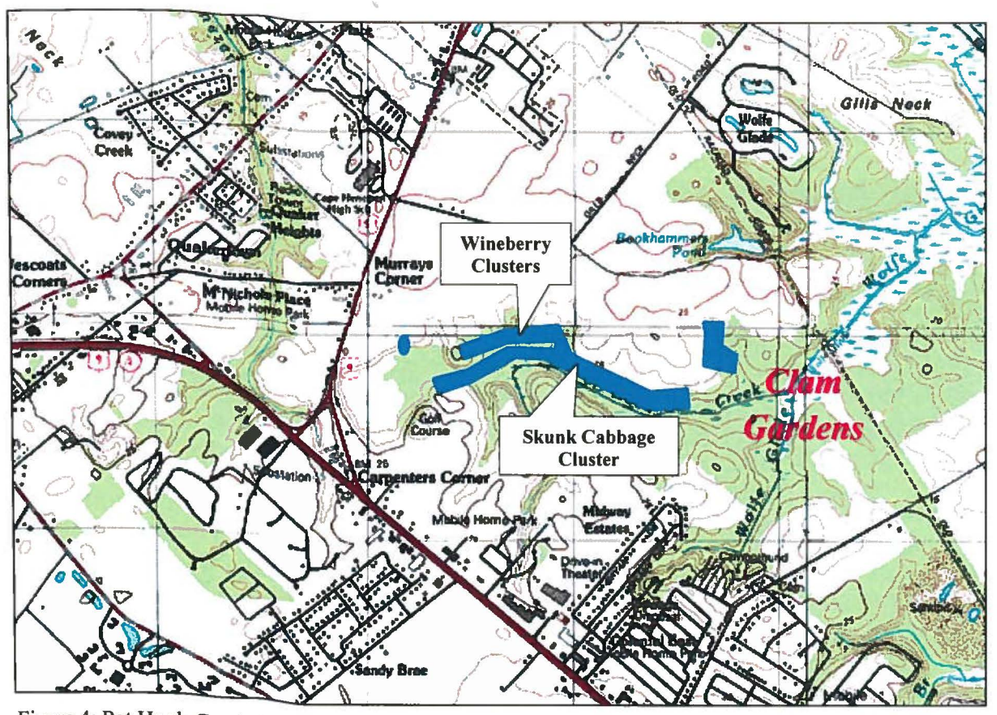

Figure 4: Pot Hook Creek (West Side) Survey Results in Blue. The unlabeled survey results area to the west is the Jimson Cluster, and the unlabeled survey results area to the east is part of the Wineberry Clusters.

On the west side of Pot Hook Creek, flanking the agricultural field area of the Townsend Site are two large wooded areas (see Figure 4). A large Wineberry cluster is found in each of these mature wooded parcels. The measured limits of the western Wineberry cluster are GPS 0487438–4288872 to the west and 0487934–4289031 to the east. The measured limits of the eastern Wineberry cluster are GPS 0488664–4288841 to the west and 0488750–4288793 to the east.

An unpublished archaeological survey of these wooded parcels (Heite 2004) discusses culturally modified soils, Mockley ceramics, and clamshells identified in the eastern woodlot, and CMSs, Coulbourne ceramics, and clamshells identified in the western woodlot. Our survey found a large Wineberry cluster growing in each of these wooded areas on these previously identified Native American CMSs.

On the east side of Pot Hook Creek, flanking the agricultural field area of the Wolfe's Neck Site, we identified a large Wineberry cluster growing in the western and northern wooded slope areas and along the eastern bluff edge of the previously recorded Wolfe's Neck Site area (see Figure 4). We documented this current western limit of this Wineberry cluster at GPS 0490068–4289293. Close by, an overturned tree stump exhibited some cultural

shellfish debris at GPS 0490072–4289298. Alternately, the Delaware State Historic Preservation Office (DE SHPO) Wolfe's Neck Site NRHP nomination form (Thomas 1976:5) pinpoints the southwestern site limit (Point A) at GPS 0490100–4289260. We believe these very similar GPS readings are not simply a coincidence. What we have discovered here, at this location, is that this large cluster of Wineberry is growing on these previously documented CMSs, at least as a result of the reduced soil acidity found in the culturally derived shellfish debris deposited there.

