TEST EXCAVATION AND LOCATIONAL ANALYSIS OF PREHISTORIC SITES IN THE HIAWATHA NATIONAL FOREST, MICHIGAN: 1985 SEASON

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Abstract

During the 1985 field season limited test excavation was conducted at 6 prehistoric sites on the West Unit of the Hiawatha National Forest. Testing was initiated to help evaluate the potential of non-coastal sites for the National Register of Historic Places and contribute to locational model development. Included are a Late Woodland site, 2 sites attributed to the Woodland Tradition on the basis of small pottery samples, and 3 sites that lack temporal diagnostics. Chipped stone dominates the cultural material recovered and analysis focuses on raw material preferences, the reduction sequence, and core types. Both bipolar and non-bipolar industries are present. In an attempt to determine if they represent the Chippewa Pattern of winter hunting in interior areas, locational analysis was conducted on a sample of 68 non-coastal sites, including the sites tested. The site catchment technique revealed that sites not adjacent to water features are located in swamp conifer areas with high potential for winter deer hunting. Sites on inland lakes are dominated by Pine-Oak and Northern Hardwood habitats, with potential for both winter and summer resources. However, larger sites on inland lakes are located on shores protected from prevailing winter winds. Sites eligible for the National Register of Historic Places are identified and recommendations are made for future research.

Acknowledgements

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Table of Contents

List of Figures

List of Tables

List of Appendices

Chapter 1
INTRODUCTION

Background

One of the major accomplishments of the cultural resource management program on the Hiawatha National Forest has been the identification of a large number of previously unrecorded prehistoric sites within the interior of the Central Upper Peninsula. At the time of Martin's (1977) overview study virtually no prehistoric sites were known outside of Great Lakes coastal settings. As of the end of the 1984 field season, 68 sites had been located on the west unit of the Forest (Fig. 1) that were greater than 1 1/2 miles from modern Great Lakes shores.

These sites are highly correlated with inland lakes and streams. Although shovel testing has been largely confined to riparian features, creating the possibility of a biased picture, there are factors which compensate for this. The test of the model based on Martin's (1977) overview study surveyed a random sample of forest lands stratified on the basis of ecological zones. No prehistoric sites were found (Lovis 1979). In addition, large areas away from water with good surface visibility have been examined over the last eight years. These have mainly consisted of hundreds of miles of unimproved roads and skid trails, as well as other areas where soils have been exposed through both natural and cultural processes. A final control has been the initiation in 1984 of shovel testing in certain non-riparian settings thought to have potential based on ethnohistoric, ethnographic, and environmental data (Franzen 1986). Examples of these areas include the margins and well-drained inclusions within swamps or wetlands, lithic raw material sources, and potential maple sugaring areas. Through these efforts, a small number of sites have been located which apparently are not associated with extinct or extant water features. One of these is discussed in detail in this report (Star Salvage site).

The discovery of this sample of sites in an area which was previously terra incognita for prehistoric archaeology creates several cultural resource management needs and opportunities. In terms of effective management, we need to evaluate these sites to determine if they are eligible for the National Register of Historic Places. In order to do this, in many cases we need more information than is normally obtained through surface inspection and shovel testing. A program of test excavation has been initiated to gather this information. In conjunction with this program, locational analysis is also necessary in order to provide a settlement pattern context for evaluating the results of test excavation. A previous report in this series (Franzen 1986) includes detailed ethnohistoric and environmental background for the study area.

The following specific information needs were identified relative to the evaluation of these prehistoric sites:

1. chronological placement
2. site type/function - i.e. presence of features, faunal/floral remains, artifact types
3. integrity

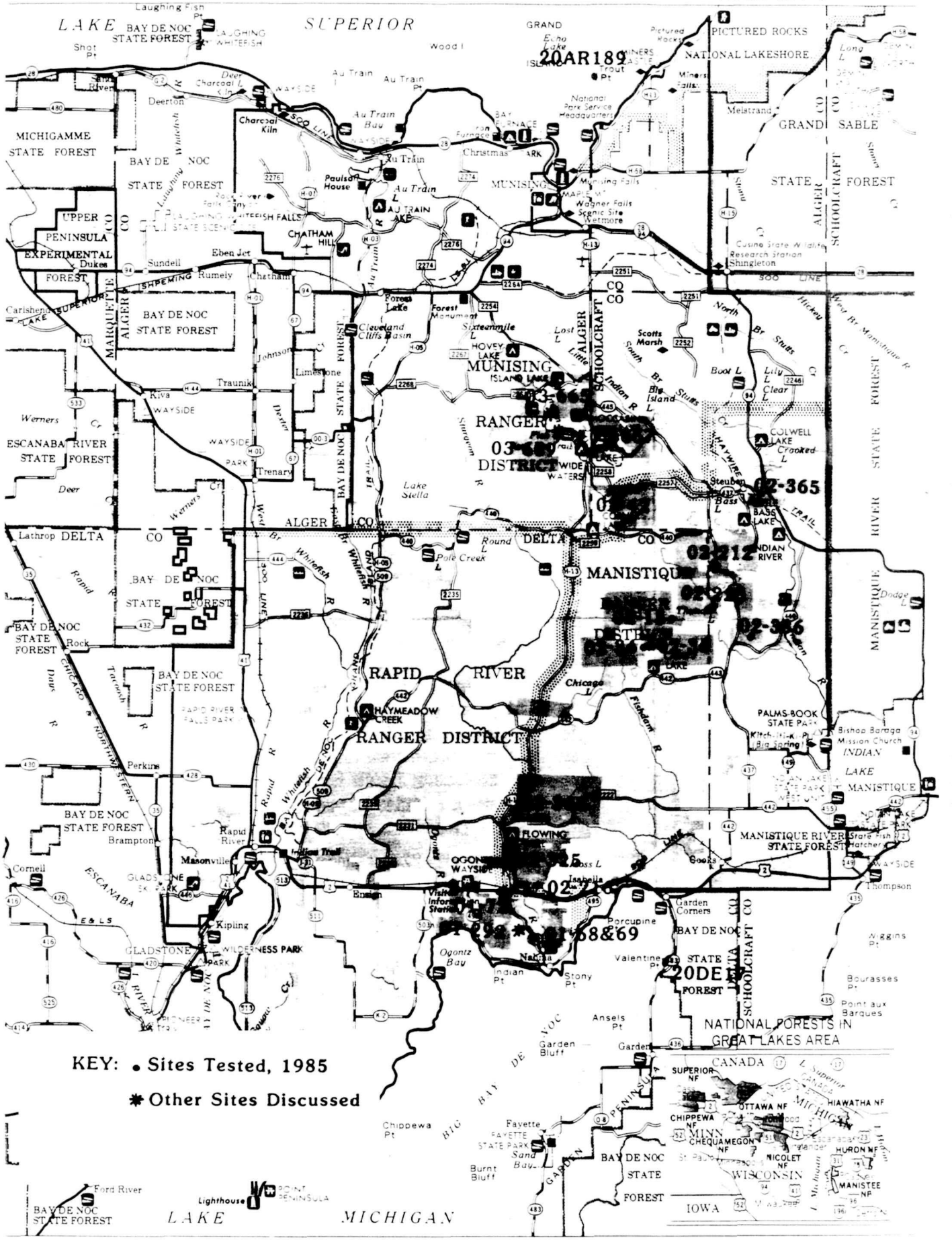


FIG.1 Selected Prehistoric Sites, West Unit, Hiawatha National Forest

These factors are the key to determining whether or not sites can contribute to the understanding of prehistoric cultural history or subsistence/ settlement patterns in the study area.

In general, very little of this information has been supplied through surface indications and shovel testing. One goal of our testing program is to help us evaluate the results of shovel testing and surface collection. Previous test excavation indicates that shovel testing may provide an indication of the overall density of cultural material at a site. However, it also seems to be an unreliable indicator of the density or even presence/absence of specific artifact classes or cultural features.

Previous Test Excavation Results

Gooseneck Lake IV, 09-10-02-36 (20DE44)

Relatively good surface visibility at this site permitted a large surface collection to be made at the time of initial inventory, which included a variety of stone tools, cores, and debitage (Commonwealth Associates Inc. 1979). A stemmed point found in 1978 and a large corner notched point found in 1982 (Franzen 1983) have resulted in the site being attributed to the Initial Woodland Period. An additional small stemmed chert point was found on the surface in 1985 (Fig. 8f). This point is similar in shape to Garden Stemmed, Variety 3 (Cleland and Peske 1968:32-34, Fig. 11) and similar points from the Middle Woodland component at Summer Island (Brose 1970, Plate XIX, q, s).

Two 1x2 meter test units were excavated at this site in 1982. Although no ceramics were recovered during initial surface collections at this site or during shovel testing done to define its extent, 4 small exfoliated grit tempered sherds were found during test excavation (Franzen 1983). Two additional small grit tempered sherds were collected from the surface during 1985. Although portions of this site have been disturbed by recent campers, an undisturbed cultural feature consisting of a well defined cluster of fire cracked rock and an associated bipolar core were encountered during test excavation.

Leg Lake Site, 09-10-02-212 (20 ST97)

This site was initially defined on the basis of 44 lithic items in an exposed 2-track road and one positive shovel test (Commonwealth Associates Inc. 1982). Ten 50cmx50cm test units were excavated, but only two produced cultural material. Out of the total of 70 pieces of chipped stone, seven were unifacial tools, including scrapers and retouched or utilized flakes. No temporal diagnostics, bone, or cultural features were encountered.

Sturgeon River Site, 09-10-01-72 (South of US-2) (20DE75)

This site was initially defined by shovel tests and four 1.5x1.5 meter test units which included bone, plant remains, chipped stone, and shell tempered Oneota ceramics, indicating a Late Woodland period date (Martin and Martin 1980). A large amount of additional work consisting of shovel tests, twelve 1x1 meter test units, and three 2x2 meter test units was conducted in 1983

(Buckmaster 1983). They revealed a thin, sporadic cultural deposit defined in 5 positive units which contained 178 fragments of chipped stone, 1 biface, 1 retouched flake, and 27 potsherds. No cultural features, botanical remains, or significant faunal remains were recovered.

Sturgeon River Site, 09-10-01-72 (North of US-2) (20DE75)

This appears to be a separate component because of a number of differences between materials there and those south of US-2. Materials consisted of 30 pieces of chipped stone debitage found on the surface in a large disturbed area and 26 fragments found in the four positive 2x2 meter test units out of the six excavated (Buckmaster 1983). No tools, features, faunal, or botanical remains were discovered and much of this area had been disturbed.

Unnamed Site, 09-10-03-665 (20AR243)

This site included a single positive shovel test containing two flakes and two fragments of firecracked rock and one flake from an eroded area. Three 1x1 meter test units failed to recover any additional cultural material (Gilbert/Commonwealth, Inc. 1985).

Unnamed Site, 09-10-03-669 (20AR247)

Six positive shovel tests yielding nine flakes (one retouched) and fragments of firecracked rock initially defined this site. Of the six 1x1 meter test units excavated at this site, the only positive unit yielded three flakes (Gilbert/Commonwealth, Inc. 1985:195-196).

Widewaters Site, 09-10-03-667 (20AR245)

Six positive shovel tests yielded nine fragments of debitage and two chipped stone tools at this site. A surface exposure along the river bank included 17 fragments of chipped stone. Seven 1x1 meter test units recovered a relatively large amount of cultural material, including over 300 debitage fragments, retouched and utilized flakes, 100+ fragments of firecracked rock, and eight grit-tempered ceramic sherds. Turtle and mussel remains were encountered, but could not be definitely attributed to the prehistoric occupation. Ceramics from the site identify it as a Late Woodland Period manifestation (Gilbert/Commonwealth 1985).

Ten Mile Rapids Site, 09-10-02-366

This site was discovered in 1983 through both surface indications and shovel testing. It covers approximately 1,000 square meters along the Sturgeon River, adjacent to a rapids formed by a dolomite outcrop and angular boulders. Seven excavation units covering 5.75 square meters were completed, yielding chipped stone, ground stone, bone, and ceramics (Commonwealth Associates, Inc. 1984). Included were a small triangular point, a ground stone "elbow pipe", and cord-marked ceramics, suggesting a Late Woodland occupation. The faunal assemblage, which was dominated by sturgeon and beaver, is diagnostic of an occupation during the spring sturgeon spawning run. The site is located about nine miles from Lake Michigan.

Methodology

Selection of sites for test excavation was based on characteristics revealed by survey level data. We also sought to test sites in a variety of environmental settings. Sites with multiple positive shovel tests and/or abundant surface materials were preferred because of the higher liklihood of productive deposits. Sites were tested on a large inland lake (02-220), a river (02-325, 02-365), streams (02-15 and 02-216 - which is also on Nipissing beach ridge), and in an area without surface water (02-386). These sites were located in a variety of terrestrial habitats including areas dominated by organic soil, lacustrine sands and dunes or ridges (02-216, 02-325, and 02-386), outwash sands (02-15 and 02-365) and a mixture of outwash sands and moraines (02-220).

Test excavation consisted of one meter x one meter units. These were placed judgementally based on the results of survey level investigations in an effort to maximize the recovery of cultural material and were influenced by obstacles such as trees, tree falls, and obviously disturbed areas. Excavation was done in arbitrary 10 centimeter levels. All soil was passed through 1/4 inch hardware mesh screen. Fifteen liter soil samples were collected from all levels with substantial amounts of cultural material or organic staining, and samples of various sizes were also taken from all cultural features. Soil samples were later processed using a 1/16 inch mesh water screen floatation technique.

Chapter 2
RESULTS OF FIELD INVESTIGATIONS

Namtuart Site, 09-10-02-325

This site was located in 1982 during shovel testing conducted along the Sturgeon River (Fig. 2). It was defined on the basis of seven positive shovel tests which yielded 27 fragments of chipped stone debitage (Franzen 1983). None of this debitage showed signs of modification or use. The Sturgeon River immediately adjacent to the site is a slow moving sand bottom stream dominated by warm-water fish. The immediate site area is a relatively open pine and aspen forest with a ground cover of sweet fern and bracken. The soil in this area is classified as Kalkaska sand, a well drained soil with low fertility, which has formed in this area on an outwash sand deposit which may be windblown. Forest fires are likely to have influenced soil and vegetation development in this area. The broader site setting is dominated by organic deposits with sand ridges, organic deposits with sand dunes, and level poorly developed outwash sands. It is a setting characterized by coniferous species, both in uplands and in poorly drained areas.

Test excavation at this site consisted of two 1x1 meter squares placed adjacent or between positive shovel tests excavated in 1982 (Fig. 2). Although the thickness of the A_2 horizon varied, the typical soil profile consisted of 2-4 cm duff and humus, 4-8 cm dark grey sand, 7-26 cm grey-tan sand, and a basal deposit of reddish brown sand with some mineral accumulation. The site yielded a moderate amount of chipped stone debitage, two bipolar cores, and a utilized flake. All materials from this site are chert and appear to result from the later stages of the reduction process (Table 2). Both bipolar cores are relatively large (3.53 x 3.00 x 1.07 cm. and 3.99 x 3.62 x 2.18 cm.) and are of the flat rather than polyhedral variety (McPherron 1967:136). Both show signs of impact at right angles to the major axis. The largest core can be refit with a platform fragment and a utilized flake from the same level appears to be the same raw material. The retouched flake from Unit 1, Level 1, is very small (1.7 x 1.075 x .31 cm) and it would appear to have required hafting for efficient use. The materials from Test Unit 2 extended deeper than expected (0-40 cm).

If unvegetated, this sandy soil would be subject to erosion and deposition. Although there was at least 3 cm of vertical separation, the 2 bipolar cores were closely associated (6 cm horizontal separation). Debitage from Level 4 was very small and appears to be the same raw material as the bipolar core from Level 2.

This site appears to represent a relatively restricted set of activities, the most apparent of which involves the finishing and/or maintenance of stone tools and the knapping and/or utilization of bipolar cores. A discrete activity area where bipolar cores were processed or used was identified. Sites like this where activity areas are relatively simple and do not overlap may help clarify the role of this ubiquitous artifact.

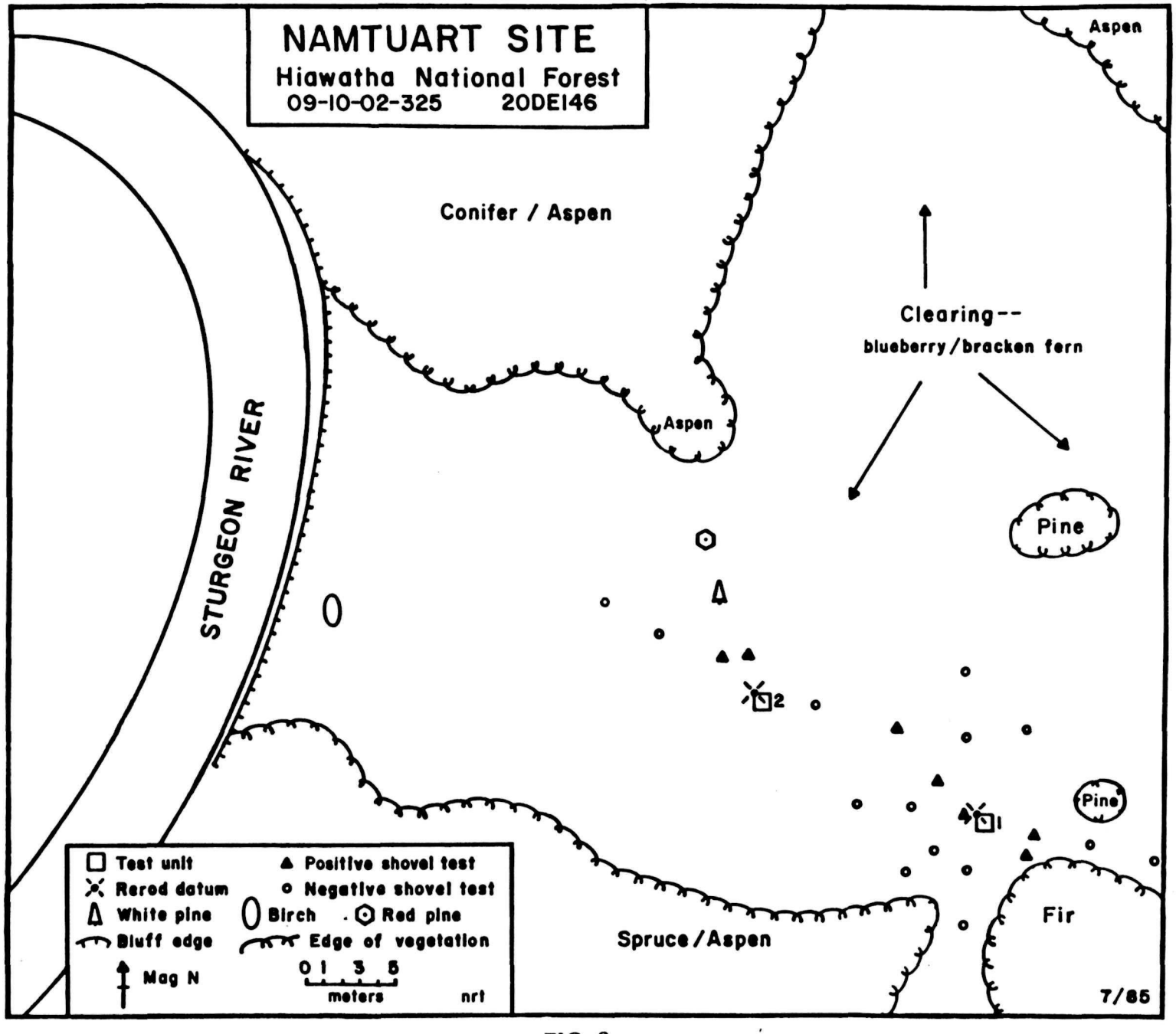

NAMTUART SITE
Hiawatha National Forest
09-10-02-325 20DE146
Aspen
Conifer / Aspen
Clearing--
blueberry/bracken fern
STURGEON RIVER
Aspen
Pine
2
1
Pine
Fir
Spruce/Aspen
Test unit
Rered datum
White pine
Bluff edge
Mag N
Positive shovel test
Negative shovel test
Birch
Red pine
Edge of vegetation
0 1 3 5
meters
nrt
7/85

FIG. 2.

The Moss Lake I Site, 09-10-02-216 (20DE141)

This site is located near Bull Run Creek, a small sluggish stream that flows into the Sturgeon River and is associated with large wetlands. The sandy ridge upon which the site is located has been cut into by the creek. This ridge, which crests at approximately 620 feet above sea level, represents a coastal foredune created by post - Glacial Lake Nipissing, circa 4200 B.P. The Rubicon soil, which has developed on this ridge, is dominated by jack, red, and white pine. Some living trees adjacent to the site exhibit scars from forest fires. The surrounding area includes large wetland habitats. These wetlands are either unforested marsh or bog, or dominated by swamp conifers such as black spruce or cedar.

The site was initially defined in 1982 (Franzen 1983) on the basis of 5 positive shovel tests yielding 9 fragments of chipped stone. Although the site is small in extent (approximately 160 square meters) it is relatively high density. Testing done in 1985 consisted of 2 1x1 meter test units placed in the vicinity of positive shovel tests (Fig. 3). The typical profile consisted of 1 or 2 cm of litter, 2-4 cm of dark grey humic sand, a highly variable layer of a light grey-tan sand averaging about 22 cm, and a basal layer of reddish-brown sand extending to the limit of excavation. Cultural material from this site is dominated by quartzite debitage and fire broken rock, most of which is derived from a grey-tan sand deposit from 0 to 30 cm below surface. Cores and core fragments reveal both a bipolar and a "freehand" pebble reduction strategy, ranging from relatively large "split cobble" type quartzite core (5.8 x 4.5 x 3.5 cm) to a small grey chert polyhedral bipolar type (1.62 x 1.39 x .86 cm). A core from Test Unit 3, level 3 is a water worn but not rounded chert chunk with several hinge fracture flakes removed. It lacks bipolar indications and may have been rejected because of imperfections. Retouched or utilized flakes may be present on quartzite in this assemblage but unrecognized.

