



CONNECTING PEOPLE AND PLACES

The Archaeology of Transportation
at Lewistown Narrows

Pennsylvania Department
of Transportation



Paul A. Raber



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Paul A. Raber
Heberling Associates, Inc.

Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
for the Pennsylvania Department of Transportation

2007

Commonwealth of Pennsylvania
Edward G. Rendell, Governor

Federal Highway Administration-Pennsylvania Division
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Pennsylvania Department of Transportation
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Pennsylvania Historical and Museum Commission
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The archaeological studies for the U.S. Route 22/322 Lewistown Narrows highway improvements project received the 2006 Federal Highway Administration/ Pennsylvania Division Transportation and Historic Preservation Excellence Award.

Photographs courtesy of Heberling Associates, Inc., except as noted.

Layout and design by Christopher Yohn

Digital edition ©2019

Cover: "Lewistown Narrows, On The Juniata River" by John Hows, Robert E. Wagoner Collection.
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ISBN 0-89271-121-3



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The Lewistown Narrows, facing east from Blue Mountain

The Archaeology of Transportation

We often take transportation for granted. The roads and other transportation facilities that make our modern lives possible are so much a part of our daily experience that we seldom pause to think about them. People and goods move across the country on a network of roads, rail lines, waterways and air links that provide the foundation for our economic and social lives. Travel and transportation are essential parts of our nation's well-being.

This has always been true. We know from historical accounts how important roads and transport were to the early development of the United States, bringing settlers from Europe and elsewhere into North America in the fifteenth to eighteenth centuries. These settlers carried with them items that would profoundly change the face of the continent, its people and their way of life. Transportation was critical to the growth of new industries and commerce, supplying them with the raw materials they needed and providing the connections to markets that allowed their products to be distributed widely. It determined the location of towns and villages and their fortunes, opening new regions to settlement and supporting the growth of previously settled areas. Where a road or railroad was routed could make the difference between whether a town flourished or died, whether it became the county seat or faded into obscurity.

We can still trace the network of transportation facilities that developed in the last few centuries in the remains of roads, turnpikes, railroads, canals and towns. But there is another less visible transportation history hidden beneath the surface of the earth. For thousands of years before European settlers arrived, the first inhabitants of the land—descendants of the people who crossed the Bering land bridge into North America during the last Ice Age, more than 12,000 years ago—faced the same challenges that the later arrivals did: how to link people and resources across the landscape. The technology differed but the needs of these first settlers were much the same. They had to communicate across long distances and obtain a wide variety of resources and goods. Unlike the remains of historic transportation, the records of *precontact* (see the glossary for explanations of italicized terms) travel, trade and resource use are often hidden and subtle, requiring the intensive efforts of archaeologists to discover and identify them.

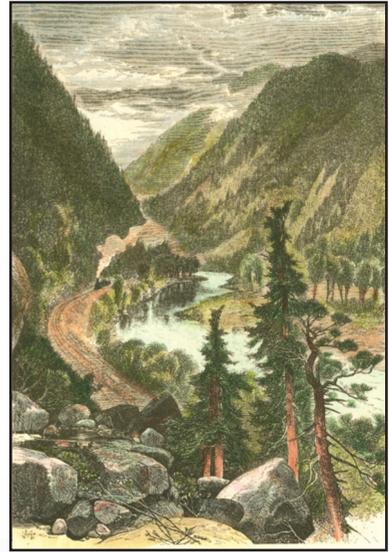
Archaeologists had an opportunity to look at the long and varied record of transportation in one location as part of the preliminary studies for the improvements to U.S. 22/322 in the Lewistown Narrows in Juniata and Mifflin counties, Pennsylvania. The Pennsylvania Department of Transportation asked Heberling Associates, Inc. to look at the historic structures and archaeological sites within the Narrows, identify significant sites and properties, and record or recover important information from some of the sites before they were disturbed or destroyed by construction. Heberling Associates conducted surveys of historic archaeological sites (including the Juniata Division of the Pennsylvania Canal) and Native American archaeological sites, discovering eight previously unrecorded prehistoric sites, all of them camps occupied by Native American peoples over the course of at least 9,000 years. It was evident that one of the sites, 36Ju104¹, contained large amounts of archaeological remains that justified a program of full excavation.

¹ All archaeological sites in Pennsylvania are recorded according to the Smithsonian trinomial system: the first two numbers refer to the state (36 for Pennsylvania), the next two letters to the county (Ju for Juniata) and the last number to the sequential site number (104) assigned within that county.

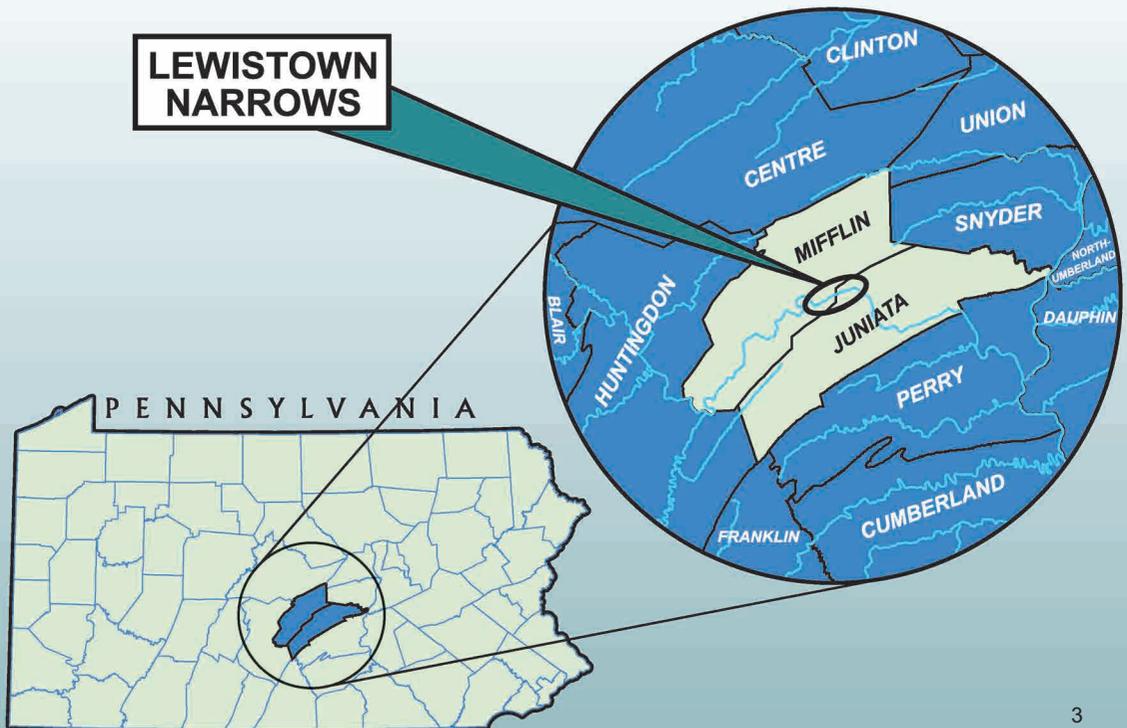
In three seasons of field studies (2001-2003) we recovered over 103,000 artifacts and other evidence representing the repeated use of the site by Native American groups traveling through the Lewistown Narrows. We were able to learn something about when people stayed at the site and what they were doing there. The story of the prehistoric use of the site provides a vital piece of the picture of transportation history in the Lewistown Narrows, one that could only be obtained through the patient and painstaking application of modern archaeological methods.

