

The Watershed Model, Local Contexts, and Settlement Pattern Studies

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Paper presented at the
(77th) Annual Meeting of the
Society for Pennsylvania Archaeology
Washington, PA

May 5-7, 2006

Watersheds are excellent resource planning and management tools and can provide meaning to archaeological data collected within and between watershed boundaries. In this paper we will discuss the watershed model used by the Bureau for Historic Preservation and its possible utility in helping to ascribe time period affiliation to what have otherwise been thought to be undatable prehistoric sites. We present two examples from the CRM literature, one from West Virginia where this was done on a local level, and a second from Pennsylvania in a section of the Susquehanna West Branch.

To make our definitions clear, a watershed is defined here as a drainage basin or catchment area based on Pennsylvania Department of Environmental Protection mapping (Figure 1). These drainage basins divide Pennsylvania by major river systems, then by 20 smaller tributary drainages, and finally by minor tributaries of which there are 104. One of the things that is helpful about using this system for the organization of archaeological information is that watersheds often cross different geographical and geological formations so that, for example, a single watershed can show human behavior and settlement patterns across a wide landscape. As an example, Watershed 9 from the Central West Branch Susquehanna River, which was recently synthesized as an alternative mitigation (MacDonald 2006), extends from the Ridge and Valley

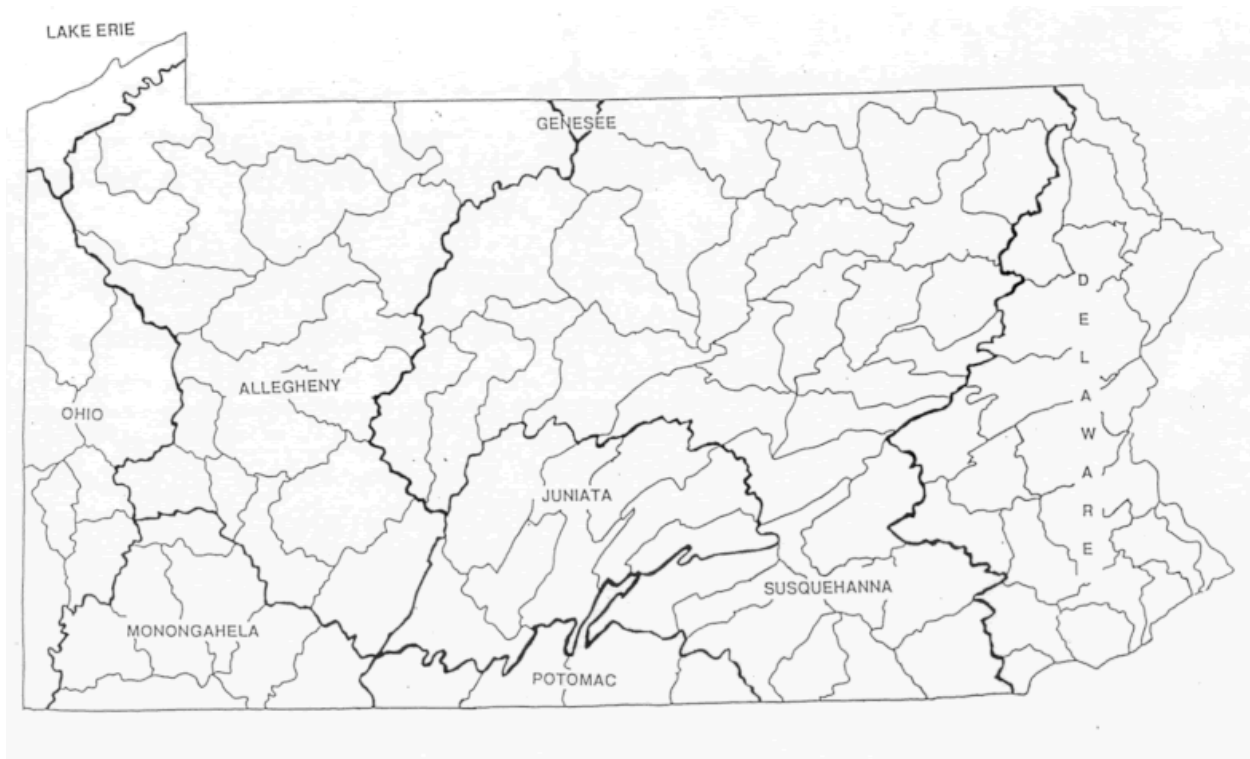


Figure 1. Pennsylvania Watersheds

across the Susquehanna river floodplain, through the Allegheny Front, and into the Glaciated Allegheny Plateau. (Figure 2). Within this watershed is a settlement pattern that cannot be fully understood or appreciated within a smaller, more arbitrary context.

For many years the Bureau for Historic Preservation has advocated using watersheds for organizing prehistoric archaeological information. Since the mid 1980's, we have organized the PASS data by watersheds. With the launch of the cultural resources GIS program, this information, the raw data of Pennsylvania archaeology, is always current. What is needed at this point, however, is to synthesize this data in a manner which is accessible, understandable, and useful to the general and interested public and professionals alike.

Efforts to these ends are ongoing and are taking place on all levels from comprehensive studies such as the Millennium Volume to full watershed syntheses. To

