THE LITTLE SHAVER SITE:
Site Structure and Excavation Methodology on a Small Unploughed Site

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ABSTRACT

Excavations conducted in 1991 on the Little Shaver site, located near Ancaster , Ontario, yielded substantive data concerning Middle Archaic (Brewerton) and Early Woodland (Meadowood) settlement patterns and site structure. Highly controlled excavations were conducted to assess the utility of piece plotting compared to shovel excavation. Current models of hunter-gatherer site formation were applied to the Little Shaver spatial data. This analysis highlights the need to maximize the information potential of small undisturbed sites while at the same time refining models of hunter-gatherer site formation.

RÉSUMÉ

Des fouilles furent effectuées au site Little Shaver situé près d'Ancaster, Ontario en 1991. Celles-ci livrèrent des données qui portaient sur l'organisation de l'espace et les schèmes d'établissement de la période moyenne de l'Archaïque (phase Brewerton) et du Sylvicole moyen (phase Meadowood). Une fouille très minutieuse fut entreprise afin d'évaluer le rendement de cette approche comparé à une fouille à la pelle. Nous avons interprété les données à l'aide de modèles communément employés pour étudier la formation des sites de chasseurs-cueilleurs. Ces analyses démontrent l'importance de maximiser le rendement des petits gisements non-perturbés ainsi que le besoin de raffiner nos modèles de formation des sites de chasseurs-cueilleurs.

INTRODUCTION

The Little Shaver site (AhHa-146) is a small prehistoric camp located near Ancaster, Ontario, Canada (Figure 1). It was excavated by the Ontario Ministry of Transportation in 1991 in advance of the construction of Highway 403 between Brantford and Ancaster. The site was located in a mature woodlot that had never been ploughed. As a small and relatively undisturbed site, Little Shaver had high potential for yielding data about the structure of small hunter-gatherer sites. It also provided an excellent opportunity to study the effectiveness of highly controlled excavation techniques including piece plotting of artifacts and debris.

Determining the appropriate degree of excavation control is an issue in both Cultural Resource Management and research contexts where archaeologists are sometimes pressured to sacrifice precise excavation control in favour of less time-consuming techniques. The Little Shaver data allowed us to assess the costs and benefits of trowel excavation and piece plotting, and compare these with shovel excavation of one metre square units and the resulting grid data.

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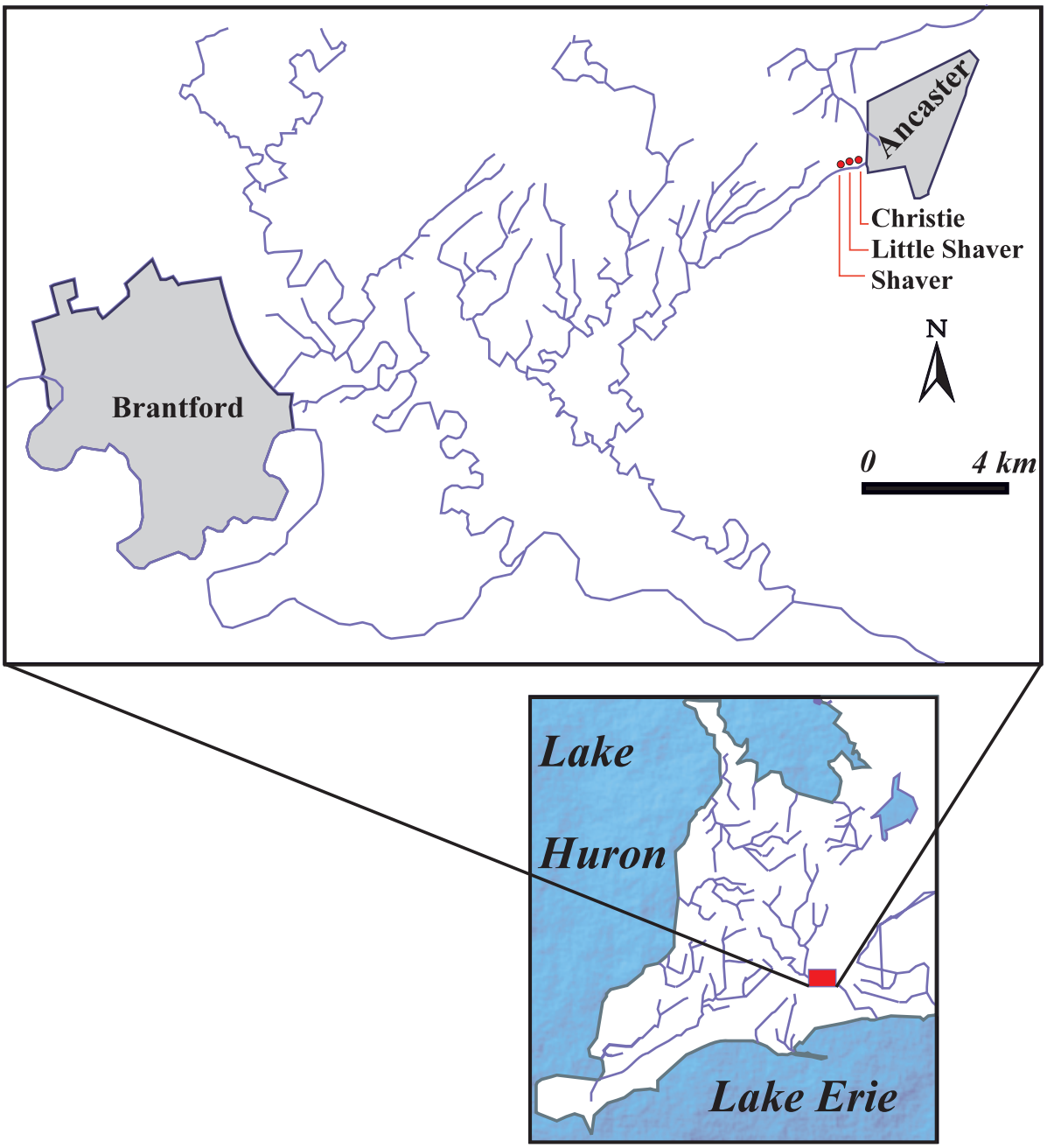

Figure 1 Location of the Little Shaver site near Ancaster, Ontario.