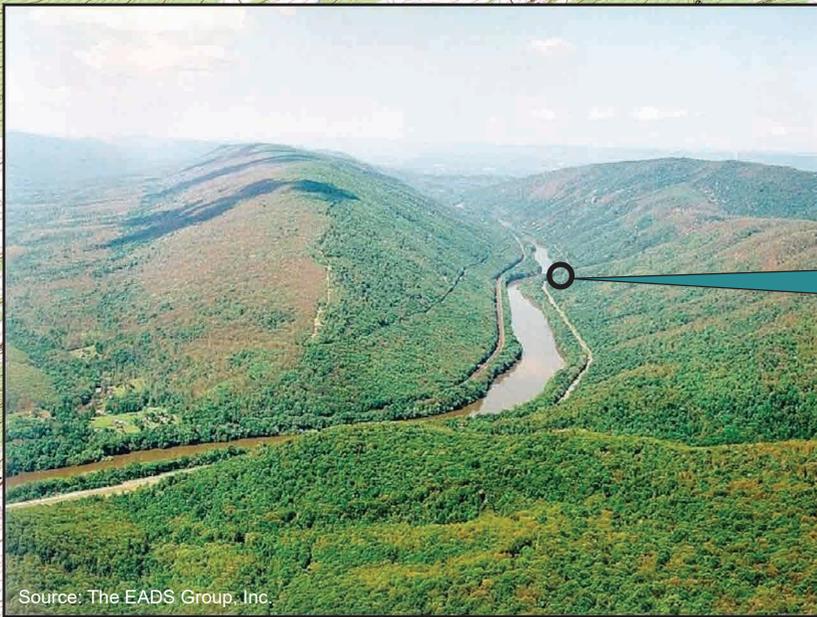
The Lewistown Narrows

As the name implies, the Lewistown Narrows is a narrow, six mile long gorge cut by the Juniata River through Shade Mountain and Blue Mountain as it flows through the Ridge and Valley region of central Pennsylvania. The regional landscape of long, parallel ridges and broad, fertile limestone valleys is a product of millions of years of geological activity, during which the land was uplifted, folded, and eroded, then again uplifted and eroded. Resistant rocks like sandstone top the ridges, while less resistant rocks like limestone underlie the valleys. The resulting landscape had a profound influence on the human use of the region. The characteristic grain of the landscape along the northeast-southwest trending ridges has channeled movement through the region since the first arrival of humans.



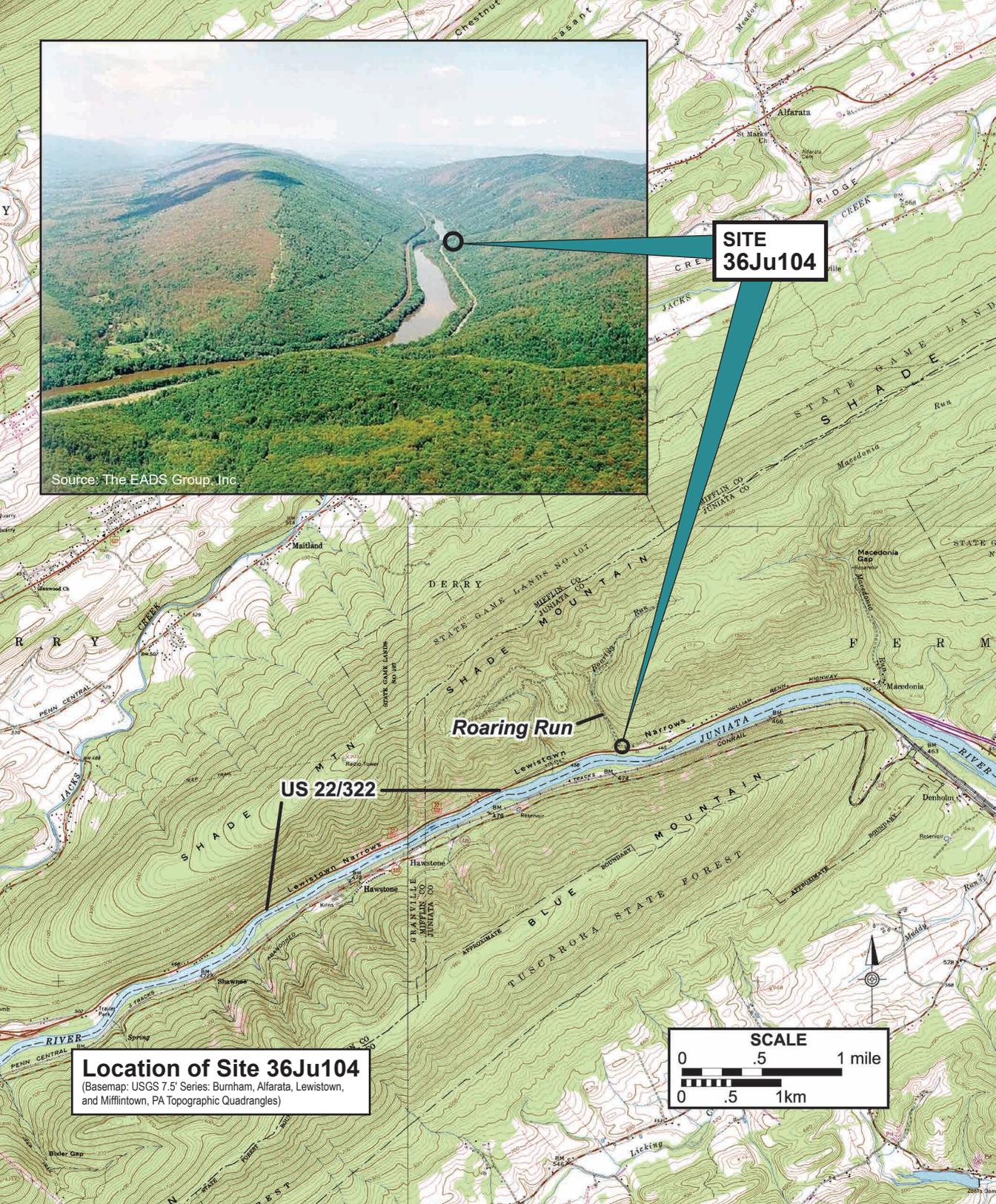
Nineteenth century view of the Narrows
("Lewistown Narrows" by T. Moran,
Robert E. Wagoner Collection)





Source: The EADS Group, Inc.

**SITE
36Ju104**

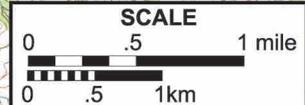


Roaring Run

US 22/322

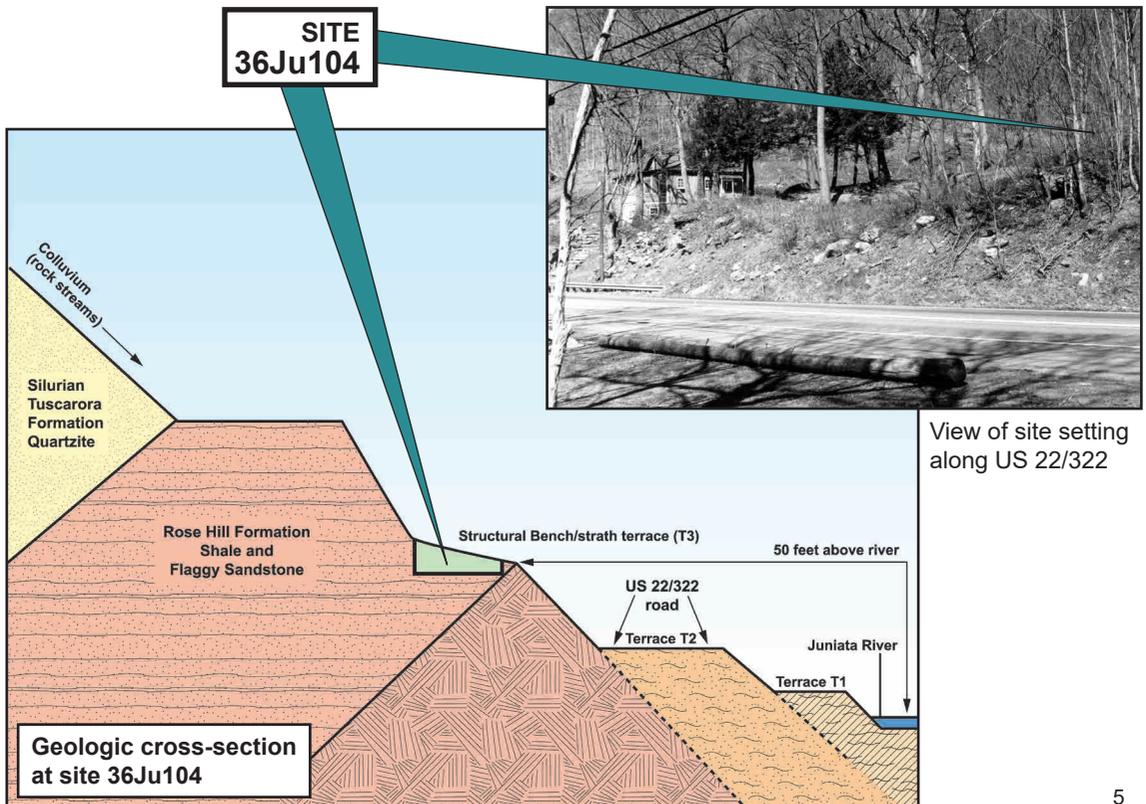
Location of Site 36Ju104

(Basemap: USGS 7.5' Series: Burnham, Alfarata, Lewistown, and Mifflintown, PA Topographic Quadrangles)

