

**Indigenous Cultural Landscapes Study for the
Captain John Smith National Historic Trail:
the Lower Susquehanna Area**

September 2015

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prepared under cooperative agreement with

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Lewisburg, PA

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Annapolis, MD

Executive Summary

The area of the Lower Susquehanna River from Harrisburg, PA to the head of the Chesapeake Bay in Maryland contains more than 50 identified sites of significance for Native American history and culture. These sites are part of a larger landscape of river, hills, plains, and waterways that are meaningful to the history and present-day lives of people who claim American Indian descent, especially from the Susquehannock Indians. This study, based on scholarly and oral traditions, argues that remnant peoples of Susquehannock descent were absorbed into the various nations of the Haudenosaunee and continue to have a vital interest in the interpretation and preservation of this stretch of the Susquehanna River.

This report provides background and evidence for the inclusion of many of these locations within a high-probability indigenous cultural landscape boundary—a focus area provided to the National Park Service Chesapeake Bay and the Captain John Smith Chesapeake National Historic Trail Advisory Council for the purposes of future conservation and interpretation as an indigenous cultural landscape.

In this study we define indigenous cultural landscapes as areas that reflect “the contexts of the American Indian peoples in the Lower Susquehanna area and their interaction with the landscape.” The identification of indigenous cultural landscapes “ includes both cultural and natural resources and the wildlife therein associated with historic lifestyle and settlement patterns and exhibiting the cultural or esthetic values of American Indian peoples,” which fall under the purview of the National Park Service and its partner organizations for the purposes of conservation and development of recreation and interpretation (National Park Service 2010:4.22).

Using this definition, we identify two indigenous cultural landscapes that meet the criteria we provide based on a thorough mapping of the areas and also a full survey of the scholarly sources and we describe the methodology used to obtain this information and represent the resulting landscapes.

Acknowledgements

This study has benefitted from the input, advice, and expertise of many people.

First, Dr. Ben Marsh, Department of Geography, Bucknell University, provided invaluable guidance and deep vision at the outset of this study. The mapping of the Native American archaeological sites and paths would not have been possible without the foundational work done by two Bucknell University students: Emily Bitely '11 and Steffany Meredyk '14. These two extraordinary women produced professional quality work as undergraduates, the fruits of which are to be seen in the map layers used to analyze and define these Indigenous Cultural Landscapes.

The Lower Susquehanna indigenous cultural landscape study leaders, Brenda Barrett (Living Landscape Observer) and Jackie Kramer (National Park Service) were also instrumental in paving the way for our study. In addition, Jerry Dietz provided initially the lens through which the PI looked at the landscapes of the Lower Susquehanna on a long hilly walk one afternoon up the steep hill behind the Zimmerman Heritage Center on Long Level, Wrightsville. Here the plan, now realized, to interpret the hilltop as the site of a major Susquehannock settlement was laid out. In addition, Paul Nevin introduced the PI to the enigmatic petroglyphs of Safe Harbor and to the powerful evocative meeting of earth, water, and sky at their location in the river.

At Bucknell, Dr. Alf Siewers inspired us to look at landscapes as signifying entities that do not exist to merely feed humans but that themselves harbor meaning. Sid Jamieson has continued to tell the stories of the Haudenosaunee, in which beings-other-than-human speak, play games, and teach us, Native and non-

Native, that there are other ways to see the world than the one that dominates for the most part today.

These threads came together to make the fabric that underlies this report. But without the vision of Deanna Beacham, and the Indigenous Cultural Landscape concept that comes from her office, we could not begin to look at the world around us through this new lens, and see what has been and what is in these landscapes, and what we must do to preserve them for all.

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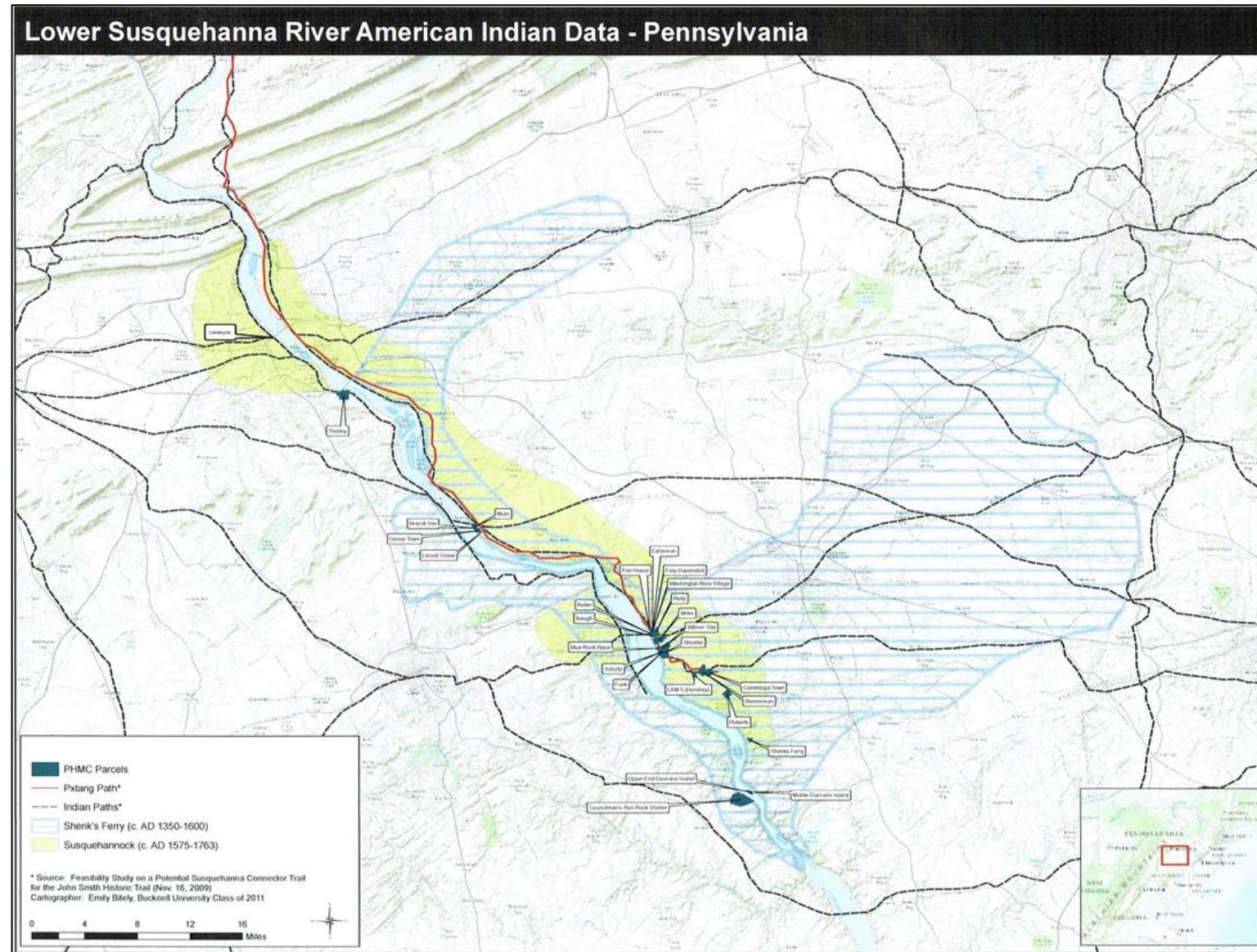
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Introduction

The area of the Lower Susquehanna River from Harrisburg, PA to the head of the Chesapeake Bay in Maryland contains more than 50 identified sites of significance for Native American history and culture. Spanning a time period from the Late Woodland (900 CE-1600 CE) into the Contact Period (1500 CE-1763 CE), these sites are part of a larger landscape of river, hills, plains, and waterways that are meaningful to the history and present-day lives of people who claim American Indian descent, especially the Susquehannock Indians. Although frequently written out of history by scholars of Colonial Pennsylvania after the infamous 1763 Paxton Boys' massacre, this study draws instead on the argument from scholarship and oral tradition that remnant peoples of Susquehannock descent were absorbed into the various nations of the Haudenosaunee and continue to have a vital interest in the interpretation and preservation of this stretch of the Susquehanna River.

The purpose of this study is to provide evidence and interpretation of the locations and landscapes that lie within a high-probability boundary that will be provided to the National Park Service, Chesapeake Bay and the Captain John Smith Chesapeake National Historic Trail Advisory Committee for the preservation, interpretation and conservation of the area as an historic indigenous cultural landscape (see Fig. 1).

Figure 1: High-probability boundary area for indigenous cultural landscape in the lower Susquehanna River



Criteria

The criteria we have developed for the designation of an Indigenous Cultural Landscape of the Lower Susquehanna are derived from the original questions posed by the Captain John Smith National Historic Trail: namely, 1) known archaeological, ethnohistorical, and contemporary academic secondary source data connected to the landscape, 2) presence of and use by descendent communities, 3) present-day landscape evocative of what may have been encountered by Captain John Smith and used by the Susquehannock people of the early 17th century, and 4) mutual interest in landscape conservation by partner agencies (e.g., state and community organizations).

Methodology

In the determination of probable ICLs this study employed the following methodology. First, a database of all documented archaeological sites in the study area was made and maps drawn in GIS that contained data layers focused on the biophysical environment, the historical and archeological sites, and contemporary boundaries and infrastructure. A complete list of data layers that were gathered and that are available in a single geodatabase can be found in Appendix E.

These layers were then supplemented with georectified archival maps of the area from archival sources. Then, a thorough ethnohistorical account was written by our consultant, Dr. David Minderhout. This account was then edited and abstracted by PI Dr. Katherine Faull and maps illustrating the argument of the narrative drawn up by Dr. Kristal Jones. In order to illustrate the view sheds discussed in this report, Dr. Faull then used the data layers included in Dr. Jones' maps in ArcMap Online to run an analysis of view sheds from strategic positions within the ICL. In order to identify view sheds that best captured the area of the ICLs the study team visited sites on the Lower Susquehanna and met with local experts, Paul Nevin. An interview was requested from Jerry Dietz, but he was unavailable at that time. However, Dr. Faull had met with him previously when the Native Lands Park was being planned and had conducted lengthy interviews with him at that point and with other members of the Lancaster-York Native Heritage Advisory Council.

ICL recommendations

Based on the findings presented through this report, we recommend for conservation as indigenous cultural landscapes the areas along the lower Susquehanna that are:

- a. within the view sheds from Conowingo Dam and the Susquehannock fort, Meanock; (a landscape of indigenous trade, exchange and movement);
- b. within the view shed from Highpoint scenic vista (a landscape of horticulture and settlement as evidenced by density of Native population documented over centuries).

Indigenous Cultural Landscape Concept

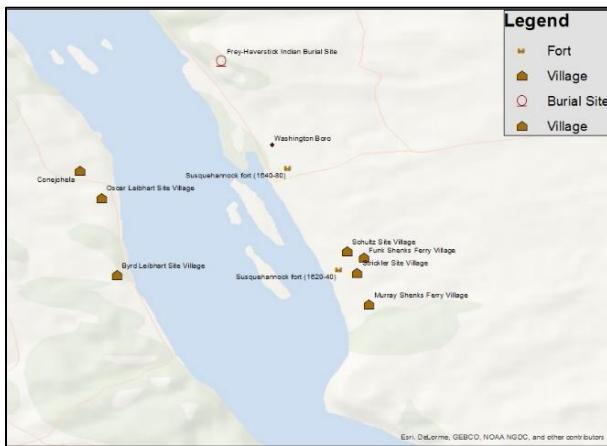
In this report we define indigenous cultural landscapes as areas that reflect "the contexts of the American Indian peoples in the area of the Lower Susquehanna River and their interaction with the landscape." (National Park Service 2010: 4.22) This identification of indigenous cultural landscapes "includes both cultural and natural resources and the wildlife therein associated with historic lifestyle and settlement patterns and exhibiting the cultural or aesthetic values of American Indian peoples," which fall under the purview of the National Park Service and its partner organizations for the purposes of conservation and development of recreation and interpretation. (National Park Service 2010: 4.22) Using this definition, this report provides the significant indigenous cultural landscape criteria met by the area that we define as reflecting a high probability of being an indigenous cultural landscape. The report also bases its findings on information obtained through a described and documented methodology used to represent the landscape.

Eco-philosopher Val Plumwood asks us to reconsider the landscapes in which we live to include what she has termed the "local earth stories" of place. (Plumwood 1997, 327) These earth stories consist of the histories of the people who lived in landscapes, whose very identities are inextricably linked to the environment, the "Umwelt" or world about them. This philosophical approach to our world expands what had previously been understood as a cultural landscape approach, first coined by Sauer (1963, 342) in

1925, to include not only geographical or ecological parameters, but also human perceptions and values as well. In his 1995 study of the interrelationship of landscape and memory, cultural historian Simon Schama asks us to consider that topography itself can become an historical agent (Schama 1995, 13). By this view, water, rock, wood, soil are all agents in the creation of history, and not just humans. Even as environmental historians define our era as the one of the "anthropocene," that is, a geological era in which human activity is considered to be the dominant influence on climate and the environment, the indigenous cultural approach invites us to move away from such anthropocentrism. Figure 2 depicts the layering of the physical and social characteristics that can help us understand the cultural landscape of a particular place.