The site is situated near the bottom of a small valley, on a low terrace, 55 metres north of a creek that is only seasonally wet today (Figure 2). This watercourse rises in the Christie Bog, a small bog located just east of the site. The creek flows in a southwesterly direction, eventually entering Big Creek which in turn empties into the Grand River near the village of Middleport.

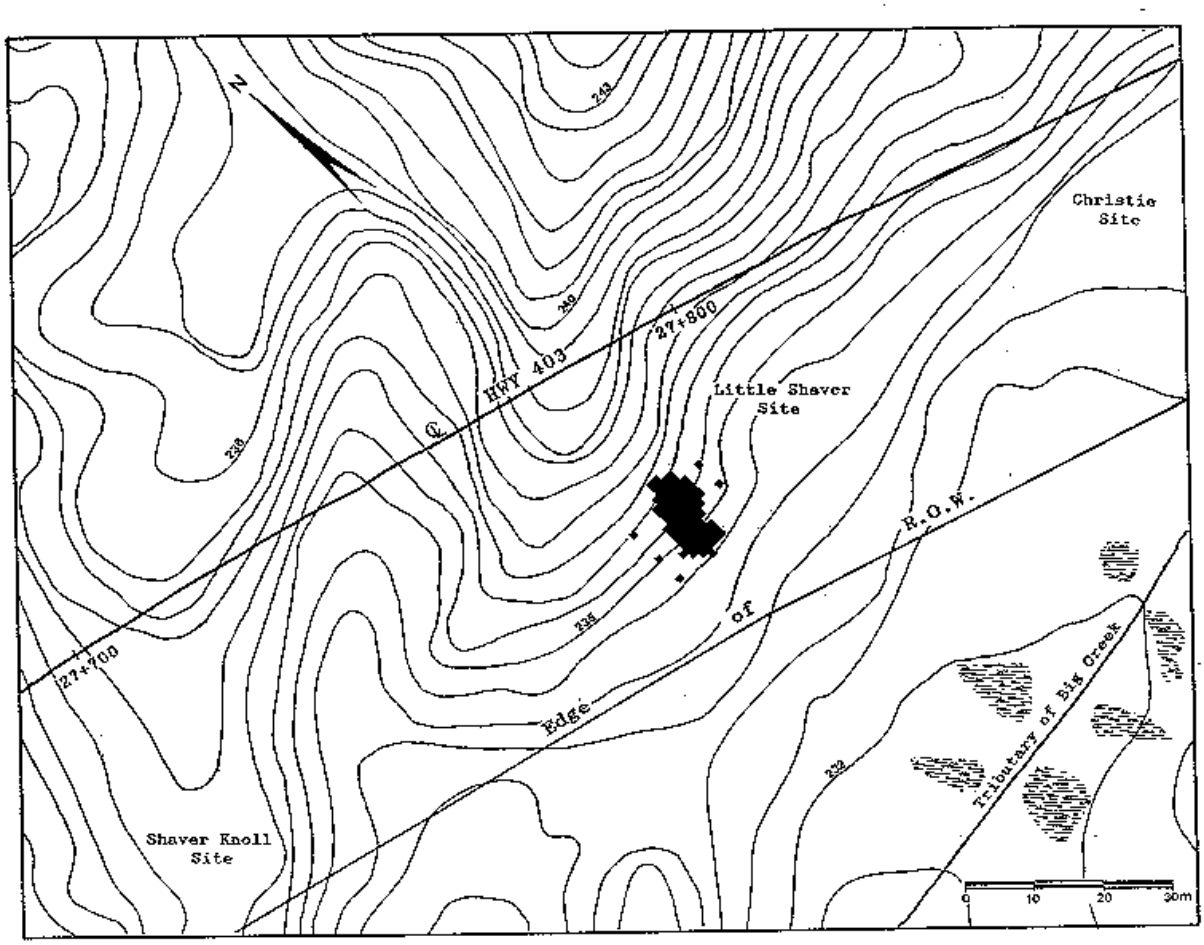

Figure 2 Location of the excavated area of the Little Shaver site.

Middle Archaic, Terminal Archaic and Early Woodland materials are present on the site, although the Middle Archaic component is the most substantial. The diagnostics most closely resemble Brewerton Laurentian materials. The artifact collection is small and the only Middle Archaic diagnostics are four Brewerton side and corner-notched points showing various stages of reworking (Figure 3). In Ontario, Brewerton-like material likely dates around 5,000 - 4,500 years ago (Ellis *et al.* 1990:72, 83-93). The Terminal Archaic and Early Woodland components are represented by a single Crawford Knoll projectile point and three probable Meadowood artifacts: a drill and two finely made point tips of Onondaga chert (Figure 4). The Terminal Archaic Crawford Knoll point probably dates between 3,300 and 2,900 B.P. (Ellis *et al.* 1990:107), but it is an isolated occurrence on this site. The accepted dates for Meadowood are between 2,900 and 2,400 years ago, immediately following the Terminal Archaic (Spence *et al.* 1990:128). No Early Woodland ceramics were recovered, and it is possible that the Crawford Knoll and Meadowood-like artifacts date to the same Terminal Archaic occupation.

Figure 3 Brewerton points from the Little Shaver site.

Excavation of the first few units indicated that most of the cultural material was located at the topsoil-subsoil interface and in the subsoil. To maintain vertical control on a site where no stratigraphy was apparent, the site was excavated in arbitrary 5 cm levels following the surface contours. Level 1 consisted of the topsoil layer and Level 2 was the topsoil-subsoil interface. Levels 2 through 5 extended 15 cm into subsoil in 5 cm increments.

The site was excavated one level at a time by digging several contiguous squares to permit an assessment of soil changes and artifact distributions over several square metres at once. With the exception of two 1 m^2 test units, all excavation was conducted by trowel. Artifact locations were piece plotted to record their horizontal distribution with the aid of a portable grid divided into 10 cm units. The only exception to the piece plotting rule was in the case of very dense flake clusters, where enough flakes were plotted to show the pattern and density of the cluster. Soil was screened through 6 mm mesh to recover artifacts not found *in situ*. In the end, approximately half of the cultural material was piece plotted.