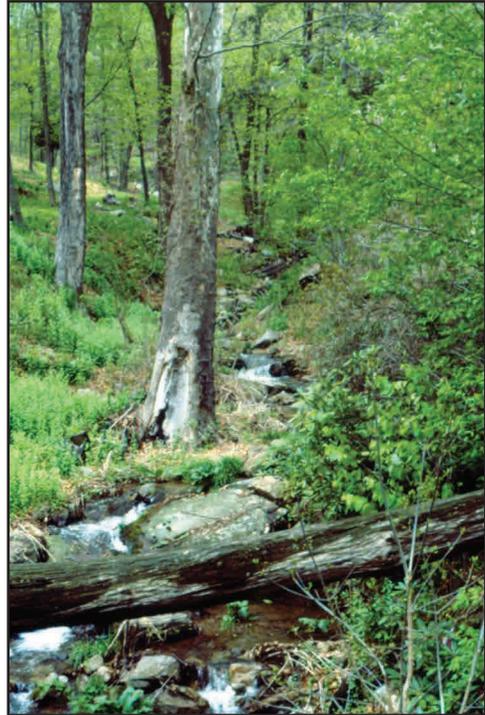


Like other ridges in the region, Shade and Blue mountains extend for dozens of miles with only a few gaps. They were major barriers to the movements of people and goods through the region. Movement tended to be along the river and streams, since the ridges—often 1,000-1,500 ft above the surrounding valley floors—impeded early travelers as they do those of the present day. Resources of interest to the early inhabitants of central Pennsylvania tend to lie in parallel zones along the valleys and the ridge slopes. The search for food and materials for tools was also oriented along the grain of the landscape.

As the river cut its channel through the rocks of the Lewistown Narrows it left a series of successive terraces. Most of the early paths and roads traversed the two river terraces created over the past 10,000 years. The building of the canal in the 1830s disturbed or destroyed much of the lower terrace, while the higher second terrace provided the route for nineteenth and twentieth century highways. A higher bench or terrace, visible in only a few locations, served as a convenient camping spot for generations of travelers and the location of site 36Ju104. The bench was created at the contact between the shale of the Rose Hill formation and the harder *quartzite* of the Tuscarora formation. The softer shale formed



a well-drained and level surface suitable for Native American camps, while the Tuscarora quartzite, large outcrops of which occur just above the site, provided a durable and convenient material for cutting and scraping tools. With the water from nearby Roaring Run, the location would have been a very attractive spot to camp for a night or two while traveling along the banks of the Juniata River.



Roaring Run, downstream (left) and upstream (right) from 36Ju104. The foot bridge is in the foreground of the left image; US 22/322 and the Juniata River are visible in the background.

The environment has changed little over the past 2,500-3,000 years, but earlier travelers might have encountered a very different climate and variety of plants. As the Ice Age glaciers retreated from northern Pennsylvania some 16,000-10,000 years ago, the region was covered with a mosaic of tundra and parkland unlike any environment on earth today, with tundra-like vegetation interspersed with clusters of trees. Conditions were cooler and harsher for the first people to enter Pennsylvania over 12,000 years ago ². We saw no signs

² The exact date and origins of the first settlers to arrive in North America are the subjects of an animated and continuing debate among archaeologists. There is a consensus that people using typical Clovis spearpoints were in Pennsylvania by around 13,500 years ago, but there is growing evidence that pre-Clovis peoples may have arrived several thousand years earlier.

of these earliest arrivals at 36Ju104 but we know from the evidence at other contemporary sites that they were living in central Pennsylvania. The climate became substantially milder with the final disappearance of the continental glaciers. By around 10,000 years ago a modern array of animals was established and the early *boreal* forest gave way to a more familiar mixed coniferous/deciduous forest. This is the environment faced by the first recorded people to camp at 36Ju104, roughly 8,500-9,000 years ago.

One of the distinctive features of the setting is the presence of *colluvial* soils, that is, soils formed in sediments that have been eroded and moved downslope through the action of water and gravity, in contrast to the *alluvial* soils that develop in flood deposits on the lower river terraces. Under the right conditions, these sediments accumulate gradually over time and can preserve *stratified* deposits that contain the evidence of the successive inhabitants of campsites. Our preliminary studies at 36Ju104 suggested that there might be shallow stratified archaeological deposits undisturbed by recent activities that represented the repeated use of the site for at least 8,500 years. We hoped to see patterns in the artifacts that represented individual campsites.