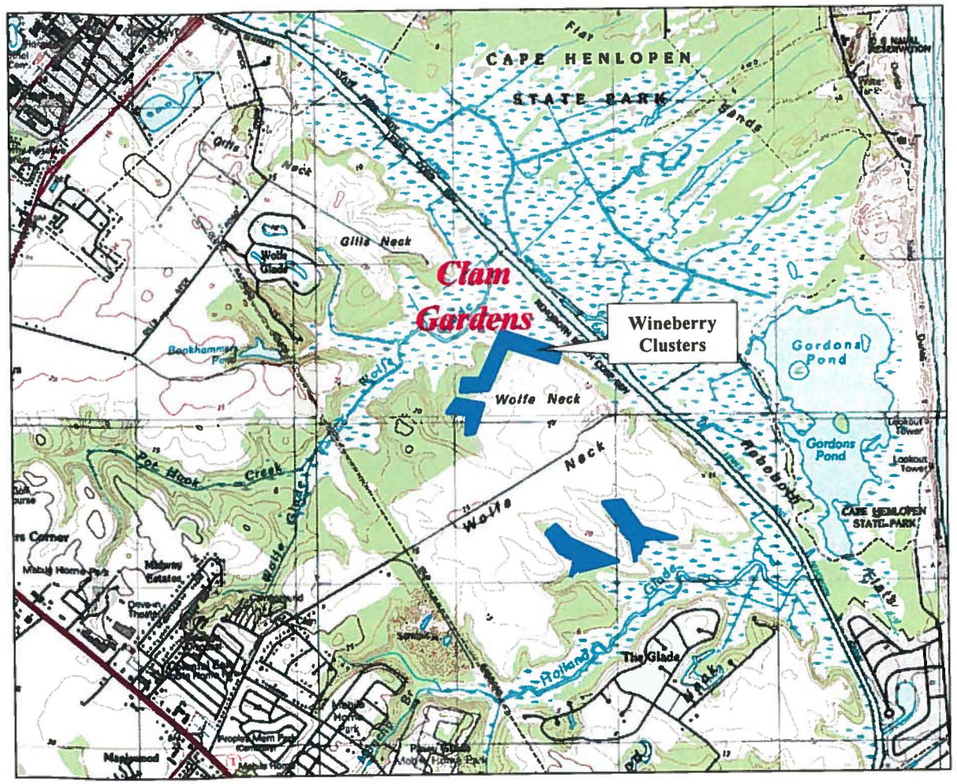

Figure 5: Pot Hook Creek (East Side) Survey Results. The three unlabeled survey result areas are part of the Skunk Cabbage Cluster.

The co-occurrence of Wineberry found in cluster form in these wooded environments and CMSs, at all three known wooded site areas, is a profound new realization. Wineberry, it would seem, is able to populate and thrive on these areas of CMSs. As a future indicator of presence or absence of wooded archaeological sites, this Wineberry species is likely a powerful new tool. Further research in the field of Ethnobotany may show that Wineberry is just one species in a suite of species (see our previous discussion on Jimson Weed) capable of showing astute observers where CMSs are located.

Set Two: Skunk Cabbage and Clam

Skunk Cabbage

Skunk Cabbage is listed by McAvoy (2013) as a common Native plant in Delaware. Moerman (2009) lists the Skunk Cabbage as having Native American medicinal uses and is reported to be an edible plant, especially in late winter and early spring. Turner (2014) discusses cultural benefits of growing and harvesting Skunk Cabbage, which we will address momentarily in this section. When we do find Skunk Cabbage in Delaware, the plants appear in discrete clusters. These clusters have endpoints that are highly definable and easily mapped using GPS documentation. We do not generally encounter examples of Skunk Cabbage that appear to be randomly or sparsely populated.

