CUMMINS PALEO-INDIAN SITE AND ITS PALEOENVIRONMENT, THUNDER BAY, CANADA

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Abstract

The outcome of recent excavations and geophysical prospecting at the extensive late Paleo-Indian Cummins site is reported together with a review of past discoveries and relevant Quaternary surficial geology.

Introduction

This paper reports on ongoing investigations at Cummins (DcJi-1), a Late Paleo-Indian (Plano) site in the city of Thunder Bay, on Lake Superior (Figure 1). The site is located on an abandoned beach of Glacial Lake Minong, a proglacial high water phase of the Superior basin that ended ca. 9500 B.P. (Prest 1970; Clayton 1983). Taconite of the Gunflint Formation outcrops on the site was quarried and worked locally with chipping debitage concentrations visible in disturbed sediments throughout several hundred acres. Hugh Cummins, a local collector, reported the site in 1962. Excavations were conducted in 1963 by J.V. Wright (National Museum of Canada) and K.C.A. Dawson (Lakehead University, Thunder Bay). Dawson (1983) has recently reported on these excavations, and an analysis of Cummins artifacts. The fragmentary remains of a cremation burial recovered in 1963 from the face of a gravel pit on Cummins by J.V. Wright have been recently accelerator-dated to 6530 ± 390 B.C. (8482 B.P.), providing the earliest and only absolute date for Cummins occupation. Geological evidence from our 1983 investigations, however, indicates initial occupation was at least a millenium earlier.

Cummins is the most extensive of a number of Plano sites and find spots reported in the region. The first investigated was Brohm site (MacNeish 1952), situated on a Minong age beach on the western side of the Sibley peninsula, thirty miles east of Cummins. Plainview and other Plano point types from Brohm firmly established a Paleo-Indian presence north of Lake Superior. A selection of Plano points from the vicinity are shown in Plate 3 and Plate 4.

By the middle 1970’s a regional picture was emerging of numerous sites (Figure 1) associated with Lake Minong age beaches in addition to some interior riverine and lacustrine locations to the north and west. Fox (1975, 1980) designated these sites and assemblages the Paleo-Indian Lakehead Complex. Dawson (1983:25) considers this “Lakehead Complex” to be loosely defined, as not all of these sites have clearly diagnostic Plano artifacts. Also, location of these sites on Minong age beaches does not prove contemporaneity with Lake Minong (Phillips 1982; Dawson 1983:23). Water-tumbled artifacts are generally absent in most Minong site collections, except for a heavily weathered Plainview point from Brohm (DdJe-1) (MacNeish 1952), possible water-tumbled debitage from Catherines (DcJh-11) (Fox 1975:31), and a deeply buried water-worn assemblage from our 1983 excavations at Cummins.

As survey work continues in the area, other potentially early sites are reported annually by Thunder Bay Regional Archaeologists William Ross and David Arthurs, however, a lack of excavation continues to limit reconstruction of early postglacial occupations in the area. In addition to refining the chronology, important problems requiring investigation include lithic technology, subsistence, and local and community settlement patterns.

The 1983 investigations at Cummins were designed to investigate stratigraphy, surficial geology and site formation processes, both on upland (beach ridge) portions and in sediments of Cummins pond, to assist in directing future excavations. Subsequent discussion will therefore focus on geological and paleoecological
aspects of Cummins (as integrated into regional research), although information will be provided on cultural remains and features encountered.

