

## A Lake through Time: Archaeological and Palaeo-Environmental Investigations at Lake Temagami, 1985–1994

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(with contributions by John H. McAndrews and Ian D. Campbell)<sup>1</sup>

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*Surveys for precontact and historic sites, excavation of the multi-component Three Pines (CgHa-6) and Witch Point (CgHa-7) sites, and pollen coring of three bogs provide wide-ranging information on the changing cultural and natural history of Lake Temagami. Increased knowledge of changing palaeo-shorelines modifies interpretation of known sites and alters survey methodology. Survey first along and later inland from modern shorelines produced precontact campsites, lithic workshops, vein quartz quarries, and nineteenth- to twentieth-century Teme-Augama Anishnabai traditional use sites. Because of the topographic constraints of Lake Temagami, hunter-gatherers favoured those limited locations with well-drained, flat ground; protection from cold winds; and ease of shoreline access. Three Pines has shallow, compressed soils that are typical of precontact sites on the Canadian Shield, but a modified Harris Matrix analysis allows insights into the stratigraphic sequence of occupations from the Archaic to Modern periods. Site-significant landscape changes seem to have affected spatial patterns of site usage and potentially led to the loss of early components. In contrast to the results from the Three Pines site, preliminary results from the Witch Point site show deeper deposits, greater artifact densities, numerous cobble features, and lithic reduction activities. These structural differences relate to variation in site landscape, elevation, seasonality, and cultural usage. Late Woodland ritual behaviour, suggested by a dog burial and red ochre at the Witch Point site, is examined in the context of early post-contact accounts wherein rituals reinforce group alliances.*

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### Introduction

This paper presents a chronological overview of archaeological and palaeo-environmental research conducted at Lake Temagami between 1985 and 1994 (Figure 1). Fieldwork involved the 1986 excavation of the multi-component Three Pines (CgHa-6) site (Gordon 1986, 1987, 1989, 1990a, 1990b, 1990c, 1991a, 1991b), palynological and palaeo-hydrological research on Lake Temagami in 1987 and 1991 (Gordon 1989, 1992; Gordon et al. 1992; Gordon and McAndrews 1992), and excavations at the Witch Point (CgHa-7) site in 1993 and 1994 (Gordon 1993, 1994a, 1994b, 1995a, 1995b).

What ties this diverse work together? The first tie is the research narrative: the interweaving of

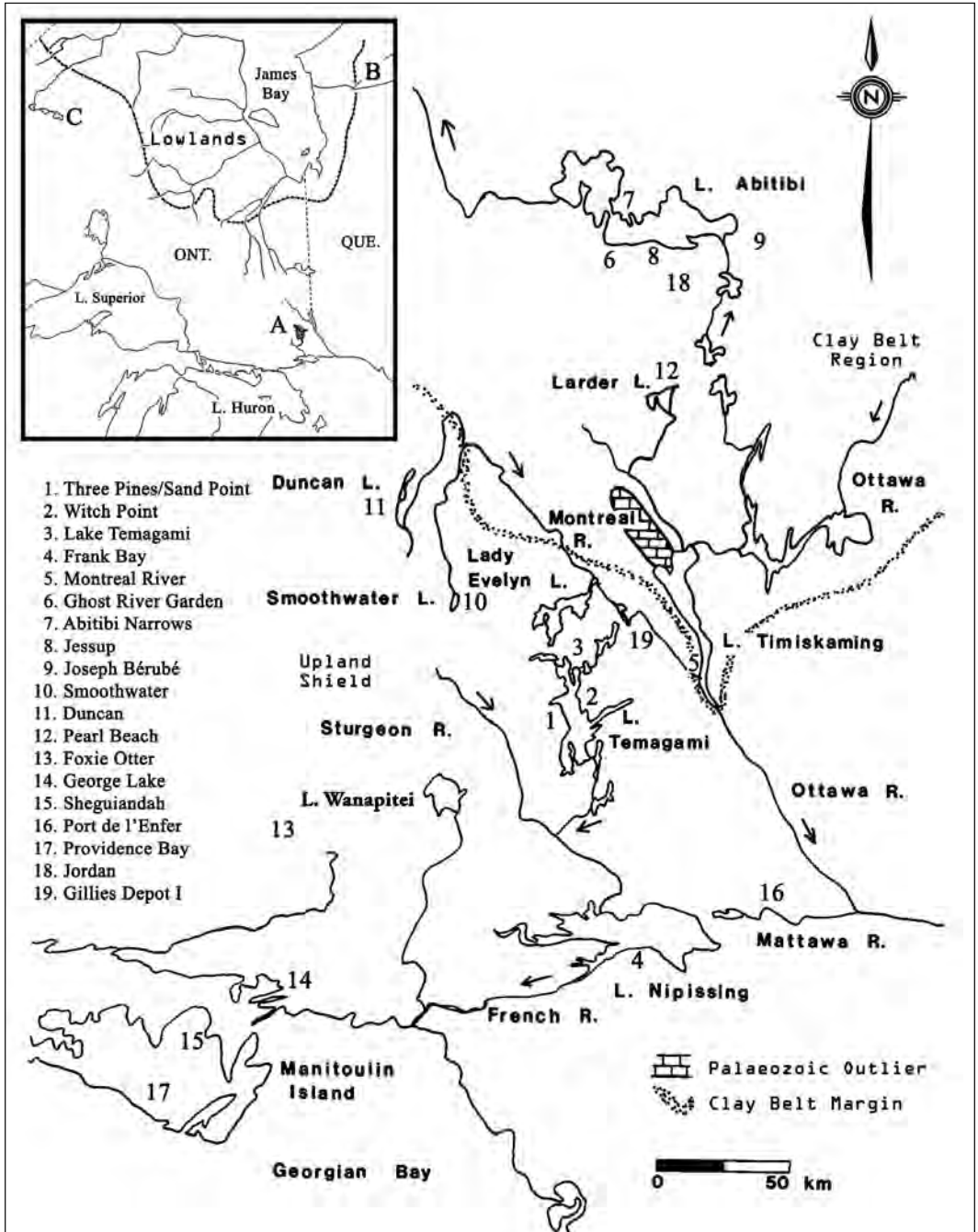
clues that connect questions arising from one project to further investigations in the next. For example, a Harris Matrix stratigraphic analysis of the Three Pines site indicated that some Archaic period occupations were marginally closer to the shore than nineteenth-century ones, suggesting

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<sup>1</sup> The analysis and writing of this paper were conducted largely by Gordon, but the paper incorporates field investigations and analysis by McAndrews in the sections entitled “Mid-Holocene Lake Transgression: Evidence from the Three Pines Bog” and “Vegetation and Climatic History of Lake Temagami” and by McAndrews and Campbell in the section entitled “Palaeo-hydrological Investigations at Lake Temagami: Implications for Precontact Site Location.”

changing water levels. This interpretation was confirmed by a pollen core from the adjacent Three Pines Bog, which showed a substantial lake

level rise of 4 m over the past 7,500 years. This finding led to the field-testing of a predictive model of palaeo-shoreline location, involving the



**Figure 1.** Northeastern Ontario Drainage Systems and Key Archaeological Sites  
(Inset: Locations of (A) Lake Temagami Study Area (B) Lac Washadimi, Qué. (C) North Caribou Lake).

coring of three additional bogs as well as some inland archaeological survey. It also led to choosing a higher-elevation site, the Witch Point site, for excavation, to add to the developing sequence of occupation for Lake Temagami.

The second interconnecting factor is the “landscape context/stratigraphic approach” (Gordon 1991a, 1991b), which integrates the methodological work of Edward Harris (1979a) in stratigraphy, Karl Butzer (1982) in geoarchaeology, and Michael Schiffer (1987) in site formation processes. This approach focuses on the natural and cultural formation processes that have interacted to create the archaeological site and its landscape setting over time and incorporates such geoarchaeological studies as geology, geomorphology, pedology, and microstratigraphy. These broader lines of inquiry complement formal artifact analyses.

The discussion also integrates ethnographic, historical, and oral history information to aid in the interpretation of cultural formation processes in the precontact, historic, and modern periods. Gordon’s archaeological research at Lac Washadimi in northwestern Québec (Chism 1978; Gordon 1980; Tanner 1978a, 1978b) and at North Caribou Lake in northwestern Ontario (Gordon 1985, 1988a, 1988b) was conducted in conjunction with ethnographic and ethnoarchaeological studies, working with both Cree and Ojibway families (see Figure 1 inset). The insights gained into the subsistence, locational, and material usage strategies of these modern hunter-gatherers have strongly influenced the overall project approach to the archaeological record of Lake Temagami. In 1994, former Chief and *Teme-Augama Anishnabai* Elder William (Bill) Twain of Bear Island showed Gordon many traditional use sites, sharing his knowledge of the history of the “Deep Water by the Shore People”. This information has helped interpret site selection criteria based on the landscape context of surveyed sites and elucidate differences in seasonal use between the Witch Point and Three Pines sites. It has also suggested possible interpretations of social factors underlying evidence for Late Woodland ritual behaviour at the Witch Point site.

These different projects together reveal a research trajectory, an expanding focus of inquiry in space and time. Here a visual analogy is useful, one of ever-broadening, concentric rings from an artifact in its stratigraphic context (Three Pines Harris Matrix analysis); to the archaeological site, first in its local landscape context (Three Pines baymouth bar and bog); then in its regional environmental context (palaeohydrology of Lake Temagami); and, finally, hunter-gatherer behaviour in the context of the human ecosystem (site selection criteria; Late Woodland ritual evidence and alliance formation).

### Natural and Cultural Setting

Lake Temagami is a deep lake with good fishing and a diversity of shoreline features, and it would have been attractive to precontact and historic hunter-gatherers. It is connected to three drainage systems and to north–south travel routes (Figures 1 and 2). From Diamond Lake to the north, one enters the Montreal River drainage into Lake Timiskaming and the Ottawa River system. One can also reach Lake Timiskaming eastward through the Matabichuan system. Through Cross Lake to the south and the Temagami River, there is access to the Sturgeon River drainage, Lake Nipissing, the French River, and Lake Huron. Several of these routes were well known in the early post-contact and fur trade periods (Heidenreich 1971; Mitchell 1977). The height of land marking the drainage divide between the Great Lakes and Hudson Bay is 130 km to the north.

