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THE PALEOINDIAN-ARCHAIC TRANSITION IN NORTHEASTERN MINNESOTA

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ABSTRACT

Research on the archaeological history of Northeastern Minnesota is of interest in both the academic and applied aspects of archaeology. The nature of the Paleoindian-Archaic transition (about 8000 to 6000 years ago) is of particular interest in that different models of the transition have been proposed for different geographic areas of the United States. Minnesota in general and Northeastern Minnesota in specific are located between the two major areas; research to find and excavate sites is needed to explore this topic. This project focused on two areas where archaeological sites that span the transition are reasonably expected to occur.

Knife Lake on the U.S.-Canadian border is the location of the bedrock sources of Knife Lake siltstone, which was used heavily in the Paleoindian and Archaic times. One site was excavated, with the unexpected recovery of pottery dating to the Terminal Woodland (1000 to 250 years ago). Older components lacked diagnostics but could represent the target age of Paleoindian or Archaic. The site appears to be a location for secondary reduction of Knife Lake siltstone.

Flat Horn Lake west of Isabella has previously received considerable survey as well as three site excavations. The survey of the northwestern side of the lake was completed; three new site locations were discovered there and a fourth found on the southeast side of the lake. One of the newly discovered sites was excavated. However, unlike the previously excavated sites, this one was a very sparse scatter of lithics possibly representing a very short and ephemeral occupation.

Research was conducted in cooperation and with the support of the Heritage Resource Program of the Superior National Forest. Three student volunteers participated for credit in an archaeological field course and gained invaluable experience suitable for further work in the field of cultural resource management. This project is the latest in a series of cooperative ventures that has benefited students and CRM professionals by conducting research projects that contribute to management topics.

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INTRODUCTION

BACKGROUND

The archaeological history of Northeastern Minnesota is not as well known as that in other parts of the state. The dense vegetation and relatively inaccessible terrain over much of the area has impeded research. Archaeological investigations have generally been sparse and scattered, although certain areas have received considerably greater attention (Mulholland 2000). For example, substantial investigations have been conducted by the Heritage Resource Program at the U.S.D.A Superior National Forest (SNF) on Forest lands within the SNF boundaries (Okstad et al. 2000). However, these projects were focused on specific tasks at specific locations, primarily to determine if any archaeological sites would receive impacts from Forest projects and how to avoid those sites. However, more broadly structured research projects based on the accumulated data from the SNF management activities would benefit the Program as well as contribute to the archaeological database of the region.

One important research question is that of the PaleoIndian-Archaic transition in Northeastern Minnesota. The transition from the Late PaleoIndian to the Early/Middle Archaic traditions (about 8000-6000 years ago) is not well known in Northeastern Minnesota. A sequence from PaleoIndian big game hunters to Archaic foragers using a wider variety of food sources has been the traditional model. However, Mason (1980:111-115) proposed that Late PaleoIndian groups (best represented on the Great Plains) and Early Archaic groups (best represented in the Eastern Woodlands) may have been coeval traditions with both derived directly from the preceding Early PaleoIndian groups. The transition between PaleoIndian and Archaic would differ depending on geographic location.

The Midwest lies between the Great Plains and Eastern Woodlands and may be expected
to show influences from both areas. Mason’s theory leaves open the amount of interaction between the two regions and the degree of influence for any specific location. Research in Northeastern Minnesota is needed to determine if this area even has an Early Archaic (eastern influence) or whether the Late PaleoIndian persists into the mid-Holocene (western influence). The Early/Middle Archaic is currently mostly unknown in this region but it is not certain if this is a true representation of history or an artificial view based on too little information.

Research on the PaleoIndian to Archaic transition will also provide the background data for evaluation of site significance for this time frame. The Heritage Program cannot devote substantial resources to this (or any other) research issue; however, it can partner with other entities for mutual benefits. A partnership with the Sociology-Anthropology Department of the University of Minnesota Duluth (UMD) to provide an archaeological field school has been extremely productive over the last two decades. The SNF gains volunteer work on projects outside the direct scope of their project load while UMD students gain valuable experience in field methods and techniques. This project is the latest effort in a long-standing relationship that has greatly increased the knowledge on the archaeology of the region, provided numerous students with a valuable field experience/training, and assisted the SNF Heritage Program in their mission of managing archaeological resources in the Forest.