Regional Deglaciation

Deglaciation of the northwest Lake Superior basin has been investigated by Farrand (1960, 1969), Zoltai (1963, 1965, 1967), Saarnisto (1974, 1975) and Drexler et al. (1983). Prest's (1970) interpretation of ice marginal positions in the Great Lakes region remains generally accepted, however, difficulty exists in accurate correlation of late Quaternary sequences and chronology throughout the Superior region (Dreimanis 1977; Saarnisto 1974, 1975), and specifically the nature, extent and movement of the western Superior Lobe between ca. 10,000 - 11,000 B.P. (Phillips 1982; Clayton 1983; Drexler et al. 1983). The main lobe of the Patrician ice mass gradually withdrew (or stagnated) to the north of Thunder Bay just prior to Holocene times, however, the Superior Lobe still occupied much of the basin to the east. This lobe may have been fairly mobile, with the Marquette advance of northern Michigan over-running trees dated to ca. 10,000 B.P. (Hughes 1978; Drexler et al. 1983). The effect of this late Superior Lobe surge on the Thunder Bay area is presently uncertain; however, Phillips (1982) considers the eastern ice mass pushing close to the site but not directly affecting it. Despite these complexities it is apparent that Cummins and vicinity was likely suitable for human occupation by initial Holocene times (or possibly a bit earlier, when not submerged), although stagnating buried glacial ice may have persisted in protected localities despite the substantial climatic warming.

Glacial Lake Levels and Shore Lines

Interpretation of the ages and sequence of glacial lake levels in the Superior basin has recently been modified. Earlier investigations (Hough 1958, 1963; Farrand 1960, 1969; Prest 1970; Saarnisto 1974, 1975) had suggested generally declining levels from the earlier ponding in the western end of the basin (Lake Duluth and Post-Duluth levels), as shown by elevated beach sequences in the Duluth, Minnesota area. Clayton (1983) reinterpreted the “older” shore lines in the Duluth area as being Post-Marquette in age, and proposed that Lake Minong levels (230 - 250 meters above sea level in the Thunder Bay area) were present in the Superior Basin during two periods; from ca. 10,400 - 10,100 B.P. and ca. 9500 - 9400 B.P., with a higher stand (Lake Duluth levels) occurring between these two Minong stands, and rapidly falling levels subsequently. This interpretation is based on data from Lake Agassiz basin levels to the west, and correlation of interbasin flow between Agassiz and Superior basins. This revised interpretation of Superior Basin levels is corroborated by recent work of Drexler, Farrand and Hughes (1983) along the south shore of Lake Superior. It is generally agreed that by 9500 B.P. Glacial Lake Minong occupied the Superior basin and received inflow from Lake Agassiz to the west.

Minong beaches near Cummins are generally well developed, extending between about 225 to 240 meters above sea level (Figure 2) with some wave cut features at higher elevations (Phillips 1982). The end of the Minong phase in the area is dated to 9380 ± 150 B.P. (GSC - 287) on wood from a section in a gravel pit at Rosslyn village, five miles west of Cummins (Zoltai 1965).

Water levels dropped rapidly after 9400 B.P. (Clayton 1983), exposing a broad coastal plain and reached the low Houghton levels by ca. 8000 B.P., when isostatic recovery of the St. Mary’s River outlet at Sault Ste. Marie caused a rise to the Nippissing levels. This level dates to about 5500 B.P. and exists as a well developed wave cut feature at 210 meters above sea level below the Cummins site (Phillips 1982). Archaic points are found at and below this level.

Local Surficial Geology

Predominant surficial deposits in the area of Cummins are glaciolacustrine silt and clay plains of low relief that are interrupted by beach ridges and taconite bedrock outcrops. Bedrock closely underlies much of the area and the addition of glacial lake clays causes poor drainage. These factors contributed to the develop-
ment of large areas of peat land since the mid-Holocene. The well drained Minong beach ridges adjacent to the taconite sources provided excellent quarry/workshop and camping locations in the generally poorly drained swamp and swale environment.

It is apparent, however, that a dryer and more open landscape prevailed during a part of the early Holocene occupations at Cummins. Well developed sand dunes are present along the Kaministiquia River Valley to the west. Dune sand has modified and strengthened the beach ridges at Cummins, by up to several meters in some areas. Our analysis of sediments indicates an eolian component in most areas of the site, including near the base of Cummins bog core (Figure 3), which suggest a date of ca. 8000 B.P. for the major dune-forming episode. These eolian sands may provide an important time stratigraphic marker for the Cummins sedimentary sequences.