Figure 4 Crawford Knoll projectile point (left) and probable Meadowood artifacts.

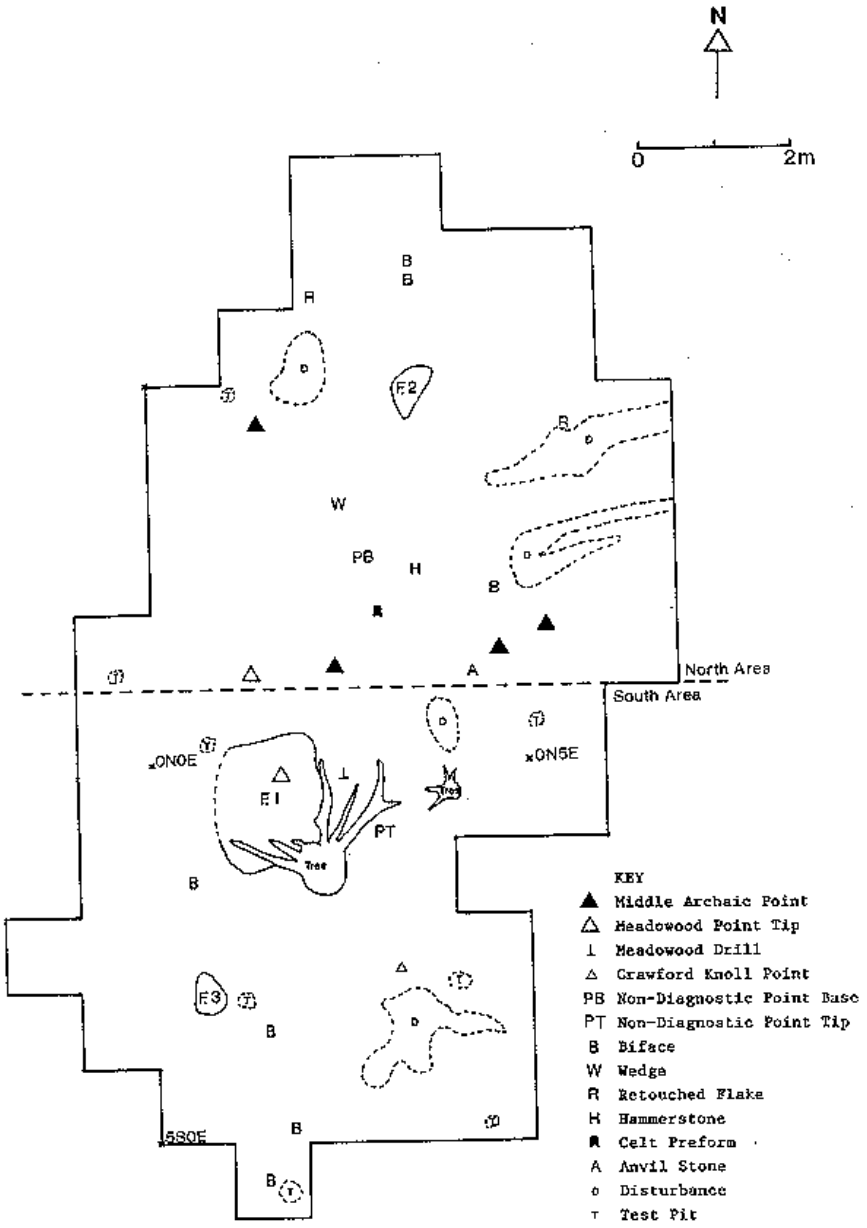

Figure 5 Distribution of diagnostic artifacts and features.

The excavations revealed artifacts and features distributed over an area measuring 17 by 6 metres. Figure 5 shows the distribution of formal tools, fire-broken rock, and features.

All diagnostic Middle Archaic artifacts were found north of the 1 North line, which was designated as the site's North area. Two of the three Early Woodland (Meadowood) artifacts were found in the South area and the third was located just a short distance to the north. The single Terminal Archaic (Crawford Knoll) artifact was found in the South area. This distribution of diagnostic artifacts suggests some spatial separation of the Middle Archaic and Terminal Archaic/Early Woodland components, but there was obviously some overlap of the two occupations as well.

Three features were discovered. They each contained debitage, calcined bone and bits of carbonized wood. Feature 1 was interpreted as a large refuse-filled depression. Feature 2 appeared to be associated with a circular cluster of fire-cracked rock and was interpreted as part of a hearth complex. Feature 3, located in the South area, was interpreted as a hearth. The calcined bone found

in these features was highly fragmented and only about half of it could be identified to class, in this case as mammal bone.

ARTIFACT SPATIAL DISTRIBUTIONS AND SITE STRUCTURE

The intra-site spatial organization of hunter-gatherer sites has been a topic of much discussion in the literature over the last two decades (Binford 1978, 1983; Carr 1991; Kent 1984, 1991; Stevenson 1991; Yellen 1977). Several researchers have tried to develop models to account for the distribution of material on these sites, usually focussing on physical and ecological factors as prime determinants of camp spatial organization. Factors such as site population, threat of predators, seasonality, subsistence, and group mobility have all been recognized as important variables for influencing the organization of such camps (Kent 1991:33). At a more basic level, site structure is conditioned by fundamental physical and biological properties including the size of the human body, the number of people who can comfortably sit around a hearth, the need for light, and necessity for protection from heat and cold (Binford 1983:172-186). Since these properties are common to hunter-gatherers in general, it is not surprising that there is a high degree of similarity in the size and layout of hunter-gatherer camps in various cultures (Binford 1983).

Following Binford (1983) and Kent (1991), the term site structure is used here to refer to site size, arrangement of activity areas, structures, features, and the patterning of artifacts within the site. Analyzing site structure involves combining general spatial models relating to particular activities to account for the overall distribution of features and artifacts (Binford 1983:172). On small hunter-gatherer sites, where direct evidence of structures and features is often lacking, the distribution of artifacts is crucial to interpretations of site structure.