Figure 2: Map of Washington Boro showing a) documented Indian archaeological sites; b) Indian paths; c) streams and rivers; and d) tree markers from 1719 warrant map survey

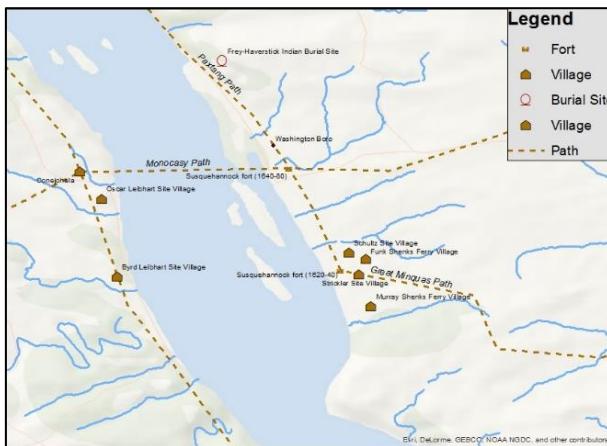
a)



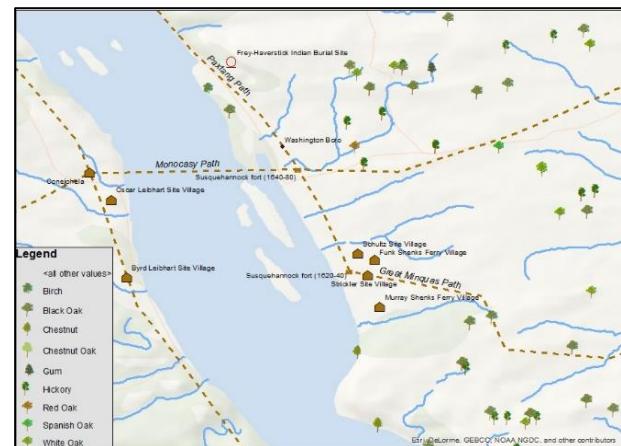
b)



c)



d)



It is therefore central to this report that Native American perceptions of the natural environment be introduced in a consideration of landscape interpretation. In recent decades, many non-Native Americans have come to appreciate that a life of harmonious interaction between humans and the natural environment is a salient feature of the Native American worldview, and many books, from popular texts like *Black Elk Speaks* (Neihart 2004) to scholarly works like *The Way of the Human Being* (Martin 2000) have documented and extolled that worldview. And indeed, according to the native perspective, nature does not exist to be dominated, controlled or subdued by humans, but rather humans and nature are intertwined and mutually dependent on each other. In his book, *Native Religions of North America* (1987), Hultkranz notes that Native Americans “...share a notion of cosmic harmony, in which humans, animals, plants, all of nature, and even supernatural figures cooperate to bring about a balanced and harmonious universe.” (1987, 20-21). The cultural landscape included animals and plants, not just as potential food items, but as intelligent, spiritual beings that had meaning for humans. As Hultkranz continues, “...Indians have paid more attention to nature than perhaps any other peoples, and Indian hunters have tended to protect nature, or parts of nature, as manifestations of the supernatural. They care about the trees, because they give evidence of the supernatural; they care about the animals, because they may represent spirits; they care about the vast lands because they may reveal God. Nature is potentially sacred...” (1987, 24). It is a matter of chance that we are born human or non-human; spiritually we are identical. Or, as is said in Lenape, *Elan Kumankw* (“We are all related;” see Hayden 2013, 181-183).

In this sense, through the thousands of years of Native American habitation of the physical landscape of the Susquehanna River Valley, this was not land to be exploited for human gain, but rather a cooperative venture in which all life forms participated as equals. The landscape did not exist to be remade, but rather, as Hultkrantz puts it, “Indians value highly life on earth and their religion supports their existence in this world. The whole spirit of their religion is one of harmony, vitality, and appreciation of the world around them.” (1987, 24).

Natural context of the Susquehanna River

In comparison to the major rivers of North America, the Susquehanna River is seldom mentioned, though it has been extremely significant in the early settlement, commercial and industrial development of the eastern United States and, as a result of the hydroelectric dams built along its lower reaches, an important source of energy for the areas that border it today. The Susquehanna is a river of superlatives. It is the longest river on the East Coast as well as the longest non-navigable river in the United States, i.e., commercial boat traffic from the Atlantic Ocean cannot enter the river because (historically) of the rapids where the river enters the Chesapeake Bay and (in modern terms) the dams that now block passage at the same point. With its North and West Branches and many tributaries, the Susquehanna River drains an area of almost 28,000 square miles, an area as large as the states of Delaware, New Jersey, Massachusetts and Vermont combined. Geologically the river is ancient, perhaps the oldest major river system in the world, at over 300 million years. Unfortunately, it also has the dubious distinction of having been named one of the most environmentally endangered rivers in the U.S.

The North Branch of the river originates at Lake Otsego in Cooperstown, New York, flowing then 324 miles through southern New York and northeastern Pennsylvania. The West Branch begins near Carrollton, Pennsylvania and runs 240 miles until it joins the North Branch at the towns of Northumberland and Sunbury. The combined waters then flow an additional 120 miles south past Harrisburg, Lancaster and York, Pennsylvania, until it empties into the Chesapeake Bay near Havre de Grace, Maryland. While the focus of this narrative is the Lower Susquehanna - the section below Harrisburg to the Bay - the native cultures focused on here - the Shenks Ferry and Susquehannock cultures - were also indigenous to the other branches of the river - and in the case of the Susquehannock, originated there, on the North Branch near Athens, Pennsylvania. As a result, the archaeological information used in this narrative draws upon work in the West and North Branches, and in the case of the Shenks Ferry Culture, is more detailed and complete on the West Branch.

Kent writes, “As it emerges from the gap in the Blue Mountain, just above Harrisburg [the river] reaches the Great Valley Section of the Ridge and Valley Province. The crossing of these two features - the Great Valley and the river - marks the largest intersection of prehistoric travel routes in Pennsylvania.” (1984, 10-11). As the river enters the Triassic Lowland Section of the Piedmont Province, native settlements continue to be found primarily on islands in the river, but as it enters the Piedmont Highland Section, the rolling terrain of the region dominates the river. Here again, native communities are generally found at basin-like openings that naturally occur along the river, such as at Wrightsville and Conestoga Creek, though as at Washington Boro, communities can be also found on the bluffs overlooking the river. According to Kent, “[Washington Boro] might well be considered the Indian capital of Pennsylvania from Paleo-Indian times to the beginning of the eighteenth century.” (1984, 11). In general, Native Americans did not live just anywhere in the Susquehanna Valley, but typically sought out areas where smaller waterways - streams or smaller rivers - intersected the river itself. These areas were complex ecosystems producing a wide variety of natural resources.

Travelling down to the Lower Susquehanna from Northumberland southward, the river appears placid and wide, almost lake-like in places. That is not the river Native Americans knew, nor, for that matter, European explorers, settlers and traders in the 17th and 18th centuries. Prior to the building of the Conowingo Dam (completed in 1928) at Havre de Grace, Maryland, the river was more narrow and shallow - except during periods of spring-time flooding as a result of thawing winter snows upstream. Then swiftly rising waters discouraged commercial traffic; in the rest of the year, the river was unsuited for commerce because of the many rocks in the now relatively shallow river. Large forested islands dominated the scene in the river from Northumberland to Harrisburg; below Harrisburg the river was dotted with many large rocks and rocky outcroppings. This is shown clearly in Benjamin Latrobe’s 1802 map of the Lower Susquehanna, from Columbia, Pennsylvania, to the border with Maryland. Now in the Maryland Historical Society’s archives, and most recently displayed at the Zimmerman Heritage Centre, the map shows a narrow, meandering river dominated by huge rocks protruding above the waterline.

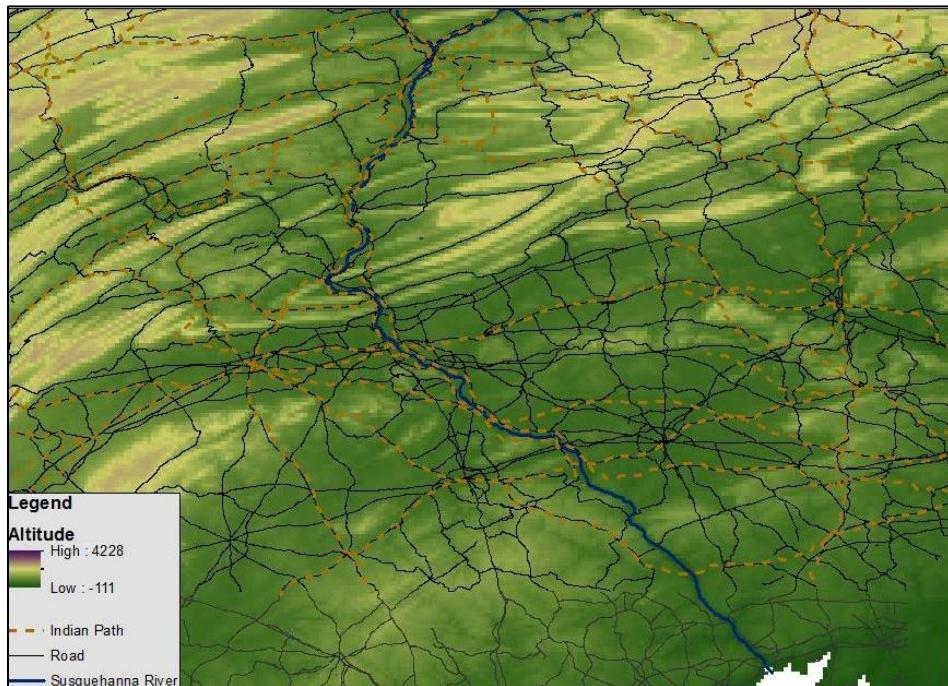
Latrobe attempted to open up the river to navigation by blasting the rocks from a 40 foot wide channel along a long section of the river, but it was not until 1840, with the completion of the Susquehanna & Tidewater Canal from Wrightsville, Pennsylvania, to Havre de Grace, that the Lower Susquehanna became relatively easy to navigate for commercial traffic.

The relationship between the natural environment of the Susquehanna River Valley and its Native Americans inhabitants in different time periods over 11,000 years seems well known. The river provided transportation (by dugout canoe), sustenance (especially in the form of migratory species of fish, such as shad and eels) and later fertile soils along its banks on which to grow maize, beans and squash. The surrounding forests and meadows brought game animals of many kinds into native diets as well as wild plant foods - nuts, berries, seeds, edible roots and so on - and provided the stone and wood necessary to build shelters and make tools.

At the same time, the natural environment set limits on native population and movement. As noted throughout this narrative, native populations were relatively small - though some Susquehannock towns in the 17th century briefly numbered a thousand or more people. Native horticulture could not support intensive agricultural techniques; without industrial scale technology, fertilizers, pesticides and so on, Native Americans could not continuously cultivate crops in a given area for more than a few years at a time. Eventually, without fertilizers, fields became less productive, and communities were forced to relocate. The natural environment also placed restraints on the movements of people and the location of communities (see Figure 3 for historical and contemporary paths of movement across the landscape). Raber (2007, 1) writes, "Within the Ridge and Valley physiographic province, the characteristic long parallel northwest-southwest trending ridges and broad fertile valleys both constrained and facilitated the movement of people and items in keeping with the salient aspects of the landscape. The ridges, whose summits may reach 300 to 450 meters (1000 to 1500 feet) above the valley floor, proved a major barrier to movements across the grain of the landscape, and even modern highways and railroads generally avoid the challenges of crossing the ridges unless necessary. Rivers and larger waterways, on the other hand,

facilitated movements that followed the trellis drainage pattern, paralleling the ridges, except where they were breached by the infrequent water gaps cut by the principal regional streams.”

Figure 3: Waterways, paths and roads around the lower Susquehanna River



People of the Lower Susquehanna

Archaeological and historical research has confirmed that Native Americans have lived in the Susquehanna River Valley for at least 11,000 years. (See Appendix A for more detailed pre-history) Evidence of Native American activity and technology can be found in abundance along both the North and West Branches of the river, as well as the main/lower branch of the river that subsequently flows into the Chesapeake Bay. Investigative research by professional and amateur archaeologists has occurred in the region since the 1920's, and amateur collectors have recovered projectile points, pottery shards and other detritus of everyday existence for long before that. Today, every rise and subsequent receding of the river reveals the existence of more artifacts for enthusiastic collectors, and each spring finds those collectors scanning newly plowed fields along the river for whatever they can find; private collections can number in the thousands of items. Nevertheless, despite the abundance of artifacts and the many centuries

of native habitation, many questions remain about native life along the river, and the archaeological record remains incomplete (Carr and Adovasio 2002; Raber and Cowin 2003; Minderhout 2013.)

Both contemporary economic development and the nature of native life itself give rise to this lack of completion. For most of the time Native Americans have lived along the Susquehanna River, they have been socially organized into small groups that move from time to time through the landscape. These groups seldom maintained a settlement long enough for a wide variety of evidence to be recovered in an archaeological excavation. Highly desirable locations were used and reused as settlements in many places along the river for centuries, but few occupations left much behind other than a few stone tools and the remains of hearths. In order to move through the landscape looking for food you should have few material possessions - basically only the tools essential for survival. Even after agriculture was introduced into the river valley around 3000 years ago, native communities remained small and were often abandoned periodically as the soil in an area became less fertile and wild game and plant foods became over-utilized - a process of perhaps eight to twelve years in contact-era villages. Except for stone tools - and the flakes and fragments left behind in their manufacture - and broken pottery after its introduction - there is little in the material culture of native communities to be preserved and recovered by an archaeologist centuries later. Much of what existed must be inferred and read into the landscape.

For example, for centuries, native cultures made dwellings out of branches set into the soil and bent into hemispherical or loaf shapes; these frameworks were subsequently covered with a bark sheathing to create a shelter. In Pennsylvania's acidic soils, these building materials quickly decompose, but the process of decomposition discolors the soil in which a branch was set - which is called a post mold by archaeologists. Thus, the size and shape of a dwelling can be inferred by the position of post molds in a carefully excavated site. However, compared to prehistoric cultures that worked in stone and lived in large, permanent settlements, sometimes for centuries, such as the ancient Egyptians or Mayans, native communities in the Susquehanna River Valley - and in the Northeast generally - left little to be

found later. This, of course, makes the discovery, excavation and interpretation of what native communities are there to be found to be difficult - and extremely important.