Firecracked rock was abundant at this site and although all materials were piece plotted, no well defined cultural features were noted. However, chipped stone, firecracked (and other) rock do seem clustered especially in Test Unit 1, although not enough to warrant feature designation. Numerous fragments of sandstone were present in the unit and some showed signs of heat.

The site presents an interesting contrast to nearby sites in terms of lithic raw materials. Chert dominates sites located on the Algoma Beach approximately 3 miles to the south, as well as 2 sites located on the Nipissing ridge about 1/4 mile east of 02-216 (02-217, 02-218; Franzen 1983). As Buckmaster (1983) has noted, the predominance of quartzite may indicate contrasts with known Woodland age sites in the area. The Moss Lake I site has the potential to aid in the study of raw material preferences and related cultural historical questions.

The Carr Creek Site, 09-10-02-15

The Carr Creek site (Fig. 4) was initially recorded by Michigan State University in 1978 (Lovis 1979). A quantity of chipped stone was collected from the exposed sandy road and camping area that crosses the site. Our investigation in 1985 consisted of surface collection, shovel tests to help define the site, and 2 1x1 meter test units. Five positive shovel tests in conjunction with good surface visibility in the road and camping area revealed a site covering about 400 square meters.

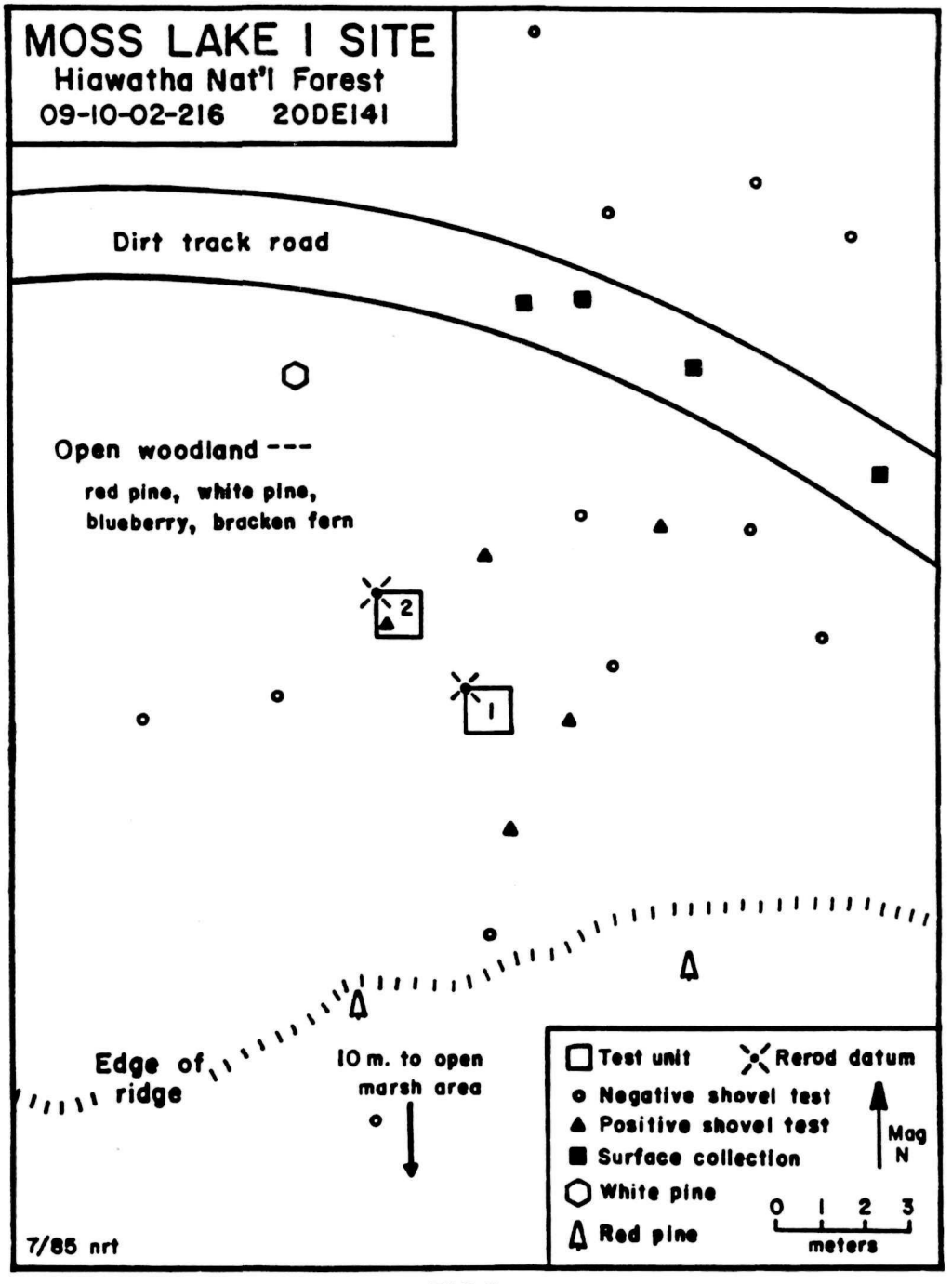

MOSS LAKE I SITE
Hiawatha Nat'l Forest
09-10-02-216 20DE141
Dirt track road
Open woodland ---
red pine, white pine,
blueberry, bracken fern
2
1
Edge of ridge
10 m. to open marsh area
7/85 nrt
Test unit
Rerod datum
Negative shovel test
Positive shovel test
Surface collection
White pine
Red pine
Mag N
0 1 2 3
meters

FIG.3.

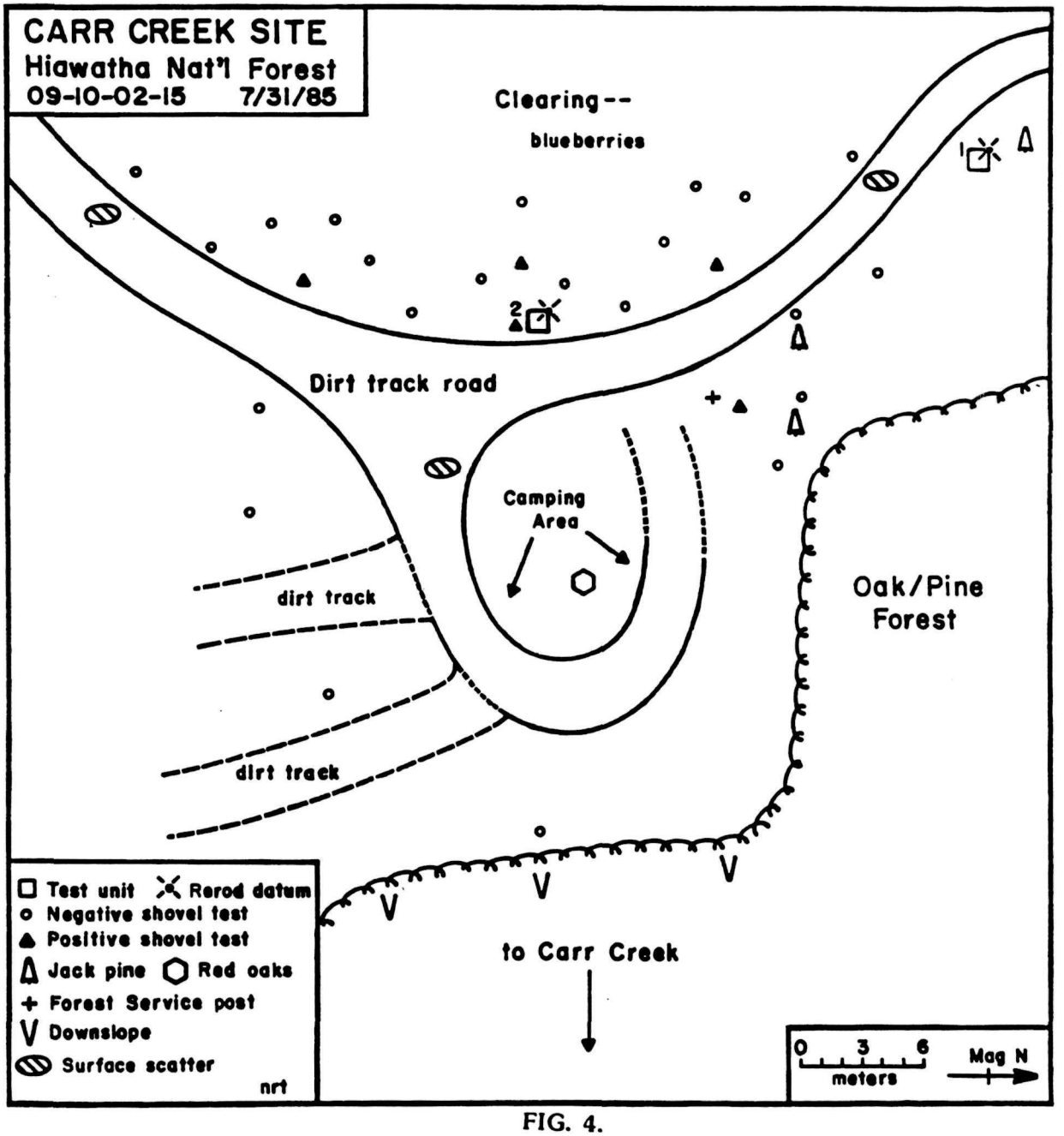

CARR CREEK SITE
Hiawatha Nat'l Forest
09-10-02-15 7/31/85
Clearing--
blueberries
Dirt track road
Camping Area
dirt track
dirt track
Oak/Pine Forest
to Carr Creek
Test unit
Rerod datum
Negative shovel test
Positive shovel test
Jack pine
Red oaks
Forest Service post
Downslope
Surface scatter
nrt
0 3 6
meters
Mag N

FIG. 4.

Most of the site is relatively open, with a ground cover of blueberries and grasses. Scattered pine and aspen surround the site, with the broad area within several miles dominated by glacial outwash sands and Rubicon soils which support a pine and oak forest. Carr Creek is a small cold water stream with a small amount of associated wetland.

Surface collections made from eroded portions of this site yielded a number of chipped stone cores and tools. A small shallowly side-notched projectile point collected from the surface (Fig. 9d), cannot be unequivocally attributed to a specifc time period, although it most likely relates to a Late Woodland occupation. Small side-notched points were found at the Juntunen Site (McPherron 1967: Plate XXII). Most points from nearby Middle Woodland sites are either different in morphology or much larger (Brose 1970; Cleland and Peske 1968; Richner 1973).

Of special interest is the presence of 4 bipolar cores on the surface along the 2-track trail that crosses the site (Fig. 4). Two quartz cores were found 8 cm apart without associated flakes and 2 chert cores were found approximately 50 cm apart. Both are within 5 meters of each along the north edge of the site in a area with little or no additional material on the surface. One of the cores is associated with a flake that can be refit, and the other core and an associated flake are heat damaged. This possible activity area may help clarify the function of these artifacts.

Additional bipolar artifacts include an "orange segment" shaped quartz core from Level 1, Test Unit 2, and one from surface collection area "A" (southern-most collection area) which appears to be a biface fragment subjected to bipolar flaking. One margin of this artifact also shows unifacial utilization or retouch (Fig. 9h).

Test Unit 1 at this site, located adjacent to some surface materials near the edge of the site, was sterile. Test Unit 2, which was located near the center of the site, contained chipped stone, firecracked rock, and a small sample of prehistoric ceramics. The soil profile in Test Unit 2 consists of a thin 1-2 cm duff layer, 5-7 cm of dark grey organic sand, 4-8 cm of light grey sand, and a reddish brown sand with some mineral accumulation that extended to the limit of excavation at 30 cm below surface. All cultural material was found in the upper 20 cm of the unit. The presence of ceramics in Test Unit 2 was surprising given their absence from the large area of surface exposure at this site. These 6 small grit tempered fragments are all smooth and undecorated and the one small rimsherd exhibits a flattened lip.

Indian River Site, 09-10-02-365

The Indian River Site (Fig. 5) was located during a survey conducted by Commonwealth Associates Inc. in 1983 (Commonwealth Associates Inc. 1984). Originally defined on the basis of 5 positive shovel tests and surface material in a 2-track road and along the eroding river bank, some additional shovel testing was conducted in 1985 to help relocate the site.

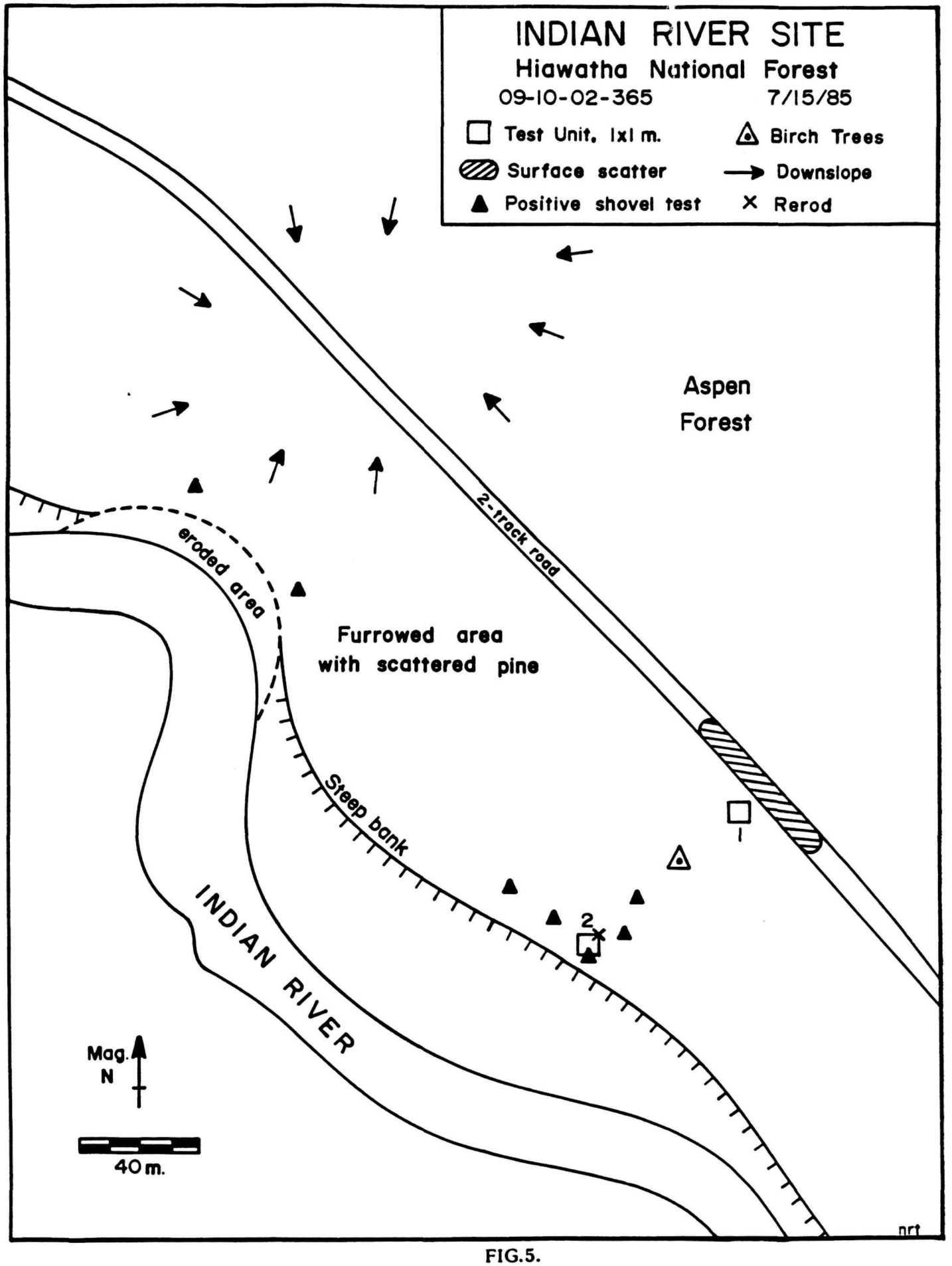

INDIAN RIVER SITE
Hiawatha National Forest
09-10-02-365
7/15/85
Test Unit, 1x1 m.
Birch Trees
Surface scatter
Downslope
Positive shovel test
Rerod
Aspen
Forest
2-track road
eroded area
Furrowed area
with scattered pine
Steep bank
INDIAN RIVER
1
2
Mag.
N
40 m.
nrt

FIG.5.

The site is situated in an area of glacial outwash sands overlooking the Indian River, which is actively eroding a portion of the site. The low fertility, well-drained Rubicon sand which has developed supports a planted red pine forest. The Indian River is one of the major rivers on the Forest and although greatly reduced in number, sturgeon spawning runs still extend into this portion of the river (Schrouder 1985).

After relocating the surface material in the 2-track road, shovel tests at 5 meter intervals were placed along the river bank downstream from the eroded area. Several shovel tests yielded firecracked rock and one yielded a chert flake. This appears to be in the vicinity of 3 positive shovel tests excavated in 1983.

Test Unit 1 (1x1 M) was placed just southwest of the 2-track road and adjacent to some chipped stone visible on the surface. This unit was devoid of cultural material. Test Unit 2 was placed adjacent to a positive 1985 shovel test in what appeared to be a narrow strip of undisturbed soil between tree planting furrows and the steep river bank. The soil profile in the undisturbed portion of this unit consisted of about 2 cm of duff, a dark grey humic sand 5-6 cm thick, 5-17 cm of grey sand, and a reddish-brown sand extending to the limit of excavation.

Test Unit 2 contained firecracked rock, chipped stone, and prehistoric ceramics. A deep intrusive pit in this unit contained a metal can and much charcoal. Prehistoric cultural material in the remainder of the unit may be undisturbed. Although one of the 2 grit tempered ceramic fragments recovered has indistinct decoration, the other appears to be a rimsherd with a row of wavy diagonal impressions above horizontal rows made by the same instrument (Fig. 8d). Although weathering makes a positive identification impossible, it appears similar to some of the Laurel Pseudo - scallop shell rimsherds from the Naomikong Point site (Janzen 1968: 124).

The Star Salvage Site, 09-10-02-386

This site was discovered in the spring of 1985 by district Cultural Resource Paraprofessional Mary Mumford, who observed chipped stone in an area recently disturbed by heavy equipment. Located on a level portion of a stabilized sand dune which supports a sparse cover of pine and aspen, the site is surrounded by large areas of swamp forest. It is adjacent to a major winter deer yard. District personnel report that ridges in this area serve as travelways for deer moving to and from winter yards. The nearest water features are Big Murphy Creek (7/8 mile) and the Indian River (1 1/2 miles). The swamp areas surrounding this site do not appear to represent former lakes that have eutrophied. No shore terraces have developed on adjacent uplands and the wetland soils in this area (Tawas muck and Roscommon Mucky sand) have relatively shallow organic deposits (18 to 36 inches) which overlay sand from lake plains, outwash plains, or till. Dunes like the one the site is located on are thought to have formed along the shores of post glacial lakes such as Lake Algonquin or on freshly exposed lake beds as waters receeded.
(Berquist 1936: 129).

Initial work at the Star Salvage site consisted of the excavation of 32 shovel tests at 5 meter intervals to define the site area, which covers approximately 400 square meters. This was followed by controlled surface collection and the excavation of 6 1x1 meter test units. Because a greater

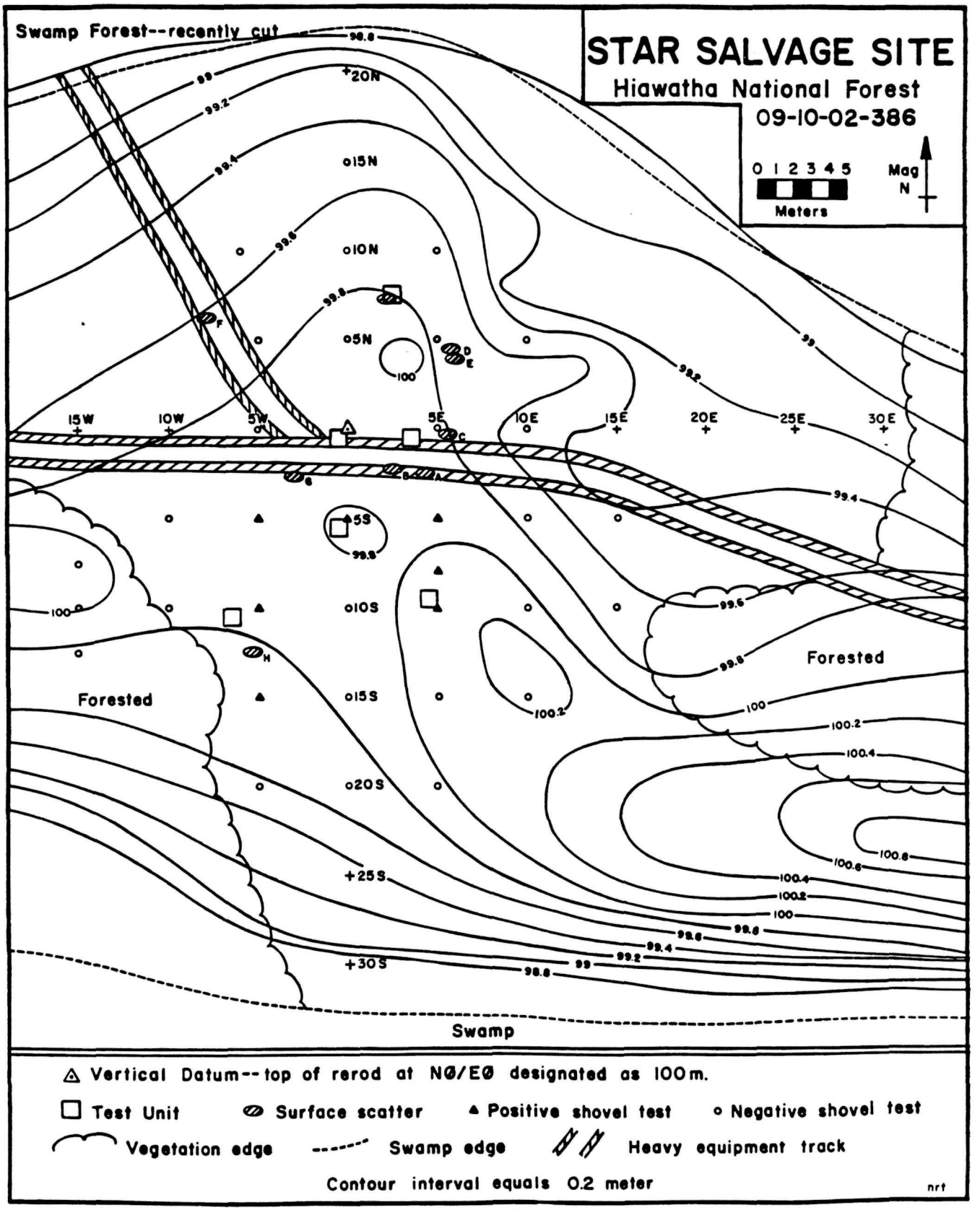

STAR SALVAGE SITE
Hiawatha National Forest
09-10-02-386
0 1 2 3 4 5
Meters
Mag N
Swamp Forest--recently cut
+20N
015N
010N
05N
15W
10W
5W
5E
10E
15E
20E
25E
30E
05S
010S
015S
020S
+25S
+30S
Forested
Forested
Swamp
98.6
99
99.2
99.4
99.6
99.8
100
100.2
100.4
100.6
Vertical Datum--top of rerod at NØ/EØ designated as 100m.
Test Unit
Surface scatter
Positive shovel test
Negative shovel test
Vegetation edge
Swamp edge
Heavy equipment track
Contour interval equals 0.2 meter
nrt

FIG.6.

amount of work was planned at this site, a transit was used to locate test units within a 1 meter grid system and pepare a 20 centimeter interval contour map (Fig. 6).