The Exterior Hearth Model

Much of the ethnoarchaeological and archaeological research on site spatial organization has focussed on artifact distributions that are hearth-centred (Binford 1978; Carr 1991; Stevenson 1986, 1991). Binford developed a model for refuse disposal and cultural site formation for men's exterior hearths based on his ethnoarchaeological work among the Nunamiut. This exterior hearth model predicts the formation of two concentric rings of refuse around the hearth: an inner “drop zone” where small items are usually deposited, and an outer “toss zone” where larger debris is tossed. Stevenson (1991) has refined this model with the addition of a “displacement zone”, between the drop and toss zones, into which material is usually swept, brushed, or kicked. The drop zone around an exterior hearth is usually semi-circular since people tend to sit on the upwind side of the hearth to avoid smoke. The downwind side is often used as a toss area for larger objects. Both intentional and unintentional size sorting affects the distribution of debris around hearths. In general, larger objects tend to be displaced or tossed greater distances from hearths than are small

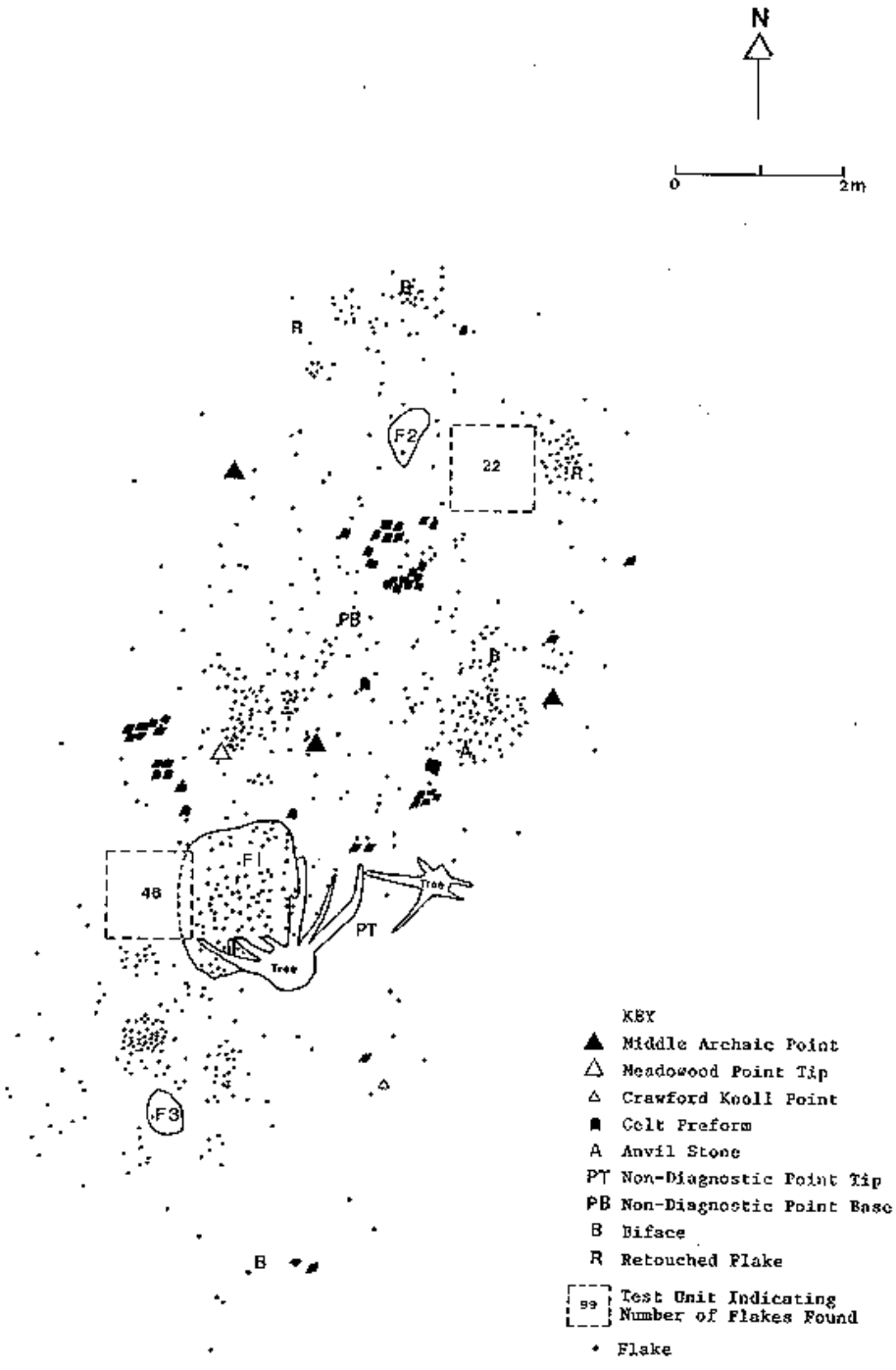

Figure 6 Piece plotted artifact distribution.

objects (Stevenson 1991). The effects of these processes should be observable in archaeological contexts.

The Interior Hearth Model

Models for artifact distributions inside structures have also been developed. Binford (1983) developed such a model from his Nunamiut data and Stevenson (1991) has done research on the spatial distribution of debris inside Yukon gold rush prospector tents. Some of the formation processes that occur around interior hearths are similar to those associated with exterior hearths. For example, drop zones dominated by small debris are to be expected around interior hearths (Stevenson 1991). Displacement zones also occur with the build-up of secondary refuse along the inside walls of structures from cleaning and sweeping the central activity area (Carr 1991; Stevenson 1985, 1991). Toss zones are not expected within structures as people do not usually throw waste against the inner walls of their homes. Seating plans inside structures are not affected by wind so smoke is not a factor in seating arrangements.