Site 36Ju104 during excavation

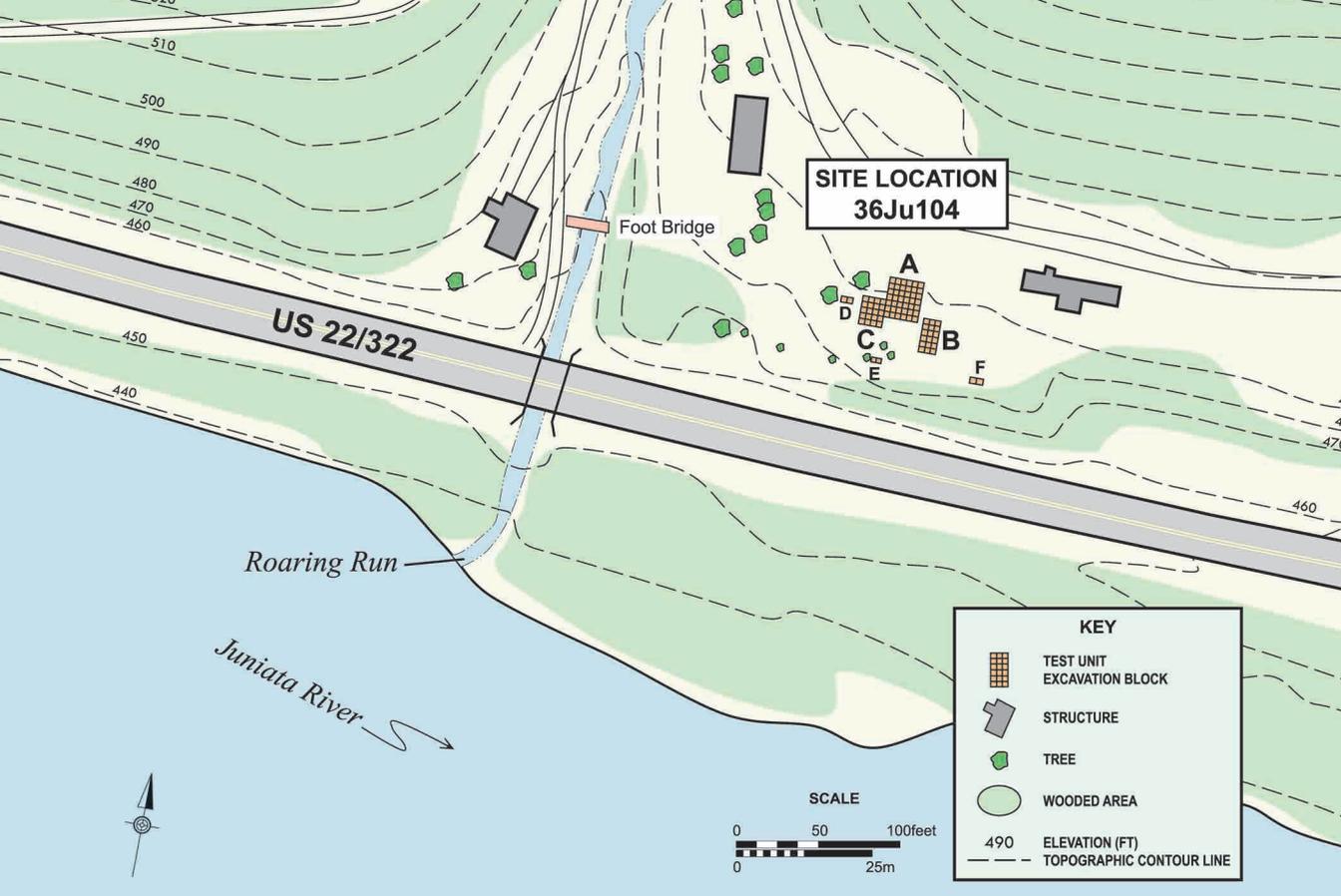
Archaeology at 36Ju104

Our goal in excavating 36Ju104 was to answer questions about the past use of the site and regional trends in settlement and subsistence:

- ▶ We wanted to examine changing patterns of resource use through time, especially the use of local and non-local stone for tools, including the Tuscarora quartzite that outcropped next to the site and *rhyolite*, which we know came from quarries on South Mountain in Adams and Franklin counties, some 60 miles away. The patterns of tool stone use tell us about the connections between groups and regions in prehistory and how local groups perceived and used the landscape.
- ▶ Judging by the location and size of 36Ju104, we expected that travelers had always used the location as a convenient overnight camping spot, and did not anticipate finding any signs of larger or more prolonged settlements. We were concerned with what the site's occupants were doing there and, given the gradual stratified accumulation of soils there over time, we hoped that we could identify individual occupations.
- ▶ Archaeologists have recently looked at several sites located in similar settings, at gaps in the region's ridges. We hoped to recover information that would tell us about the unique role these settings and sites played in regional travel and transport.



Site 36Ju104, Block A, during excavation, facing south



Plan of Site 36Ju104

We adopted an excavation approach that would recover information from fairly small and tightly defined spatial units that might tell us what an individual camp looked like. So we examined larger contiguous *excavation blocks* rather than scattered *test units* as we had in the early phases of work, and within each block we excavated soil in 5 cm (2") levels within 50 cm by 50 cm (20" x 20") units³. We were then able to tell precisely where any artifact at the site came from, using an electronic *total station* to record the exact three-dimensional location of larger artifacts, especially tools, and archaeological *features* (like fireplaces or *hearths* and *postmolds*). Having precise measurements of the position and depth of artifacts and features allowed us to use a computer mapping program to plot the distribution of various types of artifacts with respect to features by level. We recorded the locations of all artifacts and features as accurately as possible, entering information about them into a computer data base. Soil from features, almost all of which were prehistoric

³ We excavated the site using the metric system of measurement (meters/centimeters, liters, etc.). For the convenience of the reader, we have translated all metric measurements into their English system equivalents (feet/inches, quarts, etc.).

hearths, was mixed with water in a flotation device that separated out lighter organic material like seeds, nutshell and bone. We also collected charcoal from features for dating by radiocarbon (C-14) analysis. Together with the *diagnostic artifact* types that we could date to fairly broad time spans, this information gave us some idea about when people had visited the site.

We screened all excavated soils through a 1/8" mesh to make sure we caught even the smallest artifacts. Most of the artifacts we recovered were waste products from the making of stone tools, stone debris that archaeologists refer to as *debitage*. We also found a variety of carefully chipped and formed tools, including spearpoints, knives, and scrapers, as well as unfinished stone tools. Many of the tools, however, were flake tools. These were flakes of various materials that displayed sharp edges suitable for cutting and scraping. These flake tools or utilized flakes were easily made and required little effort or planning. They could be used and discarded. The Tuscarora quartzite from the nearby outcrops was apparently often used for flake tools, since it was easy for prehistoric stone tool makers to produce a flake with a sharp and durable edge. Quartzite is generally not suitable for carefully formed tools because of its tough texture and unpredictable *knapping* behavior.



Water-screening excavated soil



Excavation of Block A



Feature 35:
A Late Woodland period
rock-lined hearth



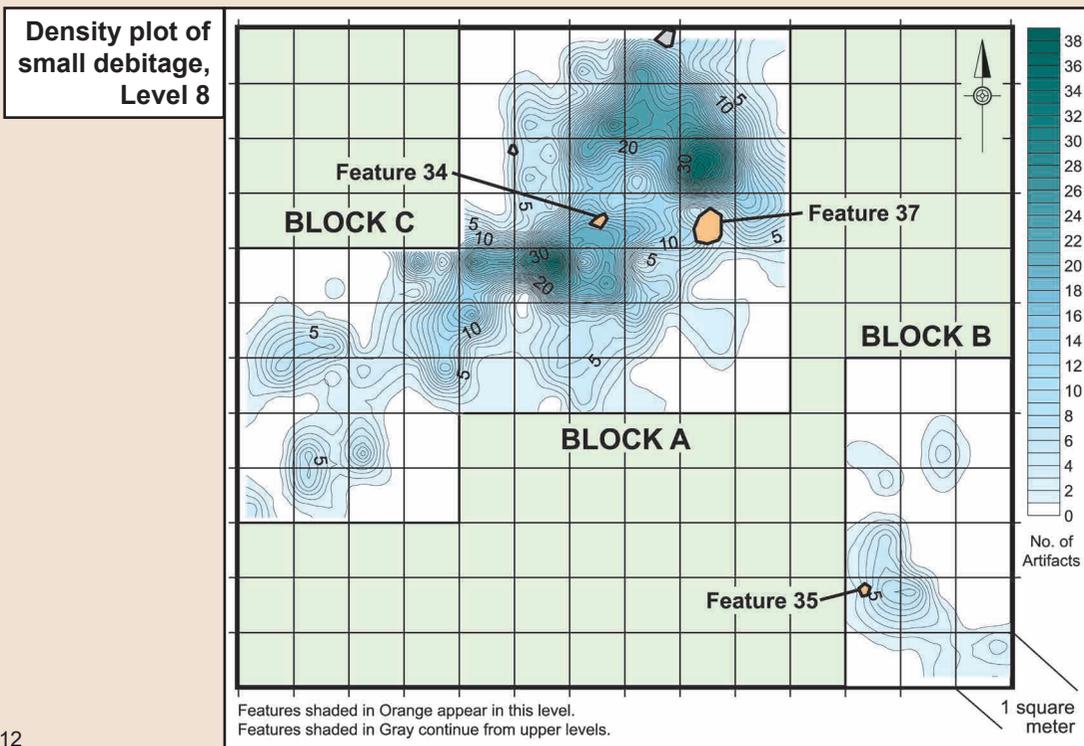
Feature 60:
A Middle Archaic
period hearth

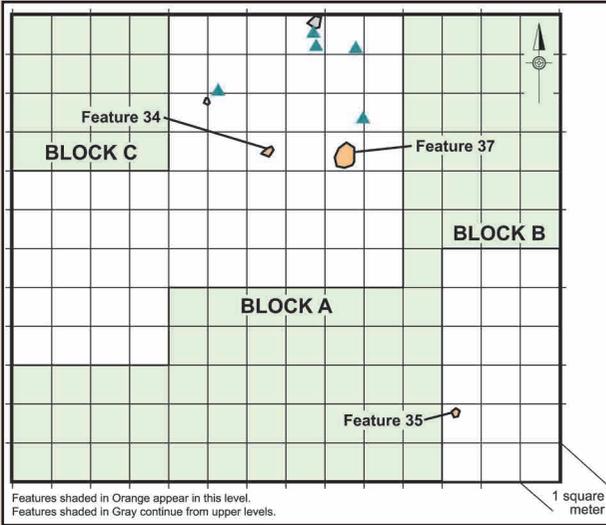
Features exposed during excavation in Block C