Test excavation and surface collection revealed an extremely dense deposit of chipped stone debitage and tools. Most artifacts were found in the upper 10 centimeters of the soil deposit, which appears to be a Rubicon sand formed on the dune deposit. Although the depth of the A_2 or leached horizon is quite variable most profiles exhibit the following: a very thin layer of duff about 1 cm thick, 3-5 cm of dark grey organically stained sand, 6-25 cm of light grey or white sand, and a basal reddish brown sand which in some areas is partially cemented with mineral accumulation. On-site vegetaton consists of reindeer moss and bracken fern, with a few scattered spruce, jack pine and aspen around the site edges. Charred pine stumps in the vicinity indicate forest fires have affected vegetation and soil development on this ridge. The chert which forms 98% of the chipped stone assemblage consists of white and light grey or tan varieties which have been observed at modern rock quarries in the Cataract and Manistique formations of the Niagaran dolomite series. The very light, almost white appearance of some flakes appears to result from weathering. Several white flakes without cortex were deliberately broken and revealed a light grey or tan interior, with only a thin rind of white on the exterior. Cortical surfaces on this material do not appear to be waterworn, and the nearest bedrock outcrops are approximately 8 miles south.

All stages of the lithic reduction process appear to be represented, but an abundance of small flakes indicates an emphasis of the later stages. Although not seperately tabulated, many flakes of bifacial retouch were observed and 18 bifaces or biface fragments were recovered. A variety of other tool types were recovered (Table 1) and ceramics were conspicuous by their absence from this large assemblage. Only 24 fragments of possible firecracked rock were recovered and no prehistoric charcoal or cultural features other than artifact concentrations were identified. Two fragments of bone were collected, one of which was identified as a phalanx from a white-tailed deer less than one year old (Appendix 2). However, this bone was recovered from the surface of the site and may be of recent origin.

Although no direct evidence of the age of this site was recovered, the absence of ceramics and its similarity to sites located on Algoma strand lines to the south suggest it may be Late Archaic age. The "Late Archaic" period in Michigan's Upper Peninsula appears to last from circa 3000 B.C. until about 100 B.C. and includes a Archaic-Woodland transition period extending from approximately 1500-100 B.C. (Mason 1981). In terms of lithic reduction technology, the differences between this site and known Woodland Tradition sites in the vicinity are dramatic, especially the absence of the small bipolar cores so common at Woodland sites in a variety of settings.

Three sites (01-68, 01-69, 01-292) located along a beach ridge thought to relate to Lake Algoma or shortly thereafter exhibit the following similarities to the Star Salvage site (Commonwealth Associates Inc. 1981; Gilbert/Commonwealth 1986).

1. large amounts of chert debitage from a relatively homogenous source
2. predominantly block cores, freehand percussion reduction process
3. absence of ceramics
4. absence or scarcity of small bipolar core/wedges
5. habitat dominated by swamp forest

However, additional research is certainly necessary to clarify this question. What is clear is that there is a distinct site type characterized by large amounts relatively homogenous Niagaran chert debitage, absence of ceramics, predominantly a block core or free hand chipped stone industry, and locations on high ground within swamp forests, some of which are former strand lines of extinct post-glacial lakes.

Although a variety of tool types were recovered, none appear diagnostic of a particular time period. They do indicate that biface production was a major activity at the site. Core fragments appear to represent block cores or freehand percussion knapping. The variety of other tool types present indicates that activities other than lithic reduction are represented.

The Star Salvage site offers opportunities to explore a relatively unique site type. It may permit a better understanding of the activities of pre-Woodland peoples in the Upper Peninsula or the transition between Archaic and Woodland cultures. Although the prospects for radiocarbon dating seem slim, larger samples from this site and from other sites in the region may enable its chronological placement to be inferred through comparative studies of tool types and/or lithic reduction technology.

Studies of the chronological placement of this and similar sites holds the key to several important research questions:

-Is there an identifiable Archaic occupation of the study area?
-Did Archaic or transitional peoples exhibit a different settlement pattern from later Woodland peoples?
-Did Woodland peoples in the study area occupy aceramic sites that differ greatly in terms of lithic assemblages and locational characteristics from nearby known Woodland sites?

Test excavation at the Star Salvage site revealed a dense deposit with internal variation that may represent activity areas. For example, Unit S10/E5 only yielded 237 flakes but also included 5 bifaces while Units N7/E3 and S1/E0 each yielded over 2,000 flakes but contained only 4 and 3 bifaces respectively. Another indication of internal variability in terms of lithic reduction is the difference in average chert debitage weights between S1E4 (202 fragments, average weight 1.78 grams) and S1E0 (1987 fragments, average weight .53 grams). Our test excavation also revealed that possible disturbance at this site is confined to the narrow heavy equipment track (Figure 6) and that the somewhat dramatic (2338 items in level 1, 5 in level 2 N7/E3) concentrations of material in the upper 10 centimeters of the site are indicative of vertical integrity.

Thunder Lake II Site, 09-10-02-220 (20ST109)

This site was discovered during shovel testing conducted by Forest Service archaeologists in 1982 (Franzen, 1983). It was defined as covering approximately 650 square meters on the basis of 15 positive shovel tests excavated in 1982 and 4 additional positive tests excavated in 1985 (Figure 7). The initial work at this site in 1982 recovered chert debitage, a quartz wedge, point fragments, burnt bone, and cord-marked grit tempered ceramics. Another concentration of prehistoric material 47 meters north of this site was designated as the Thunder Lake II Site (09-10-02-221) and contained similar materials, including what appears to be a small triangular Late Woodland projectile point with a serrated edge (Franzen 1983:69).

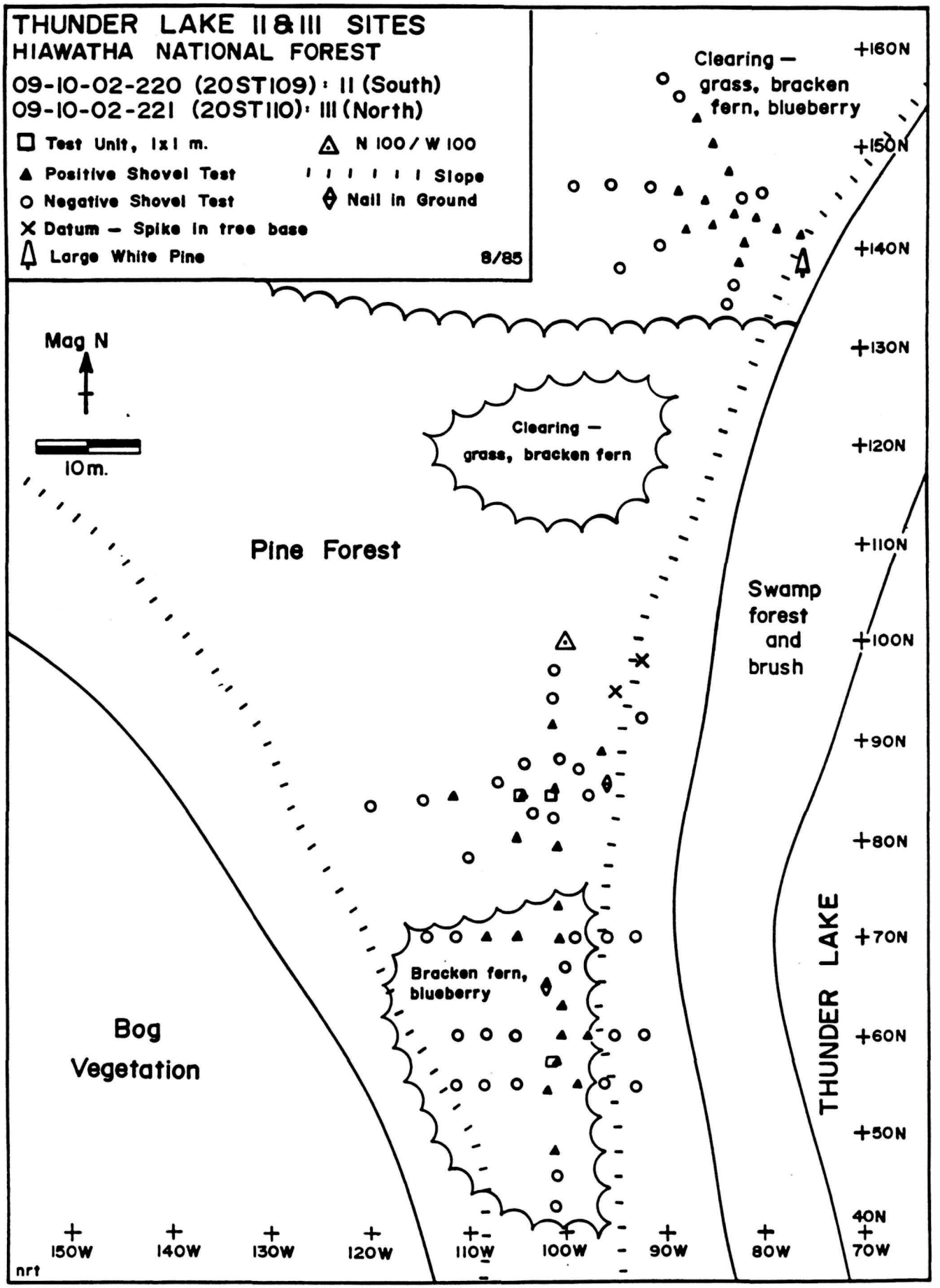

THUNDER LAKE II & III SITES
HIAWATHA NATIONAL FOREST
09-10-02-220 (20ST109): II (South)
09-10-02-221 (20ST110): III (North)
Test Unit, 1x1 m.
Positive Shovel Test
Negative Shovel Test
Datum — Spike in tree base
Large White Pine
N 100 / W 100
Slope
Nail in Ground
8/85
Clearing — grass, bracken fern, blueberry
Mag N
10m.
Clearing — grass, bracken fern
Pine Forest
Swamp forest and brush
Bracken fern, blueberry
Bog Vegetation
THUNDER LAKE
+160N
+150N
+140N
+130N
+120N
+110N
+100N
+90N
+80N
+70N
+60N
+50N
40N
150W
140W
130W
120W
110W
100W
90W
80W
70W
nrt

FIG.7.

The site is 25 to 30 meters west of Thunder Lake, a large (480 acre) inland lake which is drained by Big Murphy Creek, a major tributary of the Indian River. Although a small wetland forest exists to the north, most of the surrounding area is well drained outwash sand or moraines. Located near a transition between landforms, the site has access to both Northern Hardwoods and Pine dominated habitats. Thunder Lake supports a variety of warm water fish species and the site is located on a protected bay choked with aquatic vegetation during the summer. Current on-site vegetation consists of white, red, and jack pine, aspen and white birch with a ground cover of braken fern and blueberry. Soil type on site is Rubicon Sand, a droughty soil with low natural fertility which has formed here on a glacial outwash deposit.

Test excavation at this site consisted of three 1x1 meter test units placed generally in the areas where shovel tests had indicated the presence of ceramics or bone. A transit was used to locate test units within a 1 meter grid. These units yielded a substantial amount of cultural material, including a variety of artifact classes. All units exhibited a root mat with a dark gray organically stained sand 7-12 cm thick. In unit N84/W104 a light grey to white sand extended below the organic soil to the limit of excavation at 30 cm below the surface. In unit N84/W101 this leached sand was 9 to 14 cm thick and was underlain by a reddish brown sand. In unit N57/W101 this leached zone was approximately 22 cm thick before the reddish-brown B horizon was encounted.

Unit N84/W101 yielded a small amount of chipped stone and firecracked rock. An oblong dark gray charcoal flecked stain approximately 52 cm x 30 cm was apparent in contrast to the light gray and white leached horizon at 20 cm below surface. This stain was cross sectioned and found to have relatively straight sides and a flat bottom which was encountered at 26-30 cm below surface. This possible feature contained a soft, possibly baked limestone or dolomite cobble, but no other cultural material.

Unit N84/W104 was placed at the location of a 1982 shovel test which yielded pottery. Additional fragments of grit tempered pottery were found but all were small and many were exfoliated. Two fragments showed traces of faint cord impressions. This unit also included a small amount of chipped stone and firecracked rock. Considerable root disturbance was present in this unit.

Unit N57/W101 was placed at the location of a 1982 shovel test which yielded bone fragments. A large amount of both burned and unburned bone was recovered from this unit, as well as chipped stone, firecracked rock, and prehistoric ceramics. The majority of this material came from the upper 6 cm of the unit, except for that found in dark soil stains designated as cultural features.

As light colored sand was encountered at about 4 cm below surface, an oblong dark grey charcoal flecked stain 24 x 36 cm appeared and was designated as Feature 1. It also contained larger charcoal pieces, burnt bone, chipped stone, and fire cracked rock. Cross sectioning revealed that the southern 2/3 was relatively flat bottomed and extended about 15 cm below surface and the northern 1/3 extended about 27 cm below surface, with sloping walls and a slightly rounded bottom. The deepest portion of Feature 1 terminated at the beginning of the red-brown B horizon sand. The amount of charcoal recovered from this feature appears adequate for radiocarbon dating.

Feature 2 was located adjacant to Feature 1 and consisted of a mottled grey and brown stained sand containing a small amount of bone. It is slightly oval shaped and was first encountered at 14 cm below surface. In cross section the east side is nearly vertical while the west side slopes unevenly towards the narrowed and rounded base, which terminates at about 29 cm below surface.

Feature 3 was a nearly circular mottled brown and dark grey stained sand approximately 14 cm in diameter, with less charcoal than Features 1 and 2. It contained a large quanity of beaver bone, but this bone is unburnt, in contrast to the bone from the rest of the test unit. This feature, which is relatively straight sided and flat bottomed, was apparant at about 18 cm below surface and extended to 25-28 cm below surface. It may at least partially be a result of animal burrowing or other processes not related to the prehistoric occupation of the site.

All soil from Features 1,2, and 3 was collected, as well as a 10 liter sample from level 2. These samples were subjected to 1/16 inch water screen flotation. Plant and animal remains from this site are detailed in Appendix 2.

Both Features 1 and 2 contained adequate quantities of charred wood for radiocarbon dating. Other carbonized plant remains were rare, and included bedstraw and bulrush or knotweed seeds, and fragments of hazelnut and red oak acorn. This small amount of plant material would seem to preclude inferences about the site's season of occupation.

Animal remains were much more abundant and dominated by beaver, which comprises 84.5 % of the total identified elements. Also present were muskrat, 2 turtle species, 3 fish species, white-tailed deer, and either moose or elk. One turtle species was probably procurred in the spring, but the use of shells as utensils the year round makes it unwise to infer seasonality based on this one individual. Other faunal remains are not indicative of a specific season of use. (see Appendix 2 for discussion).

Cultural material from the Thunder Lake II site, the bulk of which comes from the 1x1 meter unit designated N57/W101, is relatively diverse. The chipped stone assemblage includes a variety of tool types and a large number of bipolar cores and core fragments. Two bipolar cores exhibited a lateral edge which is retouched like a scraper. Of particular interest is the presence of a waterworn dark grey igneous cobble which exhibits distinctive wear suggesting use as both a hammerstone and anvil (Figure 8a). The pitting in the center of one face of this cobble resembles that of stones thought to have been used as anvils for the bipolar flaking of quartz cobbles or pebbles at the Hoko River site in coastal Washington (Flenniken 1981). Most identified chipped stone tools from this site are small enough to have been derived from the bipolar cores recovered. Almost all the chert appears to fall within the range of variation observed in modern Niagaran formation dolomite quarries. Cortical surfaces, when present, appear to be waterworn on both quartz and chert at this site, although several relatively unweathered cortical surfaces were observed on chert.

Although the ceramic assemblage from this site is highly fragmented and often exfoliated, some sherds exhibited what appears to be surface treatment by cord-wrapped paddle. All ceramics with cordmarking are grit tempered.

Several decorated rim and body sherds from this site are valuable chronological indicators. The only decorated shell tempered sherd from the site exhibited a straight trailed line 5.5 mm wide (Fig. 8f). A grit tempered cord-marked sherd with curvature indicating it may be from a vessel neck area exhibits slightly diagonal corded-stamp impressions (Fig. 8e).

Two very small grit tempered rimsherds from a vessel lip exhibit diagonal cord impressions. Diagonal cord impressions are found on the same vessel with cord stamp impressions at the Sand Point site (Dorothy 1980: Plate VI) and on some Madison cord impressed vessels (Hurley 1975: Plate 24). The presence of cord impressed decoration, corded stamp, and trailed shell tempered ceramics, would suggest a Late Woodland occupation with Upper Mississippian influence, perhaps in the range of A.D. 1000-1400, if in fact all sherds are contemporaneous.

The presence of temporal diagnostics, cultural features, and bone preservation make this site a potentially significant repository of information on prehistoric subsistence and settlement patterns. Although there are some areas which may have been disturbed by historic period logging, the integrity of subsurface features appears at least partially intact. The scarcity of datable sites with these data present argues for eligibility of this site for the National Register of Historic Places.

Swan Lake Site, 09-10-02-42

This site was recorded in 1978 about 10 meters south of Swan Lake in a heavily eroded camping area (Commonwealth Associates Inc. 1979). At the time the site was recorded, chipped stone tools, debitage, and firecracked rock were collected or observed in a small area of about 5 square meters. The chipped stone included 11 fragments of unmodified debitage and 2 retouched flakes.

Because of ongoing erosion and planned campsite rehabilitation, this site was scheduled for evaluation. Swan Lake covers 46 acres and is classified as warm water, high productivity. The surrounding area is dominated by Rubicon soils on outwash sand deposits which now support a mixture of pine and hardwoods.

The site vicinity is near the center of a heavily eroded camping area with good surface visibility covering about 5200 square meters. It was estimated that at least 75% of this area was devoid of vegetation. However, no prehistoric cultural material was observed in walking over the area at 1-2 meter intervals. A row of shovel tests was placed at 5 meter intervals along the edge of high ground along the lake and 2 rows at 10 meter intervals at 5 and 10 meters back from the first row. Only recent historic debris was found in these shovel tests. Because of the lack of additional cultural material at this site, it is not eligible for the National Register of Historic Places.

Collections from other sites

Every year, known prehistoric sites in the forest are visited for a variety of reasons: monitoring their condition, making management recommendations, illustrating field characteristics as part of training sessions, and tours

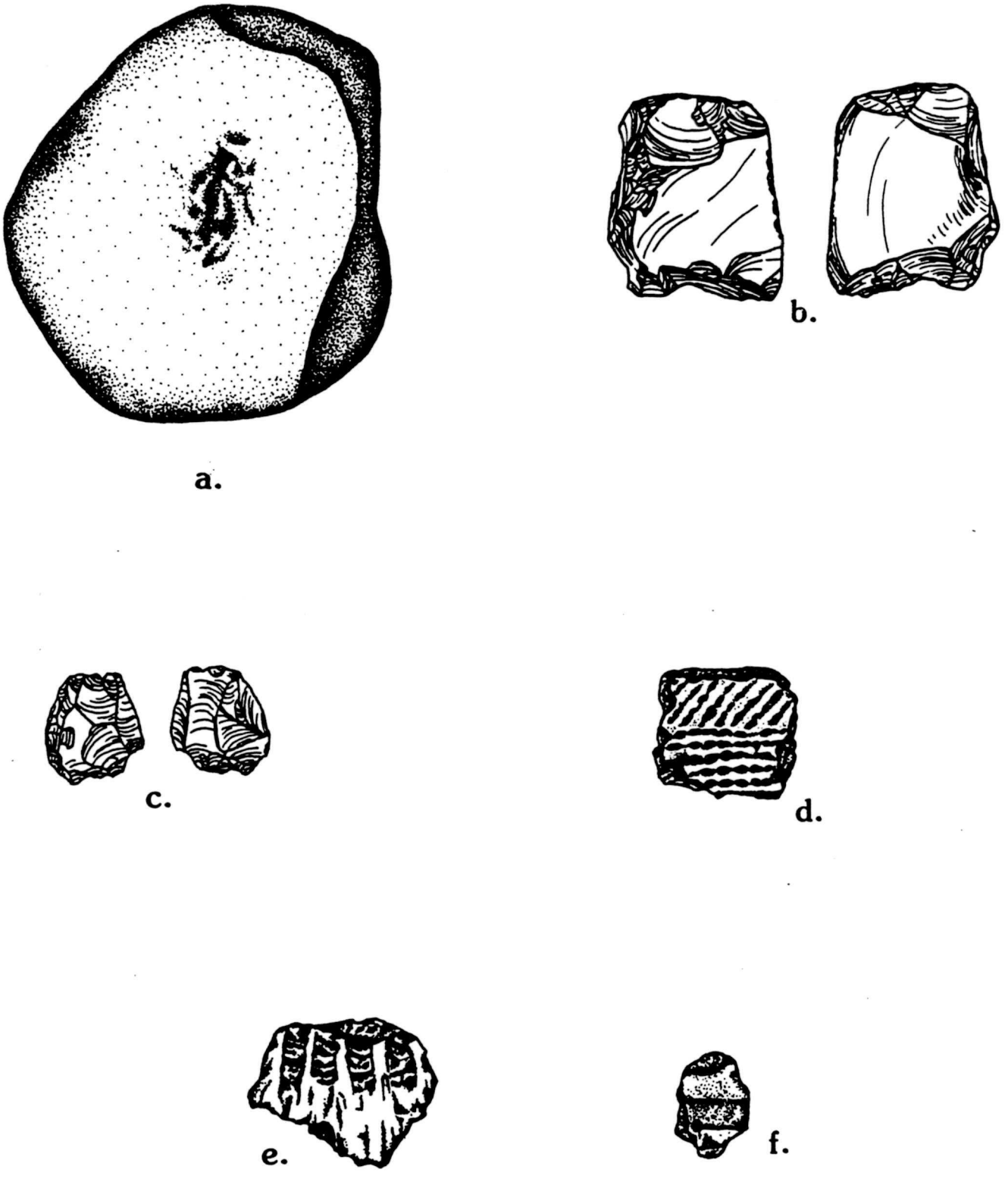
for interested colleagues. This report includes brief descriptons of some of the surface materials collected during these visits. The reports or site forms describing their initial discovery should be consulted for more complete informaiton.