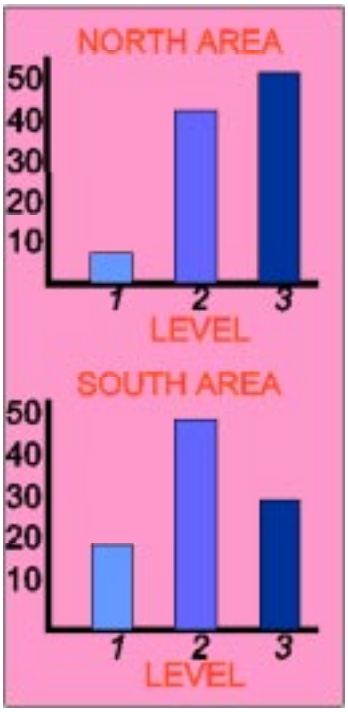

Figure 7 Histogram comparing debitage depth in the North and South areas.

Interpretations - Applying the Models

Figure 6 shows the distribution of piece plotted artifacts on the Little Shaver site, with all levels combined. The overall distribution of piece plotted flakes is interesting in view of the differing distribution patterns associated with exterior and interior hearths. As noted previously, all the diagnostic Middle Archaic artifacts were recovered in the North area of the site, while most of the Terminal Archaic/Early Woodland artifacts were found in the South area. It is inferred that much of the debris in the North area relates to the Middle Archaic occupation, while much of the debris in the South area may relate to the Terminal Archaic/Early Woodland occupation. This inference is supported by the vertical distribution of artifacts, which shows that most of the Middle Archaic diagnostics were found deeper than the Terminal Archaic artifacts. A study of debitage depth also supports this north/south separation since more debitage in the North area was found in deeper levels than the debitage in the South area (Figure 7). This pattern would be expected if the North area occupation was older.

Interpretation 1: Two Exterior Hearths

One possibility is that both the North and South artifact distributions are related to separate exterior hearths (Figure 8). If this is true, we would expect to find an inner drop zone, a displacement zone, and a toss zone in each area.

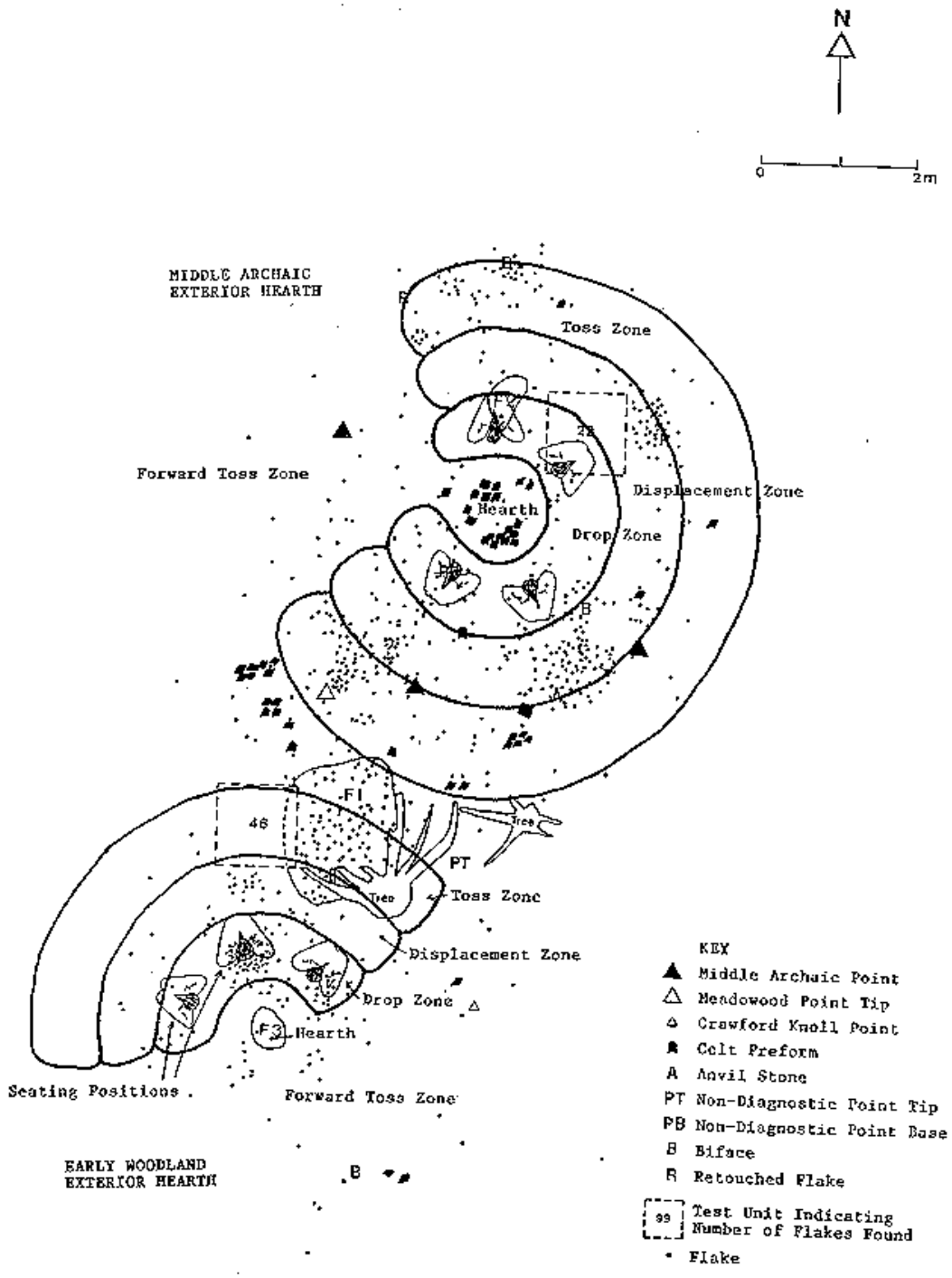

Figure 8 Interpretation 1: Two exterior hearths.