Paleóécology

The rapid retreat of glacial ice in the western Superior Basin after 11,000 B.P. is apparent from northeast Minnesota; Lake of the Clouds (Craig 1972), Weber Lake (Fries 1962) and Myrtle Lake (Janssen 1968) indicate a general rise in pine pollen by ca. 10,000 B.P. (Wright 1974). More recent research on Lake Agassiz basin pollen sequences west of the study area indicates a mean summer temperature at ca. 9,000 B.P. of 2 - 3 ° warmer than at present (Ritchie 1983).

Along the north shore of Lake Superior a number of pollen diagrams have been compiled (Saarnisto 1974). In the Thunder Bay area and to the west, McAndrews (1976, 1983) has cored Pass Lake (near Brohm site), Cummins Pond (Figure 3), Hayes Lake and Peggy Lake. Hayes and Peggy Lakes, northwest of Thunder Bay, have similar pollen profiles with the spruce/pine transition date (at Hayes) to ca. 10,780 B.P. Cummins Pond lacks Zone 1 pollen, and has a near basal dates on spruce wood of 8110 and 8000 B.P. The Pass Lake profile is interpreted (McAndrews 1976) as indicating a generally closed boreal forest during Zone 1 (Paleo-Indian) times.

Boreal species dominate the fossil pollen assemblage at Cummins Zone 2a, similar to Pass Lake, however, greater percentages of poplar and herb pollen are present, possibly indicating dryer more open conditions. This suggestion is supported by the nearby evidence of dune deposits as well as near the base of the bog core (Figure 3). Deep cores from Lake Superior indicate (by an analysis of sediments) a decrease in bottom current velocity and correspondingly a decrease in average surface wind velocity (atmospheric circulation and storm frequency) subsequent to the period from 9500 to 6500 years ago (Halfman and Johnson 1984). The sedimentary evidence from basins and uplands thus indicates that early Holocene climate was dryer, warmer and windier than today.

Similar to earlier fluted point populations in the Northeast, the early occupants of the Lakehead areas are thought to have relied heavily on caribou (Fox 1975; Dawson 1983). Faunal remains have not been recovered from area early sites, however, in our 1983 excavations three medium size mammal bone fragments were excavated from a pressure flaking area. These calcined fragments were not large but two of them had articular facets, and a reasonable (but not absolutely certain) match was obtained for one of them with the proximal end of a caribou radius. From the same unit we recovered two taconite points (Plate 7, two specimens on the right), and over 17,000 pressure flakes, some of Knife River chalcedony derived from North Dakota. No faunal remains were recovered in our bog investigations in 1983, however, more units will be excavated in 1984. Because of the presumed littoral association of Cummins and other beach ridge sites, Fox (1975) hypothesized that fish and other aquatic resources were also important in the economy. With basin levels dropping rapidly after ca. 9400 B.P. (Clayton 1983) it is apparent that the lake was probably some distance from Cummins during the major tenure of occupation. Several sites (Figure 1) are, however, associated with river crossings of the beach ridge. The level of fish resources in Lake Minong is uncertain, but there is evidence of cold loving species, e.g. lake trout, lake and ling, entering and repopulating the Agassiz basin from Minong at an early period (Stewart and Lindsay 1983).

Cummins is presently at the boundary of the Boreal Forest and Mixed Deciduous/Conifer Forest. With climatic conditions somewhat warmer and dryer in the early Holocene, conditions to the west of Cummins may not have been too ideal for caribou populations, in terms of preferred vegetation. Bison were prey species ca. 8000 B.P. at the Itasca site in northern Minnesota (Shay 1971), at the Sinnock site in southeastern
Manitoba (Pettipas and Buchner 1983), and fossil bison were present (but lacking evidence of human use) at Kenora in western Ontario (Rajnovich 1980; McAndrews 1982). It is apparent that bison was likely available as a prey species for late Paleo-Indian and Archaic populations in northwestern Ontario (McAndrews ibid.), including the Cummins vicinity.