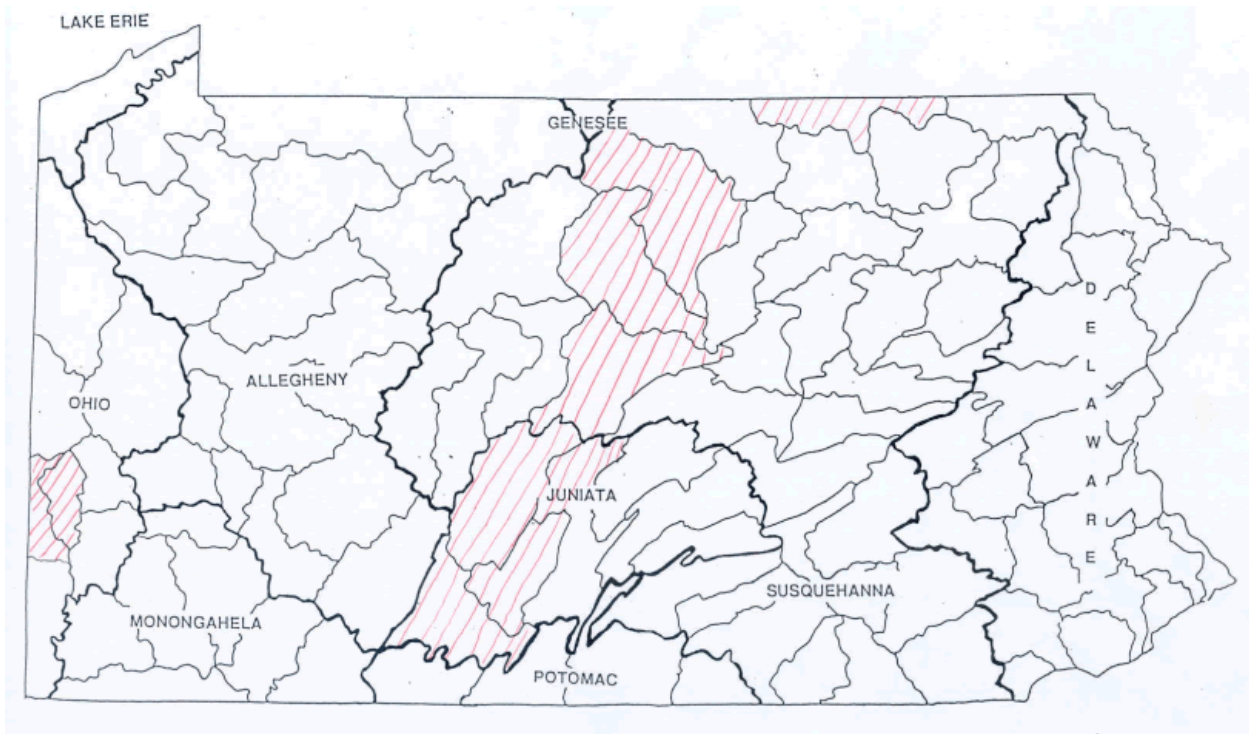


Figure 2. Synthesized Watersheds

date, about a half a dozen watersheds have been synthesized as alternative mitigation projects of one sort or another, and these studies and have provided important guidance regarding the state of our knowledge and avenues for further research. On a smaller level, data from minor tributaries can be organized for use in CRM reports where what is needed is just enough information to figure out what a site represents in a context that is just large enough to be meaningful (Table 1).

The standard research area used for CRM reports is an arbitrary one or two mile radius around a project area. The problem, however, is that this area may or may not reflect any significant differentiation in geographic or topographic region and so it is usually too small to make a meaningful statement about settlement patterns and our understanding of past land use. This is to say, why is this site important, or not, and

Prehistoric Sites in watershed	264
Datable prehistoric sites	164
Upland datable sites	23
Prehistoric sites with features	24
Stratified datable prehistoric sites	6
Historic sites	34
Sites w/ Identified Lithic Material	133
Archaeological Surveys	64

Table 1. (10) Lower West Branch of the Susquehanna River : Watershed D

why should we potentially spend a whole bunch more money to do additional field work, or not. Since one of the primary concerns at the BHP is helping to assign importance within the regulatory framework, we need statements to this end to make logical and clear sense within a meaningful context.

Near and dear to my heart, or at least near to it, are lithic scatters and the ever present question of what to make of them. The usual response given in most CRM reports is what I flippantly refer to as '15 flakes and a shrug.' To be fair, these sites are singularly unimpressive. Collectively, however, they represent much, if not most, of human prehistory in the northeast. These sites have much to tell us if we ask the right questions in the right way. What we advocate here is using regional settlement patterns and the watershed approach to help tie these sites 1) to some sort of human activity other than "people doing something for a very short period of time prior to 1492" and 2) trying to tie these sites to dated sites in the same general area.

Settlement Pattern Studies and Local Contexts

Settlement pattern studies pose some of the most basic questions in archaeology and are fundamental to the premise of anthropological archaeology in their focus on human behavior and interaction with the environment. Such studies can approach questions concerning the full range of human behavior and organization and are, in one

way or another, all predicated on "the assumption that human behavior is economically rational" (Bettinger 1987:137). This is not to say that people always make rational choices; however, such studies do provide a useful framework for the basic assumptions that prehistoric sites are "distributed non-randomly across the landscape and environmental factors are, in part, responsible for that non-random distribution." (Lawrence et al. 2003:149). Non-rational behavior may very well be indicated in the archaeological record, but, as stated by Beckerman (2002:3), separating "the non-meaningful noise from the meaningful information" is one of the challenges of archaeology. In doing so, it should not be assumed in advance that small lithic sites are non-rational noise, but rather the opposite: there is a rational and logical reason for sites being where they are and that there are exceptions. In regions poorly known to archaeology, an understanding of what is and is not chatter can present a complicated set of questions and so be it. One such poorly known area is the inland region of the Chillisquaque Creek in Watershed 10D. This area is in the northern section of the Ridge and Valley in the wedge area between the West and North Branches of the Susquehanna River and south of the Allegheny Plateau. One of the contributions of analyzing small sites in this area would be the clarification and broadening of the few existing settlement pattern studies for this region.