Lake Temagami’s shoreline is relatively undeveloped in terms of mining, hydro-electric generation, and construction. It is mostly Crown land with restricted road access. Cottage building is confined to the 1,200 islands. During this fieldwork, development was slowed by legal cautions on land titles filed in 1973 by the Bear Island Foundation (Court Judgments 1984; Hall 1990; Potts 1989). Land claims had also generated much local interest in heritage matters and support of archaeological and ethnoarchaeological research. While archaeological resources had been documented (Boyle 1900; Conway and Conway 1989; Dewdney and Kidd 1967), there was, and still is, great potential for in-depth exploration.

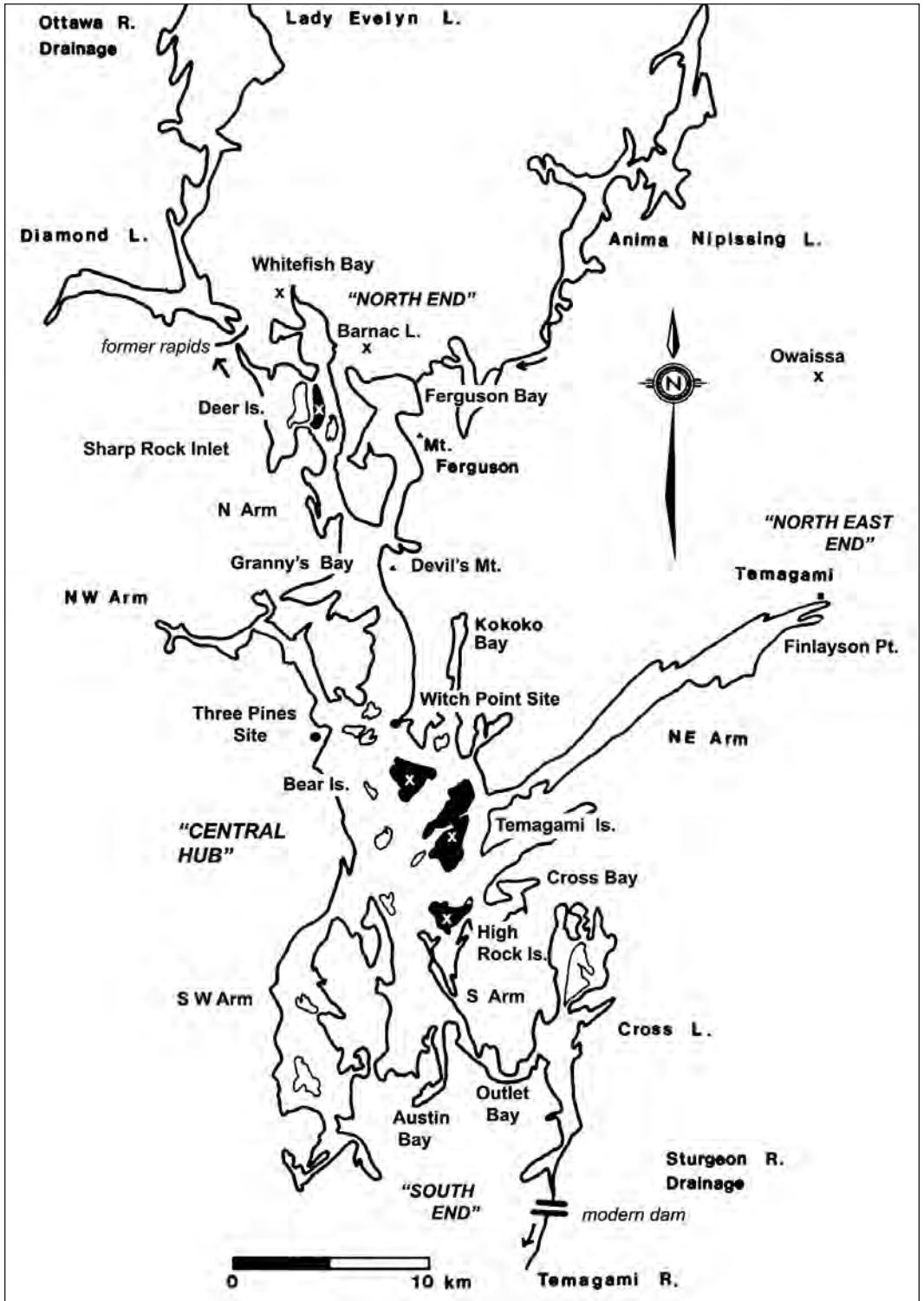


Figure 2. Lake Temagami - Key Locations (Note: only the largest of the 1,200 islands are shown).

### Bedrock Geology

Bedrock and surficial geology define the configuration of the lake and its varied landforms. Table 1 presents a lithologic column for Lake Temagami (Gordon 1990a) and possible primary and secondary sources of lithic raw materials used by precontact tool-makers, identified by sedimentary geologist Geof H. Burbidge (1988).

Lake Temagami lies at the junction of all three structural provinces of the Precambrian Canadian Shield: the Superior, Southern, and Grenville provinces (Burbidge 1988; Hewitt and Freeman

1978; Simony 1964). Oldest are the Superior Province rocks (Archean >2.5 bya) formed in a “marine environment with volcanism and sedimentary activities” (Hewitt and Freeman 1978:75). In the Temagami area, Superior Province rocks comprise mostly metamorphosed volcanics.

In the Early Proterozoic (2.5 bya), Huronian rocks of the Southern Province formed. These sedimentary rocks underwent repeated folding, faulting, and metamorphosis (Hewitt and Freeman 1978). Two of the four Huronian

**Table 1.** *Lithologic units, Lake Temagami area (after Gordon 1990a). Numbers in parentheses refer to lithic raw material sources for tools recovered from the Three Pines site. (1) light grey, fossiliferous “local” chert nodules in glacial deposits; (2) well-rounded cobbles of hard granitoid and sandstone, pottery temper; (3) mafic gneiss; (4) vein quartz, pottery temper; (5) metamorphosed olive-grey quartz siltstone; and (6) mudrocks (mudstones, mudshale, claystones, clayshales), wackes and low metamorphic grade sandstone.*

Phanerozoic			
Cenozoic			
	Quaternary Period		
	Glacial deposits: unconsolidated sand and gravel (1, 2)		
	-unconformity-		
Palaeozoic			
	(Lake Timiskaming)		
	Temiscaming Outlier: limestone, dolostone (1)		
	Silurian Period	Thornloe Formation (1)	
Precambrian			
Late Proterozoic			
	Grenville Province: gneisses, metagranitoid rocks (3)		
	-Grenville Front-		
Early Proterozoic			
	Nipissing quartz diabase (4)		
	-intrusive contact-		
	Southern Province		
	Huronian Supergroup		
		Cobalt Group	
		Bar River Formation (5)	
		Gordon Lake Formation (5)	
		Lorrain Formation (2, 5)	
		Gowganda Formation (6)	
			Firstbrook Member
			Coleman Member
	-unconformity-		
Late Archean			
	Superior Province: metagranitoid, metavolcanic, metasedimentary rocks		

Supergroup formations outcrop in and near Lake Temagami. These are the Lorrain and Gowganda Formations. The slightly metamorphosed sedimentary rocks (mudrocks, sandstones, slates, and conglomerates) of the Gowganda Formation comprise more than half of Lake Temagami's bedrock exposures (Burbidge 1988:1).

Around 2.2 billion years ago, molten igneous rock from the mantle intruded into the Superior and Southern province, creating Nipissing Diabase dikes and sills (Hewitt and Freeman 1978).

In Lake Temagami, Nipissing Diabase, which occurs in the form of dikes of various sizes up to several hundred metres is the second most exposed bedrock type after the Gowganda Formation. Because the Nipissing Diabase is relatively more resistant to erosion than the softer rocks of the Gowganda Formation, it forms most of the high land, ridges, lookouts and steep waterside cliffs [Burbidge 1988:2].

The highest peak, Mount Ferguson, at 582 m asl, is an example of a dike, as is High Rock Island (Simony 1964). Nipissing Diabase includes veins of milky quartz, several of which are found on the east-central and west-central mainland of the lake (Simony 1964).

About 1 billion years ago, in the Late Proterozoic, the Grenville Province formed. The uplifted Grenville Front, which marks the boundary with the Southern province, lies just south of Lake Temagami (Hewitt and Freeman 1978). "Composed primarily of hard competent gneissic and granitic rocks, the Grenville province rocks do not outcrop in Lake Temagami but are found in the lakes and waterways to the south, such as the Temagami River" (Burbidge 1988:2).

At the head of Lake Timiskaming, 70 km to the northeast, is the Temiscaming Outlier (see Figure 1) of Palaeozoic (440 mya) sedimentary limestones, dolomites, and shale rock that underlie the Hudson Bay Lowlands and the Clay Belt north of Lake Temagami (Lovell 1977; Lovell and Caine 1970; OMNR 1978). This outlier contains a grey-and-tan-coloured, soft fossiliferous chert in

its Silurian Thornloe Formation (Hewitt and Freeman 1978). Glacial ice moved south-southwest in this area and deposited material from the Temiscaming Outlier onto the Precambrian bedrock. Large pockets of carbonate-rich till are found around the Northeast Arm of Lake Temagami and in the lower Montreal River (Veillette 1989). "Pebbles and cobbles of a porous, light coloured fossiliferous chert are quite common on beaches in Lake Temagami [...] and may come from this Temiscaming outlier" (Burbidge 1988:2).