Illustrated in this report stemmed points from the Gooseneck Lake II (Fig. 9e) and the Gooseneck Lake IV site (Fig. 9f). Additional material collected from the surface of the Gooseneck Lake IV site includes two opposed ridge bipolar cores (Fig. 9g) and 2 smooth grit tempered body sherds weighing 1.8 grams. These materials do not contradict previous interpretaton of this as a Middle (Initial) Woodland site (Franzen 1983).

Materials collected from other sites are not illustrated or formally discribed in this report. Included are a lage bipolar core and debitage from the Clear Lake site (09-20-02-03), chipped stone tools from Site 09-10-01-69 (the base of a large chert stemmed point, 2 biface fragments, and an end scraper), and a large grit tempered collared and castellated rim sherd decorated with diagonal cord impressions (Indian Point Site, 09-10-01-80, 20 DE 108).

Recommendations

Based on the test excavation conducted in 1985, the eligibility of some sites for the National Register of Historic Places can be determined. Because they contain information likely to help explore the culture history and settlement pattern research questions discussed in this report, we conclude that the Moss Lake I, Carr Creek, Star Salvage, and Thunder Lake II sites are eligible. It appears that the Indian River site is largely disturbed and the Namtuart Site lacks adequate amounts of cultural material to facilitate future research, but additional testing is desirable to confirm these impressions. The Swan Lake Site is not eligible for the National Register because of the absence of cultural material. In reviewing these results, one should keep in mind that relatively high potential sites were selected for test excavation, and consequently a higher frequency of significant sites may be included than is found within the sample of known prehistoric sites as a whole.

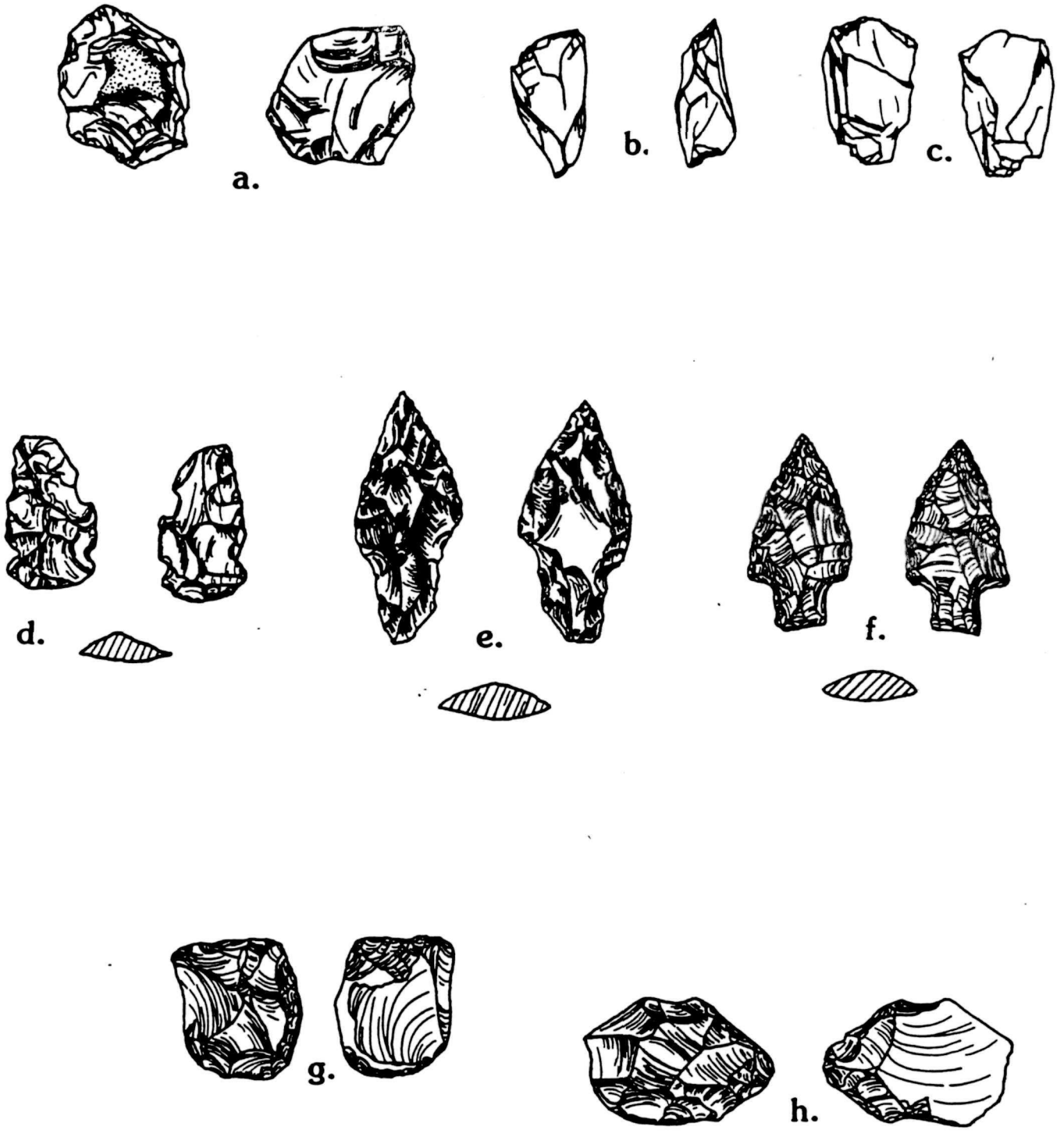


(Actual Size)

FIG.8. Artifacts from the Namtuart, Indian River, and Thunder Lake II Sites.

KEY - FIG. 8

	Site No.	Temporary Catalog No.	Description
a.	09-10-02-220	85-4	Hammerstone/Anvil - quartzite
b.	09-10-02-325	13-1	Bipolar Core - chert
c.	09-10-02-220	85-10	Bipolar Core - chert (lateral edge retouched to form scraper)
d.	09-10-02-365	37-2	Grit-tempered Rim Sherd (possible pseudo-scallop shell decoration)
e.	09-10-02-220	84-8	Grit-tempered Cord-marked body sherd with corded stamp decoration
f.	09-10-02-220	84-7	Shell tempered body sherd with linear trailed decoration



(Actual Size)

FIG. 9. Artifacts from the Carr Creek, Gooseneck Lake II, and Gooseneck Lake IV Sites.

KEY - FIG. 9

	Site No.	Temporary Catalog No.	Description
a.	09-10-02-15	4-1	Bipolar Core - chert
b.	09-10-02-15	6-2	Bipolar Core - quartz
c.	09-10-02-15	6-1	Bipolar Core - quartz
d.	09-10-02-15	3-1	Side-notched projectile point, chert
e.	09-10-02-34	1-1	Stemmed projectile point, chert
f.	09-10-02-36	2-2	Stemmed projectile point, chert
g.	09-10-02-36	2-1	Bipolar Core - chert (edge retouched as scraper)
h.	09-10-02-15	65-2	Bipolar Core - chert (bifacial and unifacial retouch)

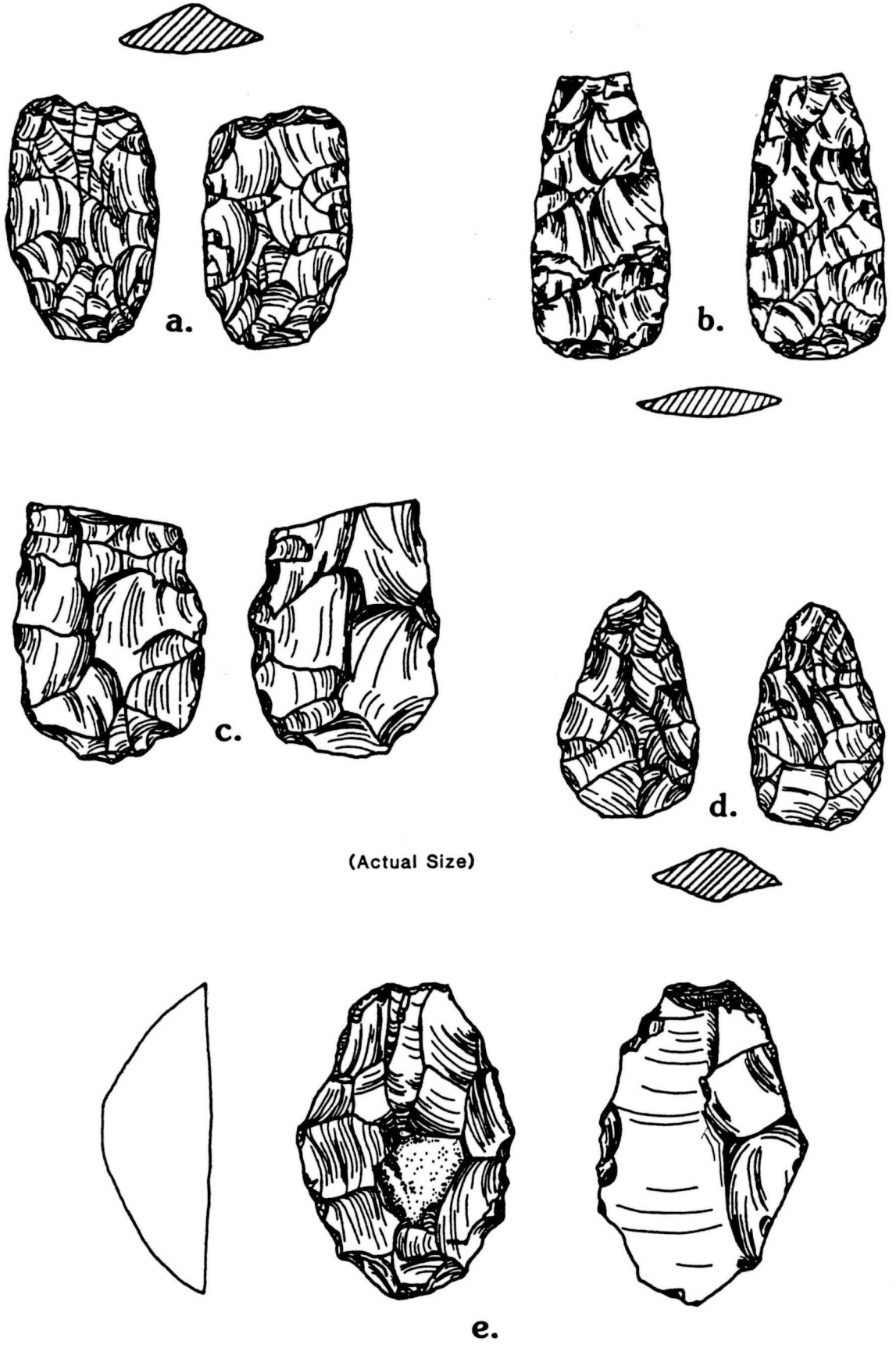
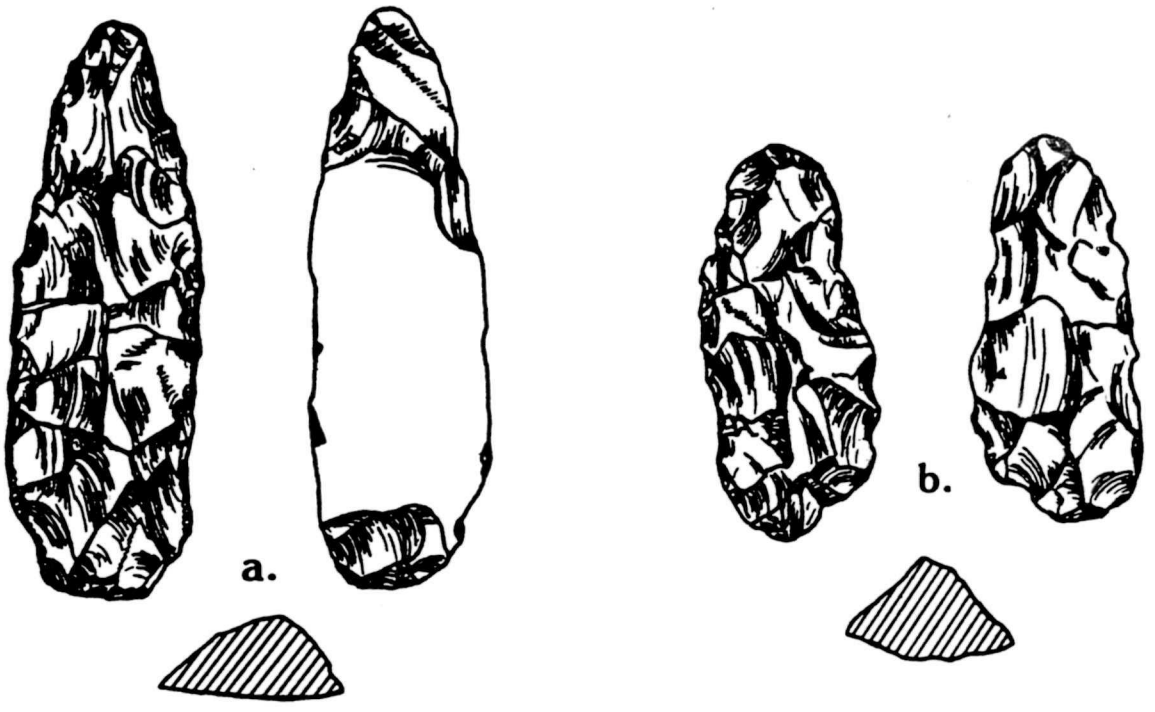


FIG. 10. Artifacts from the Star Salvage Site.

KEY - FIG. 10

	Site No.	Temporary Catalog No.	Description
a.	09-10-02-386	58-1	Biface, chert
b.	09-10-02-386	8-1	Biface, Tip missing, chert
c.	09-10-02-386	41-1	Biface, proximal portion, chert
d.	09-10-02-386	58-2	Biface, chert
e.	09-10-02-386	57-2	Plano-convex scraper or core, chert



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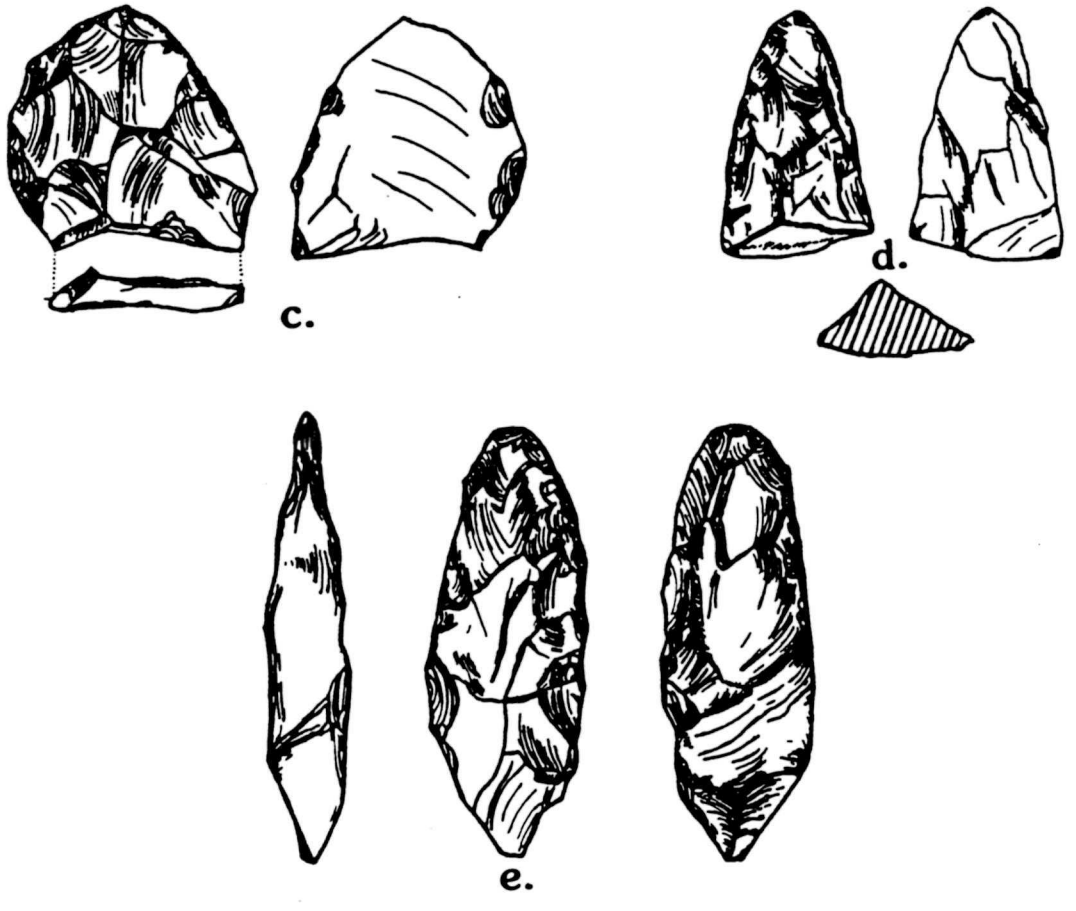


FIG. 11. Artifacts from the Star Salvage Site.

KEY - FIG. 11

	Site No.	Temporary Catalog No.	Description
a.	09-10-02-386	60-1	Biface, chert (2 fragments refit)
b.	09-10-02-386	60-2	Biface, chert
c.	09-10-02-386	9-2	Uniface Fragment, chert
d.	09-10-02-386	60-3	Biface Tip, chert
e.	09-10-02-386	9-1	Biface Fragment, chert

Chapter 3
CHIPPED STONE ANALYSIS

More detailed analysis of artifact assemblages from the sites tested in 1985 will focus on chipped stone, which vastly outnumbers all other artifact classes. Other classes, such as ceramics and ground stone are discussed under individual site descriptions. All tools, cores, and ceramics are listed in Appendix 1. Table 1 includes counts of all classes of cultural material recovered. The rarity of ceramics and diagnostic chipped stone tool types make the analysis of chipped stone debitage especially important. Many sites contain only debitage or debitage and a few non-diagnostic tools, such as retouched flakes. Research in the study area would benefit immensely if we could identify any cultural historical and/or functional implications of different chipped stone reduction technologies or raw material preferences.

The identification of chipped stone tools and cores is based on comparisons with similar materials from other sites in the region. These include Summer Island site (Brose 1970), Burnt Bluff (Fitting 1968), the Winter site (Richner 1973), and a series of lithic assemblages from the north shore of Lake Michigan (Binford and Quimby 1963). Bipolar cores are designated as such with an awareness that some may also have functioned as tools.

Retouched flakes are perhaps the most subjective tool type identified. Becuase of their casual nature, some are very difficult to identify. The term "retouched" includes both deliberate retouch and edge modification caused by utilization. Only the most obvious retouched flakes were designated and flakes briefly utilized are not likely to be identified. Especially difficult is the identification of retouch on quartz or quartzite flakes. The relatively soft chert used at the Star Salvage site also made identificaiton of retouched flakes difficult. It is likely that counts of utilized/retouched flakes are consequently low in many cases.

The system used to classify chipped stone debitage is similar to that used in previous surveys of the Hiawatha National Forest conducted by Commonwealth Associates Inc. (1981). Debitage was classified according to the following variables: raw material (chert, quartz, quartzite, other), flake type (flake or chunk-shatter), reduction stage (dorsal surface 100% cortex, dorsal surface partial cortex, no cortex, or cortex present on chunk-shatter), and size class (less than 3/8" or greater than or equal to 3/8" minimum dimension). A subjective consideration of raw material color was also made. Because of the large amount of debitage recovered from the Star Salvage site, not all flakes could be classified for all variables. Consequently, only flakes in the larger size class (>3/8") were classified according to flake type and reduction stage at this site.