In general, what is known of northern Pennsylvania settlement patterns is based on our knowledge of sites located in floodplain areas. The first model developed specifically for the Susquehanna West Branch was developed by Turnbaugh (1976). Most of Turnbaugh's study was conducted along the Susquehanna West Branch River Valley; however, settlement in the area north of the West Branch and south of the Allegheny Front was also discussed to the extent of the known resources at the time. Settlement in this area was thought to represent short term extraction activities with the Susquehanna River Valley representing the focal point of occupation. The dominant period of prehistoric occupation in the inland areas was indicated as being the Late

Archaic with a resurgence of small sites in the Late Woodland (Turnbaugh 1976:256-257). In general, the main purpose of the inland areas seemed to be seasonal extraction of resources in support of the main occupation in the Susquehanna Valley itself.

Fieldwork conducted in the Allegheny Plateau of Maryland by Wall (1981) indicated the same type of adaptation found by Turnbaugh as do three additional studies from Western New York (Cowan 1999), Central New York (Versaggi 1996) and Northeastern Connecticut (Feder 1981). In Pennsylvania and New Jersey, Custer (1996), Stewart (1998), and Wall et al. (1996) have each used Binford's (1980) concept of foragers and collectors to describe hunter-gather settlement and mobility patterns. In brief, the forager strategy is characterized by a high degree of mobility with populations moving to the resources that they need. The main site type is the residence camp characterized by a wide variety of tool types. The artifact assemblage is characterized by a tool kit that is predominantly the product of formal core reduction. In the collector or logistical strategy small work groups bring the resources to base camps. The most common site type in this system is the field camp with artifacts representing a limited number of functions. Base camps would generally be larger and less common. Field camps are characterized by the use of expedient tool assemblages that are the result of informal bifacial and/or bipolar reduction. The importance of this for studying lithic scatters is that as settlement patterns and subsistence strategies changed, lithic technology changed and this should be reflected in the archaeological record.

Now for a couple examples...

The Spring Creek Site (46Gb114)

Site 46Gb114 is a prehistoric site that was found in the course of a Phase I survey in Greenbrier County, West Virginia (Mickelson 1997) (**fourth slide - the Spring Creek Site**). The site is located on a narrow terrace remnant above Spring Creek, roughly 2 miles "upstream from its confluence with the Greenbrier River." (Mickelson 1997:42).

Phase I and II testing recovered 79 prehistoric artifacts, most of which were debitage with a predominance of late stage bifacial reduction. Several non-diagnostic tools were recovered including 5 bifaces, a utilized flake, and 7 modified cobbles. Most of the lithic material is local chert, but also present are siltstone, silicified shale, quartzite, and argillite. The non-chert material makes up roughly 8% of the assemblage; however, this type of material makes up 60% of the tools. This same preference for making tools from non-chert material was also shown to be the case at other datable sites in the same drainage, such as 46Su67 and 46Gb44, and is indicative of tool making practices in this area during the Middle to Late Archaic Period. It was thereby tentatively inferred that 46Gb114, while not a dateable site in a strict sense, can tentatively be placed in the Middle to Late Archaic within this localized context.

The Pulsifer Site (36Mo79)

Site 36Mo79 is a prehistoric site identified during the course of a Phase I investigation in Montour County, Pennsylvania (Shaffer et al. 2002) (**fifth slide - the Pulsifer Site**). The site is located on a stream terrace of the County Line Branch of the Chillisquaque Creek 15 miles upstream of the Susquehanna River.

The site assemblage consists of 32 artifacts, including 31 chert flakes and 1 biface. Debitage represents both early and late stage reduction, with a preponderance of the former. One of the biface reduction flakes shows evidence of retouch. The lithic material is chert described as not consistent with local bedrock sources (Shaffer et al. 2002:46). However, since glacial till is found in the area, the material could have been locally available.

Upland Sites and Redundant Data

To digress momentarily, a frequent argument used to dismiss small upland sites is that they will not contribute new information and merely represent redundant data.

In order to prove this case, though, the following questions must be addressed.

- 1) How does the site fit into a settlement pattern?
- 2) How can the site contribute new information to this body of knowledge?
- 3) Redundant to what?