RESEARCH OBJECTIVES

The general objective of this project was to conduct archaeological research bearing on the PaleoIndian-Archaic transition within Northeastern Minnesota by teaming with the Superior National Forest Heritage Program on projects of mutual interest. Most archaeological work by the SNF over the last 30 years has by necessity focused on determining site locations within
specific project areas. More comprehensive site excavations have been outside their normal work responsibilities but some were conducted as part of field school or public volunteer efforts. Excavation is required to obtain certain kinds of information, especially diagnostic artifacts such as projectile points. Diagnostics are the only way to determine the date or affiliation of individual sites. These datable artifacts are rarely found in survey.

The plan of work for 2006 built on known data on the PaleoIndian-Archaic transition. First, survey previously identified several sites around the Flat Horn Lake area, which is about 5 miles from the documented PaleoIndian and Archaic site of Misiano on McDougal Lake. In addition, we planned survey and evaluation on Knife Lake which is the source of one of the primary stone types for making chipped stone tools used in the PaleoIndian and subsequent occupations. Bedrock quarries of Knife Lake siltstone may have been used throughout history but it is theorized that the most extensive use was in the PaleoIndian times. Use of this quarry is believed to have decreased after the PaleoIndian period. We hoped that evaluation of selected sites in both areas would reveal occupations spanning the PaleoIndian-Archaic transition.

Previous investigations on both these research aspects had been conducted by the SNF Heritage Resource Program. The project therefore built on previous work as well as contributed information directly useful to the Program.

Both areas should contain PaleoIndian and subsequent Archaic occupations, possibly in multicomponent sites, as demonstrated by previous investigations. Both areas require additional field work, especially excavation, to date of the sites and to obtain more comprehensive information about the transition to the Archaic period.

*Flat Horn Lake*: Survey of the Flat Horn Lake shoreline started in 2001 with review of
specific areas of highest potential; one site was located. Subsequent survey in 2002, 2003, and 2005 resulted in identification of a complex of sites on the north end of the lake and a more dispersed scatter of finds along the northwestern side. Three sites were excavated (2002, 2003, 2004) and recommended to be eligible for the National Register of Historic Places as containing the potential to contribute to our knowledge. Unfortunately, no diagnostic artifacts were recovered. The objectives in 2006 were to 1) to complete the survey on the northwestern side of the lake and 2) to excavate a fourth site.

*Knife Lake:* Knife Lake has received some survey in association with specific SNF projects, as well as more intensive work on the Canadian site (Nelson 1992). Most survey has been done in campsite areas. Recently proposed burn units for fuel reduction in the 1999 blowdown in the Boundary Waters Canoe Area Wilderness include inland areas as well. Numerous quarry locations with associated sites exist on the Canadian side (Nelson 1992) and similar situations are expected on the U.S. side of the border. One known site, the Lillian Joyce quarry, has yielded a Late PaleoIndian projectile point. The objectives in 2006 were to 1) survey recently burned areas to locate additional sites, and 2) to evaluate a site near the known quarry site.

**METHODS**

This project was accomplished by a combination of survey of targeted areas and evaluation of selected sites within the Superior National Forest. Work was carried out with students from the University of Minnesota Duluth who received academic credit for participating in an undergraduate archaeological field school. Six weeks of research were conducted in summer 2006. One week of orientation/instruction preceded four weeks of field work. The field
school ended with one week of laboratory work. The initial week of instruction prepared the
student volunteers to recognize artifacts and to place the project in perspective with
archaeological and cultural resource management theory. The final week involved cleaning and
identifying the materials recovered in the field.

The archaeological survey used standard phase I survey techniques of pedestrian
walkover where the ground surface is exposed or the subsurface disturbed. Shovel testing
occurred where the ground was undisturbed or vegetated. Essentially, we trained the students to
look at the ground systematically or dig small holes with shovels to test the soil for artifacts. Our
excavations used standard phase II techniques of 1x1 meter units to explore the subsurface
component of specific sites. All artifacts remain the property of the U.S.D.A. Forest Service and
were cleaned and labeled to Forest Service standards. Reporting includes this report to CCRR,
summary to the Forest Service, individual site reports, and ultimately articles published in peer
reviewed journals.