Table 2 shows contrasting percentages of raw materials. Overall, chert is the dominant raw material, although quartz and quartzite together make up 48% of the Indian River site and 83% of the Moss Lake I site. In contrast, chert makes up 98% of the Star Salvage site. Although one might expect chert to decrease and other materials to increase as one moves away from the chert bearing bedrock in southeast portion of the west unit, the Moss Lake I site is an exception to this trend. Most nearby sites are dominated by chert (Franzen 1983; Buckmaster 1983) in this area where chert is now readily available, suggesting a cultural historical or functional

Table 1 Summary of Cultural Material

Test Units		Unmod. Debitage Cht No. Wt	Qtz No. Wt	Qte No. Wt	Fire Altered Rock	Unmod. Rock	Ceramics	Cores/ Frags.	Uni-facial Tools	Bi-facial Tools	Ground Stone
02-15	T.U.1,L.1										
02-15	T.U.1,L.2										
02-15	T.U.1,L.3										
02-15	T.U.2,L.1	6(.8g)						1			
02-15	T.U.2,L.2	21(4.g)	2(2.2g)		12(160.3g)	1(96.6g)	6		1		
02-15	T.U.2,L.3										
02-216	T.U.1,L.1		1(1.7g)					1			
02-216	T.U.1,L.2	5(1.8g)	8(3.3g)	44(49.4g)	39(131.9g)	1(72.7g)					
02-216	T.U.1,L.3	26(26.8g)	12(6.1g)	75(175g)	210(1576.1g)			1	2		
02-216	T.U.1,L.4	1(.4g)	2(.6g)	3(3.1g)	13(240.5g)			2			
02-216	T.U.1,L.5				5(1.6g)						
02-216	T.U.2,L.1										
02-216	T.U.2,L.2	2(3.6g)		23(28.3g)	48(241.3g)			1			
02-216	T.U.2,L.3			3(2.0g)	22(63.6g)						
02-216	T.U.2,L.4		1(.1(g)								
02-220	N84/W101,L1	13(10.5g)	2(.2g)		3(129.8g)						
02-220	N84/W101,L2	6(2.5g)			5(189.9g)	1(137.9g)					
02-220	N84/W101,L3		1(4.5g)								
02-220	N84/W104,L1	5(3.0g)			6(60.4g)		21		2		1
02-220	N84/W104,L2	2(.1g)				4(8.7g)	11				
02-220	N84/W104,L3										
02-220	N57/W101,L1	101(49.8g)	21(21.4g)		142(1191.1g)	9(597.1g)	46	6	3	2	1
02-220	N57/W101,L2	6(1.7g)			7(13.8g)	1(123.9g)					
02-220	N57/W101,F1										
02-220	N57/W101,F2										
02-220	N57/W101,F3										
02-325	T.U.1,L1	16(12.2g)							1		
02-325	T.U.1,L2			2(7.5g)							
02-325	T.U.2,L1	2(.2g)									
02-235	T.U.2,L2	6(2.6g)						1			
02-235	T.U.2,L3	11(26.g)			1(15.6g)				1		
02-235	T.U.2,L4	9(1.7g)									
02-235	T.U.2,L5										
02-365	T.U.1,L1										
02-365	T.U.1,L2										
02-365	T.U.2,L1	2(1.1g)	3(8.6g)		14(356.8g)				1		
02-365	T.U.2,L2	5(6.2g)	2(.6g)	7(20.5g)	12(207.3g)		2				
02-365	T.U.2,L3	4(3.1g)			2(163.9g)						
02-365	T.U.2,L4	1(1.5g)									
02-386	T.U.1,L1	70(62.8g)		1(2.3g)						1	
02-386	(S6/E0)L2	5(1.4g)									
02-386	(S6/E0)L3	1(.1(g)									
02-386	(S10/E5)L1	214(67.6g)		19(31.9g)	2(6.0g)				4	5	
02-386	(S10/E5)L2	1(.1(g)									
02-386	(S10/E5)L3										
02-386	(S11/W6)L1	12(3.9g)									
02-386	(S11/W6)L2	1(.1g)									
02-386	(S1/E4)L1	158(289g)		1(.1(g)	9(174.2g)				5	1	
02-386	(S1/E4)L2	44(71.1g)	1(.1(g)		3(2.2g)			2	2	1	

Table 1 Summary o Cultural Material (continued)

Test Units		Unmod. Debitage Cht No. Wt	Qtz No. Wt	Qte No. Wt	Fire Altered Rock	Unmod. Rock	Ceramics	Cores/ Frags.	Uni- facial Tools	Bi- facial Tools	Ground Stone
02-386	(S1E0)L1	1984(1040.7g)		1(.1(g)	14(172.1g)				23	2	
02-386	(S1E0)L2	3(2.7g)									
02-386	(N7/E3)L1	2281(1177.4g)	52(84.1g)	11(7.7g)	9(86.2g)				26	4	
02-386	(N7/E3)L2	4(.7g)									
Surface Collection and Shovel Tests											
02-15	Surf A	5(10.9g)						1	1		
02-15	Surf pp1									1	
02-15	Surf pp2							1	1		
02-15	Surf pp3							1			
02-15	Surf pp4							2			
02-34	Surface									1	
02-36	Surface						2	2		1	
02-386	Surf A									1	
02-386	Surf pp1									1	
02-386	Surf pp2								1	1	
02-386	Shov Test 1								3		
02-15	Shov Test 1	3(3.8g)									
02-15	Shov Test 2	2(1.4g)									
02-15	Shov Test 3	3(1.5g)									
02-15	Shov Test 4			2(8.6g)	2(12.4g)						
02-15	Shov Test 5	1(.2g)									
02-15	Surf Piece Plot							1			
02-386	N7E3-Surf	29(24.7g)		1(.5g)	2(20.8g)						
02-386	S13W5-Surf	2(29.2g)						1			
02-386	S1E3-Surf	5(2.4g)									
02-386	S1E2-Surf	36(26.9g)									
02-386	S1E1-Surf	31(12.0g)									
02-386	S1E5-Surf	2(15.2g)									
02-386	S1E0-Surf	157(127.1g)									
02-386	S1E4-Surf	34(32.5g)									
02-386	Shov Test 1	117(42.2g)									
02-386	Shov Test 2	2(1.8g)									
02-386	Shov Test 3	2(.8g)									
02-386	Shov Test 4	3(1.6g)									
02-386	Shov Test 5	1(.1(g)									
02-386	Shov Test 6	1(.6g)									
02-386	Shov Test 7	21(7.2g)									
02-386	Plots 2 Surface piece	8(18.3g)									
02-386	Shov Test 8 S15W5	17(6.3g)									
02-365	Shov Test 1	1(.8g)									
02-33									1		
02-220	N57W101,F1	1(.3g)	1(.9g)		3(54.1g)						
02-220	N57W101,F2										
02-220	N57W101,F3	1(.3g)									

Table 1 Summary of Cultural Mat rial (continued)

		Unmod. Debitage										
		Cht		Qtz		Qte		Fire Altered	Unmod.		Cores/	Uni-facial	Bi-facial	Ground
		No.	Wt	No.	Wt	No.	Wt	Rock	Rock	Ceramics	Frags.	Tools	Tools	Stone
02-220	N70W102 3M													
	Shov Test	2	(1.8g)											
02-220	N70W102 6M													
	Shov Test	1	(.1(g)											
02-220	N55W99													
	Shov Test	1	(.5g)											
02-220	N60W102 4ME													
	Shov Test	2	(.9g)											
02-216	Surface					1	(30.5g)							

Table 2 Chipped Stone Debitage Charac eristics

	Site Number					
	02-325	02-15	02-365	02-216	02-220	02-386
Raw Material:						
Chert						
(%)	100	88.1	52	16.6	84.8	98
Avg. Wt (grams)	1.0	.5	.9	.9	.8	.6
Quartz						
(%)		4.8	16	10.2	14	1.3
Avg. Wt (grams)		1.1	1.8	.4	1.1	1.6
Quartzite						
(%)		7.1	32	72.7	1.2	.7
Avg. Wt (grams)		4.3	2.9	1.9	1.1	1.3
Flake Type (%)						
Flakes	97.6	97.6	92	93.7	94.7	97.4*
Chunk/Shatter	2.4	2.4	8	6.3	5.3	2.6*
Reduction Stage (%)						
Dorsal-100% Cortex			4	5.9	1.8	4.3*
Dorsal-Partial Cortex	17.1	14.3	28	40	17	21.3*
No Cortex	82.9	83.3	64	49.3	78.9	73.1*
Cortex Present (chunk/shatter)		2.4	4	4.9	2.3	1.3*
Size Class (%)						
< 3/8 inch	46.3	30.9	32	21	39.8	55.8
> 3/8 inch	53.7	69.0	68	79	60.2	44.2

* Only applies to Size Class 2 (>3/8 inch)

explanation for quartzite preference. The dominance of a relatively homogenous chert type at the Star Salvage site along with other factors suggests the initial processing of chert obtained nearby. Chert also dominated the Thunder Lake sites, although its heterogeneity, lower density, and the presence of other materials suggest utilization of secondary deposits and less emphasis on the lithic reduction process.

The predominance of quartzite at some sites seems correlated with certain other debitage attributes. Moss Lake I and Indian River show some of the highest percentages of large flakes, chunk/shatter, and debitage with cortex. As might be expected, smaller assemblages such as Carr Creek and Namtuart seem to reflect a more narrow range of the reduction process. Star Salvage stands out as a site where both early and late stages of lithic reduction took place. Comparison is limited because only the larger size class debitage was examined for all variables. However, the large number of small flakes seems to reflect the intensive biface manufacture at this site, both in absolute terms and relative to other tools.

The chipped stone technology at the Star Salvage site is characterized by the total lack of bipolar cores. Considering the abundance of bipolar cores at other sites, this is an important distinction. Two block core fragments weighing 26.3 and 26.4 grams were recovered, as well as a 27.8 gram oval scraper-like artifact which may represent a plano-convex core (Fig. 10e).

Bipolar cores are abundant at Thunder Lake (6) and Carr Creek (5), and present at Namtuart and Moss Lake I (2). The presence at Moss Lake I of 2 small chert bipolar cores is an interesting contrast to the large quartzite cores and core fragments also found there. This suggests at least some of the associated tehcnological contrasts relate to function or raw materials rather than culture history.

The small bipolar cores so common at some Woodland sites are also absent or scarce at several large sites on the West Unit of the Hiawatha National Forest. These sites are located in the vicinity of extinct Algoma stage beach ridges and often in areas dominated by wetland forests. Site 09-10-01-68 yielded 7 core fragments (Fig. 1). Only one of these was bipolar, the rest being "extremely blocky and probably resulting from freehand percussion" (Commonwealth Associates 1981: 104).

The large number of core fragments recovered during shovel testing and surface collection at the enormous Site 09-10-01-69 (20DE93), which covers approximately 36,000 square meters, are described as "both bipolar and freehand" (Commonwealth Associates, Inc. 1981: 106). However, this large assemblage (over 500 items) includes no complete specimens that fit the classic bipolar core definitions of Binford and Quimby (1963) or McPherron (1967). Although tools are relatively infrequent at this site, several biface fragments, including the base of a large stemmed point, have been recovered in subsequent visits. Along the same beach ridge (Fig. 1) Site 09-10-01-292 (20 DE167), another relatively high density lithic site, yielded 2 chert cores weighing 84 and 148.5 grams, which are much larger than the typical "bipolar" core, and core fragments weighing 2.7 and 7.4 grams (Gilbert/Commonwealth Inc. 1985: Appendix A-2).

Although the excavated sites in the region have yielded both bipolar and block cores within Middle Woodland and Upper Mississippian components (Brose 1970; Richner 1973), bipolar material dominates the Middle Woodland component at the Winter site and Summer Island. However, Brose (1970) notes a sizeable number of block cores for the Summer Island Middle Woodland component and a predominance of pebble and block cores in the Upper Mississippian and Protohistoric compenents. This should be viewed with caution, since the average weights of pebble and block cores from these two late components are actually much less than that of the bipolar cores. This suggests that these core types may have been defined differently at this site, since other researchers in the region have uniformly found block cores to be larger than bipolar (McPherron 1967:131; Richner 1973:28; Janzen 1968:60).

The presence of both bipolar and block or pebble core reduction within Middle and Late Woodland assemblages is common, and consequently lithic reduction techniques should be viewed with caution as a chronological indicator. However, there does appear to be significant variation in chipped stone reduction strategies that we should continue to explore. Although bipolar and block core techniques are not exclusive to single cultural periods, relative proportions of core types may vary greatly. At this point, large aceramic sites with high densities of debitage and predominately non-bipolar technology have occurred in association with extinct post-glacial shorelines (01-68, 01-69, 01-292, 20AR189) or in interior areas away from water freatures. As a working hypothesis, it is proposed that at least some of these sites represent Archaic occupations predating or contemporary with the recession of the Algoma Stage of the Great Lakes (Circa 3200-2000 B.P.). Of the four tested sites containing bipolar cores, two relate to the Woodland tradition. Although the bipolar technique could certainly have been used prior to Woodland times, and a freehand block or pebble technique was certainly known to Woodland knappers, the bipolar technique dominates at known Woodland sites in the study area. The reasons for this remain unclear, but the function of the small bipolar core type defined by Binford and Quimby (1963) should be a focus for future studies. Battering as well as deliberate retouch on some of the bipolar cores recovered during this project reinforces speculation that they often served as tools.

In summary, the lithic assemblages recovered during the 1985 test excavations fall into four broad categories: a low density, low diversity bipolar assemblage (Namtuart); assemblages with a large proportion of bipolar cores with other stone tools (including bifaces) present (Carr Creek, Thunder Lake II); high frequency quartzite assemblages which lack bifaces (Moss Lake I, Indian River); and a high density, non-bipolar chert assemblage with bifaces present (Star Salvage). Although the possibility of sampling error should certainly be considered in evaluating these characterizations, some attributes are relatively clear cut and unlikely to change with additional work.

Chapter 4
SETTLEMENT PATTERN AND LOCATIONAL ANALYSIS

The research question currently most relevant to the sites tested centers around settlement patterns and the use of interior areas away from Great Lakes Shores. Although probably an oversimplification, previous researchers proposed that interior areas, at least during late prehistoric times, were utilized by small bands for hunting during the winter (Fitting and Cleland 1969). Although many sites have been found in inland areas, little progress has been made in identifying their season of occupation. A key part of this research is the identification of the chronological placement of sites so complementary elements of the same settlement system can be identified. Cultural historical questions also merit consideration in their own right. For example, the initial occurrence of Archaic peoples in the region is poorly documented, as is the transition from the Archaic to the Woodland traditions. Diagnostic artifacts such as ceramics can also help us understand the relative influence of surrounding cultures on groups within the study area.

The 1985 test excavations revealed that two of the sites contained aboriginal ceramics that were not represented in initial investigations. This permitted the Indian River site and the Carr Creek site to be placed in a Woodland tradition context. Cultural features containing bone at the Thunder Lake site provided information on the subsistence base of this site, and a sample of ceramics confirmed a Late Woodland/Upper Mississippian affiliation. The large sample from the Star Salvage site revealed a site of intensive biface production and a non-bipolar reduction strategy, providing a dramatic contrast to known Woodland sites in the area, although no temporal diagnostics were recovered.

Although the testing provided some definite chronological information, no direct evidence on season of occupation was evident. Even the one site with faunal preservation lacked unequivocal evidence of seasonality. Because of the nature of soils in the study area, it is likely that sites with bone preservation will continue to be rare. It appears that in many cases settlement pattern analysis will have to proceed based on indirect evidence, such as catchment analysis, as well as artifact types.

By considering information on both site content and setting, the sites tested can be evaluated relative to the ethnohistoric "Chippewa Pattern" settlement type (Fitting and Cleland 1969) which emphasizes winter use of interior areas and summer use of Great Lakes shores. However, recent research has noted that warm season use of inland areas may also have occured, based on catchment analysis of sites in the Northern Lower Peninsula (Holman 1978) and detailed consideration of ethnohistoric, ethnographic, and environmental information relevant to the study area (Franzen 1986). Table 3 summarizes the characteristics of the four ecological zones (Land Class Groups) utilized for this study.

Based on the author's (Franzen 1986) review of relevant literature, some test implications of seasonality based on indirect evidence can be offered. At least 3 possible winter strategies were identified: deer hunting in areas dominated by swamp conifers (land class groups 3 and 4), beaver hunting along water features, and moose hunting, especially in recently

Table 3. Characteristics of Land Class Groupings

1. Northern Hardwood Forest

LTAs			
1a	Northern Hardwood-Hilly	Dominant Landforms:	Moraines covered by Glacial Outwash, Moraines over limestone bedrock - high relief, Moraines over sandstone bedrock
1b	Hardwood-Undulating		
1c	Northern Hardwood-Level		
4a	Mixed-Steep		
4b	Mixed-Undulating		
		Dominant Climax Timber Species:	sugar maple, beech, hemlock, red maple, balsam fir, white spruce

2. Pine-Oak Forest

LTAs			
2a	Pine-Hilly	Dominant Landforms:	Outwash sands
2b	Pine-Level	Dominant Climax Timber Species:	jack pine, red pine, red oak, red maple, white pine, hemlock, balsam fir, white spruce

3. Wetland Forest

LTAs			
3a	Clay flats	Dominant Landforms:	Lacustrine Deposits (fine textured), Moraines over limestone bedrock - low relief, organic deposits
3b	Drainways		
5	Lowland sandy loams		
6	Muck		
10	Bogs		
		Dominant Climax Timber Species:	white cedar, hemlock, black spruce, balsam fir, red maple, black ash

4. Wetland Forest/Dune and Ridge Complex

LTAs			
7	Muck with sand ridges	Dominant Landforms:	Wind deposited lacustrine sands and organic deposits
8	Muck with dunes		
		Dominant Climax timber:	uplands same as 2 lowlands same as 3

burned areas. The aspen preferred by beaver as well as the browse preferred by moose would be most abundant in the habitats most frequently disturbed by fire and other processes. The major land class groups which occur on the forest can be ranked according to the expected frequency of early successional habitats: (See Franzen 1986)

1. Wetland Forest
2. Wetland/Dune-Ridge Complex
3. Pine-Oak
4. Northern Hardwood

However, the use of wetland areas without dunes and ridges would be limited because of the difficulty in overland travel and in finding dry, level campsites. Beaver would be associated with water features during the winter, while deer would not. Since moose and beaver could utilize similar habitats a winter locational strategy might focus on both species.

Although bifaces could be expected to be abundant at some winter sites, they could be relatively infrequent in comparison to other tool types because of their curation, especially later in the winter. Bifaces could also be absent from winter sites where butchering and processing were important. Because many activities could also occur during the summer, it seems unwise to focus on tool types as seasonal indicators. Even at sites subjected to substantial amounts of excavation, researchers have lacked confidence in making functional inferences based on relative frequencies of different artifact classes (Holman 1978: 115).

Site catchment analysis was selected as an indirect method for assessing the seasonality of the sites tested and this approach has been utilized by other researchers in the Upper Great Lakes (Martin 1977; Buckmaster 1979; Holman 1978). These authors include discussion of the advantages and disadvantages of this approach, as well as related theoretical implications. At best, such a technique only approximates the actual exploitation area of a given site, but it does provide a standardized quantitative method for comparing the setting of different sites. Circular three mile radius catchments were utilized for this study, as were used in previous studies in the Eastern Upper Peninsula (Martin 1977) and the Menominee Watershed (Buckmaster 1979).

Using 1/2" = 1 mile scale maps and a electronic planimeter, the percentages of four different land class groupings within each catchment were calculated. These four zones include: Wetland Forest, Wetland Forest/Dune-Ridge Complex, Pine-Oak Forest, and Northern Hardwood Forest. Additional sites not tested 1985 are included in this analysis. All are located at least 1 1/2 miles from modern Great Lakes shorelines. Most lack any indicators of their chronological placement. Some characteristics of the sites used in this analysis are listed in Appendix 3.

The expectations for this analysis, based on the ethnohistoric "Chippewa Pattern" model and detailed resource analysis (Franzen 1986) are as follows:

1. If sites located away from water features relate to winter deer hunting, they will exhibit high percentages of Wetland Forest and Wetland Forest/Dune-Ridge complex.

2. Sites on inland lakes, if utilized primarily for winter hunting, will exhibit high percentages of Land Class Groupings most subject to disturbance (2, 3, and 4). However, this expectation is complicated by the fact that the same expectation might be true for summer hunting sites.

Another expectation with potential for clarifying the seasonality of sites on inland lakes would be that winter sites on inland lakes would not be located on segments of shoreline exposed to the prevailing winter winds, which are from the west or north (Michigan Department of Agriculture 1966, 1974). A final expectation would be that sites on rivers and streams would represent a variety of activities including spring fishing camps, short term campsites utilized while traveling, and winter camps relating to the hunting of deer, moose, and beaver. Consequently, sites on rivers and streams would exhibit highly variable catchments. For example, sites related to spring sturgeon fishing or short term campsites could be located with relatively little concern for the surrounding terrestrial habitats. It should be pointed out that this analysis is a preliminary exploration of our data. Detailed locational analysis is not within the scope of this project and must await the availability of additional resources.

Catchment analysis of sites not located on water features, which includes the Star Salvage site, confirms they are well situated for winter hunting, especially for deer (Table 4). Other than the Star Salvage site, sites included in this analysis are all very small, consisting of no more than three fragments of chipped stone. Because their mobility is restricted by deep snow, deer are forced into swamp conifer habitats, even though browse may be available in other areas (Tefler 1970). Wetland forests with dunes or ridges are ideal for cold-season deer hunting because they permit easy movement and provide well drained habitation sites. During the warmer months, these swamp areas offer no major aggregated resources, and in fact are quite inhospitable due to insects.

The expectation that sites located along inland lakes will have high percentages of habitats frequently disturbed and consequently favorable for deer, moose, and beaver, appears to be supported by catchment analysis (Table 5). The 33 sites for which catchments were calculated include the Thunder Lake II site. The most significant aspect of this analysis may be the dominance of Pine-Oak forest in comparison to Northern Hardwoods. The ecological literature suggests that Pine-Oak Land Class should contain more of the early successional habitats preferred by herbivores (Franzen 1986).