Excavations at Cummins

The limits of Cummins (Plate 1) are not yet accurately defined, withdebitage visible along about a mile of the relic beach. Much of the site has been damaged by gravel pits and railroad building over the past half century. A portion of the site, about one-half being undisturbed, was purchased and fenced by the Ontario Government (Figure 2). Several adjacent sites, such as Catherines and Widar, have also been severely damaged of destroyed by gravel pit operations.

1963 Excavations

Five test trenches were opened by Wright and Dawson in 1963. Three were on the main relic beach within what is now the fenced portion, immediately west of our 1983 Location 1 excavations (Figure 4). Two additional trenches were placed in relatively undisturbed areas on top of the taconite outcrop north of quarry area. Cultural stratigraphy reported by Dawson (1983:6) was a concentrated shallowdebitage layer of 2 - 4 inches, immediately below a thin humus. Any cultural material at greater depths was associated with features. Cultural features included several hearths and wedge shaped (in vertical outline) pits containingdebitage and fire cracked rock. One of the pits contained taconite blocks and was interpreted as a lithic cache.

1983 Excavations

Excavations in 1983 were within the fenced portion of the site, except for a single stratigraphic section in the dune area west of Maple Ward Road (Location 4, Figure 4). At Location 1 two deep test trenches were excavated, one across the relic beach and one parallel to it, into the bog area. It was hypothesized that if the site was occupied prior to, or during the most recent Minong levels (ca. 9500 B.P.) water-worn artifacts should be present. The dating of Cummins and other sites to specific basin levels had been suggested by Fox (1975, 1980) but remained unresolved prior to our 1983 excavations.

In addition to these test trenches, excavations to bedrock were conducted to two other locations (DT section, and WTT sections, Figure 4) about 300 m apart on the main beach ridge. The purpose was to record and analyze the sequence and nature of sediments overlying bedrock to examine site formation processes and paleoenvironment. Phillips (1982 and pers. comm.) suggested that the greater height of the beach west of Maple Ward Road was due to overlying dune deposits. Our 1983 testing in this area was to check this and to attempt locating buried paleosols, and cultural deposits.

Bog excavations (limited to a few square meters in 1983) were primarily to check for bones and other paleoecological information, and recover lithic artifacts in stratified alluvial deposits. With a dated pollen diagram from the adjacent pond (Figure 3), relative dating by correlating pollen stratigraphy was considered a possiblity.

Subsurface Remote Sensing

A series of instrument transects on a one meter grid was carried out with magnetometer, electromagnetic resistivity and gradiometer over portions of the site planned for test evaluation. This archaeological prospecting was to determine if cultural features previously reported by Dawson and Wright (hearths and pit features with taconite blocks) were associated with magnetic anomalies and could be predicted by magnetometer or gradiometer (dual sensor magnetometer with micro processor); and if major changes in surficial sedimentation and bedrock characteristics could be predicted by resistivity testing. A ground radar study (conducted by Professor John Coolen of Lakehead University, Engineering) was carried out later in the year over a portion of the same grid at Location 1, for comparative purposes.

Only a small part of the instrument grid was excavated in 1983, however, a major magnetometer anomaly
on the 259E test trench was found to correspond to a hearth, chipping station and pit features. Charcoal from the pit feature yielded a relatively recent date of 2380 ± 125 B.P. (S-2460), suggesting this to be a late Archaic component. No diagnostic artifacts were recovered among clearly associated lithic recoveries; however, the base of a side notched point or winged drill was recovered several meters south. A side notched taconite point had previously been reported from Cummins by Dawson (1983:9) although he ascribed it to the Early Archaic period.