Two periods of field work were conducted. The first, during the first two weeks of June,
consisted of an 8 day trip into the Boundary Waters Canoe Area Wilderness to the Knife Lake
area on the U.S.-Canada border. Initially, we planned to survey a prescribed burn area to search
for sites in this remote area and to complement the more limited monitoring activities conducted
earlier. However, the SNF deemed conditions within the burn area too dangerous for survey;
although burned, the blowdown was still thick and tangled, with many hanging branches and
trunks posing falling hazards. Instead, a site was selected for evaluation: the Susan Melissa site
(05-827) near the Lillian Joyce quarry.

The second period of field work, during the last two weeks of June, consisted of
completing survey around Flat Horn Lake north of Highway 1. This area has been one focus of
on-going work during 2001-2006, with eight sites found and three sites evaluated. The survey of the northwestern side of the lake was completed during this phase of the research. Four new sites were recorded during this survey. We selected the Two Aspen site (07-429) for evaluation because it had the greatest number of positive shovel tests. A positive shovel test is one in which artifacts are found, which is a proxy estimate of the potential for finding subsurface materials at a site.

STUDENT INVOLVEMENT

The field work was conducted in conjunction with three UMD students registered for ANTH 4696 Field Research in Archaeology. This field course teaches practical field skills by engaging students in real world situations that arise from conducting archaeological research. This year, students registered for 6 credits which involved approximately 40 hours per week over the six program. The classroom instruction covered many archaeological topics including cultural resource management law and approaches, artifact identification, and regional archaeological background. This instruction prepared the students for the fieldwork, which focused on training them in the typical field techniques used in archaeology. The laboratory activities included artifact processing (cleaning, identification, labeling) and site analysis of the materials. All of these course activities were directly related to the research described above.

RESULTS

KNIFE LAKE: SITE EVALUATION

The Susan Melissa site (05-827) was chosen for evaluation because it is close to the Lillian Joyce Quarry, a bedrock quarry for Knife Lake siltstone. The base of a Late PaleoIndian
projectile point was recovered previously at the quarry, indicating that the time period we were interested in was present in the vicinity. The site is located on an island about 1/10 mile north of the quarry and appeared relatively undisturbed on the surface. Assuming that prehistoric camping activities would be conducted away from the quarry site, this location therefore had a high potential for habitation by PaleoIndian groups.

Two units were excavated on the Susan Melissa site (05-827), both in an area of the island indicated by previous shovel testing as having the greatest concentration of cultural material and soil deposition at the site. Unit A was excavated to a total depth of 33 cm in 11 levels of 3 cm each. Unit B was excavated to a total depth of 21 cm in 7 levels of 3 cm each.
Each level was excavated in four quadrants; all sediment was screened through 1/4 inch hardware mesh. A shovel test (small hole dug with a shovel) was also placed in the base of each unit to test the deeper sediments.

Unit A was the most productive with 626 artifacts recovered; Unit B contained only 31 artifacts. The only diagnostics recovered were ceramic sherds from Unit A; four stone tools were also recovered from Unit A while a core (a remnant of the initial rock used to make stone tools) was recovered from Unit B. The vast majority of artifacts were debitage (waste material) from knapping (stone tool making). This debitage was dominated by Knife Lake siltstone with only two other lithic materials (jasper taconite and Gunflint silica) present in minor amounts (four and two pieces respectively). Linear stains including burned earth and charred wood were found in both units and are considered to represent burned roots or other natural occurrences.

**Unit A:**

Analysis of the artifact distribution in Unit A suggests that some vertical and horizontal separation of artifacts occurs. The greatest number of artifacts is from levels 1 and 2, corresponding to the depths at which the ceramics were recovered. A significant decrease occurs between levels 2 and 3 (approximately 6 cm below surface); although abundant, the debitage from level 3 is about 60% of the amounts immediately above. In addition, the tools occur in levels 3 (a projectile point tip) and 4 (a biface, two scrapers). The most significant indicator, however, is a horizontal shift in the distribution of artifacts within the unit by depth. In levels 1 and 2, there is a relatively even amount of artifacts in the north and south halves of the unit. By level 3, the amounts have shifted so that 70% or more are in the south half of the unit.