In considering the results of catchment analysis of sites located along inland lakes, it should be mentioned that the surface geology where most inland lakes occur results in relatively small amounts of swamp conifer habitats (Land Class Groups 3 and 4). These are the relatively well drained moraines and outwash deposits which are dominated by Northern Hardwood and

Table 4 Percent of area in different Land Class Groups within 3 mile radius of sites not located adjacent to water features

Site No.	Outside Forest Not Classified	Open Water	Northern Hardwood	Pine/Oak	Wetland Forest	Wetland Forest/ Dune-Ridge Complex
01-284			2.2	0	13	84.8
02-303	13.4		0	17.4	22.1	47.1
02-352		2.7	15.4	1.1	30	40.8
02-353		1.6	20.6	.4	28.2	49.1
02-386		2.7	14.6	44.2	3.9	34.4
Mean		1.4	10.56	12.62	19.44	51.24
Standard Deviation		1.3	8.97	19.11	10.93	19.63

Table 5 Percent of Area in different Land Class Groups within 3 mile radius of sites located on Inland Lakes

Site No.	Outside Mapped Area	Open Water	Northern Hardwood	Pine/Oak	Wetland Forest	Wetland Forest/ Dune-Ridge Complex
02-03	3.9	3.7	38.4	19.6	19.9	14.6
02-10		2.9	21.9	56	3.5	15.7
02-11		2.9	21.9	56	3.5	15.7
02-33		3.1	27.9	55.6	4.5	9
02-34		3.1	27.9	55.6	4.5	9
02-35		3.1	27.9	55.6	4.5	9
02-36		3.1	27.9	55.6	4.5	9
02-37		3.8	16.2	69.5	1.4	8.8
02-38		2.6	26.3	45.9	10.3	14.9
02-39		3.3	9.3	57.6	2.2	27.6
02-40		3.8	33.9	36.9	15.9	9.5
02-41		4.5	47.5	46.2	.9	.9
02-42		3.3	36	50.8	8.9	.9
02-43		2.5	22	57.7	1.7	16.1
02-44		2.5	53.1	12	22.3	10.1
02-45		2.5	58.1	10.6	21.7	7.1
02-56		2	34.8	32	17.2	14.9
02-183		.9	15	81.5	2.6	0
02-185		2.5	33	25.4	17	22.2
02-189		1.8	34.4	60.5	2.4	.8
02-219		5.2	25.3	61	1.4	6.8
02-220		5.1	24.8	62.4	1.3	6.4
02-221		5.1	24.8	62.4	1.3	6.4
02-207		5.3	38.2	55.1	.9	.7
02-212		8.3	39	51.3	1.4	0
02-349		3.3	25.6	57.7	2	11.4
03-269		3.7	59.3	29.6	6.6	.8
03-270		3.3	58	13.1	1.6	24
03-300		5.4	43.4	30.4	0	20.7
03-648		6.6	44.2	32.3	.3	16.6
03-665		1.4	46.2	41.8	3.2	7.3
03-666		4.2	44.7	40.7	1.7	8.7
03-668		4.7	53.5	33.1	.3	8.5
Mean		3.6	34.6	45.8	5.8	10.1
Standard Deviation		1.5	13.1	17.4	6.8	7.2

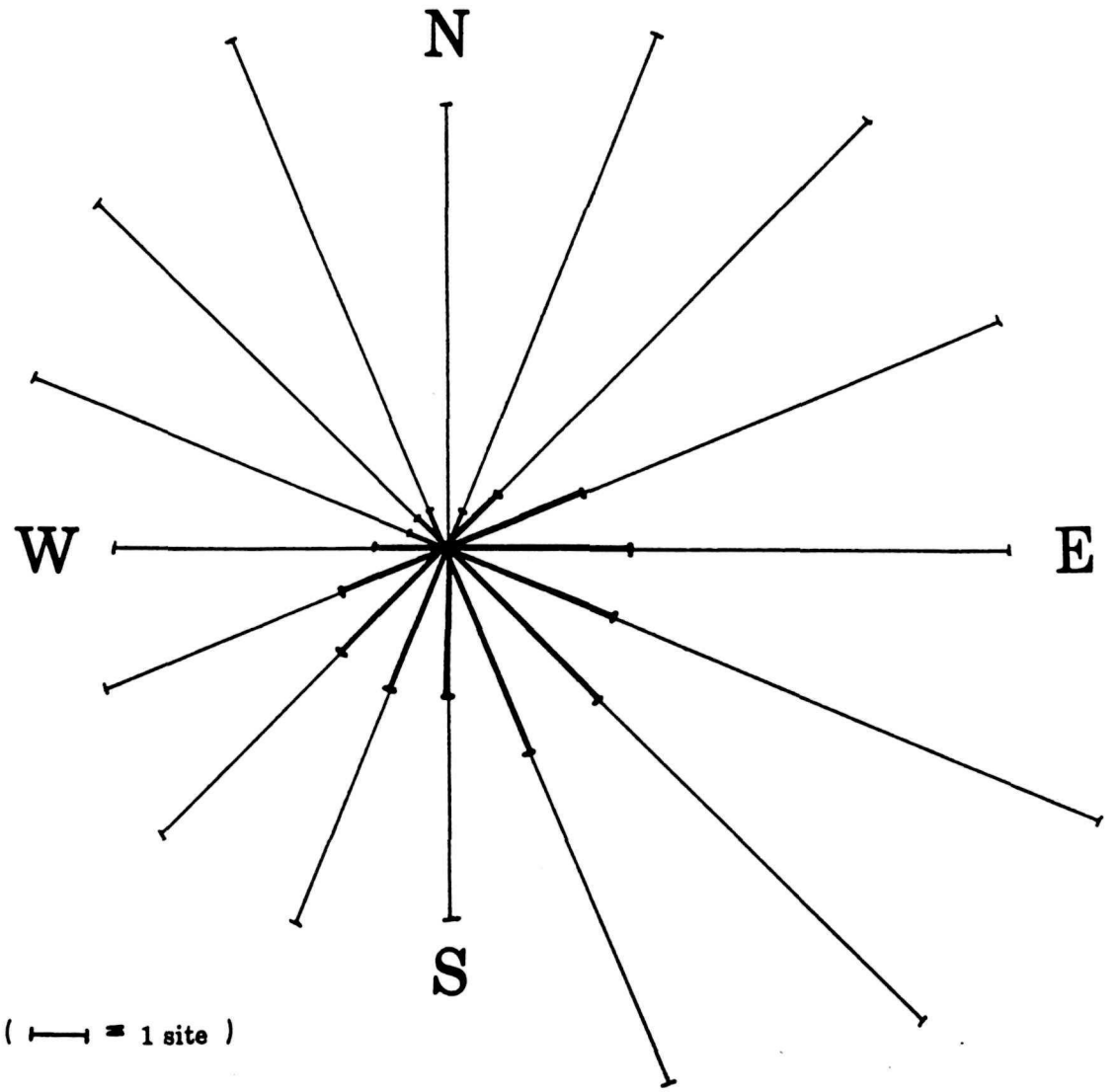
Pine-Oak forests (Land Class Groups 1 and 2). In other words, the association of inland lake sites with high percentages of Northern Hardwood and Pine-Oak areas could be a spurious association, when in fact the lake environment alone is conditioning site location. However, the fishing is very poor in most of these lakes compared with rivers and streams where seasonal spawning concentrations are more easily harvested. The hunting potential for beaver and moose (all seasons) and perhaps deer (warm season) is a likely reason for at least some of these occupations, and catchments dominated by the more frequently disturbed Pine-Oak forests are to be expected.

To some extent, this analysis is limited by a lack of information on the relative extent of each land class group in the lake area as a whole and a lack of consideration of the kinds of areas where sites have not been found. We have not calculated the relative frequency of each land class group around inland lakes or determined whether they have had survey coverage proportional to their occurrence. However, site catchments can still be compared to the proportions of land class groups in the entire West Unit of the Forest: Northern Hardwood 42.9%; Pine-Oak 14.9%; Wetlands 25.9%; and Wetlands with dunes or ridges 16.2% (Fig. 13).

Unfortunately, the catchment analysis of sites along inland lakes does not indicate their season of use. They appear to have potential for both warm and cold season occupations. Calculations of the directions in which they are exposed to wind was also attempted to help determine when they were occupied. With all 33 sites considered, no clear tendency was observed (Figure 12). However, when only the larger sites were considered (8 sites which had more than 20 artifacts), sites tended to be located on shores protected from the prevailing winter winds. If prevailing summer winds are also from the west, as is the case for Marquette, Seney, and Sault Ste. Marie, then the scarcity of larger sites on the south and east shores could be an indicator of winter use. However, if the south winds which dominate Escanaba extend inland to the lakes in question, which all are at least 10 miles from Lake Michigan, the locations on north shores could also be favored during summer occupations because the wind offers relief from insects. At this time, it appears most likely that these areas are far enough inland to be dominated by west winds the year round.

As expected, the catchments of sites located on rivers and streams exhibit a high degree of variation (Table 6). In terms of prehistoric settlement patterns, the meaning of this is unclear. To some extent, this variation could be unrelated to specific terrestrial habitat preferences. Rivers and streams crosscut a variety of landforms and sites occupied for fishing or during travels could be expected to vary accordingly. There are a number of sites that do have very high percentages of swamp conifer habitats and some of these may relate to winter hunting. A number of sites on rivers and streams are also associated with extinct Great Lakes shorelines, and may have had much different catchments at the time they were occupied.

The eight sites containing artifacts diagnostic of either the Initial or Late Woodland period exhibit a great deal of variation in their catchments (Sites 01-72, 02-15, 02-36, 02-220, 02-221, 02-365, 02-366, and 03-667). Four of these sites (01-72, 02-365, 02-366, and 03-667) are located along segments of major rivers where it is likely that sturgeon were available in the spring. Sturgeon utilization at the Ten Mile Rapids site is documented by faunal remains. These sites with high potential for fishing include two



NOTE: Darker lines represent the number of sites with more than 20 artifacts.

Fig.12. Relative frequency of sites on inland lakes exposed to the wind from each of 16 different directions (22.5 intervals).

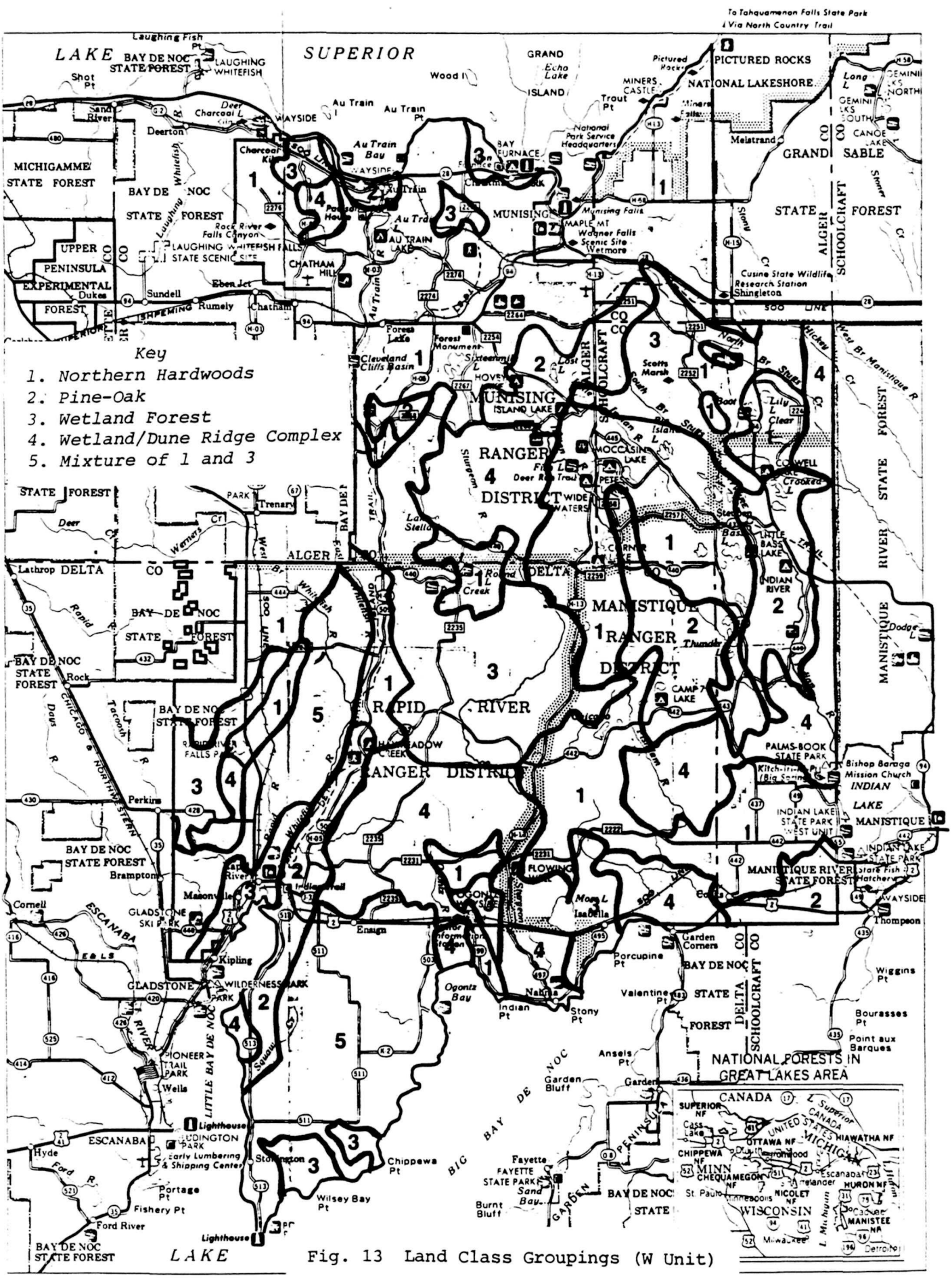


Fig. 13 Land Class Groupings (W Unit)

1977

Table 6 Percent of area in different Land Class Groups within 3 mile radius of sites located on Rivers and Streams

Site No.	Outside Area	Open Water	Northern Hardwood	Pine/Oak	Wetland Forest	Wetland Forest Dune-Ridge Complex
01-66*		29.2	8.7	2.7	33.7	25.8
01-68*	33.8	1.3	7.5	4.6	29.5	23.2
01-69*		29.2	8.7	2.7	33.7	25.8
01-70*		29.2	8.7	2.7	33.7	25.8
01-72		0	4.2	4.8	54.3	36.5
02-15		3.8	25	68.2	3	0
02-186		.2	78.1	0	19.5	2
02-190	22.3	2.2	14.8	28	9.6	23.1
02-192		5.7	60.7	24	9.6	0
02-210		7.8	52.1	37.2	2.2	.7
02-216*		6.1	5.7	2.5	50.8	35
02-217*		6.1	5.7	2.5	50.8	35
02-218*		6.1	5.7	2.5	50.8	35
02-306	32.8	3.7	0	7.5	19.1	36.8
02-325		6.4	7.5	0	49	37.1
02-330		0	46.7	0	6.5	46.8
02-331*		6.4	8.8	2.6	47.6	34.6
02-332		7.1	54.1	37	1.8	.1
02-333		15.3	42	39.6	2.3	.8
02-351		0	24.9	.2	17.9	57
02-361		6	38.9	47.2	5.8	2
02-364		4.1	16.8	54.7	3.6	20.9
02-365		6.4	21.6	54.6	3.6	13.9
02-366		0	25.4	0	21.7	53
03-28	40.8	0	50.5	1	7.7	0
03-29	40.8	0	50.5	1	7.7	0
03-271		5.2	58.1	27.9	.7	8
03-296		1.6	50.7	38.6	2	1.2
03-667		4.7	53.3	35.1	.4	6.5
03-669		7.3	52.3	31.9	.3	8.2
Mean		6.7	30.6	20.8	20.2	20.5
Standard Deviation		8.3	22.5	21.9	20.35	18.4

* Located on Algoma or Nipissing Beach Ridge

with catchments dominated by swamp conifers (01-72 and 02-366) and two where pine-oak and northern hardwoods are most abundant. Although some fishing was certainly possible at the three remaining Woodland sites located on large inland lakes, it is unlikely that this could rival the spring strugeon run available from the rivers. These sites and the Carr Creek site all exhibit very high percentages of the pine-oak land class group thought to be favorable for herbivores, such as moose and beaver. Beaver utilization is documented by faunal remains from both the Ten Mile Rapids and the Thunder Lake II site. Woodland utilization of interior areas is obviously not tied to a single resource. Evidence from the study area indicates that Woodland sturgeon fishing extended into non-coastal settings and herbivores were also obtained from inland areas. Future researchers should continue to consider both the warm and cold seasons as possibilities for this inland hunting.

Unfortunately, the only unequivocal catchment pattern indicating seasonality is the correlation between undated sites away from water features and swamp conifer habitats. Rather than offer additional speculations, it is suggested that future research is necessary to clarify the implications of the catchment variation described in this report. The division of the known interior sites into these 3 groups for comparison is intended as an exploratory device. Other divisions and comparisons with other variables, in conjunction with the generation of additional hypotheses, may permit more refined testing of the "Chippewa Pattern" settlement system in the future. As samples of datable sites increase, settlement pattern studies can focus on sites from the same cultural period, with an associated increase in clarity and reliability.

The somewhat ambiguous results of this analysis parallel those of other projects that have focused on subsistence and settlement pattern reconstruction in adjacent areas. In a study of Late Woodland sites in the northern Lower Peninsula of Michigan, Holman (1978) found that winter resource potential, as revealed by catchment analysis was high for sites located in interior areas, but that warm season resource potential was also high. Although it is suggested that Late Woodland peoples most likely moved to coastal areas during the summer, warm season occupation of interior areas is not completely ruled out (Holman 1978:154). Using faunal remains from a number of sites in the Menominee watershed, Buckmaster (1979) also found it difficult to make unequivocal identifications of winter sites, although she believes they are present:

> Because species which are available from November to March are also available throughout the entire year it was difficult to identify sites which were occupied during the winter months. The absence of species readily available during the spring and summer months, in the frequently limited to scanty faunal and floral remains at many sites, was not considered enough evidence to identify these sites as winter occupations (Buckmaster 1979:103-104)

To this I would add that very small amounts of floral or faunal remains available during the warm season, such as several plant seeds or fragments of turtle shell, are also not adequate to rule out winter use (See Appendix 2). The strongest evidence for winter occupation of interior areas consists of sites located along ridges within swamp conifer habitats. The occurrence

of the largest sites on inland lakes along shorelines not exposed to winter winds is also suggestive. It seems likely that winter sites are present in the samples but positive identification will require continued refinements in analysis methodology that focus on locational analysis and non-perishable material culture.

Obviously, these are extreme contrasts in the content and setting of prehistoric sites in the study area. Test excavations conducted in 1985 and locational analysis have expanded our knowledge of this variability and suggested some settlement pattern possibilities. However, much remains to be learned about the chronological and functional implications of this variation. This is especially difficult because of the scarcity of acknowledged culture history indicators such as projectile points or decorated ceramics. Alternative indicators should be considered because of the liklihood that certain specialized site types may lack the temporal diagnostics found at larger, more permanent Woodland sites on Great Lakes shores. Some settlement pattern research may have to proceed in a flexible manner that in some way addresses sites which can only be classified as "prehistoric" or "Woodland", rather than more specific classifications. The most immediate need is for more test excavation at prehistoric sites. Even if temporal diagnostics continue to be scarce, better samples may permit refined classifications of sites on the basis of tool types or chipped stone technology. By continuing to explore the research potential of this large sample of newly discovered non-coastal sites, we facilitate effective management and the resulting public benefit. In an area known for extreme seasonal contrasts, archaeological exploration of how prehistoric people coped with this variation has great potential for both research and public interpretation.

REFERENCES

Berquist, Stanard G.
1936 The Pleistocene History of the Tahquamenon and Manistique Drainage Region of the Northern Peninsula of Michigan. Michigan Geological Survey Occasional Papers on the Geology of Michigan, No. 40 Lansing, Michigan.

Binford, Lewis R. and George I. Quimby
1963 Indian Sites and Chipped Stone Materials in the Northern Lake Michigan Area. Fieldiana: Anthropology 36(12):277-307.

Brose, David S.
1970 The Archeology of Summer Island: Changing Settlement Systems in Northern Lake Michigan. Anthropological Papers No. 41, Museum of Anthropology, University of Michigan, Ann Arbor.

Buckmaster, Marla M.
1979 Woodland and Oneota Settlement and Subsistence Systems in the Menominee River Watershed. Unpublished Ph.D. Dissertation, Department of Anthropology, Michigan State University, East Lansing, Michigan

Buckmaster, Marla M.
1983 A Phase II Archaeological Evaluation of the Sturgeon River site (20DE75), Delta County, Michigan. Northern Michigan University Archaeological Laboratory, Archaeological Report. Marquette, Michigan.

Cleland, Charles E. and G. Richard Peske
1968 The Spider Cave Site. In The Prehistory of the Burnt Bluff Area, edited by James E. Fitting, pp. 20-60, Anthropological Papers, Museum of Anthropology, University of Michigan, No. 34, Ann Arbor.

Commonwealth Associates Inc.
1979 A Cultural Resource Survey of the Hiawatha National Forest, Alger, Chippewa, Delta, Mackinac and Schoolcraft Counties, Michigan. Report submitted to U.S.D.A. Forest Service. Commonwealth Associates Inc. Report No. 1999, Jackson, Michigan.

1981 A Cultural Resource Survey of the Hiawatha National Forest, Alger, Chippewa, Delta, Mackinac and Schoolcraft Counties, Michigan. Report submitted to U.S.D.A. Forest Service. Commonwealth Associates Inc. Report No 2247, Jackson, Michigan.

1982 A Cultural Resource Survey of the Hiawatha National Forest, Alger, Chippewa, Delta, Mackinac, and Schoolcraft Counties, Michigan. Report submitted to U.S.D.A. Forest Service. Commonwealth Associates Inc. Report No. 2409, Jackson, Michigan.

1984 1983 Cultural Resources Survey of the Hiawatha National Forest. Report submitted to U.S.D.A. Forest Service. Commonwealth Associates Inc. Report No. 2589, Jackson, Michigan.

Dorothy, Lawerence G.
1980 The Ceramics of the Sand Point Site (20BG14), Baraga County, Michigan: A Preliminary Description. Michigan Archaeologist 26(3-4):39-86.

Fitting, James E. (editor)
1968 The Prehistory of the Burnt Bluff Area. Anthropological Papers, Museum of Anthropology, University of Michigan, No. 34. Ann Arbor.

Fitting, James E. and Charles E. Cleland
1969 Late Prehstoric Settlement Patterns in the Upper Great Lakes. Ethnohistory 16:289-302.

Flenniken, J. Jeffrey
1981 Replicative Systems Analysis: A Model Applied to the Vein Quartz Artifacts from the Hoko River Site. Laboratory of Anthropology, Washington State University, Reports of Investigations No. 59, Pullman, Washington.