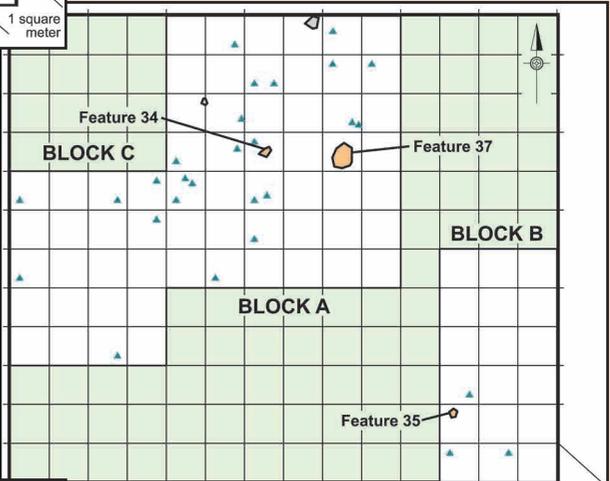
What Happened at 36Ju104?

Through the careful mapping and analysis of artifact spatial patterns at 36Ju104, we were able to define 41 artifact clusters, each of which, we believe, represents an individual occupation of the site. We looked, in particular, at the patterns of fine debitage (less than 0.2" in size), because studies by other archaeologists and *ethnographers* have shown that this class of artifacts is less likely to be moved or disturbed by cultural and natural forces (cleaning or trampling, for example) than larger artifacts. We then compared the clusters defined using fine debitage with the distribution of various tools and features to identify, where possible, the age and nature of the occupation. We were especially interested in whether the clusters were associated with hearths (fireplaces) or artifact types that could be dated to a particular period. Hearths often contained datable charcoal radiocarbon samples. *Ethnographic* studies of living or historical *hunter-gatherer* groups suggest that most brief encampments like those we expected at 36Ju104 are focused on a hearth. The activities typical of such camps—like stone tool making, cooking and socializing—took place around the hearth, which provide the necessary heat and light for these tasks. Not only was heat essential for cooking animal and plant foods, but stone was often deliberately heated to improve its knapping qualities.

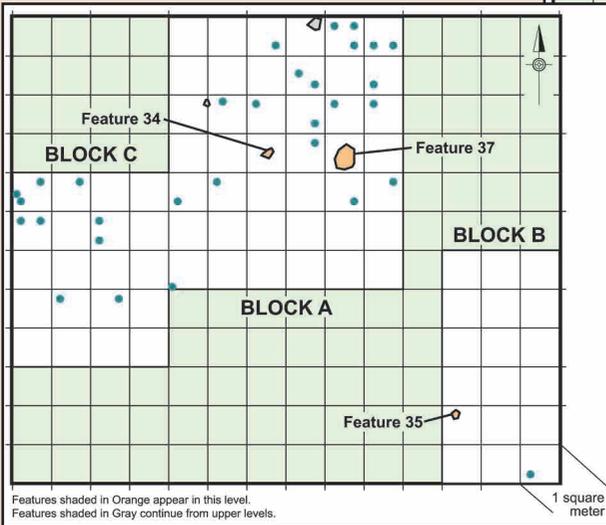




Distribution of projectile points, Level 8



Distribution of flake tools, Level 8

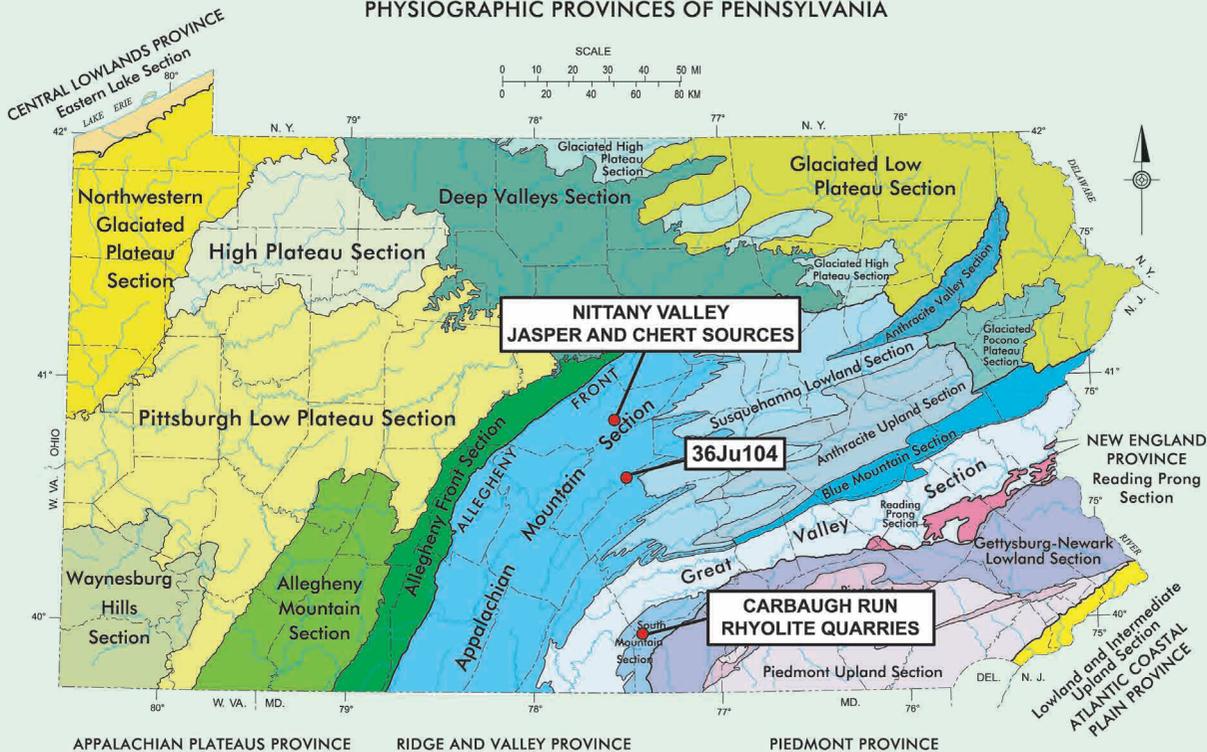


Features shaded in Orange appear in this level.
Features shaded in Gray continue from upper levels.

1 square meter

Distribution of cores, Level 8

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA



modified from "Physiographic Provinces of Pennsylvania", PA DCNR, 2000

Location of rhyolite and jasper sources with respect to Site 36Ju104

Surprisingly, we found few clear associations between artifacts clusters and hearths at 36Ju104. This might be because some hearth features have weathered over a long time and disappeared from the archaeological record. Some of the travelers camped at 36Ju104 may have been there so briefly that they did not bother to build a fire. In any case, with or without hearths, the artifact clusters record the presence of travelers through the Lewistown Narrows since at least the mid-seventh millennium BC and continuing until the period of contact with Europeans in the seventeenth century AD. None of the occupations, early or late, was very long or substantial. In fact, they were all remarkably similar in character. None lasted longer than a night or two, and we infer from the number and types of artifacts that no more than a few persons were present at any one time. We can imagine a family or perhaps a single-sex task group camped on this spot on their way through the Narrows on local or long-distance trips.

That many of the trips were to distant destinations is attested by the presence of rhyolite and *jasper*, tool stone types that do not occur locally and must have come from known sources 30-60 miles from the site. The nearest source of rhyolite is in southern Pennsylvania, at quarries near rhyolite outcrops on South Mountain, the northernmost



Rhyolite (left) and jasper (right) drills (actual size)

extension of the Blue Ridge. The rhyolite quarries were used throughout prehistory and the material appears widely on sites throughout the Susquehanna and Juniata river drainages. We found that as much as 20% of the debitage at 36Ju104 consisted of rhyolite, implying that the travelers passing through the Narrows were carrying substantial amounts of the rock.