In the case of the Spring Creek Site, it can be inferred by comparison to other sites in the drainage that this site represents a point of resource extraction during the Middle to Late Archaic Period. The situation for the Pulsifer site is not quite so straight forward. There are a total of 259 prehistoric archaeological sites in watershed 10D, and of these, 169 are datable 70 of which are located inland of the Susquehanna River flood plain (Figure 3). Based on the information we have, the sites in this area seem to range in size from very small, single occupation sites to large, multi-component sites. The main focus of occupation seems to conform to what Turnbaugh presented: Late Archaic and Transitional with a resurgence during the Late Woodland. The Pulsifer site is included in a small cluster of 5 sites three of which are datable to the Archaic and Transitional Period. Other clusters of sites extending downstream include sites with Late Woodland occupations. The lithic material from these sites, when recorded, is locally available chert with smaller amounts of siltstone and argillite.

By way of comparison, one of the datable sites in Watershed 10D is site 36Ly290. This site is located along Muncy Creek and has Middle Archaic and Late Woodland occupations subjected to Phase III excavations. The results of the lithic analysis of material recovered from datable features indicates a shift from the Middle Archaic to the Woodland period away from formal core technology to a more expedient bifacial reduction. During Middle Archaic times 36Ly290 acted as a residence camp and the interior was exploited using a forager strategy. The Late Woodland occupation was