Before looking at specific cultures from the specified time period, it is important to note that Woodland Era cultures were not strictly agricultural. Rather, they continued to combine their hunting and gathering skills with horticulture. (In fact, an important technological innovation of the Woodland Era undoubtedly contributed significantly to the hunting prowess of Woodland hunters - the bow and arrow.) Many anthropologists prefer to refer to these economies as "mixed" rather than as "agricultural," as a consequence. Hunting and fishing continued to occur, thus adding important protein sources to the native diet, and the gathering of wild plants, berries and nuts continued as well. The addition of cultivated crops to the Native American diet in the Woodland Era did not supplant earlier subsistence traditions, but added to them. However, this also added to the need to move communities periodically. After a period of time, hunters would have had to travel farther and farther from their villages to find sufficient game to hunt, which would have added to the pressure to relocate. See Appendix B for a description of Woodland Era Native Cultures in the larger geographical area of the entire Susquehanna River Valley.

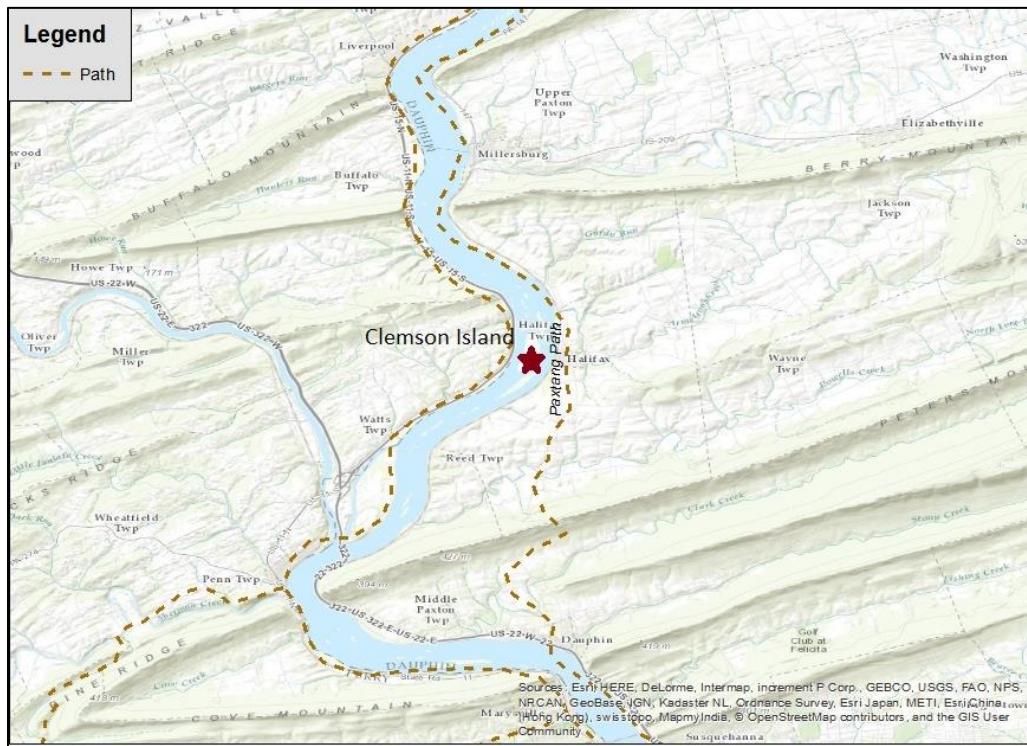
Compared to Paleoindian and Archaic foraging cultures, Woodland Era Native American communities with horticulture were less mobile/more permanent and often larger - considerably so with respect to some late Susquehannock communities, such as those in the present day site of Susquehannock Park, that are thought to have housed as many as 2000 people. The landscapes that can be viewed from what is today Native Lands County Park in York County and also the Highpoint Scenic Vista clearly include Washington Boro, and depict the rolling hills on the west side of the river (see Figure 4).

Figure 4: View looking south from Highpoint Scenic Vista



In the Lower Susquehanna, the topology of landscape had a profound effect on Native American settlements throughout the 11,000 years Native Americans are known to have lived in the Valley. As described by Kent (1984, 10-11), “From Northumberland southward to Harrisburg the Susquehanna cuts through or around the ends of 14 mountain ridges.” Evidence of native camps/settlements is found not on the ridges themselves - though certainly hunting of game animals must have taken place there - but at the mouths of the waterways that cut through the ridges and then enter the river. Settlements were also common on the large, forested islands that dot the river in this section; the Clemson Island Culture (a more complete description of which is provided in Appendix A), the first known native agricultural community on the Susquehanna, was located on these islands (see Figure 5).

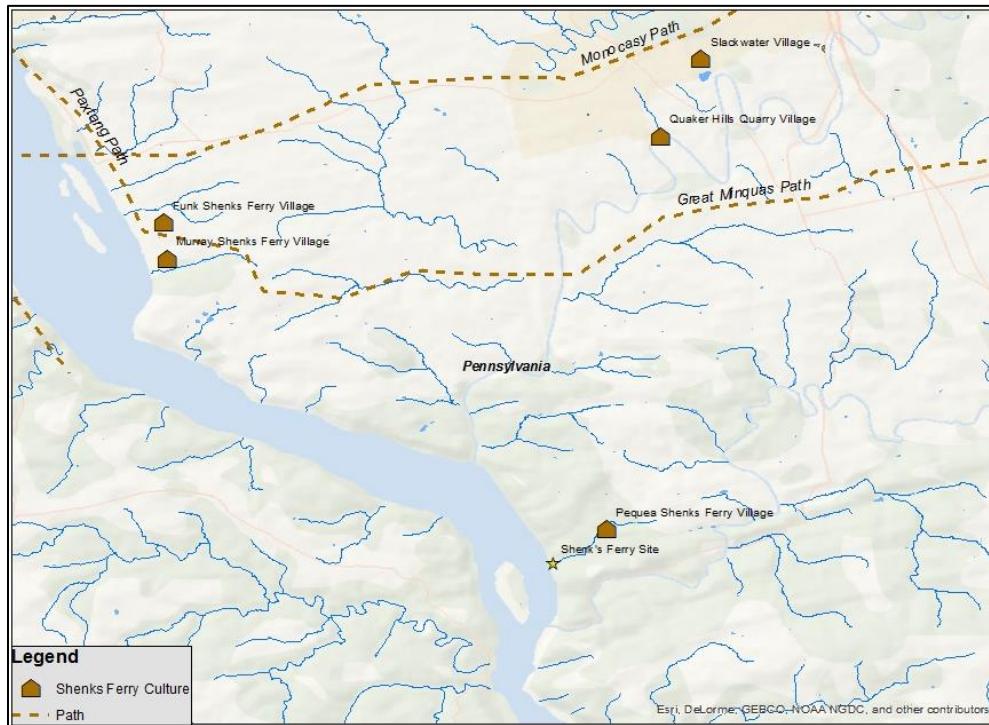
Figure 5: Clemson Island Culture



The Shanks Ferry culture

In 1931 archaeologist Donald Cadzow excavated a prehistoric site in Lancaster County on a tributary of the Susquehanna River known as Grubb Creek. The Shanks family had owned a ferry service at that spot in the 19th century, and the culture identified at this site came to be known as the Shanks Ferry people (see Figure 6 below). Shanks Ferry sites are common on both the West Branch and the main section of the river below Sunbury. Graybill and Herbstritt write that as of 2014, 66 archaeological sites have been identified in the lower Susquehanna River Valley. They continue “Due to the brevity of Shanks Ferry sites, and the lengthy history of historic, intensive agricultural activity in the Lancaster Plain, Shanks Ferry sites, such as those that remain, are extremely fragile, low visibility sites, and they are and continue to be difficult to recognize as surface manifestations.” (2014, 40).

Figure 6: Shenk's Ferry site and Native villages



Shenks Ferry sites are very different from Clemson Island sites. While Clemson Island culture is characterized by large, planned villages, substantial burial mounds, and evidence of social ranking (see Appendix B for more detailed discussion), Shenks Ferry sites are more characteristic of the classic horticultural society described above. That is, they are characterized by short periods of occupation (the brevity mentioned in Graybill and Herbstritt) as Shenks Ferry people move periodically as their fields become less productive. Also, until very late in the Shenks Ferry period, their communities are small and undifferentiated, with no signs of the social stratification found in the Clemson Island culture. There are no burial mounds associated with Shenks Ferry sites; rather, burials are single, extended interments with few accompanying grave goods. Also, instead of large, Iroquois longhouse-like residences, Shenks Ferry people lived in small, single family, hemispherical huts made of interlocked branches covered in bark (wigwams).

Given these dissimilarities, it is surprising that early researchers assumed that the Clemson Island Culture evolved *in situ* into Shenks Ferry. Perhaps this was an easy assumption to make, because as

archaeologist James Bressler points out from his excavations of Shenks Ferry sites on the West Branch of the river in Lycoming County, every Shenks Ferry village was built on top of a Clemson Island occupation. (Bressler and Rainey 2003). Shenks Ferry sites on the West Branch reveal a variety of Clemson Island and Shenks Ferry artifacts, usually separated in different strata, but also intermixed as a result of river flooding, field preparations and the Shenks Ferry custom of digging storage pits for their agricultural produce and garbage. There is even some evidence of Shenks Ferry people reusing discovered Clemson Island stone tools.

However, more recently, similarities have been noted between pottery traditions along the Potomac River in Maryland and Shenks Ferry pottery on the Susquehanna. Pottery serves as a useful tool in archaeological interpretations of the cultures that possess it. Each culture tends to make its pottery in a distinctive fashion, in shape, clay composition, exterior design and even the kind of temper added to the clay to give it strength in the firing process, and these traditions are transmitted through the generations with few changes. Also, once pottery is fired, it is quite hard - though easily broken. As a result, landfills and garbage pits in prehistoric sites are filled with broken pottery, which can then be examined by archaeologists to develop sequences of ceramic development over time and the relationship among contiguous cultures. Thus, Shenks Ferry pottery is rounder than Clemson Island pottery and generally is decorated over the entire surface of the pot, unlike Clemson Island pots which are often unmarked, except for a row of dots pushed into the clay around the raised rims.

As a result, Shenks Ferry people are now seen as Native peoples who moved up the Susquehanna from the Potomac region, and displaced Clemson Island people in the process. Bressler believes that the Clemson Island people moved north - there are Clemson Island artifacts found in sites in central and northeastern Pennsylvania (Myers 2013) - and eventually became the Seneca of western New York State (Bressler and Rockey 1997). This theory fits with the controversial theory of Snow (1994) that the Iroquois cultures of New York State and their antecedent, the Owasco archaeological culture, originated in the Susquehanna River Valley. It is hard to imagine the large, more complex Clemson Island Culture

being displaced by the small, egalitarian Shenks Ferry communities, but as Stewart (1990) points out, late in their time in the Susquehanna River Valley, the Clemson Island people had moved away from their island and the banks of the river inland, perhaps because their large culture had exhausted the horticultural limits on food production. Perhaps what appears to be displacement is, in reality, filling a cultural vacuum.

As already noted, Shenks Ferry communities are classic horticultural societies, growing maize, beans and squash in fields created from old growth forest. Judging by the size of their wigwams and the numbers of them in a particular site, a typical Shenks Ferry community, was inhabited by perhaps 30 to 40 people. They made pottery hand-formed from local clay that was then decorated with lines, dots and distinctive rims before being fired in open fires. They used bows and arrows, tipped with triangular stone points typically made from local flint, as well as larger polished stone implements, such as axes. In addition to maize, beans and squash, they also grew tobacco, which was smoked in small ceramic pipes made from local clay. Agricultural produce was dried and stored in underground pits for later use. They took advantage of the river's abundance, especially the periodic spawning runs of shad, eels and other fish, and as noted earlier, they hunted a wide variety of animals, including deer, rabbits, bears and many kinds of birds. The remains of nuts and berries in trash pits indicate the importance of collected plant foods, as do the seeds of wild plants such as chenopodium. Graybill and Herbstritt (2014, 39) estimate that their communities moved every eight to twelve years, as the soil became less productive and wild game became harder to find, and sites were not ordinarily reoccupied. Again, Shenks Ferry sites are relatively common along the river in Lancaster County. They are also found along the length of the main branch of the river below Sunbury and along the West Branch as far north as the Williamsport area.

Around 550 BP (1450 A.D.), the structure of Shenks Ferry villages changes dramatically. Now villages are surrounded by walls - palisades - of cut tree trunks set vertically in the ground, with only a

single gate for entrance.¹ The gate would have admitted only one person at a time. A stone foundation at one point inside the stockade perimeter suggests a tower built to look over the wall. These villages are significantly larger in population than earlier ones, and the individual homes, while still built by the same principles as the previous small wigwams, were now larger and oval shaped, somewhat like Iroquois longhouses.

The obvious conclusion that is drawn from these changes is that the Shenks Ferry people now felt threatened and had adopted defensive formations to guard against incursions from hostile enemies. Since this time period roughly corresponds to when archaeologists and historians know that the Susquehannock were moving down the Susquehanna from their original home on the North Branch near Athens, Pennsylvania, the conclusion typically drawn is that the Shenks Ferry people were defending themselves against these invaders - though in reality, no one knows for sure. At any rate, this period is short-lived. At the Ault site, for instance, Bressler estimates that the logs used in the palisades would have rotted in the moist, acidic soil within six years, and they were not replaced. What is known is that by 1550 the banks of the Susquehanna south of Sunbury were inhabited by the people we now call the Susquehannock and that Shenks Ferry material culture had disappeared. Bressler and Rockey note that some pottery found in Susquehannock sites includes elements of Shenks Ferry styles, leading them to suggest that some Shenks Ferry women were incorporated into Susquehannock culture. Pottery was a woman's craft among Susquehanna's Native Americans, and in the historical period, it is commonly noted that female captives, both native and European, were adopted into native communities.