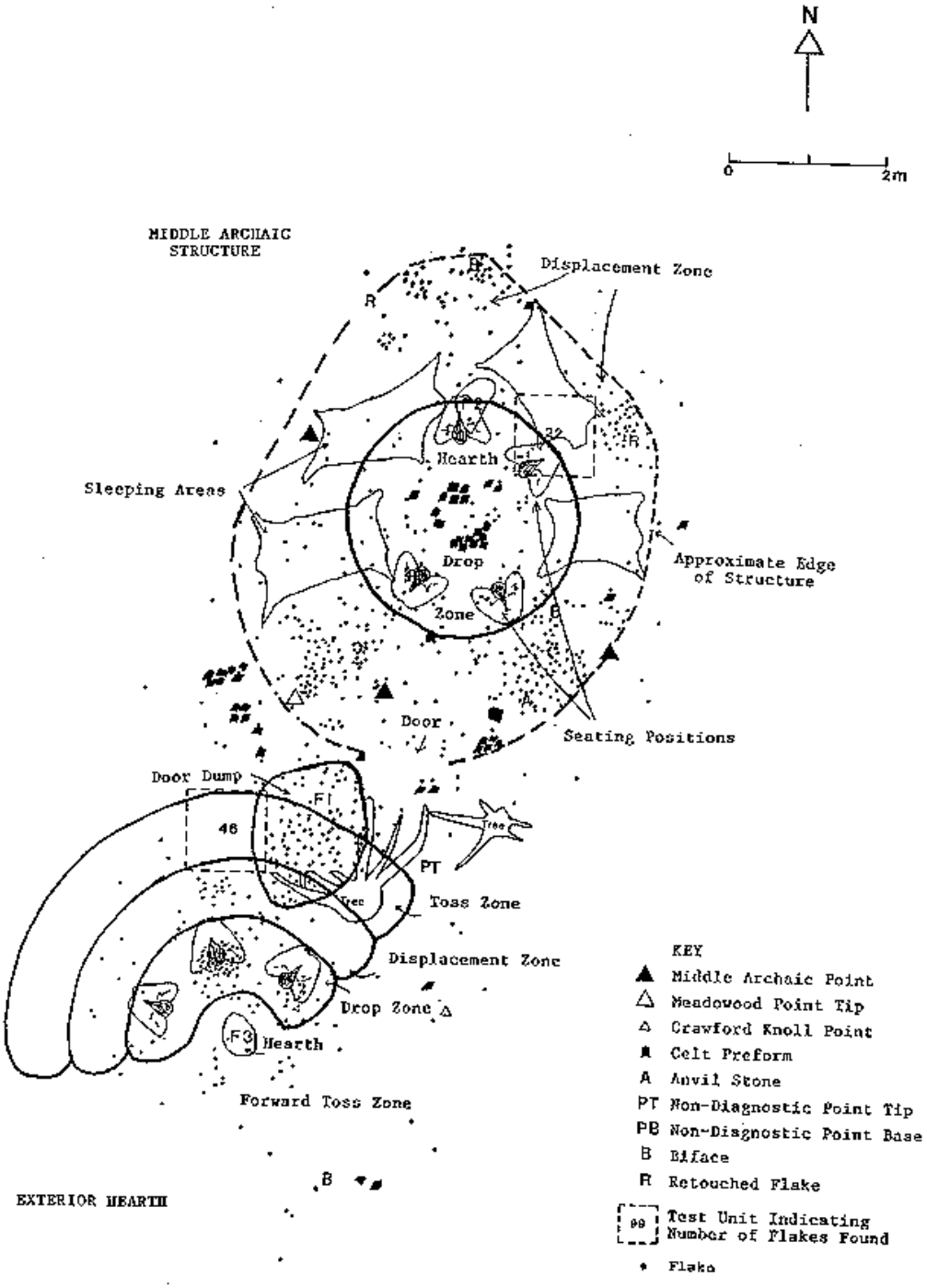

Figure 9 Interpretation 2: An interior hearth and an exterior hearth.

In the North area the flake distribution occurs in four distinct clusters. In the centre of the area circumscribed by the four debitage clusters there is a hearth complex consisting of a circular concentration of fire-broken rock and Feature 2, which contained a lot of calcined faunal material. The four clusters of flaking debris are discrete enough to suggest that they may be from specific tool manufacture or maintenance tasks conducted around the hearth. These flake clusters are about 1.5 m away from the hearth. When we compare these flake clusters to the spatial organization of other archaeologically and ethnographically documented exterior hearths they appear to be too dispersed to represent a drop zone around the hearth. It is possible that they represent a displacement zone, with the drop zone lying within a one metre radius of the hearth. In other words, flintknapping may have occurred in four distinct areas around the hearth, with most debris subsequently being swept back to create these four debitage clusters. Beyond the displacement zone there may be a poorly defined toss zone in the North area. Many of the larger artifacts, including fire-broken rocks, projectile points, and an anvil stone, occur in or near the toss zone.

Turning to the South area, Feature 3 is interpreted as an exterior hearth. The debris associated with this hearth displays the expected pattern of a high density drop zone on the north and northwest sides, and a more diffuse toss zone behind the drop zone and across the hearth on the south side.

Interpretation 2: An Interior Hearth and an Exterior Hearth

An alternate interpretation is that the North area artifact pattern has been conditioned by the presence of a structure, while the South area pattern represents an exterior hearth (Figure 9). In the North area, a drop zone is recognized within a one-metre-radius of the hearth, and the four debitage clusters form a displacement zone with each cluster possibly relating to a seating position within the drop zone. It is noted that the outer edges of these debitage clusters are sharply defined, suggesting that some sort of structure may have been present to confine the flaking debris to an interior area measuring about 6 by 5 metres. Much of the larger debris occurs just inside the inferred wall. Using an interior hearth model, a toss zone is not expected.

The area between the four debitage concentrations in the North area is relatively clean (Figure 9). These areas contain minimal debris and may represent sleeping areas or activities that did not leave preserved archaeological traces. If a structure was present, one of these areas may represent a door. It is most likely that a door would have been located along the south side, because the distribution of material extends to the south. Post moulds were not found although this may reflect poor preservation in the leached sandy soils. It is possible that a temporary structure was used. The interpretation of the North area as an interior hearth surrounded by a structure during the Middle Archaic does not affect the interpretation of the South area as an exterior hearth. The South area could represent an exterior hearth used during the Terminal Archaic/Early Woodland occupation, or it could be an exterior hearth associated with the inferred Middle Archaic structure.