Resistivity and ground radar studies were useful in predicting major variations in sediments. A discontinuous coarse shingle gravel was apparent in fluctuating EM profiles, and the ground radar readout also indicated a discontinuous readout at 0.5 - 1.0 m depth, corresponding to this coarse shingle gravel. Strong reflectances at approximately 2 m depth were related to bedrock irregularities, as revealed in adjacent excavation.

Stratigraphy

Dawson and Wright (Dawson 1983) reported cultural remains primarily concentrated in the upper part of the soil profile, as is typical of many Boreal Forest sites. Thousands of years of disturbance from tree throws, root action, frost action and rodent burrowing makes it very difficult to discern cultural stratigraphy in upland portions.

Our 1983 excavations at Cummins generally confirmed these earlier reports, however, deep trenching revealed water-worn artifacts in lower beach gravels. These deeply buried water-worn artifacts occurred in poorly sorted coarse gravels 0.5 - 1.5 m below the surface, in modest quantity; but over a wide area (300+ m) and were recovered in all deep testings. The significance of these recoveries is the indication that Cummins was occupied contemporaneous with, or prior to, the last Minong beach forming episode (ca. 9500 B.P.).

In the area of dunes west of Maple Ward Road (Figure 4) artifacts were present in the upper part of the soil profile and at the interface of well sorted eolian sands and coarse boulder lag deposits some 1.5 m below the surface. Artifacts recovered below these dune deposits consisted mainly of taconite debitage, however, retouched pieces included a large finely made parallel flaked unifacial end scraper (Plate 6, third from left). Cultural material above these dune deposits are probably post-8000 B.P.

In the bog area excavations were conducted below the main beaver dam in an area that was reasonably dry in late August. It was possible to excavate to approximately 80 cm in depth before water removal from the units became too difficult. Cultural material appeared below the 15 - 20 cm surface peat layer, and continued to a depth of 75 - 80 cm in a sandy clay matrix. It was possible but difficult to trowel the sediments; wet screening with a pressure hose was necessary to recover smaller debitage, charcoal, etc.

Two possible post mold features were recorded in square 49S/312E of these excavations. Diameters were 7 - 8 cm; they first appeared below the upper peat/sand clay interface, and terminated abruptly 8 to 10 cm lower. Further excavation of adjacent units will be carried out in 1984 to investigate these possible architectural remains.

It appears that this portion of Cummins "bog" (Figure 5) may have been an intermittently flooded seasonal beach along the stream (branch of Neebing River). Based on lithic recoveries, it appears that it may have been used as a general purpose habitation area. There is little evidence for primary lithic reduction (larger flakes), however, there are numerous taconite blocks and rejected cores below the upper peat strata that must relate to some other function. The concentration of these larger blocks below the peat may be partly due to upward movement in the sandy clay by frost action. Also a portion of this lithic assemblage may be due to children throwing them into this intermittent bog from the adjacent bank.

Preserved fossil pollen is present in some of these excavated bog sediments but absent (oxidized) in the lower strata suggesting dryer conditions in earlier times. Pollen analysis has not been completed on these samples but it appears possible to correlate certain of these sediments and associated lithics with either Cummins Pond diagram or the regional pollen sequence. Some organic preservation is evident and C-14 dating will be attempted when better samples are obtained. No organic artifacts were recovered in 1983 bog excavations.
Analysis of Sediments

Grain size analysis of sediments has been carried out on a sequence of samples from the upland sections and basal portion of the Cummins Pond core (Julig 1984). Although the upland portions are beach landforms, a wide range of sediments are evident in the sections sampled, suggesting diverse geologic environments.

To the west at the WTT Section (Figure 4) the upper fine sediments are very well sorted, lack a coarse tail (fraction) in their grain size curves and are positively skewed, indicating they are dune sands. The lower cobble and gravel layer with artifacts on its upper surface is enigmatic in terms of origin, and will require further excavation to determine its lateral extent, as it may be highly localized, or alternately a layer of reworked till.