The Susquehannock culture

In 1608, in his exploration of the Chesapeake Bay, Captain John Smith reached the point where the Susquehanna River meets the Bay. Unable to take his boat farther because of the falls at the point

¹ A site in Lycoming County, the Ault Site, has a moat around the periphery of the stockade that was twelve feet across and five feet deep at its deepest point - all dug without metal tools like shovels or picks. (Bressler and Rockey 1997).

where the river entered the Bay, Smith stopped among the native people called the Tockwagh to rest and replace provisions. While there, a contingent of sixty warriors visited the Tockwagh to trade. According to Smith, these warriors “seemed like Giants to the English...the calfe [of the greatest of them] measured three quarters of a yard [27 inches] about.” Dressed in the skins of bears and wolves, these people very much impressed Smith, who learned that they came from up the river, perhaps a two day journey from the Bay, and that their town housed “near 600” warriors. The Tockwagh called them Sasquesahanock, a name somewhat Anglicized in later years to become Susquehannock, and the river on which they lived took their name from these people - the Susquehanna.

Seven years later, a Frenchman in the service of Samuel de Champlain, Etienne Brûlé, led a delegation of Huron into an area on the North Branch of the Susquehanna River to seek an alliance with the Susquehannock against the Onondaga. Brûlé’s mission came too late; the Onondaga had already defeated Champlain’s forces by the time Brûlé reached the Susquehannock villages, which according to a map he later produced, were located around a large earthen mound now called Spanish Hill near what would later become Athens, Pennsylvania. Brûlé spent perhaps as long as two years among these people, and during that time he traveled the length of the river from Spanish Hill to the Chesapeake Bay, becoming the first European to do so.

For next 100 years, the Susquehannock dominated the Susquehanna River Valley, establishing a series of large towns in Lancaster County, the most important of which was what is now known as Washington Boro, a town that is believed to have housed as many as 2000 people. They engaged in trade with the Dutch and Swedish settlements in Delaware. They traveled south to engage in trade with the English in Maryland, eventually signing a treaty of alliance with the Maryland colony in 1661. As part of this arrangement, the Maryland colonial government posted fifty English soldiers and cannons at the Susquehannock “fort.” Throughout this period of the early and mid-17th century, the Susquehannock controlled the trade between the Europeans and their allies in Western Pennsylvania - the Erie - and in Ontario, the Huron, while they apparently engaged in conflicts with the Seneca, Cayuga, and other

members of the Iroquois Five Nations. William Penn visited their town on the Conestoga Creek in Lancaster County in 1700 and offered them his assurances of peace with “Penn’s Woods.” Eventually, however, warfare and smallpox took its toll on the Susquehannock, with the first records of a smallpox outbreak among them coming in 1661. Continuing hostilities with the Seneca; the destruction of their native allies, the Erie, in 1655 by the Iroquois and soon after the defeat of the Huron by the Five Nations; and a change in policy in Maryland leading to an all-out attack on them by a combined English militia from Maryland and Virginia in 1675 brought this once influential people to near annihilation. On Christmas Eve, 1763, a vigilante band of settlers from Dauphin County, called the Paxton Boys, massacred a community of Susquehannock in Lancaster in retaliation for native atrocities in the French & Indian War of 1755-1763 (a war in which the Susquehannock did not participate), leading some historians to conclude that the Susquehannock nation had been done away with in its entirety.

Despite their great importance in the 17th century, relatively little is known about the Susquehannock from period accounts, including what, in fact, they called themselves. John Smith adopted the Tockwagh name for them, and subsequent English accounts generally refer to these people as Susquehannock. But the French called them Andastes (or Andastogues or Andastogueronons) and the Dutch called them Minquas. In the 19th century, General John S. Clark (1823-1912), a Civil War officer and then a researcher/antiquarian, became fascinated with the Iroquoian peoples and their history, including the Susquehannock, and he collected as much correspondence and historical evidence as he could, dating back into the 17th century, to try and illuminate Iroquois traditions and culture. (in Murray 1931, 2008). He found that the Susquehannock were known by many other names as well, including Gandastogues, which he said translated into “people of the blackened ridge pole,” a reference to the aftermath of a Susquehannock attack - a burned structure. Gandastogue is thought to have evolved into Conestoga, the name by which they were known in Lancaster County in the 18th century and which would give their name to a waterway as well as the covered wagons built in Lancaster County for settlers pressing into the Western frontier.

Also, relatively little is known about Susquehannock culture, other than that they were presumably an Iroquoian people. Clark's documents plus a word list originally from an 1834 source (reproduced in Kent 1984, 30-31) show that the Susquehannock spoke an Iroquoian language, similar to that of the Huron. Brule, who had lived among the Huron before his mission to the Susquehannock, reported that he could easily communicate with the Susquehannock he lived with on the North Branch in Huron. Archaeological excavations show that most Susquehannock towns were surrounded with tree trunk palisades like those of the Five Nation Iroquois of New York State (Mohawk, Oneida, Onondaga, Cayuga and Seneca; the Tuscarora, originally from the Carolinas, joined the five in 1722 to become the modern Six Nations.) Also like the Iroquois, the Susquehannock lived in longhouses within their palisaded fortresses - structures 40 to 100 feet long of branches anchored in the ground covered in bark. (The formal name for the Iroquois is Haudenosaunee, or "People of the Long House;" the Six Nations conceptualize themselves geographically as a long house, with the eastern-most Mohawks being "the door to the east," and the Seneca of Western New York State, "door to the west.") Presumably then, like the Iroquois, the Susquehannock were matrilineal, i.e., they traced their descent through the female line, and the people living within a longhouse would have been an extended family of related women with their children and husbands. Men would have married into these households (i.e., they were matrilocal) and women would have chosen their husbands, being people of great influence and respect - especially clan mothers who directed the internal affairs of an Iroquois community. Another hint that the Susquehannock were Iroquoian people are the references to individual Susquehannock living in Iroquois towns in New York State among the Seneca in the 17th century (Englebrecht 2003, 162) and the Cayuga in the 19th century (Custer 1995, 41).

The Susquehannock, like all Iroquoian peoples, provided for themselves by horticulture based on the Three Sisters, as well as by hunting, fishing and the collection of wild plant foods. There would have been a complementary relationship between genders, with men hunting and preparing the fields, and women tending the fields and processing food for consumption and storage. And like typical

horticulturally based societies, they were forced to move their towns periodically, as the soil wore out (see Figure 7 for village sites and soil types, which will be discussed in detail in the next section). Indeed, the archaeology of the Susquehannock in the Lancaster area is one of showing the progression of towns from north to south along the river as new fields needed to be created. According to Englebrecht (2003,105), Iroquois towns in New York State moved approximately every fifteen years, and that roughly matches the archaeological and historical dates for various towns in Lancaster County in the 17th century.

Figure 7: Native village sites and soils in Washington Boro area



Snow writes that “During the period 1400-1525 the upper Susquehanna River Valley was inhabited by Iroquoians whose descendants would be known as the Susquehannocks. They are best known from a series of around 20 sites in Bradford County, Pennsylvania and adjacent Tioga County, New York. They were probably all small hamlets, and many more like them might lie still undiscovered in the valleys of the North Branch Susquehanna and its tributaries north of its junction with the West Branch in Northumberland, Pennsylvania.” (2004, 49). Maps in Snow (1994, 61) and Richter (1990, 238) both show the Susquehannock living on the North Branch in 1500. The question that has puzzled

archaeologists and historians has been why the Susquehannock chose to move southward, briefly establishing small communities on the North Branch, such as the Blackman site in Bradford County (Smith 1970), before arriving in the Lancaster County area. The standard response has been conflict with other Iroquoian nations (see Jennings 1978; Tooker 1984), and certainly the Susquehannock, according to Colonial observers, had a long history of fighting with their Iroquois neighbors - especially the Seneca in the 17th century. Jennings, however, argued that the Susquehannock moved south to become closer to Europeans so that they could more easily trade for European-made goods.

In 1633, a Dutch whaling boat made contact with the Lenape (subsequently called Delaware by the English) on the Delaware River. The contact, described in Schutt (2007, 1-2), was peaceful despite concerns by the Dutch sailors that they were to be attacked. The Lenape gave the Dutch a bundle of beaver pelts as a gift to take back with them to Europe. The arrival of beaver pelts in Europe set off a craze for beaver skin hats and other apparel, Europeans having severely reduced the number of fur-bearing animals on their own continent over the centuries. This set off a rush to trade with the Native Americans, as dozens of sailing ships rushed to Northeastern North America with holds full of goods of European manufacture to exchange for beaver peltry. This fashion craze set off intense competition among Native nations as they rushed to kill as many beaver as they could (eventually driving the eastern subspecies of beaver into extinction) in order to obtain European glass and metal items, chief among them being muskets (and shot and powder) and iron tools. The Iroquois of New York State, in particular monopolized this trade insofar as they could, and the 17th century is largely a series of encounters between them, the Susquehannock, Lenape, and other native nations with European traders.

That the Susquehannock had a preference for durable European goods is evidenced by the content of graves from the late 17th and early 18th century, which became filled with beads, iron cooking pots, hatchets, and the like - even muskets, swords, and parts of European armor, such as iron helmets. The Susquehannock buried their dead outside the palisaded walls of their towns in vast cemeteries, and hundreds of these graves have been uncovered, either by professional archaeologists, collectors, and more

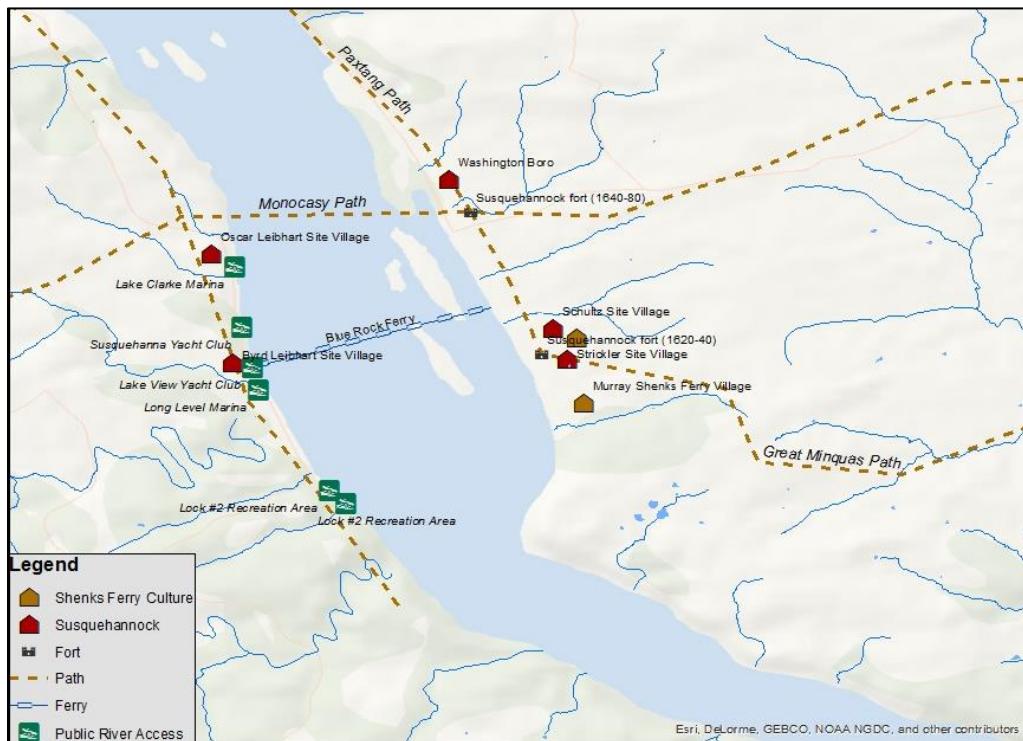
recently, contractors bulldozing those same lands for building projects. (see Kent 1984, 203+) It makes sense that the Susquehannock would be willing to move their towns closer to the sources of these highly desirable goods in places like Maryland Colony. It might also have been to their advantage in terms of obtaining European-made weapons (such as the cannons mentioned earlier) in their conflicts with the Seneca and other Iroquois nations.

In describing this situation, Jennings (1968, 21-22) wrote, "To outward appearances...the Susquehannock were the Great Powers in their part of the world, but Susquehannock power was illusory because the mechanism for generating it was beyond Susquehannock control. That mechanism was the fur trade. To maintain their glory, the Susquehannock had to get the weaponry that only Europeans could provide and that only peltry could buy. To get the peltry, the Susquehannock had to hunt and fight under rules of competition set by conditions of geography and communication. Great distances lay between hunting grounds and markets. The cycle of the trade could not be completed without secure access to both a source of peltry and a source of trade goods."

In other words, scholars believed the Susquehannock were striving to make themselves the middlemen, the key link between European powers and the sources of beaver pelts, which in the 17th century lay primarily to the north and west in the Great Lakes region, an area dominated by the Huron. There were insufficient numbers of beaver in the Susquehanna River area itself to maintain the trade the Susquehannock desired, and access to beaver pelts in New York State was blocked by the Five Nations Iroquois. The Susquehannock demonstrated time and again their willingness to travel great distances to secure trading partners. In 1626, Isaac de Raiser wrote that Susquehannock had come to Manhattan offering to serve as middlemen in the fur trade. Even from the main branch of the Susquehanna River, the Susquehannock traveled overland through what is now southeastern Pennsylvania to the Delaware River and then down that river to the Dutch and Swedish settlements on the coast (defeating the Lenape in 1636 to win this privilege, and then offering themselves to the Europeans as their defense against the Lenape), opening up a trade link to that source of goods. And, of course, the Susquehanna River gave them access

to English traders in the Chesapeake Bay area (see Figure 8 for examples of historical and contemporary paths around and across the river).