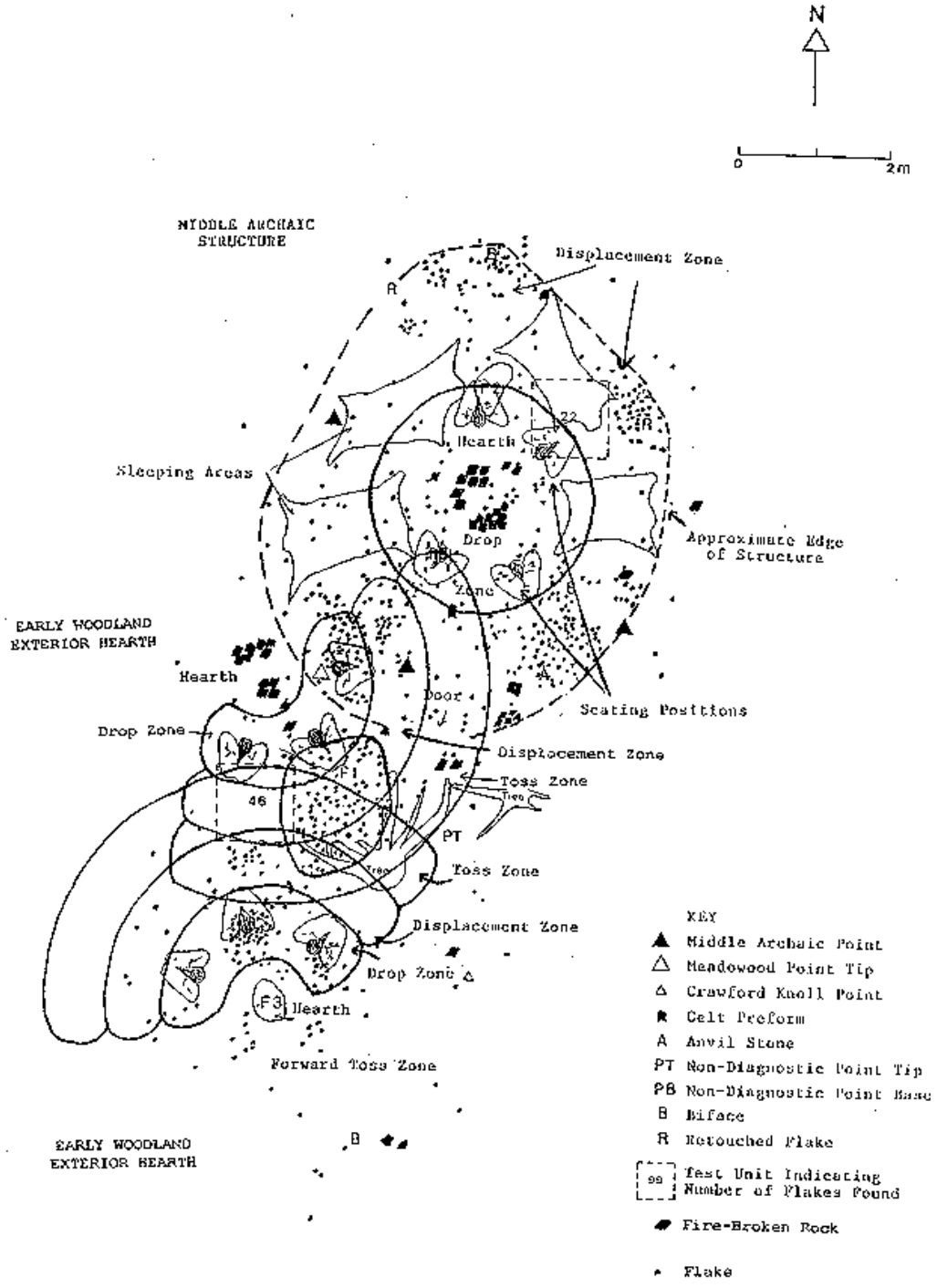

Figure 10 Interpretation 3: An interior hearth and two exterior hearths.

Ethnoarchaeological studies have shown that hunter-gatherer houses or huts often have associated exterior hearths (Binford 1983; Yellen 1977). If we accept that a structure was present in the North outside the inferred door suggests that it may represent a "door dump". Door dumps have been observed on many hunter-gatherer sites and are used for the disposal of interior house debris (Binford 1983). Alternatively, Feature 1 may be a Meadowood feature, which raises a third interpretation.

Interpretation 3: An Interior Hearth and Two Exterior Hearths

Interpretation 3 is identical to Interpretation 2 with the addition of a second exterior hearth and associated drop zone. In this interpretation Feature 1 is seen as drop zone or displacement zone associated with a third possible hearth represented by the cluster of fire-broken rock to the northwest (Figure 10). A Terminal Archaic/Early Woodland association for Feature 1 is supported by the discovery of a Meadowood point tip in Level 2, just above the level at which the feature was identified. The attractive aspect of this interpretation is that it fully accounts for the high concentration of small debris in Feature 1, the 46 flakes in the adjacent square, which was a test unit, and the presence of the Meadowood point tip.

A Comparison of Techniques

Because all soil was screened through 6 mm mesh to recover artifacts not found *in situ*, the Little Shaver data includes both the total artifact sample grouped in one-metre-square units and the piece plotted sub-sample. In this case it can be argued that the grid data represent the total artifact collection, whereas the piece plotted data represents only half of the collection.

Figure 11 presents the total debitage distribution by 1 metre square, with an isopleth plan superimposed over the 1 metre square distribution. The isopleth plan identifies six debitage density clusters in which density is greater than 40 pieces per 1 metre square. Four of these are located in the North area and correspond to the four debitage clusters apparent on the piece plotted plan.

The obvious question is, does the isopleth plan yield the same spatial information as the piece plotted plan? The four debitage concentrations identified on the isopleth plan could be interpreted as activity areas. If fire-broken rock was shown, a concentration of this rock in the centre of the four debitage clusters might be interpreted as evidence of a central hearth. However, the well-defined outer edges of the piece plotted spatial distribution are lost in the isopleth plan. It is unlikely that the interpretation of a structure would be possible using 1 m square provenience.