Our ethnoecological survey of Pot Hook Creek identified four substantial clusters of Skunk Cabbage (*Symplocarpus foetidus*). The largest Skunk Cabbage cluster currently occupies the drowned creek valley near the Townsend Site (see Figure 4). Three other Skunk Cabbage clusters currently occupy drowned runoff and seepage valleys draining from the Wolfe's Neck peninsula into the surrounding tidal, brackish and salt marsh areas (see Figure 5).

In reviewing the four clusters of Skunk Cabbage found during our Pot Hook Creek survey, the first cluster occupies the Pot Hook Creek stream valley (see Figure 4) from GPS 0487352–4288826 upstream, to 0488519–4288680 downstream. This cluster is in close spatial proximity to the Townsend Site. The second cluster occupies a drain and seepage to Pot Hook Creek, or Wolfe Glade (see Figure 5) from GPS 0489950–4289100 to 0490050–4288950. The third cluster occupies a drain and seepage to Holland Glade (see Figure 5) from GPS 0490950–4288450 to 0491100–4288200. The fourth cluster occupies a drain and seepage to Holland Glade (see Figure 5) from GPS 0490600–4288300 to 0490950–4288075.

How is our identification of these Skunk Cabbage clusters, or gardens, significant to this survey? Our ethnoecological survey was designed to look for remnant "signatures" of plants and animals that may have been of benefit or necessity to the ancestral Native Americans who lived nearby. Such ecological resources are more easily addressed through describing Native American economic programs than by excavation through archaeology. We think Skunk Cabbage played a very important role in the local economy, yet various plant remains, such as Skunk Cabbage, rarely, if ever, are preserved in the archaeologically excavated database. Nancy Turner, an archaeologist, ethnoecologist, and ethnographer, has compiled a wealth of information on the value of Skunk Cabbage in the lives of Native Americans. In her area of expertise, the northwest coastal and mountain zones of North America, Turner (2014:326–327) says:

> Skunk-cabbage leaves also seem particularly suited to aiding in food processing and storage, not only because of their large size but also because of the waxy coating on their leaves, their flexibility when warmed, and possibly, too, the raphides of calcium oxalate in their tissues that might deter pests. These leaves were used for multiple purposes: to line cooking pits, or earth ovens; as a surface on which to dry berries; for makeshift drinking cups and berry containers; for covering highbush cranberries, currants, and other

berries being stored; and for lining pits and, later, barrels used to make fermented salmon eggs.

Turner (2014:249) relays a Haida and Tlingit story regarding Fog Woman (and her husband, Raven), who taught Raven how to wrap fish and shellfish in Skunk Cabbage leaves; "Fog Woman, who was married to Raven, captured all of the fog in Raven's spruce-root hat. Then she used that same hat to capture all of the different kinds of salmon and showed Raven how to pit-cook salmon, wrapping it in skunk-cabbage leaves, and how to smoke it." Although Skunk Cabbage roots have been used in the Pacific Northwest as halibut bait, it seems the leaves were most often used as lining and wrapping materials. We view Skunk Cabbage as a cultural keystone plant in Delaware.

Clam/Quahog

Much of Delaware's descriptions of ancestral Native American contexts are based on previous archaeology conducted within these shell-middens found at the Townsend Site (Thomas 1974) and the Wolfe's Neck Site (Thomas 1976). However, in our current ethnoecological approach, we wanted to look at the extensive reliance on clams (*Mercenaria mercenaria*) from environmental and economical perspectives instead of from the traditional archaeological perspective. In short, we wanted to evaluate how shellfish factored into the ancestral Native American economy at this location—why were these people here, and what were they doing? We identified and will discuss some new solutions to those questions—solutions, which have the potential to significantly improve our understanding of these various Woodland peoples and their economic programs.