### *Surficial Geology*

In contrast to the Little and Great Clay Belts farther north, Lake Temagami is on the upland Canadian Shield, characterized as "moderately rolling thin till over bedrock with local morainic deposits and outwash" (Boissonneau 1968:98). The continental ice sheet eroded the Precambrian Shield, leaving glacial tills and moraines (Boissonneau 1968; OMNR 1978). As the ice retreated from Lake Temagami about 12,000 years ago (Veillette 1988), meltwaters reworked these materials. Glaciofluvial deposits, such as outwash plains and eskers, consisting of well-sorted sand and gravel, cover a relatively small proportion of the region (OMNR 1978:14). According to Simony (1964:17) north-south trending eskers, which resemble tributaries of south-flowing streams, are the most important Quaternary deposits on the lake. The 1985 aerial reconnaissance of Lake Temagami confirmed that the distribution of sandy soils is limited. The broad outwash plain at Ferguson Bay at the north end, the Sand Point peninsula on the west-central mainland, the Witch Bay esker on the east-central mainland, and sandy deposits on islands, such as Bear Island and Temagami Island, are unusual features along otherwise rocky shorelines (Gordon 1990a).

### *Modern Drainage*

Lake Temagami is a narrow lake, oriented north-south (Figure 2). Its five long arms, 20 km each, radiate out from the locally named central "Hub." The mainland shoreline measures 592 km, and the lake's 1,200 islands add another 320 km (OMNR

1973). Total water area is 128 km<sup>2</sup>, with a maximum depth of 110 m (OMNR 1969). Interestingly, Lake Temagami drains in two directions. Before dam-building in the nineteenth century (Hodgins and Benidickson 1989), rapids at Sharp Rock Inlet provided a northern outlet. Water flowed into the Diamond Lake–Lady Evelyn Lake–Montreal River–Lake Timiskaming–Ottawa River drainage. The major modern outlet is south, through Outlet Bay and Cross Lake into the Sturgeon River–Lake Nipissing–Great Lakes drainage. The lake is 293 m asl, which can be raised to a maximum of 294.2 m asl by three modern control gates at the south end of Cross Lake (OMNR 1973; Randy Plant, personal communication 1988). During the 1991 survey, shoreline flooding was evident at the south end, with snags occurring in Cross Lake. Remnants of a 1900s dam (1.2 m high) were noted at the entrance to Outlet Bay (Gordon and McAndrews 1992).

### *Vegetation*

Lake Temagami lies 50 km south of the northern boundary between the Great Lakes–St. Lawrence Mixed Forest and the Boreal Forest (Liu 1990; OMNR 1978). Classified as the “Timagami Forest Region,” the predominant species are white pine, red pine, scattered white birch, and white spruce. Also common is a mix of birch, pine, and spruce with balsam fir and aspen. In certain locally protected areas, there is a scattering of hard maple, red maple, and yellow birch (OMNR 1973). While a skyline forest reserve has been maintained around the perimeter of Lake Temagami, the interior forest has been logged extensively.

### *Modern Cultural Setting*

Since the cessation of mining and logging, Lake Temagami is primarily used for recreation: canoeing, boating, fishing, numerous designated campsites, portages, year-round fishing lodges, a provincial park, and summer youth camps (Hodgins and Benidickson 1989). The small town of Temagami is located where Highway 11, the Ontario Northland Railway and the TransCanada Pipeline pass the Northeast Arm (Figure 2).

The Bear Island Reserve is located in the

Central Hub. Established as a reserve in 1971, it is home to many *Teme-Augama Anishnabai*. An older settlement, the Austin Bay site (CfHa-28), once occupied the South Arm (Pollock 1992; Gordon 1995b). Bill Twain identified the people as Algonquin, speaking a slightly different dialect than is spoken on reserves on Lake Nipissing and Lake Huron. He said that the people used to live “all over the lake,” travelling extensively to such places as Mattagami and Gogama to the north, Lake Nipissing to the south, and beyond (Gordon 1995a:11). Craig Macdonald’s (1993) *Historical Map of Temagami*, based on interviews with many older *Teme-Augama Anishnabai*, identifies a vast network of traditional place names, landmarks, and seasonal travel routes (Jenish 2006). In 1913, anthropologist Frank Speck (1915a, 1915b) interviewed Bear Island residents for his ethnographic monographs on family hunting territories in the Temagami-Temiskaming area (Feit 1993). Through genealogies, oral histories, and historical documents (Potts 1989), some of which were compiled for the Bear Island Foundation court cases (Court Judgments 1984, 1991, 1999; Hall 1990; McNab 1999, 2009; McNeil 1990), the *Teme-Augama Anishnabai* have shown a long-time connection to the lake and surrounding area, which they refer to as *n’Daki Menan*—Our Land.

### **Previous Archaeological Research**

At the time of my fieldwork, in the vast area between Lake Nipissing and Lake Abitibi, only a dozen precontact site excavations had been fully reported (Figure 1). Researchers focused on the largest lakes—Nipissing, Timiskaming, and Abitibi—following Frank Ridley’s pioneering survey and excavation work between 1948 and 1962. Major, documented excavations include the Frank Bay site (CbGw-1) on Lake Nipissing (Brizinski 1980; Brizinski and Savage 1983; Ridley 1954) and the Montreal River site (CgGu-1) on Lake Timiskaming (Knight 1977; Ridley 1956, 1957, 1966). Ridley also excavated several sites on the western half of Lake Abitibi, including the Ghost River Garden and Abitibi Narrows sites (Ridley 1956, 1958, 1963, 1966). This large lake

in the Great Clay Belt straddles the Ontario–Québec border. It is known for its quarry sites, such as the Jessup site (DdGw-2) (Kritsch-Armstrong 1982), associated with the Mt. Goldsmith quarry (Pollock 1984), and a large habitation site in Québec, the Joseph Bérubé site (DdGt-5) (Marois and Gauthier 1989). Pollock's (1975, 1976) excavations on several smaller lakes included the Smoothwater Lake site (CiHd-1), the Duncan Lake site (CiHf-2), and the Pearl Beach site (DaGv-1) on Larder Lake (Noble 1982; Pollock 1976). Hanks (1988) dug the Foxie Otter site (CdHk-3) on Fox Lake in the Spanish River drainage to the southwest.

Questions of cultural identification and cultural chronology through descriptions of artifact variability characterize much of this work (Brizinski 1980; Hanks 1988; Knight 1977; Pollock 1976). Syntheses of the Shield Archaic tradition (Wright 1972a), of archaeological sequences for northeastern Ontario (Pollock 1975; Ridley 1966), and of Larder Lake (Noble 1982) have been presented. The authors themselves caution that these are based on limited data and are subject to revision (Noble 1982; Pollock 1975, 1976, 1984; Wright 1972a, 1972b, 1979).

The first published finds from the Lake Temagami area include reports of a weathered knife, a slate axe, and a birch bark canoe (Boyle 1900:6, 1904:63, 1905:27), as well as rock painting sites (Dewdney and Kidd 1967:92-93; Phillips 1907). Between 1975 and 1985, surveys were conducted by the provincial government's regional archaeologist for northeastern Ontario, Thor Conway. Based on archaeological site records maintained by the Ontario Ministry of Tourism, Culture and Sport, Conway registered 48 sites: 22 rock paintings, 13 precontact lithic sites, and 13 sites dated to the nineteenth to twentieth century sites. These latter sites include the Hudson's Bay Company post on Bear Island, burial grounds on Temagami Island and High Island, historic or modern camps, a sugarbush site, religious sites, and an area of defensive pits used against the Iroquois. Additional rock paintings, quarry sites, and habitation sites were recorded on Obabika Lake just west of Lake Temagami (Conway 1984; Conway and Conway 1989:35). Short-term

salvage work was done at the Sand Point site (CgHa-1) in 1978 and 1981 (Conway 1986). From salvage excavations at the Witch Point site in 1982, Conway identified five components, including Middle Archaic, Late Archaic, Middle Woodland, Late Woodland, and Historic period occupations (Conway 1982; Smith 1983). Subsequent fieldwork has included the excavation of the Lake Temagami site (CgHa-2) at Ferguson Bay (Carscallen 1994a, 1994b), heritage resource surveys for the *Teme-Augama Anishnabai* (Pollock 1992; Pollock and Koistinen 1993) and rock art studies (see Zawadska, this volume).

### Fieldwork at Lake Temagami, 1985–1994

In July 1985 a preliminary boat survey of the Central Hub and a Cessna overflight of the entire lake were conducted (Figure 2). The Three Pines site on the west-central mainland was excavated over eight weeks in July and August 1986. Six new sites, comprising lithic scatters, a vein quartz quarry, and an associated workshop site, were also recorded (Gordon 1986, 1987, 1990a, 1990b, 1990c, 1991a).

In June 1987, McAndrews and Gordon extracted a pollen core from the Three Pines Bog. In August of 1987, Gordon collected off-site soil samples at Three Pines, which were analyzed by Burbidge (1988), a sedimentary geologist also conducting doctoral research on Lake Temagami. A short survey at Cross Bay added two new lithic sites (Gordon 1989, 1990a, 1990b, 1991a).

To test palaeo-hydrological reconstructions by Campbell (Gordon et al. 1992), the 1991 fieldwork focused on two predicted palaeo-outlets. In July, a pollen core was extracted from Bear Bog near Sharp Rock Inlet to the north. At this time, minor archaeological survey and a brief visit to the southern Outlet Bay were also conducted. In August, short interior surveys were undertaken at the north end of the lake (Barnac Lake and Ferguson Bay) and, on contract, along the TransCanada Pipeline in the town of Temagami. In November, two more pollen cores were obtained from Baseball Bog and Jessie Fen at the end of the Northeast Arm (Gordon 1992; Gordon et al. 1992; Gordon and McAndrews 1992).



Excavation of the large Witch Point site on the east-central mainland occupied five weeks in 1993 (Gordon 1993, 1994a, 1994b) and seven weeks in 1994 (Gordon 1995a, 1995b). With the guidance of Bill Twain, rock painting sites, quartz veins, the old Austin Bay settlement, nineteenth-century cemeteries, and a nineteenth-century trading outpost were further documented (Gordon 1993, 1994b, 1995a, 1995b).