In sum, the artifact density plans based on grid data are less effective than piece plotted plans for three reasons. The most obvious limitation of grid data is that artifact distribution patterns are defined with less precision than is the case with piece plotted data. Second, grid-based density plans only show one artifact class at a time, which makes examination of the spatial relationships

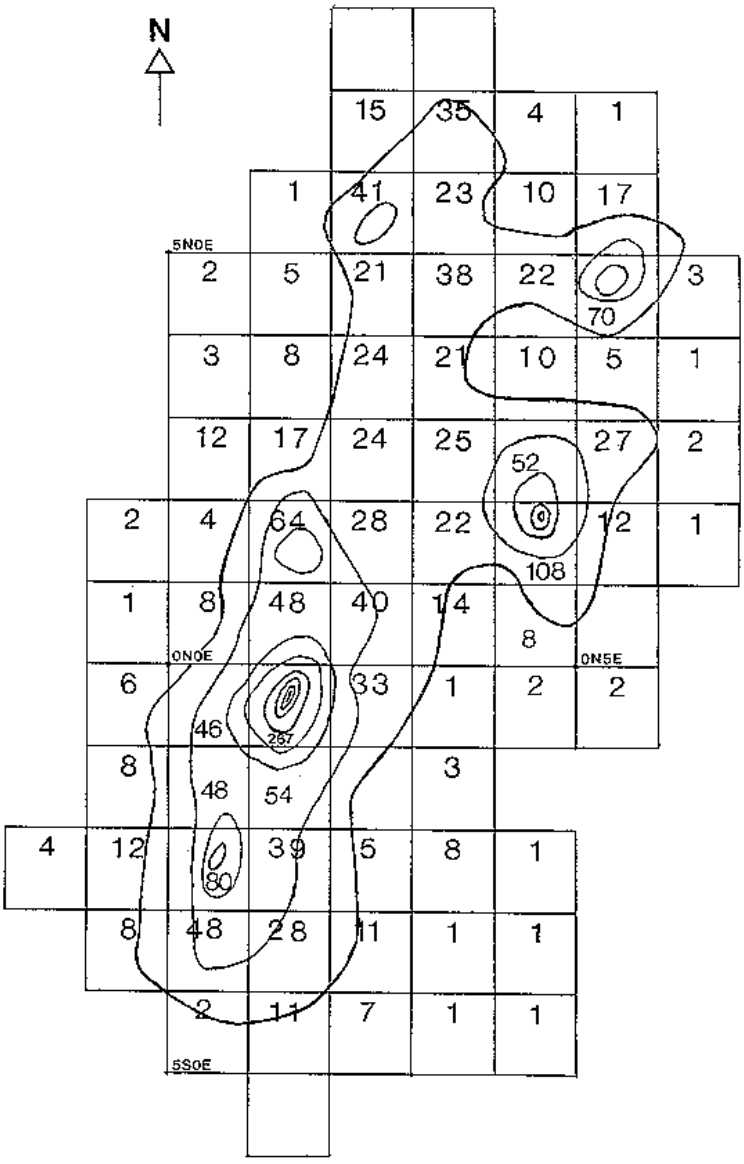

Figure 11 Distribution of debitage by one metre square.

among different artifact classes more difficult. And finally, grid-based density plans represent an abstraction in relation to the actual artifact patterns in the ground. Isopleths are used as a means of enhancing visual effect, but, in fact, they represent a further abstraction of the data. The piece plotted data exists independent of the grid superimposed over the site. This is not true with the 1 metre square data and the isopleth map. If the grid was shifted one half metre in any direction both the grid data and the isopleth plan would change accordingly.

While the piece plotting of artifacts has not led to clear, unambiguous interpretations of artifact spatial patterns, it has permitted detailed consideration of three different interpretations. Thus, while the grid data appears to limit interpretations, more fine-grained spatial data opens a range of interpretive possibilities.

The major drawback of the piece plot methodology is a higher excavation cost resulting from increased fieldwork time. Although I have not done an exhaustive study of the problem, my experience suggests that piece plot excavation is three to five times more expensive than shovel excavation.

CONCLUSIONS

In summary, while alternative interpretations have been considered, the interpretation of a Middle Archaic structure in the North area is preferred, mainly because the spatial distribution of artifacts and debris in the northern area of the site appears "bounded", possibly demarcating a living floor. The inferred structure measures approximately 6 by 5 metres and contains a central hearth complex consisting of a concentration of fire-broken rock and a small, adjacent pit feature containing debitage and calcined bone.

In addition to the inferred structure, there are two features and associated debris located in the South area of the site. Based on hunter-gatherer site formation models and the analysis of the horizontal and vertical artifact distributions, it is suggested that there may have been two exterior hearths associated with the later Terminal Archaic/Early Woodland occupation(s). Unfortunately, these interpretations are far from being clear-cut.

The Little Shaver analysis has shown the difficulties involved in applying site formation models derived from ethnoarchaeological studies to archaeological situations. Specifically, models for artifact distributions around interior and exterior hearths, although distinct in theory, leave much ambiguity when applied to the Little Shaver spatial data. This is partly due to preservation factors and the multi-component nature of the site, but it also points to the need for model refinements. Such refinements are ongoing, and the present study is a preliminary effort to apply two very simple interpretive models to the Little Shaver data. Several other models that attempt to explain more specific activities have been developed using ethnoarchaeological data. Our challenge is to continue to test these models to see if they can help us interpret our archaeological data. However, most of these models can only be effectively applied using high quality spatial data, and this usually involves piece plotting of artifacts and debris.

In all excavations, decisions about appropriate methodology involve considerations of time, costs, the nature of the site, and the type of information relevant to the research problems at hand. Differential preservation and post-depositional disturbance are inherent characteristics of the archaeological record. As a result of CRM work, more and more plough-disturbed "lithic scatter" sites are being excavated than ever before. Unploughed sites like Little Shaver can provide comparative material which constitutes a "reality check" for our interpretations of these ploughed sites. One of the basic maxims of archaeology is that we must use the better preserved parts of the archaeological record to make the more disturbed parts of it more accessible. A corollary to this is that we have to maximize the information potential of undisturbed sites. It follows that small undisturbed components should be excavated with appropriate control.

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