From a grand perspective, these accumulations of shellfish debris on Pot Hook Creek appear to be overall, horizontally and frequently vertically stratified. Shell-midden excavation analysis has provided lists of temporally organized, culturally definable contexts. Carbon samples, in association with Native American ceramics and shellfish debris, have produced carbon dates that range from about 2600 B.P. to about 350 B.P. Given this 2,200-year duration, as some models of projected sea level rise might suggest, the known locations of datable shell debris on Pot Hook Creek does not consistently or evenly, over time, move upstream. Even though there appear to be cultural "hot spots" up and down the stream valley, it seems that all of the cultures represented on the Pot Hook Creek drainage made use of all of the resources, and very likely improved and maintained, and even relocated beneficial resources within this drainage.

The quantity of cultural clamshell debris found on Pot Hook Creek is substantial, perhaps the largest known accumulation of clamshell debris within the State of Delaware. Other, smaller deposits of clamshell are recorded on discrete sites elsewhere along the Coastal Bay and Delaware Bay river systems. However, we recognize the difference in proportion of clamshell debris from location to location as being meaningful.

Measuring Native American clamshell debris can be an obtuse and cumbersome task. In this essay, we measure Native American clamshell debris by the dump truck load, an approximation of 12 cubic yards (9.2 cu m). We use this method of measurement for overall visual effect, not for its scientific accuracy. Thus, when we speak of small sites with small

cultural clamshell deposits, we suggest these deposits are within the range of one to ten dump truck loads. When we speak of cultural clamshell deposits at the Townsend Site and the Wolfe's Neck Site, we are talking about cultural clamshell debris in the range of hundreds of dump truck loads. We therefore view Clam as a cultural keystone animal in Delaware, especially at these significant sites on Pot Hook Creek.

In general, small sites with small cultural clamshell debris fields can be multicultural, but they are rarely sequentially multicultural. We propose a clam foraging economic program at these locations. With the Townsend Site and the Wolfe's Neck Site combined, they offer horizontal and vertical stratification data that exhibits sequential multicultural use. We propose a clam garden economic program at these locations. So, what is a clam garden economic model?

We use the word garden, because it implies the concept of cultivation. As Webster's (1967:202) defines cultivate, as "to prepare or prepare and use for the raising of crops", we suggest our clam garden model contained tidal areas set aside for the cultivation of clams. Today, these proposed clam garden areas along Pot Hook Creek have unfortunately accumulated massive amounts of silt where they have been transformed into salt marshes (see Figures 4 and 5).

INTERPRETATIONS

Obviously, in Delaware, years of future research could be applied to asking questions concerning clams found along Pot Hook Creek, as well as the ancestral Native American contexts in which they are embedded. What do the contents of the various shell middens and other cultural features tell us about who was doing what through time? What made this particular back-bay location a suitable place for the sustainable production of shellfish?

We should also be asking a wide range of environmental questions, such as: how and when did this back-bay form in relation to the littoral repositioning of Cape Henlopen; what were the effects of past sea level rise; what will happen to this locale if subjected to terrestrial development or additional Army Corp of Engineer dredging? How will this locale be impacted by projected future sea level rise?

The process of ancestral Native American clam gardening should be addressed wherever we find evidence of huge amounts of cultural shell debris. We need to be judicious in describing evidence of shell debris because the quantity of shellfish debris over time is important. We need to address whether a cultural deposit represents successive cultural inheritance of a managed location, or are we looking at a small deposit representing an isolated, short-term singularity. Turner (2014:212) reminds us, "Clam beds, carefully built up to extend their area and productivity, were created and sustained on many parts of the coast (Fowler and Lepofsky 2011; Recalma-Clutesi 2005; Williams 2006). Quantifying successive sustainability is likely the key element that differentiates clam gardening from clam foraging!