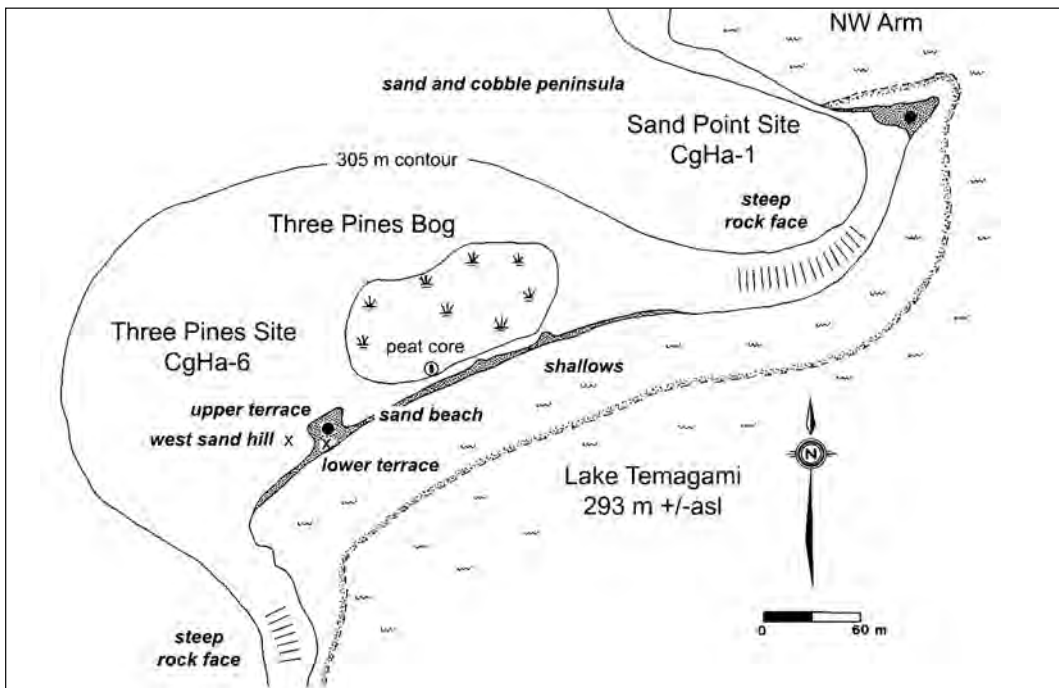
### The Three Pines Site: Applying a Harris Matrix Stratigraphic Analysis

Excavation and analysis of the Three Pines site was undertaken as doctoral research at McMaster University (Gordon 1990a, 1991a). At that time, there was no example of a Harris Matrix stratigraphic analysis (Harris 1979a) of a shallow, northern forest, precontact site. According to John Triggs (personal communication 2012) it has subsequently been adopted as a standard excavation and analysis technique by Parks Canada, the Ontario Heritage Trust, and Wilfrid Laurier University Field School. The Harris

Matrix is now used worldwide, often combined with computer-based analyses (e.g., Harris et al. 1993). However it is still not well known as an analytical technique for precontact Ontario sites. For this reason, the methodology is explained in detail. Natural versus cultural modifications to the soils are distinguished through a comparison of on-site and off-site soil samples. This comparison is followed by a step-by-step description of how the Harris Matrix was specifically applied to Three Pines site, with full examples of 3 of the 24 stratigraphic columns. A sequence of occupations is described “top down” as the site itself is encountered, from the modern present to the precontact past. Evidence for lithic raw material change between the Archaic and Woodland periods is also summarized.

#### *Modern Landscape Setting*

The Three Pines site is located on the west-central mainland, near the entrance to the Northwest Arm (Figures 2–5). Here a broad peninsula, composed of sand and gravel to the north and sand to the south, juts into the lake (Simony



**Figure 3.** Locations of the Three Pines site (CgHa-6), Three Pines Bog and Sand Point site (CgHa-1), west-Central Hub of Lake Temagami.

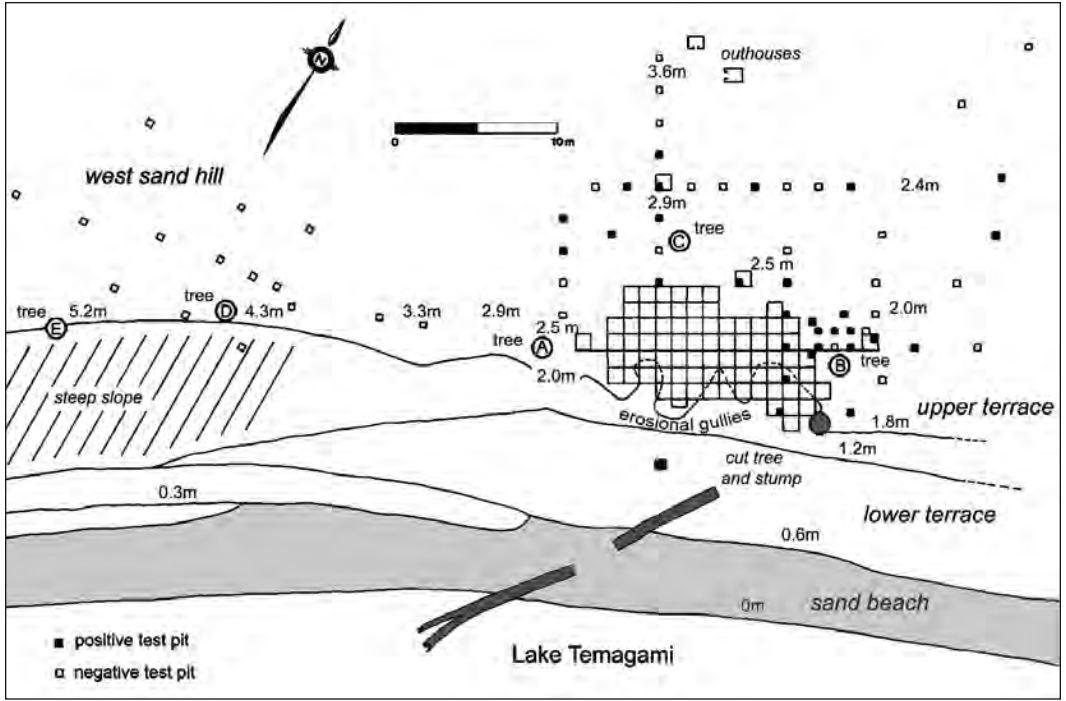


Figure 4. Three Pines site Test Pits, Elevations and Excavation Grid.

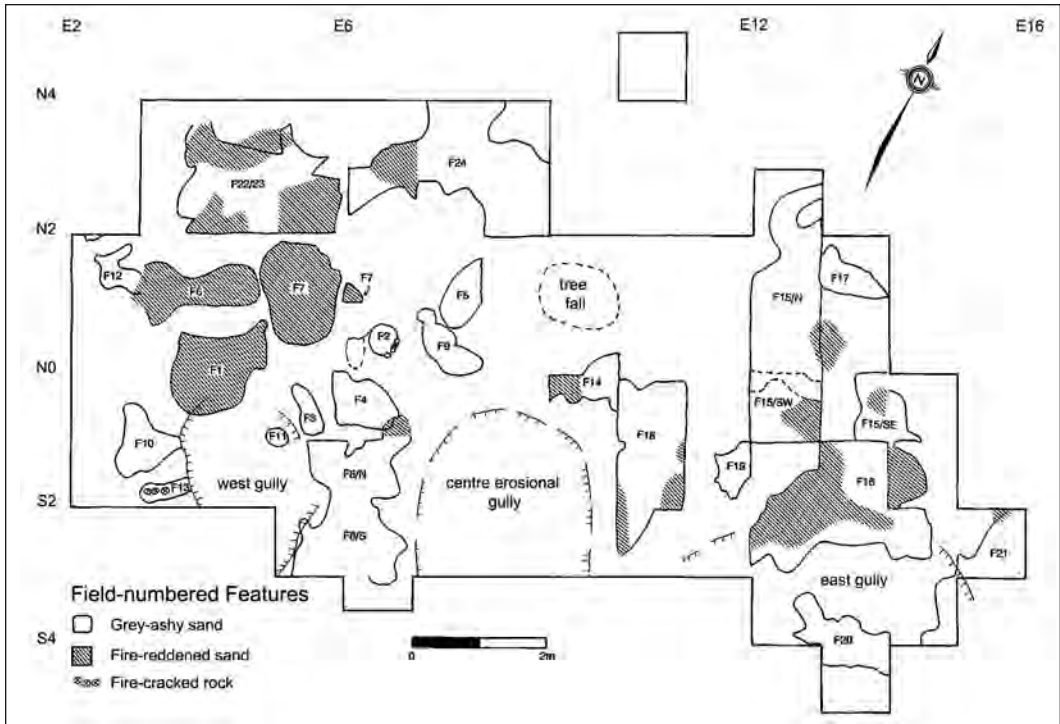


Figure 5. Three Pines site – View from the lake north-west to lower terrace and excavation on upper terrace, showing west and central erosional gullies.

1964). The site is found at the southwest corner of the peninsula. It comprises two flat sand terraces, separated by a 0.5 m erosional face (Figures 4 and 5). The lower terrace extends from the sandy beach to the erosional face. The upper terrace slopes from 1.9 m (above the lake) at the erosional face northward to 3.6 m, then it drops sharply. Immediately west of the site, the land rises to the west sand hill (5 m above the lake). To the east is a low-lying sphagnum peat bog. Farther east is a high bedrock dome, then a triangular sand spit, on which is situated the Sand Point site (CgHa-1). A 5 m wide sand beach stretches the 288 m from the west hill to the rock dome, where it becomes a narrow cobble strand (see below, section titled Baymouth Bar Formation).