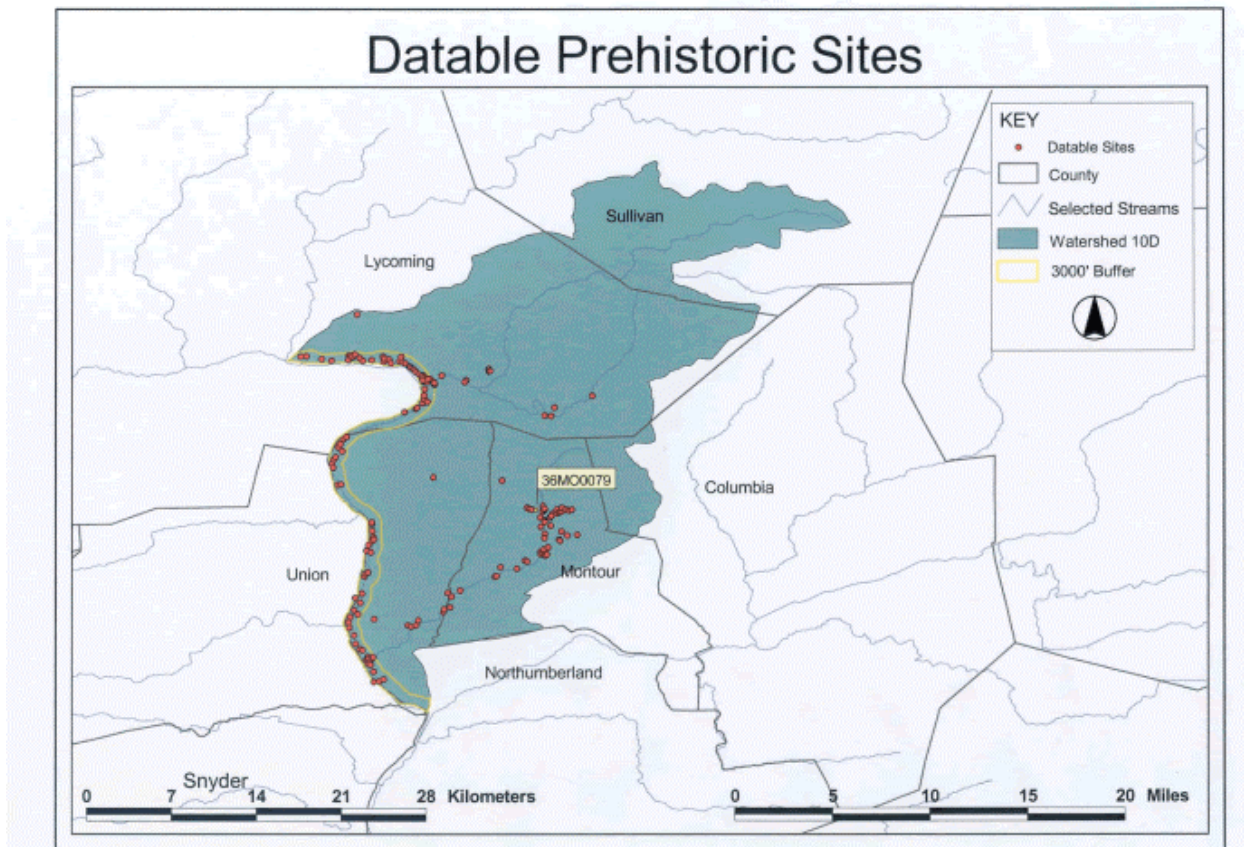


Figure 3. Datable Sites in Watershed D

characterized by a more expedient tool assemblage suggesting that this region was exploited using a collector strategy of base camps and field camps supporting larger settlements along the Susquehanna River. But can we infer anything from this site to the Pulsifer Site?

When first prepared, this paper was going to say that the Pulsifer Site represents a Late Woodland field camp based on what seems to be an expedient assemblage, the base camps being located a short distance away downstream. But it must be kept in mind that the results from 36Ly290 represent a *trend* away from formal core reduction to expedient reduction. This is to say, of course, that there was expedient lithic reduction being performed during Archaic times by otherwise content people who

didn't know any better. So, then, the Pulsifer Site could be related to the Archaic sites just up the hill. It must be remembered that analysis of debitage from the plowzone from 36Ly290 was completely inconclusive regarding time period affiliation and reduction sequences. This is not to say that we should not keep trying to pry an interpretation from multicomponent plowzone assemblages, just that it presents a complicated set of questions. So, what is our interpretation of the Pulsifer Site? It could have been a Late Woodland field camp, or it could have been a Late Archaic resource procurement site. We don't know. This time we cannot say that much. But that doesn't mean that we should stop trying.

Discussion

One might wonder at this point if a little too much time was spent time thinking about this little 32 artifact site. On some levels, one might be correct. But the fact is, sites characterized as a handful of flakes represent a large portion of the archaeological record. Very often they are either written off after the Phase I, as with the Pulsifer Site, or after the Phase II, as with the Spring Creek Site. This doesn't mean we can't learn something from them.