Two potential interpretations could be supported by this evidence. All the materials
could be from a single occupation, with ceramics and tools only coincidentally restricted to two different depth ranges; the shift from north to south could reflect different activities in the same occupation. The more likely explanation, based on this year’s field school, is that there were multiple occupations of the site. At least two separate occupations are suggested by the Knife Lake siltstone lithics; the highest one (most recent) in levels 1 & 2 is represented by the equal distribution of artifacts in the entire unit while the lower one (older) is represented by the concentration of artifacts to the south half of Unit A.

Ceramics are present in levels 1 and 2. Two of the three pieces are in level 1 and one is in level 2; all three are in the north half of the unit. This distribution is coincident with the youngest of the hypothesized occupations. However, the number of sherds is extremely low in comparison with the abundant lithics in the same levels. It is possible that more ceramics are present to the north. Alternatively, the ceramics may represent a third occupation that was much shorter in duration and that has been mixed with lower materials. The Boundary Waters area is well known for shallow and slow forming soils. Intense natural fires could destroy the duff layer and further compress the stratigraphy. No diagnostics other than the ceramics were recovered so the date and affiliation of any older occupations are uncertain. Baring significant disturbances, the deeper an item is buried, the greater its age.

**Unit B:**

Unit B was much less productive, yielding a total of 31 artifacts in levels 1 through 6. The greatest amounts are from levels 2 and 3; there is no clear pattern between halves or quadrants to suggest a distribution with respect to horizontal location. However, the amount of artifacts in each level is relatively low so patterns would be difficult to detect. One stone tool
core is among the artifacts; all the remaining artifacts are debitage.

Of the 657 stone artifacts recovered from the two units, 651 are of Knife Lake siltstone. Given the proximity of the site to a Knife Lake siltstone quarry, this is not surprising. Except for the four tools in Unit A, the stone artifacts are all debitage associated with stone tool making. However, there is very little evidence of primary reduction, where the natural outside, or cortex, of the stone is present. Most of the debitage is small to medium flakes from secondary reduction, which occurs after the cortex is removed. If the occupants of the Susan Melissa site used the Knife Lake siltstone from the quarry, they accomplished primary reduction of the large pieces elsewhere before transporting smaller pieces to the site.

The other six stone artifacts include the tip of a jasper taconite projectile point that was too small to identify its type and hence its date, and three flakes from Unit A. Two Gunflint silica flakes were recovered from Unit B. The presence of these material types is not unusual as both are found in the region. The few flakes of these materials indicate that tools brought in from other locations were retouched, e.g., sharpened, at the site.

The ceramic sherds are all fragments from the body of a pottery vessel. We did not find rim pieces, which typically are needed to identify the ceramic tradition or date. The three sherds all have cord-wrapped paddle surface treatment. This treatment is consistent with Sandy Lake ware, one of the latest (A.D. 1000 to 1750) of the Terminal Woodland traditions (Birk 1979). These ceramics then are much later than the PaleoIndian and Archaic periods.

**Conclusions:**

In summary, site evaluation of the Susan Melissa site indicates that subsurface sediment layers are largely intact. Some potential disturbance from natural fires is indicated by linear
burned earth and charcoal stains in both units. At least two occupations are suggested by the depth of artifact distribution; the most recent could be affiliated with the Sandy Lake Terminal Woodland tradition or could represent mixing at the surface. The older occupation appears to date to a period before ceramics were used (aceramic) which would suggest Archaic or PaleoIndian traditions; however, there are no diagnostic artifacts associated with the lower materials so a definite affiliation is not possible. The presence of ceramics was unexpected and, while not directly pertinent to the PaleoIndian-Archaic transition, do add a ceramic age site in this area to the SNF site database.