#### Upper Terrace Description

Initial test pits on the west hill and eastern beach berm were negative. However, surface finds of lithic flakes were visible on the upper terrace. Along the lake side of the upper terrace is a grass-covered clearing measuring 25 m by 12 m. Three erosional gullies, used as pathways from the beach,



**Figure 6.** *Three Pines site - Distribution of Field-designated Features (Detailed analyses of F15N/17, F7 and F4 in text).*

cut into the upper terrace, while shrubs have stabilized other sections. The clearing is encircled by three 150-year-old white pine trees, which have been scorched by forest fire, along with shrubs, conifers, and hardwoods. Marked as a “Day Use Only” recreational area, the site is used for picnics, swimming, boating, and occasional overnight camping. The first impression was that these modern activities and natural erosion may have destroyed precontact traces. However, beneath the grass and coarser sand of the grey-brown “overburden” were discrete areas of compacted grey ashy sand and/or fire-reddened sand, in contrast to the looser texture of the yellow-brown sand substrate. These were labelled as features because they contained high concentrations of precontact artifacts (Figure 6).

#### *Excavation Methods*

On shallow sites where I had worked previously, one metre square units were employed for horizontal control and natural soil horizons for

vertical control (Gordon 1980, 1985). Whereas, researchers in northeastern Ontario have used 1.5 m units (5 ft squares) for horizontal control and used arbitrary levels ranging from 4 cm to 12 cm deep for vertical control (Brizinski 1980; Knight 1977; Pollock 1976; Ridley 1950-53). For the Three Pines site, excavation procedures and standardized recording forms followed those developed by C.S. “Paddy” Reid for the Ontario Heritage Branch in northwestern Ontario (e.g., Hamilton 1981), a methodology learned at the Forestry Point (EgK1-1) site (Pelleck 1983). They are described in detail, as this precise recording made it possible to later conduct a formal Harris Matrix stratigraphic analysis of the Three Pines site.

The 1 m squares were subdivided into quadrants. Where specific features were designated in the field, quadrants were further subdivided as inside or outside the feature. Units were opened in a checkerboard fashion, allowing for vertical profiles of features bisected by grid lines.

Additional profiles were taken at regular intervals.

Vertical control was in 3 cm increments below surface (Level I: 0–3 cm; Level II: 3–6 cm). These “levels” were not analytical units; they were simply a method to plot and bag recoveries by square, quadrant, feature, and 3 cm level. Standard square plans were used for each level. Soil colour, soil texture, and fire-cracked rocks were mapped and photographed at the surface of each 3 cm level. Any soil changes within the level were indicated in the square plan notes. All lithics, ceramics, faunal bone, and other finds were individually plotted using a standard legend. Spot depth below surface was measured for each lithic tool and ceramic rim using a string and line level. All excavated soil was screened through ¼" (6 mm) mesh. Screen recoveries were counted and recorded in the notes.

Excavation units were dug down until one completely sterile level was removed, usually 12–15 cm deep. To confirm site depth, three test pits were dug within the main block to a depth of two metres. All three were sterile below 15 cm, with a sandy C horizon (parent material) at 40 cm deep; no buried soil horizons, bedrock, or ground water were encountered.

**Table 2.** *Three Pines site distribution of artifacts by subcategory.*

		f.	%
Faunal bone		(6,584)	(43.8)
	calcined	6,581	
	non-calcined	3	
Lithics		(6,095)	(40.5)
	debitage	5,856	
	tools	239	
Pottery		(1,377)	(9.2)
	sherdlets/exfoliate	1,027	
	body sherds	326	
	rims	24	
Modern		(956)	(6.4)
	metal	520	
	glass	270	
	plastic/other	157	
	ceramic	9	
Historic		(22)	(0.1)
	clay ball pipes	17	
	gunspalls/gunflints	3	
	decorative metal	2	
Total		(15,034)	(100.0)

Over eight weeks, a total of 82.5 excavation units were dug on the upper terrace, as well as 47 test pits (0.5 m x 0.5 m) around the main block. Including other test pits at the west hill (13),

**Table 3.** *Three Pines site distribution of faunal bone identifications (after Prevec 1987).*

		f.
Clam		
	Unionidae	2
Reptile		
	pond turtle	3
Bird		
	common loon	1
	ruffed grouse	2
Mammal		
	beaver	778
	wolf or dog	5
	black bear	7
	marten	1
	white-tailed deer	41
	moose	10
	unidentified mammal	5,722
Class unknown		12
Total		6,584

**Table 4.** *Three Pines site distribution of lithic tool classes.*

	f.	%
Scraper	66	27.6
Biface	32	13.4
Retouched flake	28	11.7
Pebble netsinker	19	8.0
Flake knife	18	7.6
Projectile point	15	6.3
Utilized flake	14	5.9
Large utilized flake	13	5.4
Celt	9	3.8
Uniface edge	7	2.9
Hammerstone	4	1.7
Battered item	3	1.3
Graver	2	0.8
Utilized cobble/celt	2	0.8
Axe	2	0.8
Abrader	2	0.8
Grinding stone	1	0.4
Utilized pebble	1	0.4
Polished pebble	1	0.4
Total	239	100.0

**Table 5.** *Three Pines site distribution of lithic tools by raw material.*

	f.	%
Hudson Bay Lowland chert	70	29.3
Mudrocks	45	18.8
Chert	44	18.4
Local chert	20	8.4
Vein quartz	16	6.7
Sandstone	14	5.8
Siltstone	11	4.6
Quartzite	5	2.1
Wacke	5	2.1
Clear quartz	4	1.7
Granitoid	3	1.3
Nipissing diabase	1	0.4
Gneiss	1	0.4
Total	239	100.0

**Table 6.** *Three Pines site distribution of lithic debitage by raw material.*

	f.	%
Conchoidal fracture (3,724)		(63.6)
	Hudson Bay Lowland chert	31.8
	Local and other "cherts" <sup>1</sup>	15.6
	Vein quartz	12.6
	Clear quartz	3.6
Sub-conchoidal fracture (2,132)		(36.4)
	Miscellaneous <sup>2</sup>	26.8
	Mudrocks	9.6
Total		100.0

<sup>1</sup> includes "local" cherts, indeterminate cherts, "chert-like" fine-grained siltstone, and fine-grained sandstone

<sup>2</sup> sample identified by Burbidge contains mudrock, medium-grained sandstone, non-conchoidal fracture wacke, gneiss, granitoid

beach berm (10), and lower terrace (2), a total area of 101.5 m<sup>2</sup> was opened. A total of 15,034 cultural items and 543 rock, soil, or organic samples were recovered (Tables 2–9).

#### *Natural and Culturally Modified Soils*

To determine cultural modification processes and natural soil development, 21 samples from a variety of "on-site" upper terrace contexts (Table 10) were microscopically examined and compared with an "off-site" soil profile and sediments from the west hill and lower terrace (Tables 11 and 12; Figure 7). A standard hummo-ferric podzol (Canadian Soil Survey Committee 1978) has developed on glacial outwash, which is the parent material for the west hill (Simony 1964). This type of soil is common in the mixed coniferous and deciduous forests of northeastern Ontario (Liu 1990). The light grey Ae horizon develops as dark organic material is leached out. The yellowish brown Bf horizon contains deposits of aluminium and iron brought down in solution by acidic rainwater (Birkeland 1984).

On-site soils vary greatly in distribution and thickness (Figures 8 and 9). The only constants are a surface and a Bf horizon. Podzolic soil

**Table 8.** *Three Pines site distribution of analyzed pottery.*

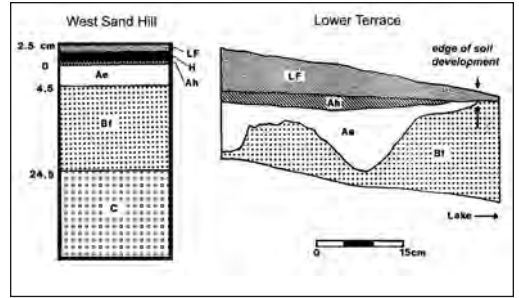
	f.	%
Body sherds (326)		
	decorated	141 40.3
	plain	138 39.4
	cord-marked	29 8.3
	indistinct decoration	18 5.1
Rims (24)	24	6.9
Total	350	100.0

**Table 7.** *Three Pines site distribution of lithic debitage by fracture category and raw material.*

Type of Fracture	Raw Material	Unmodified Flakes	Shatter	Decortication Flakes	Core/Core Fragments
Conchoidal fracture					
	HBL chert	1,318	257	264	22
	Local and other cherts	765	87	45	15
	Vein quartz	363	365	3	9
	Clear quartz	97	113	0	1
Sub-conchoidal fracture					
	Miscellaneous	989	508	70	2
	Mudrock	458	83	20	2
Total		3,990 (68.2%)	1,413 (24.1%)	402 (6.8%)	51 (0.9%)

horizons occur on the upper terrace, but with significant differences. These culturally modified soils include:

- 1) a layer of grey-brown coarser sand overburden with grass roots,
- 2) localized areas of hard-packed fine grey sand with and without ash, and
- 3) localized reddish soils with and without ash, with and without faunal bone.