Sediments from the DT Section to the east are poorly sorted throughout, and are negatively skewed, which is characteristic of beach sands (Friedman 1961). Samples of the lower portion of this section (with water-worn artifacts) are so poorly sorted and coarse that they could more accurately be described as gravel lag deposits. Pebbles are generally well rounded and the artifacts quite water-worn, suggesting a high energy environment. With the Marquette advance (in northern Michigan) dated to ca. 10,000 B.P. there may have been considerable ice plowing (icebergs?) on these Minong beaches, which would contribute to the poor sorting. After water levels dropped somewhat the formation of offshore bars (Phillips 1982) may have protected inner beaches, such as the DT section, except during high energy events such as spring break up.

Lithic Technology

Analysis of 1983 excavated artifacts is in progress; both technological and use-wear studies. Since Cummins is a quarry/workshop, large quantities of chipping debitage are present along with numerous expedient tools, in addition to the more formal types. Use-wear analysis will assist in clarifying and defining both the utilized debitage and formal portion of the assemblage, in terms of function.

The predominant lithic raw material is local tachnite including red (jasper), black and blue varieties. Minor amounts of local Gunflint silica, quartz and slate (hammerstones) are also present. Exotic materials which occur in small quantities include Knife River chaledony (North Dakota), Knife Lake siltstone (Boundary Waters area, 100 miles west), and Hudson Bay Lowland (HBL) chert from glacial drift to the north.

Knife Lake siltstone and HBL chert had been previously reported from Cummins (Fox 1975, 1980; Dawson 1983); and Knife Lake siltstone Plainview type points with lateral grinding (e.g. Plates 3, 4) are not uncommon from area sites. HBL chert endscrapers had previously been recovered at Cummins, but no other formal tool types or flakes of this material.

Our 1983 excavations yielded Knife River chaledony flakes, a distant exotic previously unreported at Cummins, although one KRC Plano point has been found north of Thunder Bay (W. Ross pers. comm.). Our recovery of KRC consisted of numerous pressure flakes in a point manufacturing area, suggesting the finishing of a point preform.

Recovery of HBL chert in 1983 also consisted of only finishing flakes, although part of an HBL chert cobble core was surface collected, suggesting this material may be more local than previously reported (Fox 1975: 36). In addition, a pooled sample of wood charcoal from a hearth feature with associated HBL flakes yielded a Late Archaic date of 2300 ± 125 B.P. (S-2426). An HBL chert scraper had been previously reported from the nearby Crane site, associated with a large tachnite biface preform cache (W. Ross pers. comm.). A Late Archaic date was also obtained on this component suggesting HBL usage may be associated with Late Archaic components, not Paleo-Indian.

Knife Lake siltstone (previously referred to as felsite in Fox 1980), occurs at Cummins (as is so far known) only as finished tools (Fox 1980), including Plainview points. A heavily water-worn flake knife of Knife Lake siltstone was recovered from the lower gravels in our 1983 excavations, indicating this material was utilized by early occupants. High quality beach cobble jasper tachnite also appears to have been utilized by initial occupants on these Minong beaches, in contrast to the later components which contains more coarse grained lower quality bedrock tachnite. Use of beach cobble jasper tachnite has been reported at the adjacent Catherines site by Fox (1975).

Fox (1975, 1980) analyzed formal bifacial and unifacial tools and debitage samples from Lakehead Com-
plex sites, using both excavated and surface collected materials. Dawson (1983) analyzed Cummins site collections from the 1963 excavations as well as various surface collections. Fox found flakes from Cummins to be significantly larger than from most of the other sites, however, 1983 excavations suggest great variability in the discrete lithic scatters at Cummins, ranging from pressure flaking areas, to primary reduction workshops. Representative sampling is a real problem at massive sites like Cummins, caution must therefore be exercised in drawing conclusions based on analysis of surface collected materials from disturbed areas.