We also think that clam gardening would regulate the division of labor where elders, women, and children (arguably three-quarters of the total available population) contributed

more directly to food procurement. Turner (2014:55) says: "This may have endowed these groups (elders, women, and children) with higher status and possibly shifted the power relationships within families away from the stronger, more dominant male who hunted in groups with other men and toward a more balanced social standing across gender and age groups." How do these suggestions oppose or agree with previously assumed social strata for these cultures in this locale? Do these suggestions add to or take away from our ideas about material, ceremonial expressions commonly referred to as "Delmarva Adena"?

This clam gardening program, along with berry gardening, and maintaining other fruit orchards and nut groves, is perhaps the strongest indication of gender biased, or matrilineal organized, economic properties we have thus far suggested in Delaware. The waste debris found in the shell middens on Pot Hook Creek is an indicator of what was being processed. Species such as razor clams, conch, scallops, ribbed mussel, etc. were likely cleaned out of the clam beds and probably contributed to edible food stocks. Harvested clams, however, represent a strong bias toward large, adult clams. We can only assume that the small- and medium-sized clams were left behind as breeding stock, as they are woefully under-represented in artifact databases and collections. We think selectively harvesting only large clams represents a regulated clam harvest size. This form of garden management would harvest adult clams that will not grow larger and produce ample room for juvenile and small clams to reach maturity. We think this form of management could increase the yield of the clam beds at least fourfold. Such management programs designed to increase sustainable yield are consistent with other examples of matrilineal organized economic properties where reliable, owned, and inherited resource based Traditional Land and Resource Management areas (TLRMs) are organized within larger, territory based TLRMs.

Clam garden management, or shellfish stewardship, implies the cultivation of harvestable clams within a storable shellfish economy, promoting enhanced economic predictability with a large degree of permanence, even if permanence is based on a repetitive seasonal basis. Such factors might enrich trade and exchange networks and result in elaborations of ritual, ceremonial, and mortuary practices. Williams (2008:1) said, "The clam gardens were one of the foundation blocks of aboriginal economy for specific coastal peoples. If they are accepted as an essential cultivated and privately owned unit of Native economy, a term like 'hunter gatherer', which has been used by social scientists to define Northwest Coast Native society, must be reassessed." This is why we are making a profound distinction between clam foraging and clam gardening. We strongly suggest our idea of clam gardening involves regulated selective harvesting and cultivation. Our ethnoecological explanation of clam gardening as an anthropogenetic landscape, or TLRM property, simply cannot be properly addressed using the moniker "hunter gatherer."

What is the legacy of clam gardening on Pot Hook Creek (circa 2600 B.P. to 1650 B.P.)? The long story is one that requires a great deal more research, but the short story is one where we need to readjust our impressions about who these people were with at least the following three thoughts:

1) The makers of Wolfe Neck, Coulbourne, and Mockley ceramics (including their various derivative and debased forms) built, maintained, owned, and sequentially inherited these clam gardens on Pot Hook Creek. Their material surpluses likely

afforded them the opportunity to engage in trade and exchange to acquire goods (and perhaps services) moving east from the Potomac Trail, the Appalachian Trail, and the Delaware Trail (Mellin and Truitt 2014b), including, but not limited to, materials and ceremonies that have previously been referred to as manifestations of "Delmarva Adena", or "Fox Creek", etc. There are no known human burials found from any of these populations (2600 B.P. through 350 B.P.) at the Wolfe's Neck Site. However, there are a number of known cemeteries and ceremonial sites (2600 B.P. through 350 B.P.) for the above populations and other populations (including the Island Field Site) located a few miles to the north.

What does this seeming succession of labeled ceramic types really mean? When viewing our clam garden economic model for Pot Hook Creek, these changes in ceramic labels probably describe a succession of technological developments within a socially stable group rather than a succession of different people or different groups of people.