Figure 8: Native, colonial and contemporary movement in Lancaster and York Counties, PA



The Susquehannock success in creating this network of relationships was remarkable for a few decades in the 17th centuries, and, as Jennings notes, it made them the Great Power in the Susquehanna region for that time. It may well have had a significant impact on their subsistence, too, because trade with Europeans brought not only glass beads and muskets; it brought iron axe heads, shovels, picks and hoes as well. In the Susquehannock home areas on the North Branch of the Susquehanna, they lived in relatively small communities, called villages by Brûlé. Other Susquehannock communities, like the Blackman site mentioned above, were similarly small-scale communities of the types generally associated with horticulture and its demands. Then, in Lancaster County, there are palisaded towns of several hundred to two thousand persons, all still living off the Three Sisters, wild game and fish. The palisade at the town of Washington Boro enclosed an area of 250,000 square feet! (Kent 1984, 338). That works out

to hundreds to perhaps thousands of trees that had to be cut down, not counting the additional forests that had to be cleared to create fields to grow the maize, beans and squash to feed 2000 people. Iron axe heads would have made that possible, and hoes and shovels would have made it possible to more deeply turn the soil and cultivate the crops. (Englebrecht raises the possibility that the Iroquois used fish as fertilizer, as in the famous story of Squanto [Tisquantum] teaching the Pilgrims to grow corn in rocky Massachusetts soil, but admits that there is no evidence to support this. [2003, 31] If true, that could explain increased fertility in Susquehannock fields, as well as why Iroquoian peoples were able to maintain the productivity of horticulture for fifteen years, rather than the Shenks Ferry' eight to twelve years.)

At the same time, positioning themselves between Europeans and the sources of beaver made the Susquehannock vulnerable to forces they could not control, and which eventually led to their collapse and eventual defeat. On the one hand, the Iroquois would eventually defeat the Huron and remove them as a Susquehannock trading partner; on the other hand, depending on European trade goods made the Susquehannock vulnerable to the whims of Maryland Colony's policies. As noted earlier, Maryland first made treaties with the Susquehannock (and gave them soldiers and arms), but then negated those treaties, choosing instead to ally with the Seneca (who with the defeat of the Huron now had access to beaver pelts) against the Susquehannock. Jennings includes in his essay a telling anecdote. A Susquehannock is listening to young Lenape warriors plan attacks on Europeans to drive them out of North America. The Susquehannock points out that the muskets, powder and shot the Lenape plan to use against the Europeans all come from the Europeans. In the short run, the Susquehannock strategy made them a force to be reckoned with; in the long run, it made them the enemies of everyone, European or native, who wanted the same thing the Susquehannock managed to maintain for several decades: direct access to European goods. When disease and war weakened their position, the Susquehannock succumbed and disappeared from the history books.

Two observations need to be made here: despite John Smith's comment, the Susquehannock were not giants, but were, in fact, no taller than other Natives. Jennings says, "The skeletal remains unearthed

at one site show a height ranging from 4 feet, 10.9 inches to 5 feet, 7.7 inches, with a mean stature of 5 feet, 3.7 inches." (1968, 17). Paul A. Wallace probably puts it best when he says, "Like the great Elizabethans, of which he was a belated member, Captain John Smith was intoxicated with words. We must not expect his measurements to tally exactly with those of science." (2005, 11) Nevertheless, in research collecting oral histories from Pennsylvanians who claim descent from Native Americans, it is common to assume that those who claim descent from Susquehannock are believed to be extraordinarily tall, because of Smith's description.

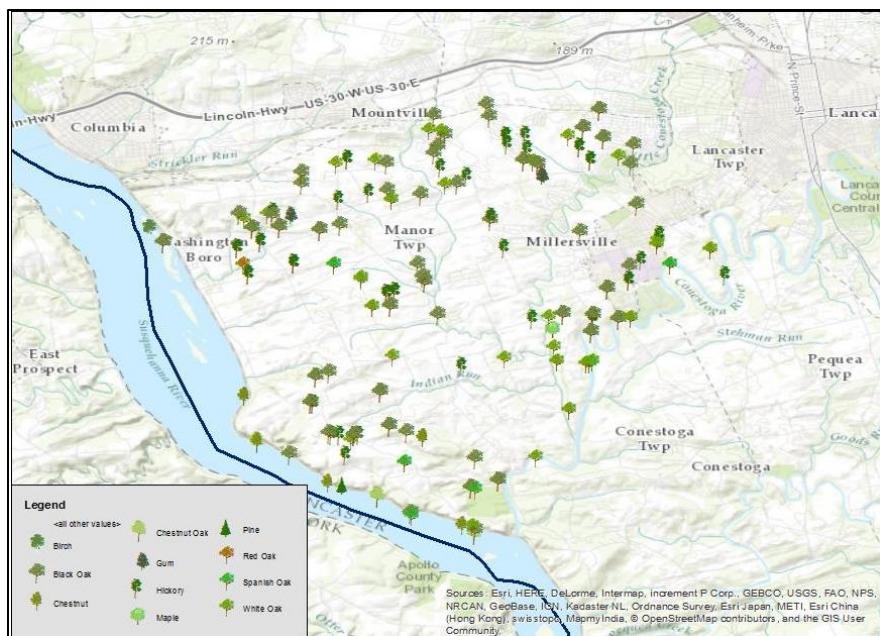
But the fact that there are people who claim descent from Susquehannock raises the other point. That is, despite the claim of their annihilation in 1763, there is good reason to believe that some Susquehannock survived. The claim of their total destruction rests on the assumption that every last remaining Susquehannock was in Lancaster on Christmas Eve 1763, seeking (false) sanctuary in the town jail. Both Kent and Jennings raise the possibility that there were Susquehannock elsewhere in the Susquehanna River Valley at the time, and Englebrecht and Snow say that some were living among the Iroquois in New York State. In particular, the archaeologist Jay Custer records an interesting discovery he made in the 1990's among legal documents in Lancaster County. This was a claim against the City of Lancaster in 1845 by three natives claiming Susquehannock ancestry. The claimants were living among the Oneida in New York State at the time, but were requesting compensation from the city for land lost at the time of the massacre of 1763. There is no record of a response from Lancaster. (Custer 1995).

The Cultural Landscape of the Lower Susquehanna

Indigenous peoples of Pennsylvania are known to have been foraging or, in older terminology, hunting & gathering societies. (See Lee & Devore 1968, Dahlberg 1981). The family groups lived on what they found in the natural environment, whether through hunting, fishing, or the gathering of wild plant foods. What kinds of foods were these? A chart in Custer (1986, 139), which lists animal remains from a later Susquehannock site from Lancaster County, notes 17 different kinds of mammals, 16 different species of birds, 4 kinds of reptiles and 7 kinds of fish. Other inventories of sites along the

Susquehanna River enumerate the remains of wild plants such as chenopodium, walnut and hickory nut shells, and the seeds of wild blackberries and strawberries. The area now described as Washington Boro provided the natural environment for such food. Figure 9 shows a reconstruction of the diversity of trees in the area of dense Native settlement around Washington Boro. The wide range of tree species suggests a diverse forest that would have held microclimates for many different types of plants and animals.

Figure 9: Witness trees in Washington Boro (data taken from warrant maps from the first survey in 1719)



In addition to foodstuffs, the natural environment provided everything else the indigenous population needed to support themselves. Clothing was made from the pelts of the animals that had been hunted. Captain John Smith, in his account of meeting Susquehannock warriors at the point where the river emptied into the Chesapeake Bay, famously describes these warriors wearing the skins of bears and wolves, some items with the heads and paws of the animals still intact. (in Wallace 2005, 10-11) As noted, shelters were made of branches bent into a hemispherical frame, covered with tree bark. Fiber from plant materials provided string or cord for fish nets and wrapping. Stone, wood and animal bones were collected and modified to become tools, ornaments and pipes for smoking. Heat for cooking and warming

shelters in winter came from the wood collected from the forest. In other words, the lives of Native Americans were entirely built on what could be collected from the natural environment, resources the Susquehanna River Valley provided in abundance.

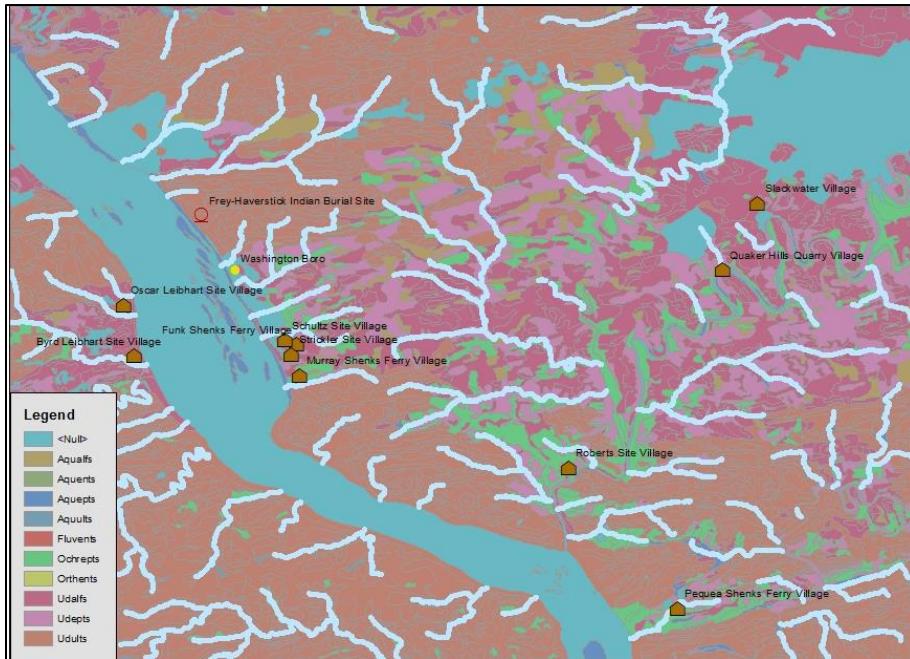
However, the environment also presented constraints for groups of indigenous people, as their settlement sizes had to be small-scale, mobile societies to make a reliable subsistence from the natural environment. Too many people or an encampment remaining too long in one place stripped the environment of its abundance and interfered with its ability to rebound and supply a population with its needs in years to come. For that reason, foraging societies seldom number more than 35 individuals in a single location, and often fewer, depending on local circumstances. A population of 35 usually consists of five nuclear families with their dependents. This gives five male hunters and five female gatherers to feed everyone, while older children and the elderly do what they can, such as gathering firewood or processing pelts or skins for clothing. A prime site would be revisited time and again, sometimes over centuries, but that was only possible with the appropriate balance among population size, patterns of movement, and time for an exploited environment to recover. Studies of 20th century foragers found them to be very aware of their impact on the natural environment and the need to allow it to recover for future visits. (see for example, Brody 2000).

When Europeans began to come into contact with Native Americans in the Susquehanna and other river valleys in the mid-Atlantic region in the early 17th century, they found them engaged in extensive horticulture. The Native system was built around the cultivation of what the Iroquois/Haudenosaunee call “The Three Sisters” - maize or corn, beans, and squash. These crops were originally domesticated in Mexico, as early as 6000 BP, and their cultivation gradually spread across the American continent. In the Northeast, it appears as though the three crops arrived independently of each other, as the earliest appearance of squash in the archaeological record is 4900 BP, maize/corn is 1400 BP and beans at 650 BP. (see Neusius and Gross for a discussion of the appearance of horticulture in the Northeast.) The three crops fit together harmoniously both in terms of their cultivation and nutritional

value. The seeds of the three crops germinate at about the same time, and Natives in the Susquehanna River Valley and elsewhere planted all three together in one hill. In this way, as the corn grew, the vining beans could grow around it for support, and the squash plants spread out around the hill to act as a kind of green mulch. Nutritionally, corn and beans are a good match: corn is deficient in certain amino acids and vitamins (especially niacin), but the missing nutritional items are present in beans. Thus, corn and beans combined in a single meal provide a diet that is nutritionally complete - a diet still consumed across much of Latin America today. It is also the case that corn is notorious for drawing plant-supporting nutrients from the soil - areas in the world in which corn is grown repeatedly in the same field without the use of chemical fertilizers quickly lose their soil fertility. Beans, however, have nitrogen-fixing bacteria that attach to their roots, which helps replace some of the soil fertility that corn depletes.

The soils in the Washington Boro supported this Native horticulture. Figure 10 depicts the contemporary soil types around the Washington Boro site. The majority of the area's soils are of the suborder Uduults (from the Ultisol order), which are found in old, weathered, humid environments including much of the lowland southeastern United States, and are naturally low fertility due the loss of nutrients over long periods of geologic weathering. The Native sites identified in the Washington Boro, however, are almost exclusively situated on soils of the suborder Ochrepts (from the Inceptisol order). These soils are young and shallow, and are characteristic fluvial areas where a high water table and seasonal flooding limits the development of deep top soil. However, the layering of soil and nutrients from upstream also increases nutrient content in these soils and makes them lighter than the surrounding clay-based Uduults.

Figure 10: Soil suborders and Native American sites in the Washington Boro area



When thinking how an indigenous cultural landscape might have looked in the peri-contact period it is important to remember that Native horticulture is not like modern, industrial agriculture: it is not characterized by large, open fields filled with a single crop. A Native field in, for example, what would become Lancaster County, Pennsylvania, would have consisted of a much smaller operation of an acre or less at the river's edge, typically surrounded by dense forest, and with the trunks of very large trees still standing here and there among the crops. Those crops would be planted in the hills described above, with each hill standing three to six feet apart from the next. There might be other vegetation growing in the field as well - berry bushes allowed to grow wild among them, for instance, or the seedlings of rapidly growing, secondary growth trees, such as locust or Eastern red cedar. In other words, from a modern perspective, it would not have seemed like a field at all - but it was a product of both Native American technology and knowledge of the natural environment.