FLAT HORN LAKE: SURVEY

Survey was conducted along the hiking trail on the northwest side of Flat Horn Lake using shovel tests to sample the subsurface sediments. The tests were placed on a 5 meter interval, alternating on either side of the trail as appropriate to the terrain and vegetation; in some locations, 10 or 15 meters occurred between tests as a result of rocky locations. In addition, steep slopes and obviously disturbed areas were avoided, as was the trail itself. All sediment was screened through 1/4 inch hardware mesh before being replaced in the hole. The tests were numbered consecutively from 1 through 53; additional tests placed in cardinal directions around positive tests were given letters associated with the positive test.

Results

Survey in 2006 started where it had ended in 2005 and continued south and west to the end of the lake (where the trail curves toward the bridge across the creek at the south end of the lake). Cultural material was recovered in three locations: ST 17, ST34, and two surface finds.
Tests around the initial positive ones, yielded another two positive tests cut of three excavated
ST17 (17A, 17B); three tests around ST34 were negative. All five shovel test placed where
artifacts were found on the surface (ST39-ST43) were negative.

A flat, elevated area at the southeast end of the lake was also tested, although
incompletely as a result of severe weather and lack of time. This “ridge” is located east of the
bridge over the creek and south of the hiking trail; it is covered with dense balsam fir. Three
shovel tests were placed in this area with one yielding artifacts.

Conclusions

This survey provides additional fine scale coverage of the area around Flat Horn Lake.
The shoreline itself was not tested because it was extremely rocky and covered with dense
vegetation. Instead, survey followed a hiking trail constructed on flatter terrain at varying
distances inland from the water’s edge. Trail construction in most cases appeared to be limited
to vegetation removal and some removal/breaking of rocks; only minor localized areas on hills
appeared to be excavated into the terrain or built up. On the assumption that recent trails will
follow the best accessible ground, it is reasonable that prior trails would be in the same location.

The four sites located in 2006 bring to a total of 12 prehistoric sites located around Flat
Horn Lake. Archaeologists define a site as any location where cultural material is found. Sites
are differentiated by distance and topographic changes between locations. A concentration of
four sites is located at the north end where the Little Isabella River leaves the lake; six are
located along the northwest side of the lake; one is at the southern end of the lake; and one is at
the picnic area on the southeast side. Note that a fine-scale survey of neither the south end of the
lake by the entrance of the Little Isabella River into the lake or along the southeast side of the
lake has yet been done. Of these 12 sites, four have now been evaluated (see below) and three are recommended as eligible for the National Register.

FLAT HORN LAKE: SITE EVALUATION

The area around ST17 was chosen for site evaluation since a group of three positive tests was found there. This site, the Two Aspen site (07-429), was evaluated by a single unit since the topography dictated that any camping area would be small. The positive shovel tests were grouped at the mouth of a depression between two hills on the north side of the trail. Additional testing on the south side of the trail as well as north in the depression and on the hills was uniformly negative.
Results

The unit was excavated to a total of 45 cm in 15 levels of 3 cm each; a shovel test in the bottom of the unit was excavated to a total depth of 90 cm and did not contain any artifacts. Each level was excavated in separate quadrants and the sediment screened separately through 1/4 inch hardware mesh. Very few artifacts were recovered in this unit: one flake, each, in levels 5, 8, 9, and 10. A total of four flakes were recovered from the three positive shovel tests for a total of only eight artifacts from the site. Seven of the flakes are Knife Lake siltstone; one is agate. All are relatively small, although the largest one (9.3 grams) was recovered at the greatest depth. None have cortex, the natural outside surface of the rock, so they are secondary or tertiary reduction flakes.