Since we are tasked to find these sites and interpret what they mean, and well we should, the following questions arise.

- 1) What is the chronology of small sites and how do they relate to other sites in the immediate area? Can a relative time period be assigned to a site based on analysis of lithic material without traditionally defined diagnostic artifacts?
- 2) Can tool assemblages be characterized using Binford's collector or forager strategy? Are tool assemblages curated or expedient in nature? Can these assemblages be defined within the regional watershed context as diagnostic?

In Watershed 10D, only 8 sites in the inland area have been tested on a Phase II level and of these sites only 1 has been excavated on the Phase III level. Because so little information has been generated in a systematic manner in the upland section of Watershed 10D, we really can't answer much of this at present in anything more than a hesitant manner with furrowed brows and a funny look. The old crutch applies, more information is needed; in particular, a comprehensive synthesis of what we do know. In order to pry more information out of the data, we need to know what they are.

I readily admit that there are many small sites that will always be merely 15 flakes and a shrug. I have worked on such sites and by themselves they are not that exciting. They represent small bits of human activity for which we can merely ascribe a few possible guesses, but other than that we will merely record them, curate them, shrug, and move on. Nevertheless, they are very important to our understanding of the past and as archaeologists we are tasked with finding them and trying to make something of them. And as long as we are, it is the position of this paper that a little more thoughtful approach does have the potential to place these sites in a more complete context. In short, we advocate giving the archaeology a little more of a chance.

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