2) The makers of Hell Island ceramics, a likely immigrant group from western New York State, did not have access to the clam gardens on Pot Hook Creek—there are no Hell Island ceramics on Pot Hook Creek. Although there is some evidence that the makers of Hell Island ceramics did forage for small amounts of clams nearby (see the Argo's Corner Site, for example), there are no Hell Island ceramics directly associated with the clam garden shellfish cultural debris on Pot Hook Creek. Overall, the efficiency of clam garden economy on Pot Hook Creek may have diminished while the makers of Hell Island ceramics lived nearby. Certainly, archaeologists have hotly debated how the makers of Mockley (and the derivative Claggett) ceramics and the makers of Hell Island ceramics could have co-existed in seemingly overlapping territories. The main cemetery and ceremonial center for the makers of Hell Island ceramics (circa 1500 B.P. through 800 B.P.) is located near Bowers Beach.

3) The makers of Rappahannock and later Townsend ceramics, possibly an immigrant lineage with Chesapeake origins, seem to either have inherited and maintained, or seized and supervised the clam gardens on Pot Hook Creek. The focus of their habitation site was situated slightly upstream on Pot Hook Creek for undetermined reasons. We do know the location of the Cape was constantly moving. Tidal and salinity regimes in the back-bay and lagoon areas, and sea level rise may have all contributed to the demise and relocation of some of the previously sustainable clam garden beds. The efficient use of watercraft may have allowed easier access to distant clam beds, across deeper waters. At the Townsend Site, we recognize a number of human burials that were interred there after 1000 B.P.

Integrating These Ethnoecological Observations

Obviously, injecting a clam garden economic program and other ethnoecological interpretations into ancestral Native American cultural explanations has the potential to add significantly to understanding Delaware's prehistory. Interpreting cultural ecology is at the heart of the issue. We share the desire, and appreciate the overall strategy, to identify, analyze, interpret, and protect significant cultural resources. Yet, when we fail to properly

identify cultural resources, using these clam gardens on Pot Hook Creek as an example, the rest of the process is pointless.

Under the umbrella of Cultural Resource Management, there are many discussions about organizing cultural traits into various periods of context—as if the label "Context" or the concept of context somehow validates, justifies, or legitimizes our efforts in exploring, organizing, and explaining the activities of individuals, families, and groups of people. We find that the implementation of the context labeling system of ancestral Native American behavior continues to be shaped by Eurocentric ideals, and, in general, continues to dwell on explanations of adult male activities. This needs to change. Our approach to investigating the totality of what qualifies, or what may qualify as a cultural resource strives to examine individual, families, and groups of people within their anthropogenic landscape, the landscape of their creation, not ours. Many elements of these anthropogenic landscapes endure to this day and are appreciated by the few who keep an open mind in knowing what to look for, and take the time to look for them.

It is nearly impossible to neatly fit this clam garden economic system into the existing organizational context system. Actually, some people prefer to organize ancestral Native American behavior through the techno-temporal context method using Early Woodland, Middle Woodland, Late Woodland as definable, non-overlapping contexts. But this method seems to disallow two different ethnic groups occupying a similar territory. For example, in this essay, we seem to have a group of people making Mockley ceramics (technically Early Woodland), engaged in a clam garden economic system, while at the same time we have an immigrant group of people living a few miles away making Hell Island ceramics (technically Middle Woodland), apparently engaged in an upland economic system.

Additionally, we have the environmental context method using Woodland I and Woodland II as definable, non-overlapping contexts. But this method also seems to disallow two different ethnic groups occupying similar territory. For example, in this essay, we seem to have a group of people, continuing to use Hell Island ceramics or derivatives thereof (technically a continuation of Woodland I), while a different ethnic group—a Rappahannock ceramic making immigrant community (technically Woodland II)—continuing with a clam garden economic program living at the Townsend Site.

Clearly, we cannot turn one context off and turn another one on as easily as drawing water from your kitchen faucet. Even trying to apply some sort of transitional apparatuses between contexts is a sloppy and probably a false assumption because, again, there are different ethnic groups of people together with their different cultural and economic systems moving and repositioning around the landscape.