The Native people who lived in Washington Boro did not have metal tools or draft animals like horses or oxen to pull plows and stumps from fields, as early European farmers did. Rather, they possessed stone tools - stone ax heads, hand held flat stones for cultivating - and human labor. As for their knowledge of the natural environment, it seems obvious from the archaeological sites currently known,

that Natives chose to situate their fields along the river's banks, where the accumulation of silt from annual spring flooding provided fertile soils. (These sites are often, though not always, situated at a point where a smaller waterway, such as a stream, entered the river. This created an ecologically rich area that provided an abundance of natural resources for their consumption.) These sites were heavily mantled, however, with old growth forest, generally composed of an oak-hickory-chestnut climax forest with individual trees 100 feet or more tall - a problem for a population without metal axes or saws.

Graybill and Herbstritt (2013, 24) describe a likely sequence of events, given this problem: "It is not unlikely that village-dwelling Native American farmers in the Middle Atlantic region, and probably elsewhere in Eastern North America, pre-selected their future village site locations, first killing off large, older trees by girdling, and later burning off residual forest growth well in advance of locating, or relocating, their village settlements to other places. These activities prepared the larger, pre-selected village location for future agricultural pursuits, and it enabled the growth of a profusion of young trees, or small tree saplings, suitable for use in village site construction activities like building houses and palisade walls."

The implications of this quotation are many. First, Natives created a field from old growth forest by girdling trees. (Stone headed axes have been demonstrated to be effective in cutting down a tree of 8 to 10 inches in diameter - but not larger.) Girdling involves removing a band of the outer bark from the circumference of a tree. Critical nutrients and moisture for the tree are contained in this band, and the result is that the tree is literally starved to death. Obviously, this is not an instantaneous process: as the quotation implies, a prospective field had to be prepared well in advance of the location of a village. Two or three years might pass before the forest was open enough to allow enough sunlight to reach the ground and support a crop. However, this is why tree trunks might still be standing in a Native American field: girdling in itself does not fell a tree. It kills it, but the basic tree structure remains. Some accounts suggest that Native Americans set fires at the base of these large dead trees to undermine their roots and cause them to fall, and, indeed, colonial descriptions of Native American fields describe fallen trunks lying

among the crops. Furthermore, maize requires a minimum of 160 days of full sun to mature. Thus, a Native American corn field of an acre required removing forest not only in that acre but for a large area surrounding the field so that trees on the circumference of the field did not shade out the crop. (Bressler and Rockey [1997] discuss the implications of this point.) This required considerable labor, well in advance of actual planting.

Contact-era descriptions note that men cleared the fields, while women tended them. Using hand-held flat stones or the scapulae of deer, women would scrape up soil and fallen leaves and other vegetation to produce a hill 8 to 10 inches high in which the seeds of the three crops were sown. This would be done in early spring; the hills elevating the soil would drain the soil from winter moisture and allow the mounded soil to warm up more quickly, thus allowing an early planting. As noted earlier, the growing habits of the three crops supported each other, with the corn stalks supporting the bean vines and the squash vines covering the ground and helping keep down weeds. All three crops could be dried and stored for later use; squash, for instance, was cut into strips that were strung and hung in a wigwam to dry. Storage pits for dried corn and beans are dug into the ground in village sites of this era; their discovery by archaeologists (by discolorations in the soil) is one of the confirmations that a community was involved in horticulture.

So far as is known, Native Americans in the Susquehanna River Valley did not add any additional nutrition to the soil through fertilizing the crops. At the end of the growing season, the dying crop vegetation was left in the fields, where it might have added a composting effect. Without additional soil additives, even the rich alluvial soil of the river banks would be depleted in time, in part because of the high water table in the areas most suitable to cultivation. In addition, weeds and invasive tree seedlings would begin to build up in the fields, and multiple sources mention a growth of insect pests over time as well. As the fields lost their fertility, and the plant and insect pests built up, the plot would be abandoned, perhaps to lie fallow and be reclaimed for future use - but given the placement of archaeological sites and the spread of European colonialism after the early 17th century, it does not appear as though this routinely

occurred in the Susquehanna region. Graybill and Herbstritt write, with regards to one Native American cultural tradition of the Susquehanna River Valley in the 16th and 17th centuries: “The average life-span of a Shanks Ferry village site was probably 8 to 12 years, and we know of only three locales that were recycled, or re-occupied, by successive Shanks Ferry groups.” (2014, 39). Indeed, the two primary late Woodland cultures of the lower Susquehanna River Valley to be discussed in this narrative - the Shanks Ferry and Susquehannock cultures - seem to be characterized by periodic movement of whole communities - which, in the case of the Susquehannock, involved large numbers of people.

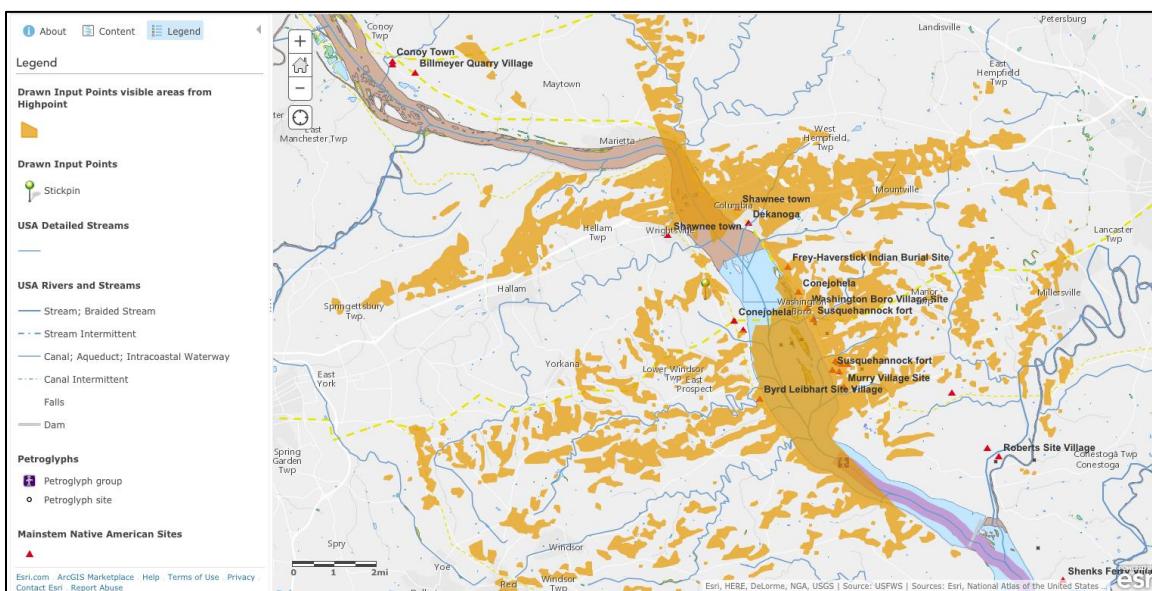
Discussion and Recommendations

We have modified the ICL criteria to fit the environmental circumstances of the study area and the political reality that in Pennsylvania there are no recognized American Indian tribes. However, there are very active conservation agencies and heritage groups in the study area, whose interests need to be considered when designating this area an Indigenous Cultural Landscape. These include the Susquehanna Gateway Heritage Area, the Lancaster Conservancy, and the Chesapeake Conservancy among many others. Other local citizens groups in Lancaster country have formed around the issue of gas pipelines crossing through historic sites, and PPL sale of lands in culturally sensitive places. Some success stories in conservation include the creation of the Native Lands County Park, now part of the Mason-Dixon Trail system and also Highpoint Scenic Vista and Recreation Area, part of the same. This latter project is exemplary for its conservation of both a vista point and the understanding of indigenous landscapes. The viewshed from this point reveals for miles in all directions the landscape of the Susquehannock people at the time of Captain John Smith’s explorations of the Chesapeake Bay. Land acquired in the development of this park saved it from becoming a luxury home subdivision. Here a visitor can learn about the last known community of the Susquehannock Indians that stood on top of a nearby hill (1676-1680) (the Byrd Leibhart site) where once 3,000 Susquehannock people lived in a stockaded four acre town in 16 ninety foot longhouses.

Figure 11: View southeast from High Point Scenic Vista



Figure 12: Viewshed from High Point Scenic Visa (including important indigenous landscape areas of Washington Boro, with sites marked)



Another criterion for this study has been the significance of these landscapes to descendant communities today. However within this area of the Susquehanna this is not easy to ascertain. The

displacement and genocide of the Native populations of Pennsylvania means that those descendant people of the Susquehannock are probably radically dislocated from these landscapes. Unlike Virginia or Maryland or New Jersey, Pennsylvania is one of only two states left in the Union that does not recognize the presence of Native nations in its borders. Thus, the very notion of a Native heritage landscape is thoroughly disrupted. And unlike other Indigenous Cultural Landscape studies (such as on the Nanticoke river) this study could not rely on input from recognized American Indian nations and ask, “What does this place mean to you?” because they are elsewhere; mostly in New York State and Canada.

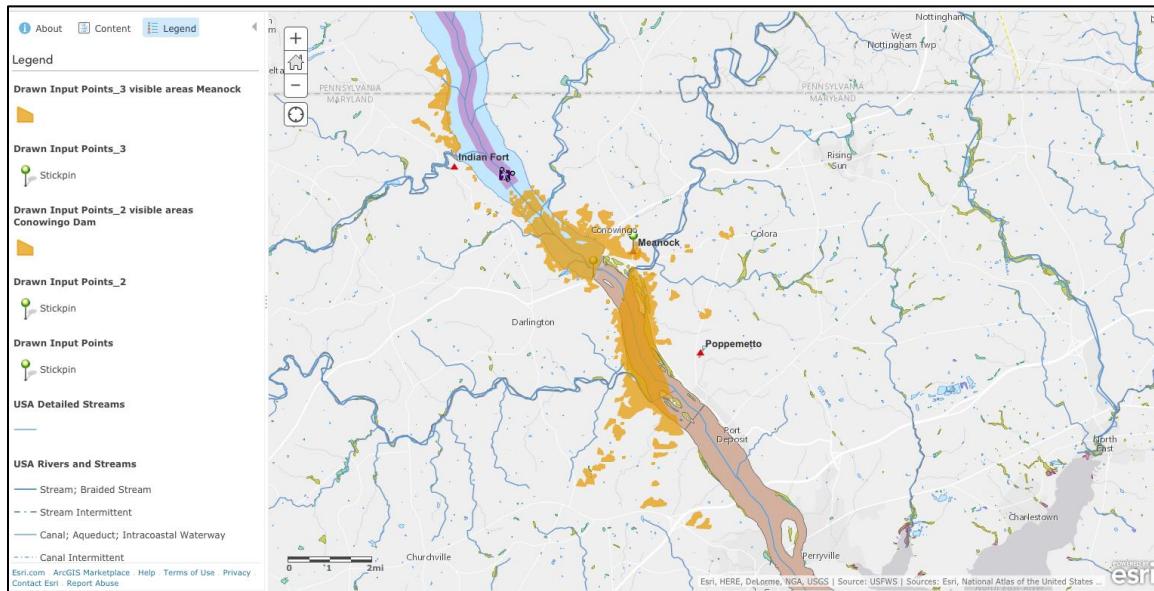
However, landscape interpreters can draw on the stories of local people who claim Native heritage and who have worked hard to have the landscapes recognized in the public realm as such. This study benefitted enormously from the expertise of Dr. David Minderhout who provided much of the historical narrative and who also has published extensively on the stories of “remnant” Native peoples in Pennsylvania. And indeed, one of them, Jerry Dietz, who claims Seneca heritage, has acted as one of the key architects of the Native Lands County Park in York County. In addition, local avocational experts on Native American history and material culture, such as Paul Nevin, have provided invaluable advice and hard archaeological evidence for the deep wealth of Native American cultural landscapes in this study area.

As can be seen from the above narrative in Sections A and B the criterion that speaks the loudest in this study is that of support from archaeological and ethnohistorical scholarly accounts. The sheer abundance of archaeological evidence in this area of the Susquehanna (listed in Appendix C) show this to be a landscape that for thousands of years housed people upon people of Native nations.

There are two distinct areas of this part of the river here. One is a landscape of trade, hunting and movement, evoked by bluffs and the narrow, rocky, river that stretches from the Maryland line down to the Chesapeake Bay. Looking at the viewshed map there are two points that provide a view up and down that passage. One is taken from the Conowingo Dam itself looking North West and the other is taken

from the site of the Susquehannock fort, Meanock, and looks directly south, revealing how strategic a position this was for the Susquehannock people engaged in trading with the Europeans in the Contact Period. This view is now defined by the final metal bridges crisscrossing the viewscape before you get to the Bay.