Franzen, John
1983 1982 Cultural Rsource Survey and Test Excavation. Hiawatha National Forest Cultural Resource Management Report No. 2. U.S.D.A. Forest Service, Hiawatha National Forest Supervisor's Office, Escanaba, Michigan.

1986 Prehistoric Settlement on the Hiawatha National Forest, Michigan: A Preliminary Locational Model. Cultural Resource Management Report No. 4, Hiawatha National Forest. Escanaba, Michigan.

Gilbert/Commonwealth Inc.
1985 1984 Cultural Resource Survey and Test Excavations, Hiawatha National Forest. Report submitted to U.S.D.A. Forest Service. Gilbert/Commonwealth Inc. Report No. 2700, Jackson, Michigan.

1986 1985 Cultural Resource Survey and Test Excavations, Hiawatha National Forest. Report submitted to U.S.D.A. Forest Service. Gilbert/Commonwealth Inc. Report No. 2786, Jackson, Michigan.

Holman, Margaret B.
1978 The Settlement System of the Mackinac Phase. Ph.D. Dissertation, Michigan State University, Department of Anthropology.

Hurley, William M.
1975 An Analysis of Effigy Mound Complexes in Wisconsin. Anthropological Papers, Museum of Anthropology, University of Michigan No. 59. Ann Arbor.

Janzen, Donald E.
1968 The Naomikong Point Site and the Dimensions of Laurel in the Lake Superior Region. Anthropological Papers No. 36. Museum of Anthropology, University of Michigan, Ann Arbor.

Lovis, William A.
1979 A Cultural Resource Management Study of the Hiawatha National Forest, Michigan: Phase II the Hypothesis Tests. Michigan State University Museum Archaeological Survey Reports, No. 36. East Lansing.

Martin, Susan R.
1977 A Preliminary Cultural Resource Management Study of the Hiawatha National Forest, Michigan (2 vols.). Michigan State University Museum, Archaeological Survey Report, No. 20. East Lansing.

Martin, Susan R. and Patrick E. Martin
1980 An Archaeological Survey of the Proposed Route of US-2 between Thompson and Rapid River, Michigan. Michigan Technological University, Cultural Resource Management Report 9. Houghton, Michigan.

Mason, Ronald J.
1981 Great Lakes Archaeology. Academic Press, New York.

McPherron, Alan
1967 The Juntunen Site and the Lake Woodland Prehistory of the Upper Great Lakes Area. Anthropological Papers No. 30. Museum of Anthropology, University of Michigan. Ann Arbor.

Michigan Department of Agriculture, Michigan Weather Service
1966 Climate of Michigan by Stations.

Michigan Department of Agriculture
1974 Climate of Michigan by Stations. Second Printing of Second Revised Edition.

Richner, Jeffrey
1973 Depositional History and Tool Industries at the Winter Site: A Lake Forest Middle Woodland Cultural Manifestation. Unpublished M.A. thesis, Department of Anthropology.

Schrouder, John D.
1985 The Indian River. In Trout Streams of Michigan pp. 51-53, edited by Janet D. Mehl. Michigan United Conservation Clubs.

Telfer, E.S.
1970 Winter Habitat Selection by Moose and Deer. Journal of Wildlife Management, 34:553-59.

APPENDIX 1
WEIGHTS AND/OR DIMENSIONS OF STONE TOOLS, CORES, AND CERAMICS

TEMP. CAT.#	SITE	PROV.	DESCRIPTION	(CM.) L	W	T	WT. (GR.)
1-1	02-34	Surface	stemmed projectile point - grey chert	4.2	1.87	.74	4.8
2-1	02-36	Surface	opposed-ridge bipolar core with lateral edge retouched as scraper - grey chert	2.34	2.0	.61	3.6
2-2	02-36	Surface	stemmed projectile point - grey chert	3.26	1.74	.67	3.4
2-3	02-36	Surface	flake worked as bipolar core, opposed-ridge grey chert				2.8
2-4	02-36	Surface	2 smooth grit tempered body sherds				1.8
4-1	02-15	Surf. pp 2	bipolar core - grey chert with cortex	2.15	2.37	.65	3.9
4-2	02-15	Surf. pp 2	flake that can be refit with above core				1.5
5-1	02-15	Surf. pp 3	bipolar core - grey-tan chert heat altered	2.58	1.97	.80	2.8
6-1	02-15	Surf. pp 4	bipolar core - quartz (possible retouch on edge)	2.42	1.62	.68	2.7
6-2	02-15	Surf. pp 4	bipolar core - quartz	2.42	1.38	1.11	3.3
3-1	02-15	Surf. pp 1	side-notched projectile point, brown chert (tip missing), heat altered	2.57	1.50	.50	1.7
13-1	02-325	T.U.2,L.2	bipolar core - grey chert	3.53	3.00	1.07	11.6
15-1	02-325	T.U.2,L.3	retouched flake - grey-tan mottled chert, banded chert				3.4
8-1	02-386	Surf. pp 1	biface (tip missing) grey-tan				6.3
9-1	02-386	Surf. pp 2	biface frag. - white chert				11.2
9-2	02-386	Surf. pp 2	uniface frag. - white chert				6.2
40-1	02-386	Surf. "A"	biface frag - grey-white chert				12.9
39-1	02-386	T.U.1,L.1	biface frag. - white chert				12.2
41-1	02-386	S1E4,L.1	biface (tip missing) grey chert				7.3
41-2	02-386	S1E4,L.1	retouched flake, partial cortex, white chert				2.7
41-3	02-386	S1E4,L.1	retouched flake, partial cortex white chert				8.
41-6	02-386	S1E4,L.1	retouch flake, white chert				11.9
41-5	02-386	S1E4,L.1	end scraper, grey chert	2.78	2.12	.85	2.5
41-4	02-386	S1E4,L.1	gauge-end flake tool, grey chert dorsal surface all cortex	3.09	3.52	1.55	11.5
10	02-325	T.U.1, L.1	retouched flake, white chert				.2
38	02-365	T.U.2, L.1	retouched chert flake				.1
57-1	02-386	S1E4,L.2	biface tip - grey chert				.8
57-2	02-386	S1E4,L.2	discoidal scraper - white chert	5.24	3.60	1.80	27.8
57-3	02-386	S1E4,L.2	retouched flake, bifacial battering - grey chert				4.6

TEMP. CAT.#	SITE	PROV.	DESCRIPTION	(CM.) L	W	T	WT. (GR.)
57-4	02-386	S1E4,L.2	core fragment, white chert				26.3
57-5	02-386	S1E4,L.2	core fragment, white chert				26.4
42-1	02-386	S1E0,L.1	biface fragment, grey chert				.4
42-2	02-386	S1E0,L.1	biface fragment, white chert				.8
42-3	02-386	S1E0,L.1	retouched flake, partial cortex - white chert				6.5
42-4	02-386	S1E0,L.1	retouched flake, partial cortex - grey chert				3.
42-5	02-386	S1E0,L.1	retouched flake, partial cortex - grey chert				.9
42-6	02-386	S1E0,L.1	retouched flake, partial cortex - grey chert				1.8
42-7	02-386	S1E0,L.1	retouched flake, complete cortex - grey chert				2.2
42-8	02-386	S1E0,L.1	retouched flake, grey chert				.5
42-9	02-386	S1E0,L.1	retouched flake, grey chert				1.3
42-10	02-386	S1E0,L.1	retouched flake, grey chert				.7
42-11	02-386	S1E0,L.1	retouched flake, grey chert				1.3
42-12	02-386	S1E0,L.1	retouched flake, grey chert				.4
42-13	02-386	S1E0,L.1	retouched flake, white chert				
42-14	02-386	S1E0,L.1	retouched flake, white chert				2.1
42-15	02-386	S1E0,L.1	retouched flake, white chert				.6
42-16	02-386	S1E0,L.1	retouched flake, white chert				.5
42-17	02-386	S1E0,L.1	retouched flake, white chert				.5
42-18	02-386	S1E0,L.1	retouched flake, white chert				.9
42-19	02-386	S1E0,L.1	retouched flake, white chert				.5
42-20	02-386	S1E0,L.1	retouched flake, white chert				.4
42-21	02-386	S1E0,L.1	retouched flake, white chert				1.
42-22	02-386	S1E0,L.1	retouched flake, white chert				1.2
7	02-386	Shovel test #1	3 retouched flakes, white chert				2.7
42-23	02-386	S1E0,L.1	retouched flake, grey chert				.3
42-24	02-386	S1E0,L.1	retouched flake, secondary cortex, grey chert				2.1
42-25	02-386	S1E0,L.1	retouched flake, secondary cortex, white chert				2.
58-1	02-386	S10E5,L.1	biface (tip missing), grey chert				6.
58-2	02-386	S10E5,L.1	biface, grey-white banded chert				5.4
58-3	02-386	S10E5,L.1	biface fragment, proximal portion, grey chert				9.6
58-4	02-386	S10E5,L.1	biface tip, grey chert				2.7
58-5	02-386	S10E5,L.1	biface fragment (irregular), grey-white chert				9.8
58-6	02-386	S10E5,L.1	retouched flake, white chert				9.4
58-7	02-386	S10E5,L.1	retouched flake, white chert				3.7
58-8	02-386	S10E5,L.1	retouched flake, grey chert				2.9
58-9	02-386	S10E5,L.1	retouched flake, grey chert				2.7
60-1	02-386	N7E3,L.1	biface (2 frags refit), grey chert				(15.1) 6.9 8.2
60-2	02-386	N7E3,L.1	biface, white chert				11.
60-3	02-386	N7E3,L.1	biface tip, white chert				3.5

TEMP. CAT.#	SITE	PROV.	DESCRIPTION	(CM.) L	W	T	WT. (GR.)
60-4	02-386	N7E3,L.1	uniface frag., white chert				.3
60-5	02-386	N7E3,L.1	retouched flake, primary cortex, white chert				4.
60-6	02-386	N7E3,L.1	retouched flake, primary cortex, white chert				4.8
60-7	02-386	N7E3,L.1	retouched flake, primary cortex, white chert				10.2
60-8	02-386	N7E3,L.1	retouched flake, partial cortex, white chert				1.8
60-9	02-386	N7E3,L.1	retouched flake, partial cortex, white chert				4.2
60-10	02-386	N7E3,L.1	retouched flake, partial cortex, white chert				.9
60-11	02-386	N7E3,L.1	retouched flake, partial cortex, white chert				2.2
60-12	02-386	N7E3,L.1	retouched flake, partial cortex, grey chert				3.2
60-13	02-386	N7E3,L.1	retouched flake, partial cortex, grey chert				1.6
60-14	02-386	N7E3,L.1	retouched flake, partial cortex, grey chert				2.4
60-15	02-386	N7E3,L.1	retouched flake, partial cortex, grey chert				2.1
60-16	02-386	N7E3,L.1	retouched flake, partial cortex, grey chert				1.1
60-17	02-386	N7E3,L.1	retouched flake, white chert				.9
60-18	02-386	N7E3,L.1	retouched flake, white chert				1.6
60-19	02-386	N7E3,L.1	retouched flake, white chert				.8
60-20	02-386	N7E3,L.1	retouched flake, white chert				.8
60-21	02-386	N7E3,L.1	retouched flake, white chert				1.2
60-22	02-386	N7E3,L.1	retouched flake, white chert				.5
60-23	02-386	N7E3,L.1	retouched flake, white chert				1.
60-24	02-386	N7E3,L.1	retouched flake, white chert				4.2
60-25	02-386	N7E3,L.1	retouched flake, white chert				.6
60-26	02-386	N7E3,L.1	retouched flake, grey chert				.7
60-27	02-386	N7E3,L.1	retouched flake, grey chert				1.
60-28	02-386	N7E3,L.1	retouched flake, grey chert				.6
19-1	02-15	T.U.2,L.2	5 plain grit tempered exfoliated sherds				1.4
19-2	02-15	T.U.2,L.2	1 plain flat lip grit tempered rim sherd fragment				.8
19-3	02-15	T.U.2,L.2	retouched flake, white quartzite				22.5
26-1	02-15	T.U.2,L.1	bipolar core, white quartz, partial water worn cortex				2.6
65-1	02-15	Surf. "A"	retouched flake, white chert				2.9
65-2	02-15	Surf. "A"	bipolar core/biface/uniface combination, opposing ridge core with 1 lateral edge unifacially retouched and the other bifacially retouched				4.3

TEMP. CAT.#	SITE	PROV.	DESCRIPTION	(CM.) L	W	T	WT. (GR.)
20-1	02-216	T.U.1,L.1	pebble core, white-purple quartzite, partial water-worn cortex				47.7
20-2	02-216	T.U.1,L.1	igneous cobble, 2 flakes removed				284.6
21-1	02-216	T.U.2,L.2	bipolar core frag. grey brown chert (refits with bipolar core, cat. no 24-1)	1.83	1.50	.89	2.1
24-1	02-216	T.U.1,L.4	bipolar core, grey brown chert (refits w/no. 21-1)	1.62	1.39	.86	2.4
24-2	02-216	T.U.1,L.4	bipolar core, white quartz, partial waterworn cortex	2.33	1.57	1.17	4.
25-1	02-216	T.U.1,L.3	retouched flake, grey quartzite, partial cortex				9.7
25-2	02-216	T.U.1,L.3	retouched flake, grey quartzite, partial cortex				4.8
37-1	02-365	T.U.2,L.2	grit tempered body sherd with possible pseudo-scallop shell decoration				1.8
37-2	02-365	T.U.2,L.2	grit tempered rim sherd with pseudo-scallop shell decoration				4.1
73-1	02-220	N84W101,L1	end-side scraper combo. (very small)	1.40	.77	.30	.3
74-1	02-220	N84W104,L1	18 grit tempered small/ exfoliated sherds				8.9
74-2	02-220	N84W104,L1	3 grit tempered cord-marked body sherds				6.8
74-3	02-220	N84W104,L1	granite ground stone tool frag.				50.8
74-4	02-220	N84W104,L1	retouched flake, grey chert, dorsal surface complete cortex (waterworn)				3.7
85-1	02-220	N57W101,L1	9 grit tempered small/ exfoliated sherds				2.
85-2	02-220	N57W101,L1	2 shell tempered small/ exfoliated sherds				.5
85-3	02-220	N57W101,L1	15 grit tempered cord-marked body sherds (most partly exfoliated)				9.9
85-4	02-220	N57W101,L1	dark grey quartzite hammer-stone/anvil				304.
85-5	02-220	N57W101,L1	dark grey chert retouched flake, heat altered				1.9
85-6	02-220	N57W101,L1	dark grey chert, retouched flake, heat altered				.7
85-7	02-220	N57W101,L1	grey chert utilized secondary cortex flake with one edge retouched to form graver, heat altered				1.3
85-8	02-220	N57W101,L1	light grey chert bifacially retouched flake/core?				8.4
85-9	02-220	N57W101,L1	light grey chert bipolar core				2.6

TEMP. CAT.#	SITE	PROV.	DESCRIPTION	(CM.) L	W	T	WT. (GR.)
85-10	02-220	N57W101,L1	mottled grey chert bipolar core with lateral edge retouched as scraper				1.5
85-11	02-220	N57W101,L1	grey-brown mottled chert bipolar core with utilized lateral edge?				.5
85-12	02-220	N57W101,L1	grey chert bipolar core fragment				1.5
85-13	02-220	N57W101,L1	grey/white banded chert bipolar core with retouched edge (heat altered)				5.7
85-14	02-220	N57W101,L1	grey chert biface midsection fragment				.8
73	02-220	N84W101,L1	piece of iron				95.7
84-1	02-220	N57W101,L1	bipolar core, grey banded chert	2.54	1.51	.49	4.2
84-2	02-220	N57W101,L1	3 shell tempered, small/ exfoliated sherds				.7
84-3	02-220	N57W101,L1	6 grit tempered, small/ exfoliated sherds				.9
84-4	02-220	N57W101,L1	6 grit tempered, cord-marked body sherds (exfoliated)				6.7
84-5	02-220	N57W101,L1	grit tempered cord-impressed body sherd				.8
84-6	02-220	N57W101,L1	2 small grit tempered rim sherds with diagonal cord impressions				1.2
84-7	02-220	N57W101,L1	shell tempered body sherd with linear trailed decoration				.5
84-8	02-220	N57W101,L1	grit tempered cord-marked body sherd with corded stamp decoration				4.3
84-9	02-220	N57W101,L1	grey (light and dark mottled) chert biface fragment				1.2
84-10	02-220	N57W101,L1	utilized flake frag. grey chert, heat altered, heavily battered platform				1.5
25-3	02-216	T.U.1,L.3	chore frag. white chert, partial cortex				31.1
60-29	02-386	N7E3,L.1	retouched flake grey chert				.5

APPENDIX 2

ANIMAL AND PLANT REMAINS FROM ARCHAEOLOGICAL SITES IN THE MANISTIQUE DISTRICT OF THE HIAWATHA NATIONAL FOREST, MICHIGAN

by
Mary Carol Masulis
and
Terrance J. Martin

Limited Distribution Report submitted to
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Hiawatha National Forest
Escanaba, Michigan

Illinois State Museum Society
Springfield, Illinois 62706
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ABSTRACT

In 1985, five prehistoric sites in the Manistique District of the Hiawatha National Forest in the western upper peninsula of Michigan (Delta and Schoolcraft counties) were tested by Forest Service archaeologists under the direction of John G. Franzen. Flotation samples from these sites were submitted to the Illinois State Museum for analysis of plant and animal remains, however, only the Thunder Lake site (09-10-02-220) contained informative materials. Similar to interior sites on Forest Service land in the upper peninsula investigated previously, most of the animal remains from the Thunder Lake site were burned or calcined. Although 85% of the identified bones were from beaver, taphonomic factors involving acidic soil and the physical properties of beaver bone indicate that the recovered faunal assemblage may not be completely representative of Late Woodland animal exploitation patterns. Other than wood, preserved plant remains were also rare, and these were dominated by seeds of native plants that grow in disturbed habitats. The samples preclude a definitive assessment of seasonality for the prehistoric occupation of this site.

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Mary Carol Masulis identified the animal remains and Marjorie Schroeder analyzed the botanical samples. Terrance J. Martin served as principal investigator.

Editorial comments on an earlier draft of this report were provided by Dr. James R. Purdue and Marjorie Schroeder. The authors, however, are responsible for the interpretations presented herein.

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ANIMAL AND PLANT REMAINS FROM ARCHAEOLOGICAL SITES IN THE MANISTIQUE DISTRICT OF THE HIAWATHA NATIONAL FOREST, MICHIGAN

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Archaeological investigations of sites in the Hiawatha National Forest in Delta and Schoolcraft counties, Michigan were directed at acquiring additional information on prehistoric settlement and subsistence in the interior area of the western upper penninsula. Materials from five sites were sent to the Illinois State Museum for faunal and floral analysis. These sites are 09-10-02-216 (Moss Lake I), 09-10-02-220 (Thunder Lake), 09-10-02-325 (Namtuart), 09-10-02-365 (Indian River) and 09-10-02-386 (Star Salvage) (Figure 1). All sites are of prehistoric origin and preliminary indications from lithics and pottery remains are that the Thunder Lake site was occupied during the Late Woodland period.

Each flotation sample consisted of the heavy and light fraction from 10 liters of unscreened matrix that had been subjected to a 1/16" water screen flotation techique. Samples received were processed by the authors to separate bone and plant material from extensive amounts of recent surface debris. Bone identifications were determined by M. C. Masulis by direct comparisons to the modern osteology collection. Floral identifications were made by Marjorie Schroeder.

Preliminary analysis indicated that Moss Lake I, Namtuart, and Indian River samples were void of much if any identifiable bone material. Two bone fragments were recovered from the surface collection at the Star Salvage site. One was tentatively identified as a phalanx from a white-tailed deer less than one year of age (based on an open epiphysis; Purdue 1983:1210). The other fragment is unidentifiable. Both pieces show acute signs of exposure to weather. Following consultation with John Franzen, the analysis was centered on the Thunder Lake site. In particular, samples from Features 1, 2, and 3 and midden material from level 2 (at 10-20 cm below surface) were designated as potentially informative.