Regional Connections

Dawson (1983:25) indicates the tool kit at Cummins is the typical Plains Plano tool kit ca. 11,500 - 8000 B.P., however, trihedral adzes and other heavy chopper forms and steep edge-angle tools suggest woodworking activities. Trihedral adzes also occur to the west in late Agate Basin sites of the Caribou Lake Complex in Eastern Manitoba (Pettipas and Buchner 1983). The single component Sinnock site, a bison kill site at a Winnipeg River crossing, has been recently accelerator dated at ca. 8000 B.P. (L. Pettipas pers. comm.). The trihedral adzes and Agate Basin-like points from Sinnock are very similar to Lakehead types, however, they are made of local raw materials. Typologically early taconite artifacts do occur throughout the Boundary Waters area from Thunder Bay and Northern Minnesota to Southeastern Manitoba (Steinbring 1974, 1980); however, they may be manufactured of local drift jasper taconite rather than originating from the bedrock sources near Thunder Bay as previously inferred (L. Pettipas pers. comm.).

A wide range of Late Paleo-Indian points and sites have now been reported in this region along the southwestern edge of the Ontario Canadian Shield, northern Minnesota and southeastern Manitoba (Fox 1975, 1980; Reid 1980; Ross 1979; Shay 1971; Steinbring ibid.), and similar assemblages are known from northern Wisconsin (Salzer 1974). With increasingly warm arid conditions occurring in the early Holocene, the grassland fringe shifted east (McAndrews 1982) and the deciduous/conifer woodland with open areas was likely reasonable habitat for bison (McAndrews 1982). With bison kill sites of this time period at Itasca (Shay 1971) and Sinnock (Pettipas and Buchner 1983) and the presence of fossil bison at Kenora (McAndrews ibid.), the possibility exists that Lakehead area Paleo-Indian groups also used bison during a part of their seasonal round, in addition to caribou, beaver and fish. The presence of exotic lithics suggest widespread social interaction and/or trade among the groups in this area, similar to Paleo-Indian groups in other areas to the south, and in earlier times.

The diversity of recovered artifact types, and stratigraphy of the large Cummins site, indicate a long time span of occupation. Stratified Paleo-Indian sites are rare and very useful in constructing chronologies, as well as deriving paleoenvironmental information. The wet site component at Cummins should also provide valuable paleoecological information on this early Boreal Forest adaptation.

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FIGURE 1. Lakehead Complex archaeological site distribution.
FIGURE 2. Map of the Cummins site showing major beach ridges.
FIGURE 4. The Cummins site showing locations of excavations.
FIGURE 5. Map of Cummins site, Location 1, site of 1983 explorations.
PLATE 1. Vertical airphoto of Cummins site (1:18,000). Inner outlined area is fenced portion.

PLATE 2. Location 1, Middle Minong beach at Cummins (location marked in photo above).
PLATE 3. Examples of Lakehead area Plano points and fragments. Bottom center: Siltstone point base (Plainview point) from Cummins. Other specimens are taconite. Photo courtesy of William Ross, Thunder Bay, Ontario.

PLATE 4. Examples of Lakehead area Plano points and fragments. Top center: Siltstone point base (Plainview point) from Cummins. Specimen on far left is siltstone; all others are taconite. Photo courtesy of William Ross, Thunder Bay, Ontario.
PLATE 5. Large biface from Brohm site (DdJe-1). It is typical of specimens from area Plano sites.

PLATE 6. Sample of end scrapers from Cummins (DcJi-1). Large unifacial specimen (2nd from right) from below dune at WTT section. (1 cm grid)
PLATE 7. Point specimens recovered from 1983 Cummins excavations. Left, refitted fragments of preform; right top, untyped (resharpened) point; bottom right, partly completed preform tip with parallel flaking. All taconite.

PLATE 8. Graving spurs on debitage; bottom left and center, gravers on biface fragments. All taconite.