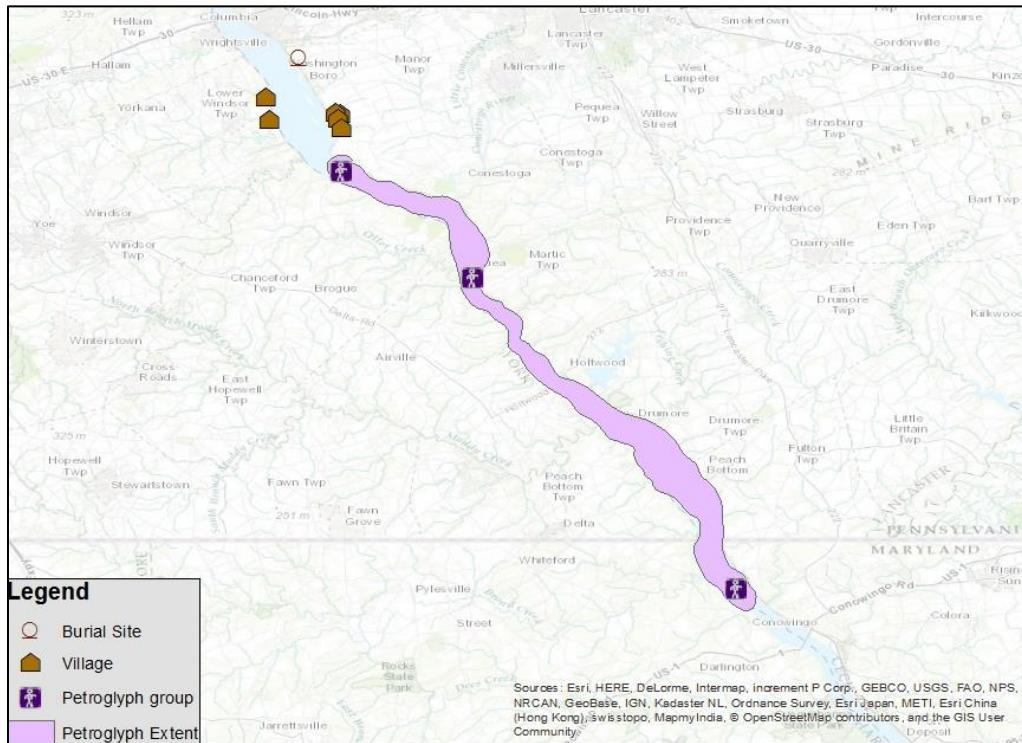
Figure 13: Viewshed around Conowingo Dam



However, the fate of Native cultural landscapes on the Lower Susquehanna has been intimately linked to the construction and development of the hydroelectric dams of Safe Harbor, Holtwood and Conowingo. The transformation of a river into a series of lakes, some over 200 feet deep, formed behind the hydro-electric dams has radically changed the landscape and river shores. Whether submerged by the building of the dams, or overzealously “saved” by being dynamited out of the riverbed, an important material evidence of indigenous culture, petroglyphs that suggest the fundamental interrelationship between Native people, landscape, and culture, have been severely compromised in the area of the Susquehanna river that runs from Columbia, Pennsylvania down to the Chesapeake Bay. These petroglyphs, thought to have been created almost one thousand years ago, have relevance both to the Native American cultures of the Susquehanna in the 17th century as well as to preservation and research interests of the present-day. As fundamental and perhaps foundational to the natural history of the

Susquehanna River, the petroglyphs give us a glimpse at Native cultures and the landscape before the coming of John Smith, while also pointing us toward the possible spiritual significance of these sites to Native peoples that met John Smith, as important cosmic monuments in the cultural landscape of the key lower Susquehanna corridor.

Figure 14: Important petroglyph groups and extent of petroglyph findings on the Lower Susquehanna



This is one of the most impressive collections of Native rock-art sites of North America, along the lower Susquehanna River, in the twenty-two and a half mile stretch from present-day Columbia to just below the Maryland border. This extent correlates with the major historical sites of the Susquehannock described on John Smith's map. Found on large bed rocks in the river, the lower Susquehanna contains approximately one thousand petroglyphs. Indeed, the petroglyphs found at Safe Harbor are noted by researcher Paul Nevin as “the most significant concentration of rock-art still in existence in the northeastern United States.” (Nevin 2004, 241-2)

In terms of a cultural landscape, the area around the Lower Susquehanna, crossing the Maryland-Pennsylvania border, constituted a paradigmatic Native landscape of trade, hunting, fishing, and diplomacy. A Susquehannock fortified town overlooked the river from the confluence of the Octorora Creek and the Susquehanna River; another was situated on what was then called Palmer's Island in the mouth of the river at the entrance to the Chesapeake Bay. Both were of such size and significance to have been commented on by Euro-American travellers and traders. In the contact period, these Susquehannock forts are well documented in travellers' accounts, surveyors' records, and on contemporary maps.²

Today, much of the indigenous landscapes of the 17th century of this part of the Lower Susquehanna is under the ownership of Exelon Corporation. For example, the Bald Friar site, just south of the state line, is a place with deep significance in Native history. The area encompassed petroglyphs (dynamited and removed from the river), a ford, and an Indian "fort." Scholars argue,

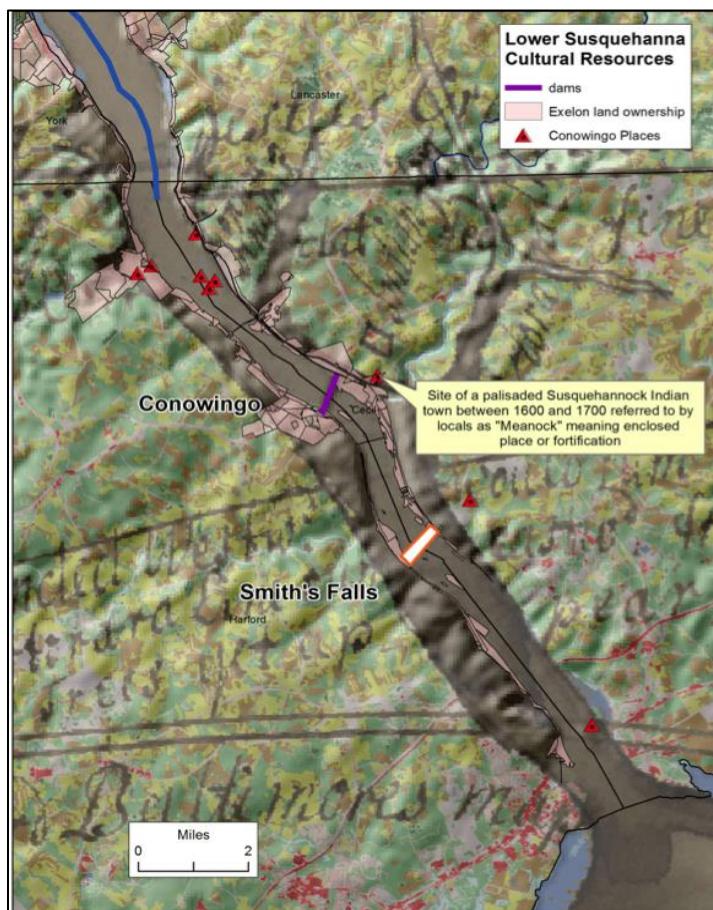
The Susquehanna River at Bald Friar represented a natural and scenic wonder for Native American peoples. Here were small islands situated between Bald Friar Falls on the north and river rapids on the south. A ford or shallow place in the river was located below the falls, providing a foot crossing from one side to the other....Bald Friar was a special place with a special meaning to which native peoples returned again and again over time... Bald Friar was undoubtedly an important fishing

² Of this Donehoo writes, "Octoraro. The name of a creek which enters the Susquehanna from the east at Rolandville, Maryland.... the exact situation of which had much to do with the dispute between the Penns and Calverts, as the southern boundary of Pennsylvania was marked by it.... In the Documents relating to the Boundary Dispute, a number of statements were taken from various persons concerning the exact situation of this fort. James Hendricks, in his statement, says, 'That the Affirmant was then told, by some of the Indians there residing (at the mouth of the creek), that they called the same place Meanock, which they said in English, signified a Fortification or Fortified Town. Has also seen the Ruins of another such Fortified Town on the East side of Susquehannah River aforesaid, opposite to a Placed where one Thomas Cresap lately dwelt. That the land there on both sides of the said River was formerly call Conajocula'... The name which Hendricks gives to the village at the mouth of Octoraro Creek, "Meanock," is used of other fortified places. Meachk, is an enclosed place, hence a fortification. Menachkhasu, is the word which Zeisberger gives for "fortified place." (Donehoo 1928, 131)

station for Indian peoples that provided an abundant and annually renewable source of food. (Lenik 2008, 64)

Bald Friar Ford constituted a shallow foot crossing located near modern-day Broad Creek that was used by Susquehannock Indians; then, in 1695, colonists established an early ferry service. All this today is covered by the Conowingo Lake. Bald Friar Fort was the site of a Susquehannock fort at Bald Friar or Maiden's Mount near the place of the Bald Friar river ford. Bald Friar Petroglyphs (point in river) were dynamited in 1926 and removed to the Druid Hill Park where stones were removed, vandalized, and unprotected. The Maryland Archaeological Conservation has worked to remove them from the park and store them in their facility since 2005.

Figure 15: Detailed map of the Susquehanna River in Maryland below the Conowingo Dam showing documented Indian sites and the dam



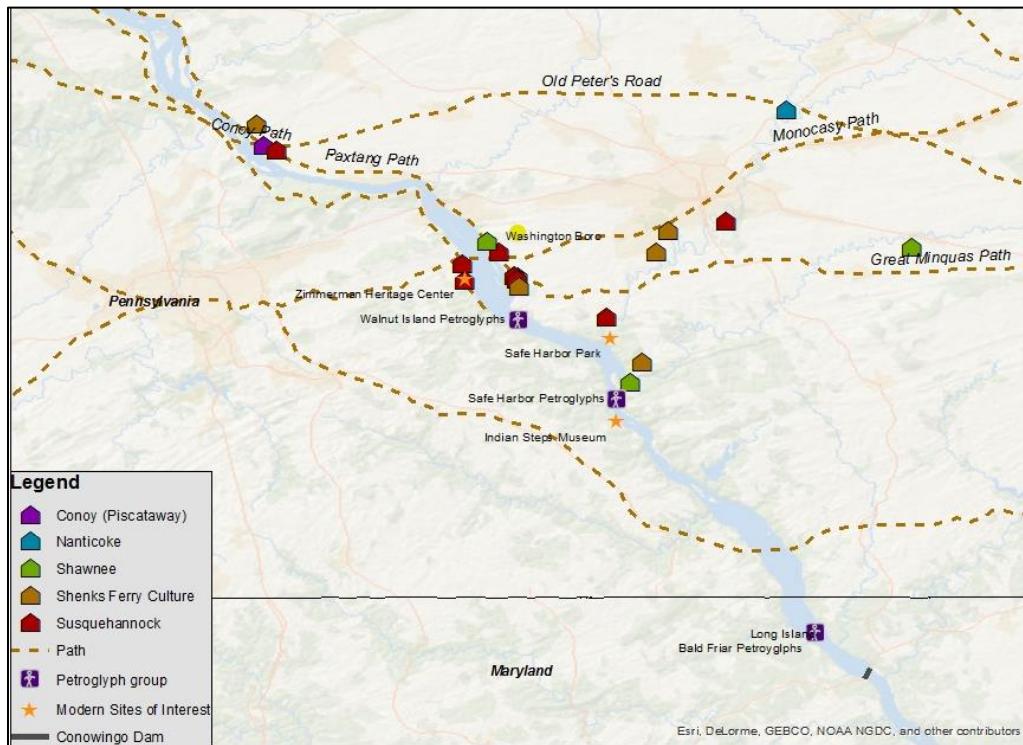
Layer from “Map of the Delaware and Susquehanna Rivers with their Tributaries and Branches, with Information about the Borderline between Pennsylvania and Maryland,” [1739?] Unity Archives, Herrnhut, Germany (TS Mp.216.1)

The second indigenous landscape within the study area is to be found in Washington Boro. This landscape too is endangered by development. What was once a fertile and wooded area that supported 1000s of Susquehannock as is evidenced by the number of sites that have been found and continue to be found as construction continues, is in danger of being lost to the demands of commercial development and gas pipeline construction. The archaeological record is in danger of remaining incomplete here, as the areas in which Native Americans made their camps or settled their villages have also been desirable locations for colonial-era and modern farms, construction and industrial development. Indeed, much of the contemporary archaeological research along the river occurs as part of required environmental impact reports conducted before modern construction occurs. Even if a newly located archaeological site is deemed significant enough after discovery to warrant careful excavation before construction begins, the time constraints under which the archaeologists work mean that the site will be destroyed before a thorough investigation is completed. This has happened repeatedly within the study area, both in Lancaster County and in the area around the Conowingo Dam. Custer, in reviewing 17th Century Susquehannock subsistence systems, includes a paragraph detailing the often hit-and-miss process by which archaeological evidence is uncovered - and sometimes lost - by highway and construction crews along the lower Susquehanna (1986, 138), while Graybill and Herbstritt note with regard to 16th century Shanks Ferry sites in the same area that many sites “...may await discovery and or have unknowingly been eradicated by residential or commercial development over the years.” (2014, 40).

Local heritage groups protesting the gas pipeline construction in Lancaster County point out that today “Lancaster County is only 15% forested land. In Lancaster County our trees are critical to our ability to maintain clean air and water. The proposed pipeline corridors would cross our limited remaining forests and several high and exceptional value streams and permanently clear-cut those forests impairing

already impaired air quality, creating erosion corridors for more sediment into our streams, heating streams, and reducing water quality.”

Figure 16: Historical and contemporary sites of relevance to indigenous cultural landscape in the Lower Susquehanna



Conclusion

From the above evidence presented and following the criteria presented by the ICL concept and the Captain John Smith Trail it is clear that the Lower Susquehanna study provides today’s visitor with the opportunity to experience the river landscape as a landscape of significant meaning to the Indigenous people. Through the rich fertility of the Washington Boro area, group upon group of Native people lived here and practiced early horticulture and farming. The river, at that time significantly lower and easier to cross, was not a boundary between peoples on either shore, but provided a crossing point, a pathway and ford that enabled peoples to move freely along the major Native pathways that traverse the Susquehanna. The river today looks very different, but the display of Latrobe’s survey at the Zimmerman Heritage Center allows the visitor a view of a river that would permit passage to the other side, Washington Boro.

The high bluffs of the final stretch of the river are not hospitable to settlements based on horticulture. However, they are ideal for strategic positioning of forts and trading posts in that they provide an excellent view down to the mouth of the Bay. The fort and trading post on Palmer's Island, the fort at Meanock all provide evidence for this part of the river being a landscape of trade, exchange and movement. Therefore, this study identifies the viewsheds from Conowingo Dam and the Susquehannock fort, Meanock (a landscape of trade, exchange and movement) and the viewshed from Highpoint scenic vista (landscape of horticulture and settlement as evidenced by density of Native population documented over centuries), as key indigenous cultural landscapes along the lower Susquehanna River.

Appendix A: The Long View: Native Americans on the Susquehanna River Before 1300 CE

To place an examination of Native American interactions with the landscape in the period since 1300 CE, a brief look must be taken at the centuries of native presence on the river that precede that era.