PLANT REMAINS

Plant remains from the Thunder Lake site consisted mostly of charred wood. Adequate quantities were obtained from Features 1 and 2 to submit for radiocarbon dating. Other than wood

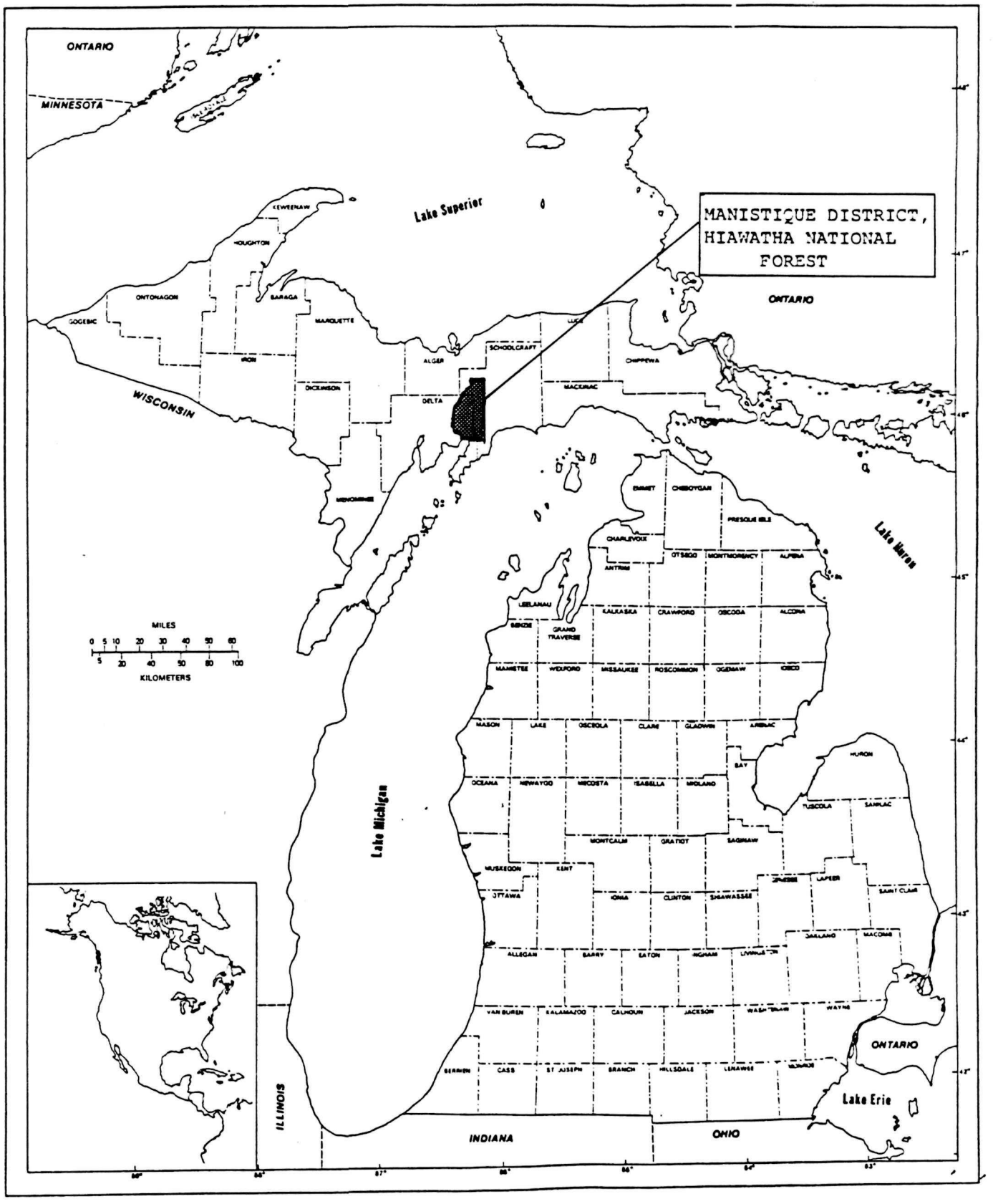

Figure 1. Location of the Manistique District in the Hiawatha National Forest.

charcoal, carbonized plant remains were sparse (Table 1). Galium (bedstraw) seeds were identified from Features 1 and 3. This plant is a native herb that grows readily in moist soil. It was used by the Ojibwa to make an herbal tea for medicinal use (King 1984:159, Yarnell 1963:160-161, 174). Charred Galium seeds were abundant at the Juntunen site (Yarnell 1963:160).

Seeds of either bulrush (Scirpus sp.) or knotweed (Polygonum sp.) were found in Feature 2. Bulbs of bulrush, which grow in shallow water and in marshes, were eaten raw by the Ojibwa (Densmore 1928:320). Tubers were available in autumn and early spring and the stem base in May and June (Yarnell 1963:50). The stem was used to make mats and toys (Densmore 1928:378). Knotweed is a common plant on paths and in gardens. The Ojibwa used the flowers and leaves in medicines (Densmore 1928:291, 344; Yarnell 1963:157). Knotweed is the leading seed type preserved at Middle and Late Woodland sites in west central Illinois where its ubiquity and quantity indicate that the species was cultivated as a food plant (Asch and Asch 1982:14-15).

A hazelnut fragment (Corylus americana) was present in Feature 2 and tenatively identified in Feature 1. This native shrub is common in thickets and disturbed woods, and nuts were collected in late summer and used as food. Various parts of the plant were also used as medicines by the Ojibwa. The stem was used for making baskets and brushes, and the plant was also used for making dye (Densmore 1928:289, 338-339; King 1984:95; Yarnell 1963:63).

A red oak (Quercus rubra) acorn fragment was tentatively identified in Feature 1. Acorns were available in September and October and were processed for food by the Ojibwa. The inner bark of red oak trees were used to make medicine and dye (Densmore 1928:292, 338-339; Yarnell 1963:69).

The small samples of preserved plant remains from the Thunder Lake site make interpretation of prehistoric plant utilization tenuous. Galium and Polygonum are plants common to disturbed habitats. The hazelnut and red oak acorn identifications are based on only two fragments. Although larger quantities of plant remains are needed, poor preservation conditions observed in the faunal samples reported here suggest that representative samples of plant remains are not likely to be obtained.

FAUNAL REMAINS

A total of 2455 bone fragments were examined from the features and midden. Of this total, 110 (4.5%) were identified to the genus or species level (Table 2). Identified elements were dominated by beaver and comprise 84.5% of the total. Other taxa that were present include muskrat, two species of turtle,

Table 1. Plant remains identified from features 1, 2, and 3 at the Thunder Lake site.

Feature 1

3 bedstraw (*Galium*) seeds
1 hazelnut (*Corylus americana*) or red oak acorn (*Quercus rubra*) fragment.
1 unidentifiable seed

Feature 2

2 bullrush (*Scirpus*) or knotweed (*Polygonum*) seeds
1 hazelnut fragment
5 grass or needle fragments
2 unidentifiable seed coats
various unidentifiable seeds, carbonized roots and wood fragments

Feature 3

3 *Galium* seeds

Table 2. Animal remains recovered from the Thunder Lake site (09-10-02-220). Numbers of identified specimins (NISP) is followed in parentheses by minimum number of individuals (MNI).

Taxon	Fea 1	Fea 2	Fea 3	Level 2	% subtotal NISP
MAMMALIA					
Castor canadensis (beaver)	7(3)	1(1)	82(4)	3(1)	84.5%
Ondatra zibethicus (muskrat)	4(1)	-	3(1)	-	6.4%
Odocoileus virginianus (white-tailed deer)	1(1)	-	-	-	0.9%
Alces/Cervus (moose/elk)	-	-	1(-)	-	-
Cervidae (deer/moose/elk)	-	-	7(-)	-	-
Unid. medium/large mammal	72(-)	-	59(-)	65(-)	-
Unid. small/medium mammal	8(-)	-	2(-)	-	-
Unid. mammal	-	-	752(-)	-	-
AVES					
Unid. small bird	-	-	1(-)	-	-
REPTILIA					
Chrysemys picta (painted turtle)	-	1(1)	2(1)	1(1)	3.6%
Chelydra serpentina (snapping turtle)	-	-	2(1)	-	1.8%
Unid. turtle	40(-)	-	79(-)	6(-)	-
OSTEICHTHYES					
Centrarchidae (sunfish)	-	-	1(-)	-	-
Esox sp. (pike/muskie)	-	-	2(2)	-	1.8%
Ictalurus sp. (catfish/bullhead)	-	-	1(-)	-	0.9%
Unid. fish	2(-)	-	-	-	-
Unid. vertebrates	826(-)	2(1)	422(-)	-	-
Total of 2455 pieces	960(5)	4(2)	1416(11)	75(1)	99.9%
Subtotal identified to genus or species levels	12	2	92	4	110

three species of fish, white-tailed deer and either moose or elk. The majority of all bone material were either burned or calcined and all elements were burned for some taxa.

One painted turtle, represented by a single calcined ishium was probably procured in the spring. Adults of this taxa mate in the spring and many young hatchlings over-winter in the nest and emerge the following spring (Holman and Harding 1977:30). Comparison of this specimen to individuals of known age indicate that this individual was approximately one year of age when collected.

As characteristic of sites in the region, the preservation of faunal remains from the Thunder Lake site appear to be affected by acidic soil conditions. Knight (1985) has experimentally demonstrated that fresh bone dissolves at a much faster rate than burned bone under acidic soil conditions. Similiar conditions existed at the Ten Mile Rapids site (09-10-02-366; Martin 1984), at site 09-07-06-17 in the Ottawa National Forest (Martin 1985), and at the Hirundo site (Alton, Maine; Knight 1985), which like Thunder Lake, show high recovery rates of calcined bone. All four sites contained varying amounts of cultural material such as fire cracked rock, chert flakes, and other bone that showed some form of incineration.

The Thunder Lake faunal assemblage as a whole is dominated by beaver bone. MNI's were calculated using a maximum distinction approach with each feature calculated separately and MNI's added together for the site as a whole. The presence of 9 individual beaver were recognized on the basis of age and bone preservation status. Of the individuals represented by calcined bone material, 4 of the nine are subadults, 1 is an adult and 1 individual is of inderterminate age. One adult of the total is represented by unburned bone and the remaining 2 individuals are represented by "weathered" bone material. This weathered bone is very fragile and highly decomposed. Field records indicate that the provienience for this weathered bone was possibly a disturbed rodent run. Since the skeletal composition of these bones (Table 3) include many vertebrae, ribs, and other elements, it seems quite plausible that this beaver expired in the run or was otherwise disposed of there by modern trappers and is, therefore, incidental to the prehistoric occupation.

All of the recovered muskrat bone is calcined and all individuals are adults. Muskrats are very common to the upper Great Lakes region (Burt 1972:132) and the environment at Thunder Lake would be conducive for populations of the aquatic rodent. The explotation of this species for food or pelt was probably commonplace.

One white-tailed deer is represented by a single metapodial fragment that was not subjected to burning. The small percentage

Table 3. List of anatomical elements from identified faunal remains recovered from the Thunder Lake site.

FEATURE 1:		
Odocoileus virginianus (distal anterior metacarpal)	1 pc.	0.7 g.
Ondatra zibethicus (3 terminal phalanges, molariform tooth)	4 pcs.	0.3 g
Castor canadensis (right zygomatic arch, 2 indet. phalanges, proximal metatarsal, left middle tibia, right distal tibia)	6 pcs.	3.4 g
Unidentified mammal	88 pcs.	12.0 g
Unidentified fish (vertebrae)	2 pcs.	0.1 g
Unidentified turtle (carapace/plastron fragments)	40 pcs.	1.7 g
Indeterminate vertebrate	826 pcs.	14.2 g
Totals	967 pcs.	32.4 g
FEATURE 2:		
Castor canadensis (left foraman magnum of occipital bone)	1 pc.	0.4 g
Chrysemys picta (left ilium)	1 pc.	0.1 g
Indeterminate vertebrate	2 pcs.	2.2 g
Totals	4 pcs.	2.7 g
FEATURE 3:		
Cervidae (antler fragments, molariform)	6 pcs.	6.8 g
Alces/Cervus (molariform tooth fragment)	1 pc.	0.5 g
Castor canadensis Calcined/burned bone: left lacrimal and maxilla, left and right lacrimal, left zygomatic, 5 cranium fragments, 1 lumbar		

Table 3 (continued)

vertebra, 2 caudal vertebrae, 3 rib pieces, right proximal ulna, 4 metacarpal fragments, left cuneiform, 2 phalanges, 3 tibia fragments (proximal, middle, distal), left ilium, right proximal fibula, left proximal metatarsal, 1 metapodial, 2 indeterminate carpal bones.	33 pcs.	17.1 g
Unburned bone: left zygomatic, left lower 3rd premolar.	2 pcs.	4.1 g
Weathered bone: left zygomatic, right upper insisor, 2 molariform teeth, right paroccipital process, left mandible, atlas and axis vertebrae, 5 lumbar and 3 thoracic vertebrae, 18 indeterminate vertebra fragments, 1 rib, right ilium, left humerus, left and right femur, left scapula, right calcaneus, left cuneiform, 2 phlanges, 3 metapodials.	47 pcs.	41.9 g
Ondatra zibethicus (distal phalanx)	2 pcs.	0.1 g
Unidentified mammal	813 pcs.	96.4 g
Centrarchidae (pterygiophore)	1 pc.	0.1 g
Esox sp. (2 dentary fragments from 2 individuals)	2 pcs.	0.2 g
Ictalurus sp. (left dentary)	1 pc.	0.1 g
Chelydra serpentina (1 vertebra, 1 pleural bone of the carapace)	2 pcs.	0.5 g
Chrysemys picta (peripheral bone of the carapace)	2 pcs.	0.4 g
Unidentified turtle (carapace/plastron fragments)	79 pcs.	8.0 g
Indeterminate vertebrata	422 pcs.	21.4 g
Totals	1412 pcs.	197.1 g

Table 3 (continued)

LEVEL 2:		
Castor canadensis		
(insisor, right ishium, terminal phalanx)	3 pcs.	1.1 g
Unidentified mammal	65 pcs.	20.3 g
Chrysemys picta		
(left lateral xiphiplastron)	1 pc.	0.5 g
Unid turtle		
(carapace/plastron fragments)	6 pcs.	0.5 g
Totals	75 pcs.	22.4 g

of deer at this site is unusual considering their abundance in the area. Deer were heavily exploited in the area of the Hiawatha National Forest throughout prehistory (Commonwealth Associates 1984:9). The reason that deer remains are so scarce at the Thunder Lake site is unknown, but it could be related to a lack of burning during use and disposal. A molariform tooth fragment from a large cervid, either moose or elk, was also identified.

The fish and turtle species recovered at the site are all locally common to interior lakes of the upper penninsula.

Aside from inferences drawn from one turtle, the faunal remains from the Thunder Lake site do not reveal the season of site usage. The presence of numerous turtle carapace and plastron elements is not necessarily indicative of warm weather seasons of exploittion since the shells were commonly used as utensils year-round. Despite the relatively high percentage of young beaver present at Thunder Lake (age being determined by degree of epiphiseal fusion), they do not impart information on seasonality. Hill (1982: 256-64) reports that new born kits grow continuously throughout the first year of life and from the second through the third year they grow in surges when food quality and quantity are seasonally best. These growth surges are separated by periods of stable maintenence and no growth. The rate and pattern of growth is not predictable for any given region and varies in accordance with local environmental fluctuations from year to year. It is known that individual beaver stop growing when they are four years of age. Therefore, all that can reliably be said about the beaver bones at the Thunder Lake site is that there are at least 2 individuals that are 4 or more years old.

CONCLUSION

Five prehistoric sites in the Manistique District of the Hiawatha National Forest were tested for the presence of plant and animal remains, but only the Thunder Lake site yielded potentially informative materials. The Thunder Lake site is similar to the Late Woodland component at the Ten Mile Rapids site, and the historic Indian occupation at site 09-07-06-17 in the Ottawa National Forest in that all three sites contain a very high percentage of burned and calcined bone. Except for porcupine bones at site 09-07-06-17, animals other than beaver are underrepresented. In consideration of Knight's (1985) experiments with bone preservation and acidic soil conditions in Maine, it is suspected that bone from the Thunder Lake site that was not subjected to incineration and is probably of historic or recent origin. It is quite possible that archaeological sites that show recovery patterns like those exhibited at the Thunder Lake site offer a distorted perception of prehistoric animal

exploitation. Although beaver appears to be the prevalent human prey species, it is plausible that taphic processes have interceded severely limiting the informational value that faunal and possibly floral remains from these sites can impart to archaeological investigators.

REFERENCES CITED

Asch, David L., and Nancy B. Asch
1982 A Chronology for the Development of Prehistoric Horticulture in West Central Illinois. Paper presented at the 47th Annual Meeting of the Society for American Archaeology, Minneapolis.

Burt, William H.
1972 Mammals of the Great Lakes Region. University of Michigan Press, Ann Arbor.

Densmore, Frances
1928 Uses of Plants by the Chippewa Indians. Forty-fourth Annual Report of the Bureau of American Ethnology, pp. 275-397.

Hill, Edward P.
1982 Beaver (Castor canadensis). In Wild Mammals of North America, edited by Joseph A. Chapman and George A. Feldhamer, pp. 256-281. The Johns Hopkins University Press, Baltimore.

Holman, J. Alan, and James H. Harding
1977 Michigan's Turtles. Educational Bulletin No. 3, Michigan State University Museum. East Lansing.

King, Frances B.
1984 Plants, People, and Paleoecology. Illinois State Museum Scientific Papers, Vol. 20. Springfield.

Knight, James A.
1985 Differential Preservation of Calcined Bones at the Hirundo Site, Alton, Maine. Unpublished M.S. thesis, Institute of Quaternary Studies, University of Maine.

Martin, Terrance J.
1984 Animal Remains from the Ten Mile Rapids Site (09-10-02-366). Appendix B in 1983 Cultural Resource Survey of the Hiawatha National Forest. Commonwealth Associates Inc., Report R-2589. Jackson, Michigan.

1985 Animal and Plant Remains from FS 09-07-06-17. Appendix 4 in Cultural Resource Survey and Test Excavation on the Ottawa National Forest, Michigan: 1984 Season, by John G. Franzen. Ottawa National Forest Cultural Resource Report No. 3. Ironwood, Michigan.

Purdue, James R.
1983 Epiphyseal Closure in White-tailed Deer. Journal of Wildlife Management 47(4):1207-1213.

Yarnell, Richard A.
1963 Aboriginal Relationships between Culture and Plant Life in the Upper Great Lakes Region. Museum of Anthropology, University of Michigan, Anthropological Papers No. 23. Ann Arbor.

APPENDIX 3

CHARACTERISTICS OF SITES INCLUDED IN CATCHMENT ANALYSIS

SITE NO.	ASSOCIATED WATER FEATURE(S)	TOTAL LITHICS	CERAMICS	CULTURAL AFFIL.	REFERENCES
01-66	Sturgeon R./Algoma Beach	2	No	Unk.	CA1-81
01-68	Sturgeon R./Algoma Beach	1052	No	Unk.	CA1-81
01-69	Sturgeon R./Algoma Beach	737	No	Unk.	CA1-81
01-70	Sturgeon R./Algoma Beach	119	No	Unk.	CA1-81
01-72	Sturgeon R.	See Text	Yes	LW	See Text
01-284	None	1	No	Unk.	G/C-85
02-03	Clear Lake	7	No	Unk.	CA1-81
02-10	Gooseneck Lake	1	No	Unk.	SS1-80
02-11	Gooseneck Lake	1	No	Unk.	SS1-80
02-15	Carr Creek	See Text	Yes	W	See Text
02-33	Gooseneck Lake	4	No	Unk.	CA1-79
02-34	Gooseneck Lake	64	No	Unk.	CA1-79
02-35	Gooseneck Lake	21	No	Unk.	CA1-79
02-36	Gooseneck Lake	See Text	Yes	IW	CA1-79
02-37	Carr Lake	5	No	Unk.	CA1-79
02-38	Steuben Lake	21	No	Unk.	CA1-79
02-39	East Lake	3	No	Unk.	CA1-79
02-40	Crooked Lake	3	No	Unk.	CA1-79
02-41	Tom's Lake	6	No	Unk.	CA1-79
02-42	Swan Lake	13	No	Unk.	CA1-79
02-43	Lyman Lake	14	No	Unk.	CA1-79
02-44	Chicago Lake	24	No	Unk.	CA1-79
02-45	Chicago Lake	15	No	Unk.	CA1-79
02-56	VanWinkle Lake	1	No	Unk.	CA1-79
02-183	Highbridge Lake	3	No	Unk.	CA1-81
02-185	VanWinkle Lake	4	No	Unk.	CA1-81
02-186	Mink Creek	2	No	Unk.	CA1-81
02-189	Bog lake	4	No	Unk.	CA1-81
02-190	Stutts Creek	1	No	Unk.	CA1-81
02-192	Indian River	3	No	Unk.	CA1-81
02-207	Mowe Lake	2	No	Unk.	None
02-210	Indian River	1	No	Unk.	None
02-212	Leg Lake	78	No	Unk.	CA1-82
02-216	Bull Run Ck/Nipissing Beach	See Text	No	Unk.	Franzen-83
02-217	Bull Run Ck/Nipissing Beach	21	No	Unk.	Franzen-83
02-218	Bull Run Ck/Nipissing Beach	50	No	Unk.	Franzen-83
02-219	Thunder Lake	4	No	Unk.	Franzen-83
02-220	Thunder Lake	See Text	Yes	LW	Franzen-83
02-221	Thunder Lake	32	Yes	LW	Franzen-83
02-303	None	1	No	Unk.	CA1-84
02-306	Unnamed Stream	1	No	Unk.	CA1-84
02-325	Sturgeon River	See Text	No	Unk.	Franzen-83
02-330	SW Branch Fishdam River	2	No	Unk.	Franzen-83
02-331	Bull Run Ck/Nipissing Beach	36	No	Unk.	Franzen-83
02-332	Indian River	1	No	Unk.	Franzen-83
02-333	Indian River	1	No	Unk.	Franzen-83

SITE NO.	ASSOCIATED WATER FEATURE(S)	TOTAL LITHICS	CERAMICS	CULTURAL AFFIL.	REFERENCES
02-349	Lyman Lake	5	No	Unk.	Franzen-83
02-351	Sturgeon River	3	No	Unk.	CA1-84
02-352	None	1	No	Unk.	CA1-84
02-353	None	4	No	Unk.	CA1-84
02-361	Indian River	1	No	Unk.	CA1-84
02-364	Indian River	1	No	Unk.	CA1-84
02-365	Indian River	See Text	Yes	IW	CA1-84
02-366	Sturgeon River	See Text	Yes	LW	CA1-
02-386	None	See Text	No	Unk.	See Text
03-28	Hickey Creek	3	No	Unk.	SS1-79
03-29	Hickey Creek	1	No	Unk.	SS1-79
03-269	Skeels Lake	1	No	Unk.	CA1-81
03-270	McComb Lake	1	No	Unk.	CA1-81
03-271	Indian River	1	No	Unk.	CA1-81
03-296	Indian River	1	No	Unk.	CA1-81
03-300	Crow Lake	1	No	Unk.	CA1-81
03-648	Crow Lake	1	No	Unk.	CA1-81
03-665	Council Lake Outlet	See Text	No	Unk.	G/C-85
03-666	Council Lake Outlet	1	No	Unk.	G/C-85
03-667	Indian River	See Text	Yes	LW	G/C-85
03-668	Indian River/Fish Lake	1	No	Unk.	G/C-85
03-669	Indian River	See Text	No	Unk.	G/C-85

KEY: LW = Late Woodland
IW = Initial Woodland
W = Woodland - specific period unknown
Unk = Unknown

REFERENCE ABBREVIATIONS

CA1-79 Commonwealth Associates Inc. 1979
SS1-79 Soil Systems Inc. 1979
CA1-81 Commonwealth Associates Inc. 1981
CA1-82 Commonwealth Associates Inc. 1982
CA1-84 Commonwealth Associates Inc. 1984
G/C-85 Gilbert/Commonwealth Inc. 1985