They were using rhyolite both for formal tools like spearpoints and knives, and for flake tools, made quickly and easily for the task at hand and discarded after use. The use of rhyolite at 36Ju104 reached its peak in the Middle and Late Archaic periods, roughly between 6500 and 2000 BC. The evidence from

36Ju104 and other sites along the Juniata River and its tributaries suggests that the Juniata Valley was the limit for the direct procurement and transport of rhyolite. Beyond the valley, rhyolite appears only sporadically through occasional trade or exchange. The pattern of rhyolite use contrasts strongly with that of jasper, probably obtained from much closer sources to the north near present-day State College. The preference for rhyolite from distant sources may suggest that the costs (in time and effort) of carrying rhyolite along rivers and streams from its southern source was significantly less than that of carrying jasper over the mountains in a much shorter trip from the Nittany Valley. Alternatively, this pattern may indicate that hunter-gatherer groups had sharply-defined territories that restricted movement in certain directions, leaving the rhyolite quarries open to use by many groups.

Travelers camped at 36Ju104 used the quartzite available from the source adjoining the site in a very different manner. Again, the period of most intensive use was from the Middle Archaic through the Late Archaic period. But quartzite was used exclusively for flake tools fashioned with minimal preparation for a specific job and then discarded. Travelers through the Narrows evidently knew they could obtain high-quality quartzite from a source next to the site and relied on this abundant material in creating various sharp-edged tools for cutting and scraping hides, wood, bone



Quartzite cores from 36Ju104

and antler. These organic materials have disappeared in the centuries and millennia since Native American travelers occupied the site, but the stone tools and debitage provide indirect evidence of their use. The opportunity to use the local quartzite was probably as much an attraction to the site as its location and access to water.

Rhyolite and quartzite were by no means the only tool stone used at 36Ju104. A substantial proportion of the materials we noted in the stone tools and debitage (about 20%) were local *cherts*, obtained from outcrops within a few miles of either end of the Narrows. By studying the local

geology and locating a number of possible chert sources, we were able to look at the ways in which the early inhabitants of the camps at 36Ju104 viewed the landscape and made decisions on where and when to obtain the resources they needed. Travelers through the Narrows carried both exotic tool stone from fairly distant sources, like rhyolite and jasper, and also made use of chert sources within a few miles of either end of the Narrows. The proportions of these materials at 36Ju104 reflect the choices they made about where to find stone for both formal and expedient tools.



Middle Archaic period
chert point fragment
(actual size)



Middle/Late Archaic period
chert points (actual size)

The temporary nature of the camps at 36Ju104 was evident in the small size of each occupation and the associated artifact cluster, the limited variety of tools we recovered from the site (discarded formal or expedient tools), and the absence of clear signs of structures (houses, lean-tos or other shelters) that would point to longer stays at the site. The same factors also indicate that only a few people were present at any one time. We can imagine that most encampments were centered on a hearth (although it may no longer be visible as an archaeological feature) and included the members of a family, or possibly a single-sex (male) group focused on a specific task like obtaining tool stone. Some of those camped at 36Ju104 may have been traveling relatively short distances from larger camps on the banks of the Juniata River or its tributaries at either end of the Narrows. Others were making through trips from more distant points, including the rhyolite quarries to the south and the upper reaches of the Juniata River drainage to the west.



Chert (left) and jasper (right)
scrapers (actual size)

In determining what they did at 36Ju104, we found that what is not there is perhaps more important than what is. We found no facilities for food storage or processing, or even temporary structures. The inhabitants of the camps traveled light, carrying only the materials, such as tool stone, that they had obtained during their travels and those items they needed to survive, primarily stone tools for hunting and basic food preparation. Many of the tools they used were expedient, shaped from the readily available stone in the vicinity. These include edged tools suited to working wood, bone and hides, as well as tools that were simply stream-rounded cobbles and pebbles that could be used for grinding and pounding nuts and seeds. Animal hides and bark may have been used to carry food items, like dried plants and meat. Despite examining more than three dozen features at the site, however, we recovered almost no animal bone, perhaps because it did not survive the centuries, or possibly because the travelers relied mostly on plant foods collected during their travels or carried in dried form.

The hunting and gathering people who camped at 36Ju104 spent most of their time in larger groups at more substantial base camps elsewhere. But their stay at 36Ju104 was an important part of their activities. The Narrows was a link in a regional network of communication and the transport of materials that stretched across central Pennsylvania and most of the Juniata River drainage. The artifacts and features we found at 36Ju104 reflect the important role that the Narrows played—then as now—in linking people and resources across the landscape.

The Middle Archaic Period at 36Ju104

The site produced substantial archaeological evidence for the movement of Middle Archaic peoples through the region. We recovered more than two dozen distinctive *bifurcate* tool types that establish the use of the site between approximately 6500 and 6000 BC, and other artifact types and radiocarbon-dated features that point to later Middle Archaic occupations between 6000 and 3500 BC. Our analysis of the stratified deposits at 36Ju104 suggested that most of the archaeological data from the earlier levels represent the Middle Archaic period use of the site. Why were Middle Archaic travelers camping at 36Ju104 and how did their activities at the site fit in with their way of life?

Across eastern North America, the Middle Archaic was a critical period in the development of native cultures, reflecting their adaptations to fully modern environments. As the Late Glacial climate of Pennsylvania moderated and a more typically modern environment was established, a broader range of plant and animals offered new sources of food and materials for clothing and shelter. Despite the critical importance of these changes, we have relatively little evidence of what was happening in the Middle Archaic period in Pennsylvania, especially during the earlier part of the period in the seventh and sixth millennia BC. Much of what we know comes from the discovery of surface sites in which Middle Archaic artifacts are mixed with those of later periods.

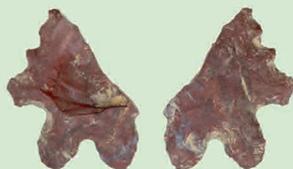
Summary of Time Periods and Cultures in Central Pennsylvania

Period	Dates*	Cultural Periods†
Paleoindian	before 8000 BC	Hunter-Gatherer I: highly mobile groups adapted to boreal forest
Early Archaic	8000-6500 BC	
Middle Archaic	6500-3000 BC	Hunter-Gatherer II: collecting focused on new variety of plants and animals
Late Archaic	3000-1800 BC	Intensive Gathering/Formative: larger and more sedentary groups using the oak-chestnut forest; new technology; trade and contact
Terminal Archaic	1800-1000 BC	
Early Woodland	1000-400 BC	
Middle Woodland	400 BC-AD 800	
Late Woodland	AD 800-1600	Village Life: settled village farming
Contact/Historic	after AD 1600	Contact: European contact and response

* all dates are approximate and vary by region.