**Figure 7.** Three Pines site - West Sand Hill and Lower Terrace Soil Profiles.

**Table 9.** Three Pines site distribution of rim and body vessels.

	f.	Design	Vessel Identifiers
<b>Rim vessels (13)</b>			
	8	Pseudo-scallop shell	A, B, C, E, F, J, L, Q
	2	Linear stamp	D, I,
	2	Cord-wrapped stick	G, H
	1	Dentate stamp	K
<b>Body vessels (4)</b>			
	1	Dentate stamp	M
	1	Plain base	N
	1	Cord-wrapped surface	O
	1	Linear/dentate stamp	P

**Table 10.** Three Pines site selected upper terrace soil samples.

Archaeological Description	Sample Identifier	Context	Soil Micromorphology	Munsell Colour
Litter and grass roots			L horizon	
Grey-brown overburden	Sample #19	S3E13/LI	poorly sorted, medium sand; moderate rock fragments 10–20%; high organic content 40%	Dark Grayish Brown 10YR 4/2
Dark brown decomposing organics			F and H horizons	
Dark grey sand with charcoal	Sample #14	FA8/11-Unit 4/LIII	poorly sorted, medium sand; sub-rounded; rock fragments 15–20%; organics 5–10%	Dark Gray 10YR 4/1
Grey ashy hard-packed sand	Sample #1	FA12-Unit 2/LIII	poorly sorted, medium sand; sub-rounded; trace rock fragments; clay/ash coating	Pinkish Gray 7.5YR 7/2
	Sample #16	FA8/11-Unit 5/LIV	poorly sorted, fine sand; sub-angular; rock fragments 10% ;organics 15%	Gray 10YR 5/1
Bright orange, fire-reddened sand with calcined faunal bone	Sample #2	FA6/LII	poorly sorted, fine sand; sub-rounded; rock fragments <5%; lots of haematite stain	Yellowish Red 5YR 5/8
Fire-reddened sand	Sample #18	FA16-Unit 9/LII	poorly sorted, fine sand; rounded; coated with iron oxide	Strong Brown 7.5YR 5/6

**Table 11.** *West hill “off-site” soil profile. Sand grains are sub-angular, indicating glacial outwash as parent material.*

Thickness (cm)	Soil Horizon	Soil Micromorphology	Munsell Colour
2.5–1.5	L horizon	forest litter: pine needles, seeds, moss	
1.5–0	F and H horizons	partially decomposing organic matter; 95% organics	Dark Brown 10YR 2/2
0–0.5	Ah horizon, weakly developed	mixed organic and mineral; poorly sorted, fine sand	Dark Gray 10YR 4/1
0.5–4.5	Ae horizon; eluvial or leached horizon	poorly sorted, fine sand	Pale Brown 10YR 6/2
4.5–24.5	Bf horizon	iron oxides precipitated out; moderately sorted, fine sand	Dark Yellowish Brown 10YR 4/6
24.5–34.5+	C horizon	moderately sorted, fine sand	Light Yellow-Brown 2.5YR 6/4

**Table 12.** *Three Pines site lower terrace soil profile. Sand grains are rounded, indicating reworking by wave action.*

Thickness (cm)	Archaeological Description/Soil Horizon	Soil Micromorphology	Munsell Colour
10.0–3.0	Litter, grass and blow sand	moderately sorted, medium sand; high percentage of rock fragments	Dark Grayish Brown 10YR 4/2
3.0–0	Grey-brown overburden	moderately sorted, medium sand; 40% mudstone rock fragments; baymouth bar washover	Dark Grayish Brown 10YR 4/2
0–3.0	Buried Ah horizon	poorly sorted, medium sand; 70% organics	Very Dark Brown 10YR 2/2
3.0–6.0	Ae horizon	poorly sorted, medium sand	Grayish Brown 10YR 5/2
6.0–15.0+	Yellow-brown sand/Bf horizon	moderately sorted, medium sand; hydrated iron oxide gives colour	Olive Brown 2.5YR 4/4

The grey-brown “overburden” is attributed to several processes: a) wind-borne beach sand deposited on the upper terrace during strong prevailing southwest winds and b) beach sand tracked up by humans or transported to smother modern picnic fires, such as the large fire mound in the centre of the excavation block. These types of processes would result in the burying of underlying archaeological sediments. In the pathways and central area, the overburden results from c) human scuffing and d) natural erosion. These processes removed upper organic and mineral horizons. All these interacting processes presumably took place in the past.

Dark brown decomposing organics (F) and dark grey humus (H) horizons are found together

in the northwest section of the excavation. These natural podzolic soil horizons are associated with historic period artifacts. F horizons are generally absent in other areas of the excavation.

Discontinuous areas of hard-packed grey soils are not simply the light colour of the leached Ae soil horizon (Fenwick 1968). These fine sands reveal the creation and deposit of ash from high-temperature burning of organic matter, such as wood and faunal bone (Butzer 1982:82). When they are viewed microscopically, it is clear that ash and/or silt coats each sand grain. This grey to light grey sand and some red sands tend to have a high ash content. When trowelled, this compacted soil made a rasping sound, as if the sand grains were cemented together, while adjacent soil had a looser

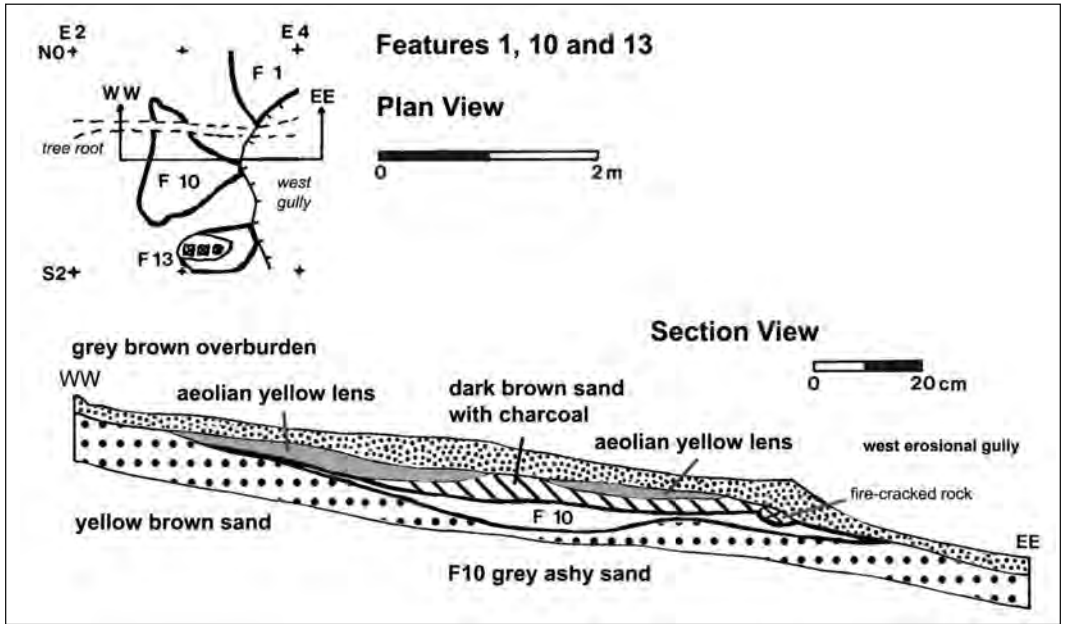


Figure 8. Three Pines site – Selected Soil Profile showing Field Feature 10 and west erosional gully.

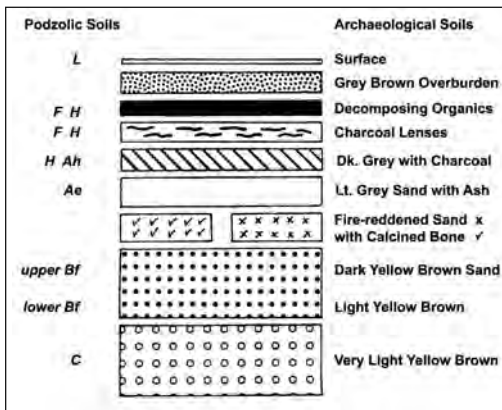


Figure 9. Three Pines site - Upper Terrace Composite Soil Column showing cultural modifications of natural podzolic sandy soils.

texture. Artifacts move less in this hard-packed matrix. Whenever hard-packed grey ashy soils were encountered, precontact artifacts were also recovered, and these soils are interpreted as hearth and living floor remnants.

Localized areas of reddened soil are sometimes, but not always, associated with areas of hard-packed grey ashy soils. These are not the natural, iron-rich Bf horizons (Fenwick 1968). They are redder in hue, are irregularly distributed, and often contain calcined animal bone. Under extreme heat, hydrated iron oxide naturally occurring in the soils may become dehydrated, creating a reddened appearance. These localized fire-reddened soils are considered the best evidence for hearth remnants at the Three Pines site. Those that contained calcined faunal bone fragments may represent the edges of former cooking and “disposal hearths” rather than the entire hearth area. The term “disposal hearth” comes from observations at Lac Washadimi, where Cree families cleaned up all animal bone and disposed of it in hearth fires, as a sign of respect for the animals (Gordon 1980; Tanner 1979). In the intense heat at the hearth centre, faunal bone is reduced to ash, while fragments are best preserved at the cooler edges. Camp fire experiments in 1986 tested and confirmed this hypothesis.



### *Natural and Culturally Modified Sediments*

For site formation processes, Butzer (1982) distinguishes among physiogenic, biogenic, and anthropogenic agents of archaeological sediments. The latter includes minerals and organics brought onto the site by its inhabitants, “residues [...] derived from alteration of human imports or human activity” and “minerals sediments due to acceleration of natural processes by human activity” (Butzer 1982:78). Along with wood ash, fire-reddened sand, and calcined faunal bone, noted above, the Three Pines site has other “sediments” brought onto the site, modified or used by precontact hunter-gatherers. These include lithic raw material, lithic knapping debitage, finished and unfinished tools, pottery, pottery temper, cobbles, rocks, and organic matter. The fire-cracked rock and rounded cobbles are “out-sized clasts” (Burbidge 1988), meaning they are too large to occur naturally in this sandy matrix. Additional lithic imports include feldspar fragments, granite, and diabase flakes similar to temper found in various pottery vessels; one small clay deposit probably introduced for pottery making; and some red ochre, or haematite fragments.

There are also naturally produced sediments from “physiogenic agents”: lenses of wind-blown sand, terrace edge erosion, tree root growth, charred wood from forest fires, root burning, root decay, and tiny rootlets dropping dark humus into underlying soils. Ground squirrels are a major “biogenic agent,” leaving visible burrows of mixed light yellow sand, often without artifacts.