There has been no evidence concerning the inhabitants discussed in this essay where an immigrant group expediently displaces or annihilates a seated group. Yet, during periods of such "assumed" immigrant positioning, there are indications of economic disruption, or social friction between neighboring groups. These disruptions sometimes lasted for hundreds of years. We do see some indications, however, that after a long time some assimilation, or cultural homogenization, did occur, at least until the next immigrant group appeared. These topics are immensely important to this discussion, but unfortunately, we do not have the

time or space in this essay to explore them. We would, however, very much enjoy reading someone else's essays addressing ideas like: "Where is Claggett a derivative of Mockley"; or, "Under what circumstances does Hell Island lose its mica temper". We think the keys to answering some of these questions are imbedded in the anthropogenic landscapes—areas much larger than a string of comparative or contrasting archaeological sites.

Why are anthropogenic landscapes/cultural resources in need of protection? Because they are critical remaining elements to understanding that humans manipulated aspects of their environment to their liking. We found an author new to this area, Dr. Nancy Turner, who addresses that question in her new book, *Ancient Pathways, Ancestral Knowledge: Ethnobotany and Ecological Wisdom of Indigenous Peoples of Northwestern North America* (2014). We very much appreciate Nancy Turner's approach and recommend her new book to everyone interested in her encompassing scope of Cultural Resource Management.

Following this new paradigm, we are persistent in integrating an ethnoecological approach to identifying and managing our collective cultural resources. It is equally important for archaeologists to have an appreciation for understanding the widest range of possible cultural behavior within all aspects of all anthropogenic landscapes and TLRMs. If this sounds like a monumental task for anyone planning or conducting a cultural resource survey, you are right. It is a monumental task. Turner (2014:165–166) discusses the many reasons why governments, archaeologists, and other "authorities" are biased and misdirected in believing ancestral Native American territory was not fully occupied, or that an "anthropogenic landscape could encompass a group's total territory."

Turner says, at the very least, we must come to grips with the concept that ancestral Native Americans maintained anthropogenic landscapes that were larger than 50 percent of their total useable territory. Turner (2014:148–149) defines a TLRM as, "The conscious accumulation, application, and adaptation of any combination of techniques and methods drawn from traditional ecological knowledge systems, mediated by particular beliefs and worldviews, that sustain or enhance the availability, abundance, productivity, diversity, and/or quality of a plant or animal population or of an entire resource area or habitat over a period of years or generations…"

When we understand that ancestral Native Americans enjoyed an indivisible kincentric relationship with their TLRMs, we have to view TLRMs as highly significant cultural resources, even though the cultural resource, or TLRM may not contain any traditionally recognizable artifacts. Some researchers suggest that residual stone, bone, shell, and ceramic, the items we commonly call artifacts, represents five percent to 10 percent of material culture. The remainder, of course, is either ethnobotanical, ethnobiological, or the TLRMs that contain them. For example, the prospective clam gardens on Pot Hook Creek probably qualify as ethnobiological economic programs contained within a definable TLRM that supported significant numbers of people, spanning successive cultures, for several thousand years. That is an important new idea.

If we connect the gardening of clams on Pot Hook Creek with the leaves of the Skunk Cabbage gardens on Pot Hook Creek as clam smoking and clam storage wrappers, then we have multiple elements within a TLRM working together as a cultural resource economic

system. In turn, we could deduce that this system produced the main reliable/storable/edible protein that enabled material and ceremonial embellishments, such as what is known as "Delmarva Adena". In short, if we didn't have these productive clam gardens on Pot Hook Creek, it is very likely we would not have "Delmarva Adena". This is where the new paradigm of TLRMs is able to incorporate these cultural elements into a unified cultural and economic explanation, where the contextual explanation alone has discouraged this sort of thinking. This has been the main reason why some people continue to erroneously support the idea that Delmarva Adena is a complete cultural context independent of all other cultural contexts, and existing without a definable economic program.