Conclusions

This site was recommended as not eligible for the National Register; the site area appears restricted horizontally to about 5 x 5 meters and does not have sufficient cultural materials to add to our knowledge about prehistoric contexts. No diagnostics were recovered that could indicate age or affiliation and no features were encountered. Features include feature hearths, garbage pits, storage pits, and decayed posts or rock piles from structures or platforms. The extreme scarcity of materials indicates a short occupation, possibly only by a few people or an individual at a single visit. The only activity is knapping including reduction of Knife Lake siltstone and retouching of an agate tool.
PROJECT CONCLUSIONS

RESEARCH QUESTION: THE PALEO-ARCHAIC TRANSITION

Information directly bearing on the nature of the transition from PaleoIndian to Archaic was not obtained in this study. The Susan Melissa site on Knife Lake yielded only diagnostic pottery from the Terminal Woodland tradition, probably Sandy Lake, which dates to the last 1000 years. While one or two older occupations are indicated at these sites, there is no clear indication of the age or affiliation. Neither the survey nor the site evaluation on Flat Horn Lake yielded any diagnostics so again the materials cannot be assigned to a tradition. However, some conclusions can be drawn from this research.

A. The unexpected discovery of ceramics on the Susan Melissa site is quite important. Before this project, the only ceramics recovered from Knife Lake were found on a site much farther to the south. This “absence of evidence” had, at least informally, been taken to indicate that the prehistoric use of the Knife Lake siltstone quarries was limited to pre-Woodland groups, that is, PaleoIndian and Archaic. The ceramics appear to be associated with Knife Lake siltstone debitage. However, it is also possible that the small number of ceramics we found could have been mixed into an older occupation, possibly by burning of the organic duff during a forest fire. Given that the site is so close to a quarry, any Woodland groups may have also utilized the quarries for material. We cannot tell from the existing data, namely a lack of diagnostic artifacts, whether the older occupation(s) is Woodland, Archaic, or PaleoIndian.

CONCLUSION: Archaeological sites on Knife Lake could be Woodland or older in affiliation. Continued excavations are needed to find diagnostics that would allow us to date
these sites and determine when and who used this area over time. The Susan Melissa site, though, appears to be associated with secondary reduction of Knife Lake siltstone, either for transport of blanks or tool production.

B. The survey of the northwestern side of Flat Horn Lake has identified six locations where cultural materials are present; two of these six sites have been evaluated. The one done in 2005, Band of the Hand, did not yield very abundant cultural materials and the one done this year, Two Aspen, was very sparse. Although it is difficult to be certain from survey data, none of these six sites are marked by abundant finds and have only a few flakes on the surface or in a few shovel tests per site. This is in direct contrast to the situation at the northern end of the lake. Four sites were located in this location and two were evaluated; all have abundant cultural materials.

CONCLUSION: Different activities/site functions are indicated by the differential pattern of Knife Lake siltstonedebitage. As a starting hypothesis, it could be argued that sites on the northern end of the lake might be associated with quarrying and primary reduction of Knife Lake siltstone from the glacial tills while the sites on the northwestern side of the lake may be associated with travel along a path or trail to the southwest.

C. The remaining two sites on Flat Horn Lake are on the southern end of the lake. One at the picnic area is probably disturbed; this spot was occupied by a logging camp in the early 1900s as well as received extensive landscaping during construction of the picnic area. One site is farther south and still undisturbed; however, time did not permit complete testing of this area. Additional survey and evaluation is required before we can determine site function.
PROJECT BENEFITS

Beyond the data generated by this research, there are additional community benefits from the conduct of this project. Students were directly involved in the research project through a 6 week field school course. All learned first hand how archaeological data are gathered and how to analyze information. This experience is essential for further pursuit of a career in archaeology, whether in cultural resource management or academic venues. Most archaeological careers in the U.S. today are in cultural resource management, where part of the objectives are to identify and manage places of relevance. Students thus received the exact sort of training and experience that they will need as professional archaeologists engaging in cultural resource management.

Further, the mutual dependence of field work and theory was illustrated by the research oriented nature of this project. In order to advance the discipline, research needs to be conducted. At the same time, identifying and managing sites and the data they contain is vital to the future preservation of cultural materials.

In recognition of this interdependence of research and management, the Heritage Resource Program of the Superior National Forest (SNF) has partnered with the Department of Sociology Anthropology at the University of Minnesota Duluth (UMD) for the past two decades in an archaeological field school. The SNF gains volunteers to work on projects outside the direct scope of their project load while UMD students gain valuable experience in field methods and techniques. This current project, in continuing this spirit of cooperation and partnership, has provided the SNF with invaluable archaeological data that contributes to the Forest Service mission.
REFERENCES