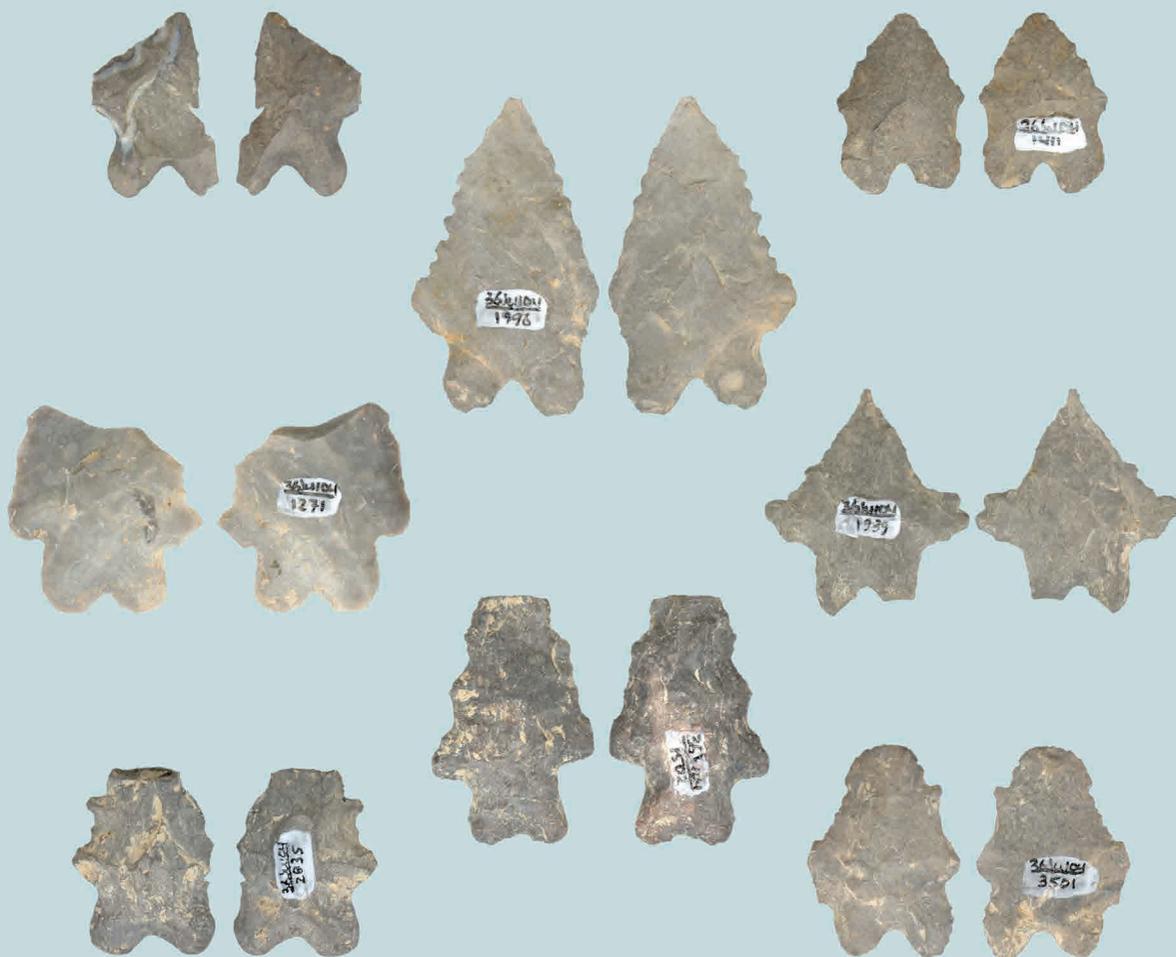
† Adapted from Custer (1996, 2001).

MIDDLE ARCHAIC BIFURCATE POINTS



Jasper

Chert



MIDDLE ARCHAIC BIFURCATE POINTS



Rhyolite

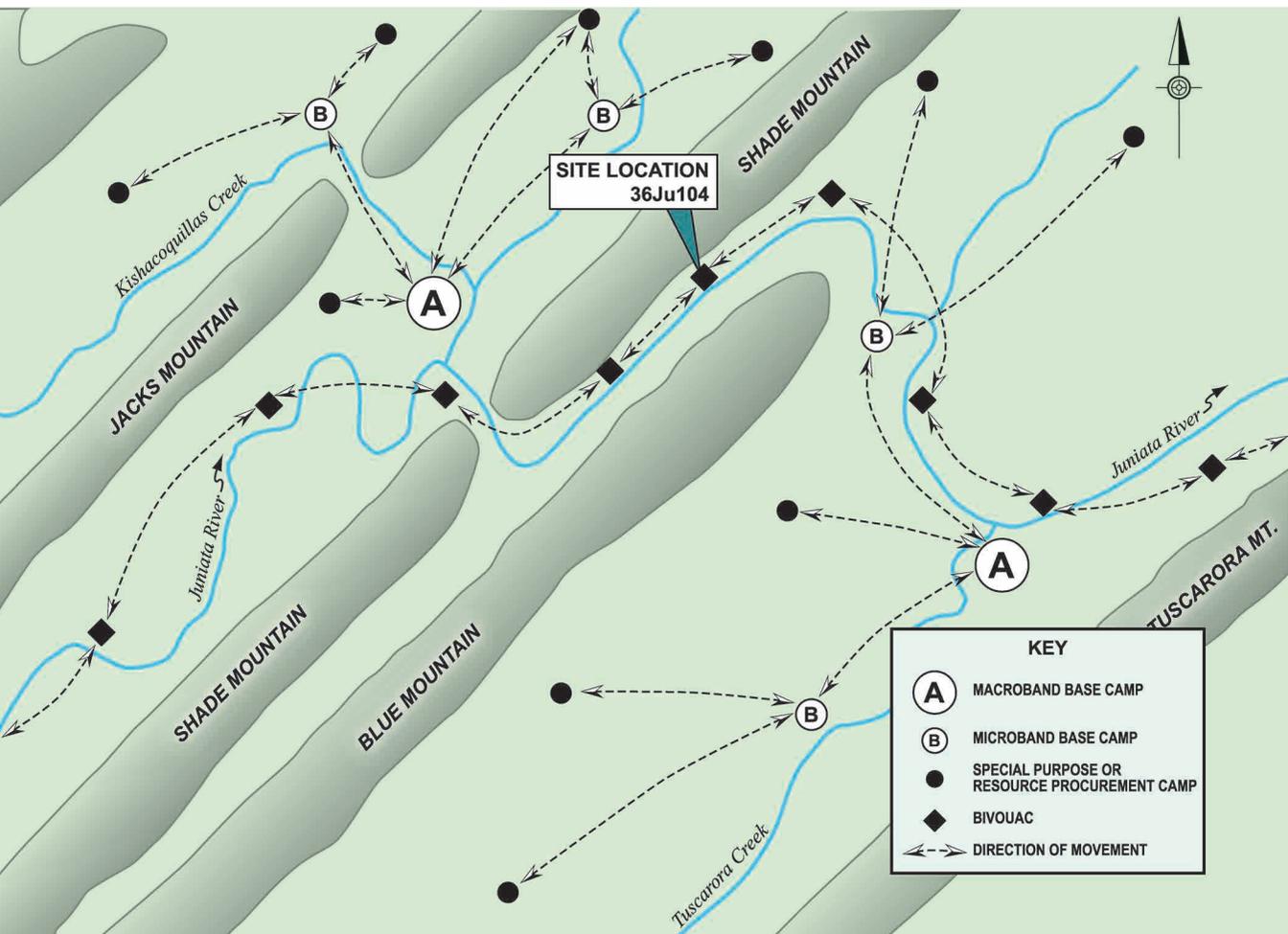
At sites where we can look at the Middle Archaic in greater detail, we see some continuity from earlier periods, but also evidence that Middle Archaic hunter-gatherers were adapting to new opportunities. The wide variety of plant and animal foods available at this time—especially white-tailed deer and various nut-producing trees like oak and chestnut—allowed Middle Archaic period peoples to schedule their movements to take advantage of the seasonal prevalence of those foods. Large seasonal base camps become important bases from which local groups organized their activities. Specific foods and other resources could be obtained by periodic forays from these base camps, rather than during sequential moves from one resource location to the next. One sign of this shift is a greater use of expedient tools that were easily made from local materials rather than tools made from higher-quality materials of more limited distribution that were carefully curated and reworked.

At 36Ju104, we saw abundant evidence for the use of expedient tools of the local Tuscarora quartzite. The quantities of non-local rhyolite that the Middle Archaic travelers at 36Ju104 were carrying hints at their use of widely scattered resources during periodic forays from base camps along the Juniata River and other major streams in the region. Local chert sources were also well-known and figured in the scheduled movements of local hunter-gatherer bands. From the prevalence of these materials and the ways in which they were used at 36Ju104 we were able to infer how Middle Archaic peoples organized themselves and how they saw the contemporary landscape. Both local resources and more

distant sources of tool stone were known to the Middle Archaic inhabitants of 36Ju104 and figured into their decisions about when and where to locate their settlements.