### *Developing a Chronological Sequence*

The next question was how to organize these natural and culturally modified soils and archaeological deposits into a meaningful chronological sequence. I first considered artifact variability and regional artifact comparison and examined collections from a large number of sites located on surrounding lakes, such as Abitibi, Nipissing, and Timiskaming (e.g., Gordon 1989; Knight 1977; Marois and Gauthier 1989; Ridley 1950-53, 1958, 1966; see Figure 1). Only a few of the Three Pines lithic tools and decorated pottery rims matched artifacts from these distant sites in

terms of size, morphology, raw material, and manufacture. Artifact variability and inter-site comparison alone could therefore not offer a solid foundation on which to build a sequence of occupations.

Compiled site excavation maps for the Three Pines site showed that site-wide level by level, vertical comparisons were also problematic. No natural soil horizons or culturally modified soils or sediments were continuous across the site, except for the grassy surface vegetation and the yellow-brown Bf horizon. Artifact-bearing features were discrete. Modern disturbances were numerous. Human trampling and erosion had exposed subsurface layers in certain parts of the excavation. These factors complicated attempts to determine a chronological sequence by excavation level and depth.

Therefore, a new approach was undertaken using the Harris Matrix (Harris 1979a). At first glance, the Harris Matrix seems more suited to sites with clearly observable distinctions between architectural features and natural layers, because Harris (1975, 1977, 1979b) originally formulated and applied his stratigraphic approach to a United Kingdom site with Roman to Mediaeval architectural features and occupations. But excavators of shell middens in New Brunswick (Black 1991) and a rock shelter site in Washington State (Stucki 1993) had also had some success with this method.

The Harris Matrix method, using his terminology (Harris 1975, 1977, 1979a, 1979b, 1989), involves:

- 1) identifying both human-made and natural units of stratification;
- 2) determining the stratigraphic relationship of each unit based on the Laws of Superimposition, Original Horizontality, and Original Continuity; and
- 3) translating those relationships into a schematic box diagram called a “Harris Matrix” by applying the Law of Stratigraphic Succession.

Individual units of stratification, such as unmodified soil layers, architectural structures, or

deposits of objects, are identified and subsequently represented by a single numbered box. Harris (1977, 1979a) also includes interfaces between layers, for example, the outline of an intrusive pit becomes a unit of stratification separate from the pit fill itself, as they represent two sequential events. The stratigraphic relationship of a single unit is illustrated in one of four ways: a unit is above, is below, equals or correlates to, or has no stratigraphic relationship with other units. The resulting sequence of stratification is based *only* on the physical context of the site, that is, independent of and constructed without reference to the artifactual contents (Harris 1979a:116). This strategy is used because formation processes are different on each site, such that the stratigraphic sequence of a site is unique and cannot be determined beforehand. It then serves as a baseline for the relative temporal sequence of events. Only after the Harris Matrix is constructed are the artifacts incorporated into each unit. The stratigraphic sequence is then phased into different occupations by making artifact and absolute dating correlations between units within the site and ultimately with other sites (Harris 1975, 1977, 1979a, 1979b, 1989; Harris et al. 1993).

#### *Application of the Harris Matrix to the Three Pines Site*

Trying to build a single stratigraphic sequence by starting at one corner of the excavation rapidly proved too unwieldy. It was decided to subdivide the site into areas around each feature. These “field-numbered features” are excavation units, so designated because they were physically distinctive, discrete areas of deposition, separated by the yellow-brown substrate (see Figure 6). “Feature Area” (e.g., FA7) is an analytical term. It refers to the maximum area around each field-designated feature in which units of stratification could be identified, correlated, and presented without getting too complicated. In this way a multi-linear series of stratigraphic columns was constructed initially.

*Step 1: Unit Identification.* For each Feature Area, the analysis started with one soil profile, in which each unit of stratification (e.g., erosional slopes,

humus-filled pits, cobble deposits, fire-reddened soil etc.) was described and numbered. Adjacent profiles and square plans were then reviewed to see whether they contained the same units. If they did not, new units were added where necessary. Unit identification was assisted by additional information from field notes and, in particular, photographs.

All units including “disturbances,” were treated equally as integral parts of the cumulative temporal record of the site. Although Harris (1977, 1979a) defines layers, features, and interfaces—all quite useful distinctions on architectural sites—I simply used the generic term “units of stratification” for this shallow, sandy matrix. Numbering was also simplified. For example, pit interfaces were not used in the numbering of units, but the analysis was mindful of their role in determining spatial relationships.

*Step 2: Unit Spatial Relationships.* The next step was to determine the four spatial relationships of each unit to the others in the Feature Area. Does a unit lie above, lie below, equal or correlate to, or not stratigraphically correlate to the other units?

*Step 3: Feature Area Stratigraphic Column.* This step created a series of stratigraphic sequences, which are combined into one master Harris Matrix diagram for each Feature Area by eliminating clearly redundant relationships.

*Step 4: Interpreting Events.* Recurrent patterns began to emerge, making it possible to interpret what event or events may be represented by each unit of stratification (e.g., ground squirrel burrows, tent drainage ditches, post moulds, intrusive pits). Human-made pits and post moulds were more distinctive in the upper levels. An intrusive pit was identified as two events: the excavation and infilling of the pit.

With shallow soils and the probability of multiple short-term occupations, I did not assume *a priori* that any one unit of stratification could be equated with any single event, such as an “activity area,” or with any one cultural or temporal period of deposition. After years of weathering, any textural distinctions between multiple periods of

deposition or events within one unit of stratification may no longer be visible to the naked eye. Also, the distinction between lower-level sediments is as much a function of natural weathering as cultural activities—hence the decision not to use pit interfaces, as noted above.

*Step 5: Unit Artifact Contents.* The next step was to identify the artifact contents of each unit of stratification, using the plotted artifacts in the square plans.

Where a unit of stratification included more than one 3 cm vertical level, artifacts were separated by level. Again the same reasoning applies as above. A unit of stratification, which today looks undifferentiated, may represent years of deposition; hence the artifact contents are presented by depth. All modern material in the lower units was associated with pits, post holes, or root holes. Occasionally small lithic flakes and ceramic sherds were noted inside tiny, humus-filled rootlet holes in the yellow-brown Bf horizon, indicating some vertical movement of these small items.

*Step 6: Phasing Units.* During the examination of the contents of each unit, certain artifact patterns began to emerge and repeat across the stratigraphic columns for each Feature Area. This information was used to assign different units to broad temporal divisions, based on relative stratigraphic position, mass-manufactured modern or datable historic-period items, or the presence of different temporal pottery characteristics (e.g., Middle Woodland Laurel and Late Woodland cord-marked pottery). Archaic was assigned to units in the lowest stratigraphic units containing lithic raw materials and tool types different from those in the upper, ceramic-bearing units.

*Step 7: Site Sequence.* Where possible the multi-linear series of stratigraphic columns were stratigraphically correlated and phased across the site. In this way a relative temporal sequence of occupations for the Three Pines site was developed, with settlement features and associated artifacts separated out stratigraphically.

Absolute dating would be most helpful at this

step. Tiny flecks of charcoal were ubiquitous, especially in the grey ashy units, but to my eye it was unclear whether they derived from forest fires, tree root burns, cultural activities, and/or rootlet deposits of humus from upper levels. For this reason, samples were not submitted for radiocarbon dating, as their context was questionable.

#### *Stratigraphic Column for Feature Area 15N and 17*

As examples of the procedures that were followed, three of the 24 stratigraphic columns are described here in detail. Field feature 15N is a wide expanse of hard-packed grey ashy sand with large cobbles (see Figure 6 for location in excavated area). It measures 270 cm by 100 cm, ranging in thickness from 3 to 25 cm. The northwest margin is truncated by modern garbage pits and a rodent burrow. Modern hearths obscure the western margin, while Tree B's roots have blurred the southeastern margin. Field feature 17 to the east is mottled, dark to light grey with yellow sand, located beneath the tree roots. It is 12 cm thick, measuring 40 by 80 cm in area. For Feature Area 15N and 17, 12 units of stratification are identified, sequenced, interpreted, and phased (Figures 10–11; Tables 13 and 14).<sup>2</sup>

Unit 1 is the grey-brown overburden, thicker at the north end than the south. Among the modern camping and picnic debris is a sawn moose vertebra and a .257 rifle shell casing, suggesting moose hunting and butchering. Unit 2 represents the excavation and infilling of a modern garbage pit. It truncates the layers below with an oblique interface, indicative of sharp shovel cuts. Buried up to 40 cm deep are modern boating and food container trash.

Units 3, 4, and 5 represent soil layers in reverse

<sup>2</sup> Units of stratification in plan view may not appear in the profile illustrations, and vice versa. The illustrations can show only a portion of all the data used to develop the sequence. Plan views present the horizontal distribution of all artifacts from all levels. It is in the accompanying tables that artifacts are placed in their stratigraphic context.