Anthropologists and archaeologists divide native communities into three main time periods prior to contact with Europeans. These are the Paleoindian/Paleo-Indian (16,000 to 10,000 years before present [or BP]; the Archaic (10,000 to 3000 BP), and the Woodland (3000 BP to European contact in the early 17th century.) All of these eras are represented in the Susquehanna River Valley - and often in the same site. Highly desirable locations (such as those in the Washington Boro location) would be utilized time and again over the centuries, resulting in a layering of artifacts from different time periods in the same excavated site. Each of these time periods is marked in large part by the nature of the physical environment. During the Paleoindian Era, Native Americans were dealing with the last Ice Age. As the glaciers receded, the physical environment changed from one marked by cold tundra and boreal forests to a warmer one with deciduous forests dominating the river's banks. The Archaic Era falls into this transitional period. By 3000 years ago, the Susquehanna River environment was very much as it is today, and Woodland Era communities dominate the river. Each of these eras is associated with distinctive stone tool technologies and particular cultural adaptations to environmental conditions.

An example of an indigenous view of the landscape can be found if we look at the oldest Paleoindian archaeological site (dated at 11,000 BP) yet found in the Susquehanna River Valley; namely, the Shoop Site on a bluff overlooking the North Branch. Situated on a hilltop, the Shoop Site has been interpreted as a place where a Paleoindian encampment could keep watch over the surrounding valleys for the movement of large game. In this time period, despite its designation as an Ice Age, the entire region was not, in fact, covered in glacial ice. Rather a line of glaciers stretched across what is now Pennsylvania from the Delaware Water Gap in the east to just north of Williamsport in the central region to New Castle in the west. A border region of arctic tundra perhaps 40 kilometers wide bordered the ice, but the rest of

the state was ice free, though presumably colder than the present. Much of the ice-free area was covered with a boreal forest, though pollen evidence shows that river valleys were bordered with deciduous forests, making them suitable foraging areas for Paleoindians. The Susquehanna River existed in its approximate same location at this time, though the river was longer, in that the Chesapeake Bay had not yet formed. The river, therefore, flowed directly into the Atlantic Ocean.

Paleoindians are assumed to have lived in small extended family groups that were highly mobile, moving from camp to camp as resources allowed. If they were like modern foragers, there would have been a complementary gender division of labor in which men hunted the larger game animals, such as deer or caribou, while women gathered wild plant foods and smaller sources of animal protein, such as birds or rabbits. The Susquehanna River undoubtedly provided a rich abundance of fish, eels, freshwater shellfish and edible aquatic plants then as it would throughout the prehistoric period.

The diagnostic stone tool associated with the Paleoindian culture is the Clovis point, a long, tapered laurel-leaf point, made to fit on the tip of a spear. A Clovis point, which can be 8 inches long, often has an impression along the length of its base, called a flute, which made it easier to secure it to a wooden spear. In the Southwest and Mexico, Paleoindian hunting sites have been excavated with Clovis points (named for the New Mexican town where they were first recognized) imbedded in or near the remains of large mammals such as mammoths or the extinct giant bison. Megafauna, such as mammoths, certainly existed in the Northeast 11,000 years ago, but to date no human tools have been found in association with their remains. Instead, the few food remains found in Paleoindian sites in the Northeast include charred fish bones and the bones of deer, caribou and moose, as a few remains of edible plants. When an excavation along the Susquehanna River uncovers a Clovis point, researchers know they have a Paleoindian site. However, the most common stone tool associated with Paleoindians in the river valley is a scraper, used perhaps to deflesh hides or shape or debark wood. Scrapers are the most abundant tool at the Shoop Site.

As noted, Paleoindians were nomads, and the stone they used for tools is often native to an area many kilometers away from where an archaeologist finds it. Not all rock makes useful stone tools, and in prehistory, high quality stone was in high demand and often found a great distance from where it would have been mined, which suggests some sort of Paleoindian trade network. Some of the tools found at the Shoop Site are made of a mineral called Onondaga chert, which is found in upstate New York.

As the climate began to warm around 10,000 BP and the glaciers receded, Native Americans began to adjust to a new environment. At first, a dense coniferous forest covered the Susquehanna Valley, but by 9000 BP a more diverse, deciduous forest dominated by oaks, chestnuts, hickories and other trees emerged. This deciduous forest could support a wider variety of animal life, and thus, greater populations of humans. Some archaeologists suggest that the native population of Pennsylvania increased five-fold during this period - the Archaic Period. If that was so, then the territories over which individual bands roamed probably became smaller. One indication of this is the decreased use of exotic stone from distant locales. Gone now, too, are the beautifully made, tapered Clovis points, as they are replaced by smaller points with a notched base. These, too, were spear points, with the notching used to secure a point to a wooden haft.

Recent evidence suggests that in both the Paleoindian and Archaic Periods, native hunters used spear throwers, or atl-atls, to kill game. A spear thrower is a notched wooden stick, perhaps 12 or 18 inches in length. The butt of a spear is placed against the notch, and the hunter then hurls the spear while grasping the handle of the spear thrower. This increases the axis of and force behind the throw, allowing the hunter to hurl a spear farther and faster than by the force of the arm alone. Spear throwers were wooden, and none have survived in the archaeological record, but spear thrower weights are often found in Archaic sites. A spear thrower weight, often called a banner stone, is a flat rock that has been chipped to produce a notch that sits over the handle of the spear thrower, behind the spear. The extra weight adds force to the throw. These efficient weapon innovations are seen world-wide in archaeological sites at this time, suggesting the diffusion of ideas through culture contact.

A technological innovation that appears in the Archaic Era is the stone net sinker weight. These flat stones are notched to fit between the gaps in a fiber fishing net. By adding weight to the net, they allow the fisherman to throw a net over a distance onto an area of water in which fish are to be found - or they can hold a net upright in a current to catch fish swimming by. An important resource throughout the Native American presence in the river valley were the fish in the river, and especially anadromous fish, such as shad, that migrated up the river from the Atlantic Ocean in order to spawn. They did so in such enormous quantities than an 18th century Moravian missionary on the North Branch of the river recorded that native fishermen caught two thousand shad in a single morning. (Hamilton 1957). The fish were then smoked or dried for storage.

By the end of the Archaic Period, pottery is seen for the first time in the Susquehanna River Valley. The idea of storage or cooking vessels was not new to Native Americans in the region. Fiber baskets and skin vessels were undoubtedly in use long before the appearance of ceramics, but because of the non-durable materials from which they are made, they did not survive in the archaeological record, but after contact, Europeans noted often native people heating water in skin or birch bark containers. (To do this, rocks are heated in a fire and then transported to a container of water by wooden carrying tongs; eventually the temperature of the water is raised to the point that it can cook food.) Once ceramic pottery is introduced to the Susquehanna River region, its use becomes ubiquitous - and broken pottery becomes a common part of the archaeological record. Fortunately for archaeologists, pottery traditions tend to remain constant across a culture as well as through time, allowing ceramic specialists to identify individual cultures, culture change and even relative time periods for collections of broken pots.

Other technological changes seen during the Archaic Period are the greater frequency of pounding and grinding tools, suggesting that nuts, berries and seeds were becoming a more important part of native diets. Greater regional variety in tool kits also becomes apparent. While projectile points with notched bases continued to be the characteristic Archaic spear point, local differences in manufacture and stone type grow. (see Fogelman 1988).

What is missing from the Archaic cultural complex is agriculture - one of the hallmarks of the Woodland Period. As a result, Archaic peoples remain small bands of probably related individuals, moving from camp site to camp site as circumstances and the availability of food stuffs dictate. With the arrival of agriculture, native communities become larger and more permanent, though, as will be seen in the next section, not entirely so.

Appendix B: Woodland Cultures in the Susquehanna River Valley

There are three successive Woodland Era cultures that practiced horticulture in the Susquehanna River Valley: the Clemson Island Culture (1100 BP to 800 BP), the Shenks Ferry Culture (800 BP to 500 BP) and the Susquehannock (500 BP to contact with Europeans). All practiced mixed economies with horticulture, and all relied heavily on the river ecosystem for subsistence.

The Clemson Island Culture is named for the large island in the Susquehanna River north of Harrisburg where remains of this Native American society were first uncovered in 1929. “Remains” is the appropriate word, since the prominent feature of the island was a large burial mound, and it was this structure that was excavated in 1929. As far as is known, the Clemson Island people were the first in the river valley to engage in horticulture. It is not known where they had come from or how they came to use horticulture. The presence of burial mounds in their communities suggest similarities with the Hopewell (1900 to 1500 BP) and Adena (2800 to 1900 BP) prehistoric cultures of the Ohio River Valley, and it has been suggested that the Clemson Island people were either migrants from those areas to the west, or at least in culture contact with them. (See Stewart 1990, 2003 for a more complete discussion of this cultural system and its characteristics.)

Clemson Island communities are of three types: larger spatially organized villages, smaller hamlets and small camp sites. The differences between villages and hamlets are essentially those of size and organization. Villages show signs of planning, with homes placed in the center of the community and activity and storage areas surrounding the homes on the periphery. In particular, activities such as butchering game animals and smoking fish seem to have been kept away from homes. The homes themselves are oval or elongated with rounded corners, somewhat like the longhouses used by the Iroquois. At the Ramm’s Site, one house structure is roughly 31 meters long by 10 meters wide (95 feet by 35 feet), a very sizable structure which again is suggestive of Iroquois longhouses, which were sometimes as long as 40 meters. Iroquois longhouses houses several extended families linked matrilineally, or through the mother’s lineage. The pottery found in association with Clemson Island sites

is also similar to later Owasco ceramic traditions, which is seen as ancestral to the Iroquois. As a result, it is easy to assume that the Clemson Island people were somehow ancestral to the modern Iroquois of New York State.

Excavations of Clemson Island sites turn up evidence of the cultivation of maize, beans and squash, chenopodium and wild barley, as well as the seeds of many wild plants, including blackberries and tree nuts. There is also abundant evidence of fishing and hunting. The small camp sites are thought to be hunting camps. By this point in the Woodland Era, the bow and arrow was widely in use, as evidenced by the small, triangular stone arrowheads that are typical of Middle and Late Woodland cultures.

What led to the excavation of the first Clemson Island site was the obvious presence of a large burial mound, and mounds are found with many of the larger villages. All of these mounds had been disturbed prior to archaeological investigation; many had been plowed over by modern farmers or topsoil had been removed to enrich farmers' fields. The excavated mounds reveal both male and female skeletons, as well as both adults and children. A wide variety of burial styles were utilized from single disarticulated skeletons to semi-flexed complete skeletons to isolated skulls and long bones. Even after having been plowed over or disturbed in other ways, the mounds are quite large, being 7.6 to 9.1 meters at the base (25 to 30 feet) and 1.8 meters or 6 feet high. They were not produced in a single episode, but were added to over time. Many pottery fragments are mixed in with the soil from which the mound was constructed, which suggests that it might have been taken from landfills. Since Native Americans did not have draft animals or wheeled vehicles, the mounds must have been built up by hand, basketful by basketful. These were not general community cemeteries, but burials for the few. In three mounds excavated on Clemson Island, each mound contained the remains of approximately 30 individuals, a small number compared to the total number of people who must have lived in these large settlements. The small number of burials plus the effort involved in the creation of these mounds suggests some sort of social ranking in Clemson Island communities. In general globally, once a culture begins to rely on agriculture for its main subsistence, some kind of social ranking begins to appear, as enough food is generally being

produced to free some people from food production. These people often become craftsmen, leaders and priests. This social innovation is not universal, however, as will be seen with the egalitarian Shenks Ferry culture that succeeds the Clemson Island culture in the Susquehanna River Valley.

Appendix C: List of archaeological sites within the proposed ICL

See attached spreadsheet or

https://docs.google.com/spreadsheets/d/1c9q19kBm2aBQoRQj2U-aBTt1wHsH1_zfY33pSyG9QQ0/edit#gid=1079403207

Appendix D: List of Persons and Organizations consulted

Name	Organization	Field of Expertise
Brenda Barrett	Living Landscape Observer	Susquehanna River ICL Study
Deanna Beacham	National Park Service American Indian Program Manager	American Indian History & Culture Indigenous Cultural Landscape concept
Jerry Dietz	Native Lands Park/ Lancaster-York Native Heritage Advisory Council	Native American/Susquehannock
Hickory Edwards	Onondaga Canoe Club/Onondaga	Onondaga Nation/River
Sid Jamieson	Haudenosaunee Confederacy	American Indian History and Culture
Jacqueline Kramer	National Park Service Outdoor Recreation Planner;	Susquehanna River ICL Study
Ben Marsh	Bucknell University	GIS/Cultural Landscapes
Paul Nevin	Gateways Heritage Region	Petroglyphs on the Susquehanna

Appendix E. Map layers identified and used to characterize the cultural landscapes of the lower Susquehanna River

Layer	Source	Notes
County boundaries	TIGER/Census	
State boundaries	TIGES/Census	
MD roads	MD Department of Transportation	Primary and secondary roads
PA roads	PA Department of Transportation	Primary and secondary roads
ICL Project Boundary	Primary research	
MD and PA soils	USDA SSURGO	Taxonomic order and suborder included
River public access sites	DCNR	
Conowingo sites	Steffany Meredyk '14 and Katherine Faull	
Modern sites of interest	Emily Bitely '11	Coordinates found using Google maps
Petroglyph sites and extent	Steffany Meredyk '14 and Katherine Faull	
Sites from Wallace	Wallace, 2005	
Trails from Wallace	Wallace, 2005 and Emily Bitely '11	
Washington Boro sites	Emily Bitely '11	
Manor Township sites	Emily Bitely '11	
Manor Township Witness trees	Emily Bitely '11	
MD and PA water flowlines	USGS	
World Ocean Base map	ESRI	
World Physical Base map	ESRI	

Appendix F: NPS Narrative Bibliography

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