Although this Middle Archaic pattern of site use persisted largely unchanged through the remaining millennia during which the site was occupied, the strong presence of Middle Archaic peoples at 36Ju104 is noteworthy in itself, suggesting that Middle Archaic groups were well-established locally. The dearth of Middle Archaic sites in the region's archaeological record may have given us an unrealistic impression of the size of hunter-gatherer populations during this period. The best way to remedy our ignorance on this topic would be to make an effort to obtain radiocarbon dates from sites where Middle Archaic camps might be located, particularly those sites where deeply stratified deposits offer a full picture of changes over a long time span.

Settlement model showing prehistoric site types and patterns of movement



The Future of the Prehistory of Transportation

Our approach at 36Ju104 yielded information that can be compared to what we know from other archaeological sites in the region and from historical sources. This allows us to see persistent patterns in the use of the landscape over long periods of time. The nature of the landscape influenced the decisions about resource use and settlement made by the first inhabitants of central Pennsylvania, just as it did for the first Euro-American settlers of the region. The constraints on movement imposed by the mountains and the routes of travel offered by the rivers and streams remained important factors in where people chose to live, where they went to obtain valued resources and how they got there—whether the resources sought were stone and deer hides or steel and lumber.

Some of what we learned from our experience at 36Ju104 might have been predicted but some results were unexpected. We expected that applying fine-grained excavation techniques would yield detailed information on individual occupations, permitting us to reconstruct the size and structure of camps, where the inhabitants were traveling and what they were looking for. We were surprised, however, that by using those techniques we were able to find a stratified record of over 8,000 years of human use of the local landscape of the Lewistown Narrows in the colluvial sediments of the site. Colluvial settings on slopes and benches are often overlooked as sites with the potential for stable and well-preserved archaeological deposits. Our studies at 36Ju104 demonstrated the value of such settings to our understanding of regional prehistoric life.

The fine-grained excavation approach we adopted—recovering and recording our results by small *provenience* units—yielded precise information on the vertical and horizontal location of artifacts and features that allowed us to define patterns of campsite organization through time, but also detailed plots of small artifacts that were particularly helpful in defining those patterns. By using fine-mesh screening of excavated soil, we were able to plot the distribution of very small artifacts that might otherwise have escaped notice. As mentioned above, these very small artifacts are less affected by the natural and cultural forces—erosion and trampling, for example—that move artifacts from their initial locations. By plotting their occurrence, we were able to examine in detail the shape and size of prehistoric camps.

We found by far the most substantial evidence for the Middle Archaic period occupation of the Juniata River valley yet known, proving that sites of this period exist and that our current knowledge of the period is seriously biased by the lack of recorded sites. A more complete record of Middle Archaic settlement certainly exists in alluvial and colluvial settings within the Juniata drainage. Documenting that record is critical to reconstructing

the profound changes in human settlement and organization that occurred in the early centuries after the retreat of the Ice Age glaciers when a modern environment was established in Pennsylvania.

Apart from the changes that occurred during the Early and Middle Archaic periods, the most striking aspect of the story we can tell about settlement at 36Ju104 is the continuity in the use of the site through time and the persistence of patterns of long-distance travel and transportation over millennia. Items like South Mountain rhyolite and Nittany Valley jasper were obtained from distant sources and carried through the Narrows in a pattern of regional resource movement that continued almost unchanged until growing populations and territorial concerns apparently limited access to the sources and the free movement of hunter-gatherer groups. Continuing research on the sources of local tool stone will help us to gain a better understanding of where people obtained the resources they needed and how they organized this movement of goods and people in response to changing needs and a much more slowly changing landscape. A large part of the record of the past is lost. Archaeologists constantly struggle to account for the things they can no longer see or find: the organic materials like bone and wood that decay and leave little or no trace. The results from our work at 36Ju104, however, demonstrate that when carefully and completely searched for and examined, even the little that remains can yield new insights into transportation in Pennsylvania, a continuing story that leads from the earliest Native American trails to the highway construction of the twenty-first century.



(Sources: Robert E. Wagoner Collection; PennDOT; William H. Rau; PennDOT)

Glossary

alluvial: related to sediments deposited by flowing water in a stream.

bifurcate: one of several distinctive types (Lecroy, St. Albans, MacCorkle) of stone spearpoint with a characteristic deeply indented base that has been dated to the period roughly 6500-6000 BC throughout eastern North America.

boreal forest: a forest composed primarily of coniferous trees characteristic of the northern latitudes.

chert: a fine-grained rock suitable for stone tool manufacture that occurs as inclusions in sedimentary rocks like limestone.

colluvial: related to sediments eroded and transported downslope by water and gravity.

debitage: waste material or debris (flakes or chips) resulting from the manufacture of stone tools.

diagnostic artifact: a tool of a distinctive style that can be dated through regional comparisons to a specific time span.

ethnographers/ethnographic: ethnographers study the cultures of living social groups.

excavation blocks: large contiguous areas examined during the excavation of a site to provide a view of the pattern of site use.

features: non-artifactual remnants of past behavior; changes in the soil that reflect a specific activity.

hearths: fireplaces, often in pits dug into the ground.

hunter-gatherers: people who obtain all or most of their food from wild plants and animals.

jasper: a fine-grained rock similar to chert (see above) with a high iron content used for stone tool manufacture, often after heat treatment.

knapping: using a hard tool (generally stone or bone) to knock off flakes from a piece of stone to create a sharp-edged tool.

postmolds: the features (see above) left by the insertion of posts into the ground.

precontact: dating to the period before the first contact with European settlers; in central Pennsylvania, generally after the middle of the seventeenth century.

provenience: the origin or location of an object in three dimensions with respect to a standard reference system.

quartzite: orthoquartzite; a sedimentary rock formed by the consolidation of sand grains cemented with silica.

rhyolite: metarhyolite; a rock of volcanic origin that has been altered (metamorphosed) by subsequent heat and pressure; the only known source in Pennsylvania is on South Mountain in Adams and Franklin counties.

stratified: containing or composed of superimposed levels of soil and occupation debris.

test units: small areas exposed by excavation to sample portions of a site.

total station: an electronic surveying transit (theodolite) with electronic distance measuring (EDM) and recording capabilities.

Sources of Information

The following list includes book-length publications that the general reader might find in bookstores or their library. More detailed and specific references can be found in any of the volumes listed below or in *Pennsylvania Archaeologist*, the semi-annual bulletin of the Society for Pennsylvania Archaeology, Inc. (see also the society's web site: pennsylvaniaarchaeology.com).

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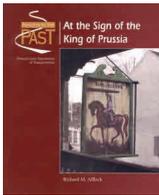
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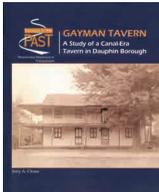
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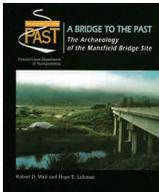
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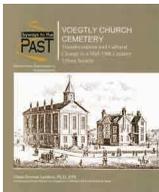
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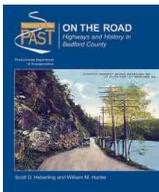
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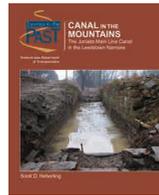
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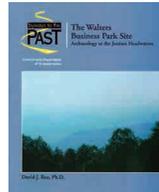
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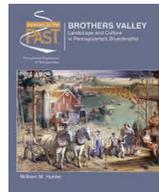
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19th Century Quakers on the Frontier
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**Eight Thousand Years on the Banks
of Aughwick Creek**
Archaeological Studies at 36HU224,
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Paul A. Raber
2017

For thousands of years before the first European settlers arrived, people were moving along the rivers and valleys of central Pennsylvania. Their movements were channeled through gaps cut by rivers in the long parallel ridges of the region, such as the Lewistown Narrows, where the Juniata River has carved a six-mile-long gorge through the mountains. Archaeological investigations at site 36Ju104 revealed evidence of nearly 9,000 years of human use. Temporary camps contained the traces of small groups moving across central Pennsylvania's landscape in search of food and other resources, a pattern continued in the roads, railroads, and canals that passed through the Lewistown Narrows in the historic period.



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ISBN 0-89271-121-3