Some people may be inclined to quickly point out that a TLRM falls under the old definition of context, but, it does not, and here are some examples why. The largest and most stubborn reason is that TLRMs, or subsets of anthropogenic landscapes, often contain no traditionally recognizable artifacts. An example might be a sandy hill next to a huckleberry swamp. The hill may have served as a very important, even essential berry harvesting and drying camp, occupied by elders, women, and children during specific harvest periods of the seasonal round. Yet, even when a few cultural features are present, if this site contains no temporally diagnostic tools or ceramics, this location would typically not qualify as an interesting cultural resource under the current assumption of context. This location would most certainly qualify as a TLRM, but because the location might lack a subjective quantity of datable cultural artifacts based principally on "style", these locations are typically ignored after Phase I survey. These very important locations usually fail to receive proper recognition, or assignation of a cultural resource location number.

If we continue to apply these forms of ineffective thinking inherent in context definition, we will continue to read ineffective explanations, such as: "We think we know where the men were and what they were doing, but we don't know where the elders, the women, and the children were, or what were they doing." This is why we have to ask, why do we continue to misidentify what three-quarters of the indigenous population were doing, and where they were doing it? Or is it that we don't really care what they were doing?

SUMMARY

As a result of our ethnoecological survey on Pot Hook Creek, there are so many new things to talk about we regrettably have to distill this summary down to a simplified list of topics discussed. Our Pot Hook Creek ethnoecological survey re-located and evaluated two known NRHP site complexes: the Townsend Site and the Wolfe's Neck Site. Our survey identified three plant species and one animal species found in cluster forms that we felt were significant to our survey. We found and recorded ethnoecological clusters of Jimson Weed, Japanese Wineberry, Skunk Cabbage, and Clam. Combining the known archaeology and our identified species clusters allowed us to make a number of meaningful interpretations about past human behavior at this locale that would not have been possible without the results of this survey.

These massive clamshell middens and debris fields on Pot Hook Creek have a date range of 2600 B.P. through 350 B.P.. Horizontal and vertical sequential strata offer many great opportunities to illustrate sequences of who was there and how they lived their lives at this

locale. The first grouping is a continuous use involving Wolfe Neck-Coulbourne-Mockley ceramic verities (perhaps 2600 B.P. through 1000 B.P.). The second grouping is an absence of use involving Hell Island ceramic verities (perhaps 1500 B.P. through 800 B.P.). The third grouping is a continuous use involving Rappahannock and Townsend series ceramics (perhaps 1000 B.P. through 350 B.P.). These dates are derived from sites within Delaware, not necessarily from these two sites immediately on Pot Hook Creek. Nevertheless, an increasing number of carbon dates with significant date overlaps, from ceramic type to ceramic type provides an opportunity for new and meaningful explanations in assessing the behavior of immigrant groups and assimilation.

Turner's (2014) concept of TLRM areas is an attempt to organize Native American groups on an ethnoecological basis. The TLRM system supports different ethnic groups simultaneously occupying adjacent and even overlapping territories. This system allows, for example, a coastal group living in close proximity to an upland group and explores the obvious benefits of trade and exchange between the two groups (occupying similar territory, but developing and exploiting different environmental niches and creating different economic systems). These different groups produced and maintained different anthropogenic landscapes, and as we identify and record elements of these different landscapes we are creating a new, more insightful explanation of the lives and times of these ancestral peoples.

We think the clam gardens on Pot Hook Creek produced the required, storable yield that offered some of these people sufficient affluence and spare time to engage in distant trade and exchange. It remains difficult to explain what was traded out of this area, but we do find various groupings of artifacts transported into Delaware that have been referred to as "Delmarva Adena". The presence of these groupings of artifacts, ritually deposited with the deceased, illustrates the maximum kincentric value in any anthropogenic landscape. Certainly, more research is needed on these very interesting topics, and perhaps in the future, a clearer picture of what really happened here on Pot Hook Creek will emerge from these shadows. As Eno and Byrne once said, the dimming of the light makes the picture clearer—it's just an old photograph, there's nothing to hide, when the world was just beginning.

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