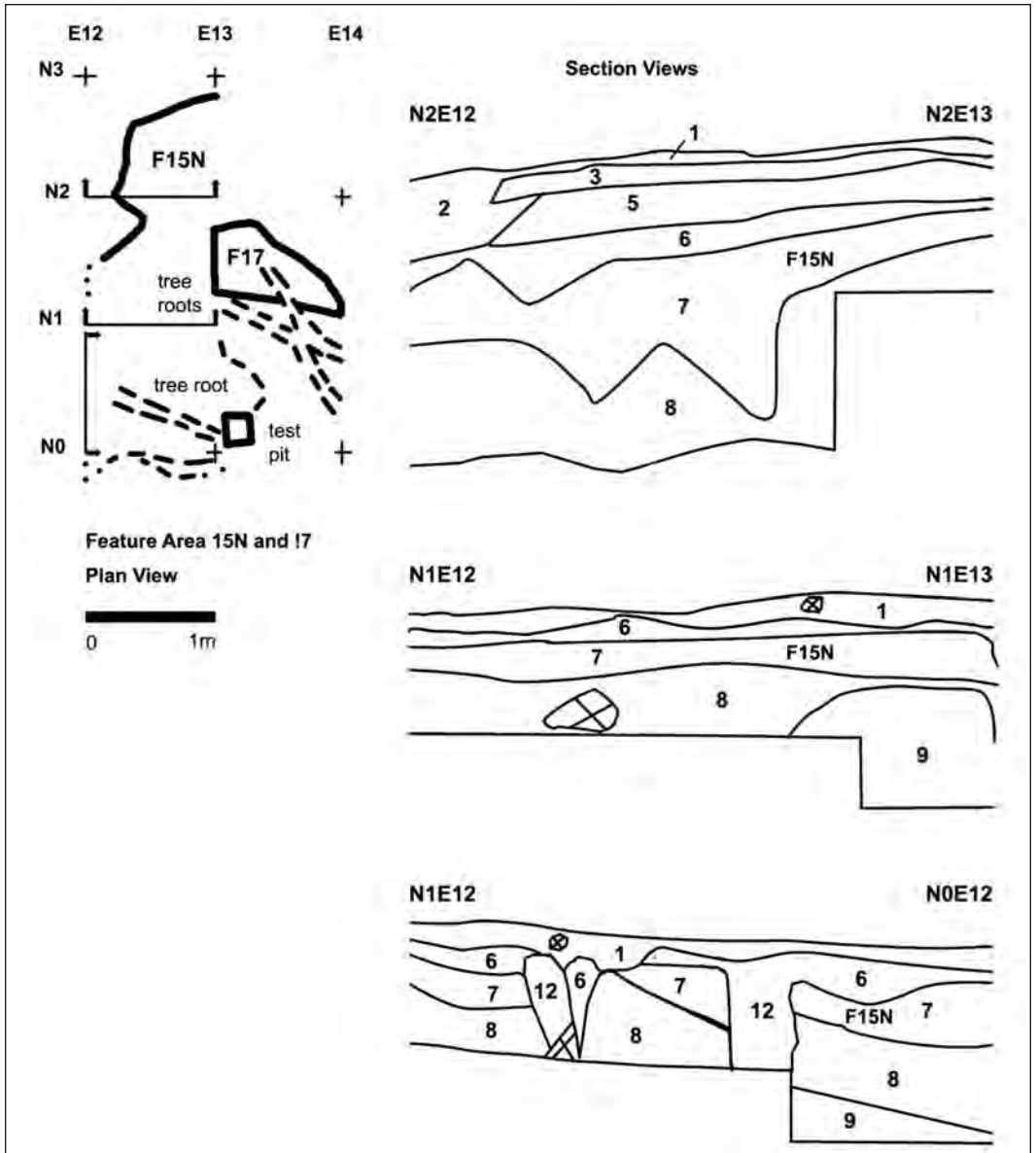
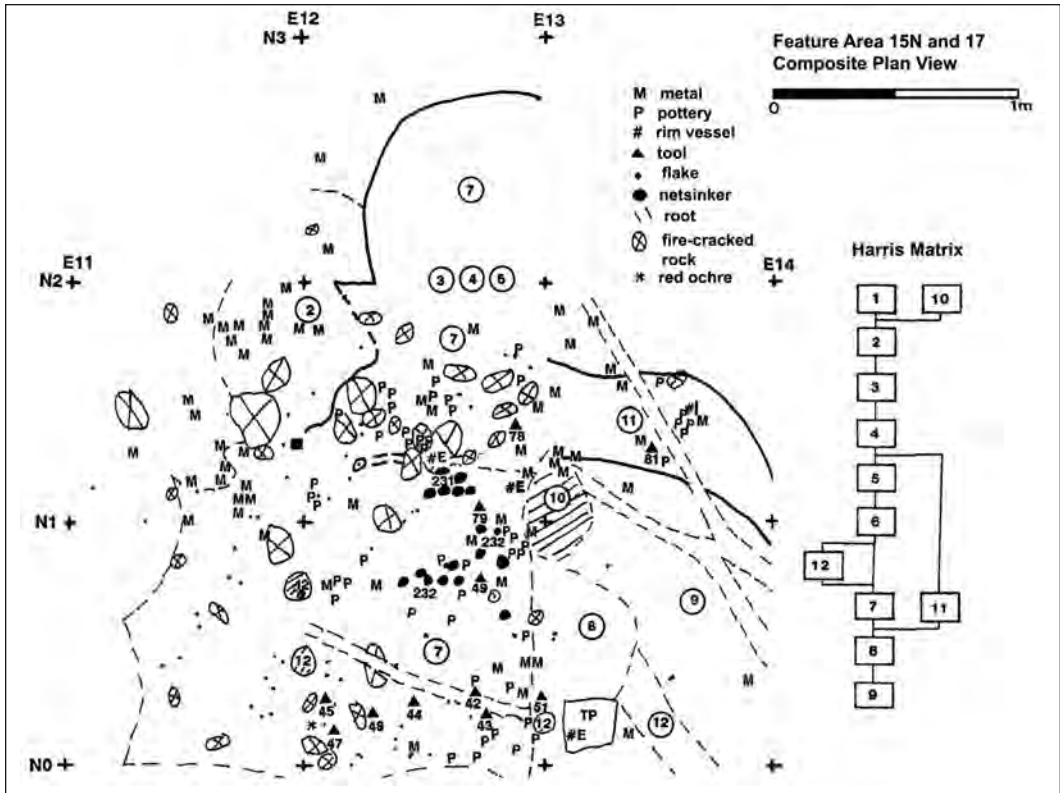


Figure 10. Three Pines site - Feature Area 15N and 17 Profiles.

order to a natural podzol, excavated out of either Unit 2 or an earlier pit. This is an example of how “reversed stratigraphy”, a term that Harris (1979:34) considers to be a misnomer, has been created by recent activities. Fortunately these deposits have aided in protecting the underlying precontact layers. Unit 6 is a clearly defined lens of charcoal, black sand, and rotted wood. Thicker

charcoal deposits occur in the northeast part of the excavation, possibly resulting from forest fires. Other recent events include Unit 10, which is a recent intrusive pit of brown sand. Corresponding dips in the layers directly beneath Unit 10 may have been caused by this intrusive activity or they may represent older post moulds. To simplify numbering, Unit 12 is assigned to several vertical



**Figure 11.** Three Pines site - Feature Area 15N and 17 Composite Plan View with Artifact Distribution (LI-VIII) and Harris Matrix Stratigraphic Sequence (See Footnote 2).

intrusives, mostly filled with charcoal from root burns and subsequent tree root growth. Some may also be post moulds, because wood stakes from a prospector-style tent were found nearby.

Unit 7 is hard-packed grey ashy sand of considerable thickness. It is one of the best preserved and most extensive precontact units at Three Pines. Unit 7 is interpreted as remnant cobble hearths and living floors. Notable is the complete absence of faunal bone. Two clusters of small, rounded, unmodified pebbles occurring near the top of Unit 7 may represent its most recent deposit. These are identified as net sinkers (Figure 11: #231, 232) for fishing nets (or perhaps a child's collection of shiny pebbles).

At the north end of Unit 7 are a series of large granitic cobbles, some piled on top of others, with pseudo-scallop shell Rim Vessel E sherds<sup>3</sup> (Figure 12: E) and very small trapezoidal or quadrilateral

scrapers of Hudson Bay Lowland (HBL) chert (Figure 12: #78, 79, 80, 49) (see below for lithic source descriptions). This northern cobble cluster is interpreted as an interior hearth into which the scrapers and various pottery sherds were discarded. The scrapers may have been too small to resharpen. Additional Rim Vessel E sherds are also found at the southern end of Unit 7 in a test pit. West of the test pit, several tools are distributed in a linear fashion, perhaps indicative of former tree root activity. Small trapezoidal and triangular HBL chert and other chert scrapers (Figure 12: #43, 47, 48) are present, along with a small side-

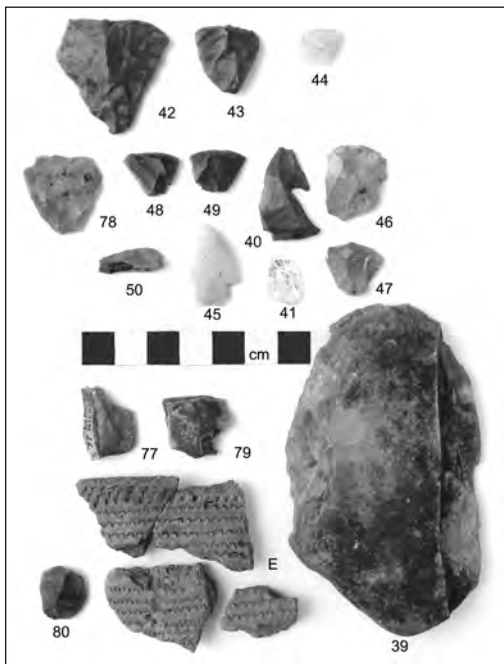
<sup>3</sup> Throughout this paper, the term Rim Vessel refers to all individual rims sherds and associated sherds from a single original pot, while Body Vessel refers to all individual sherds (non-rims) associated with a single original pot base

**Table 13.** *Feature Area 15N and 17 units of stratification.*

Unit	Deposit	Event	Artifact Content by Level
1	Grey-brown sand overburden, 2–5 cm thick	Mixed modern and precontact	LI: faunal bone (1) sawn moose vertebra; debitage (11) 1 HBL, 1 chert, 1 clear quartz, 1 vein quartz, 7 misc, 1 local chert core; modern (46) bottle caps, lid, nail, screw, wire, foil, clear glass, brown glass, plastic tape, Styrofoam, cap liner LII: debitage (5) 1 HBL, 2 clear quartz, 2 misc; modern (25) bottle cap, Alka Seltzer foil, clear glass, brown glass, plastic LIII: modern (1) .257 shell case
2	Loose brown sand pits, 40 cm deep	Excavation and infilling of modern camper garbage pits	modern (7) bottle cap, metal fragment, toy wheel, brown glass, plastic (also oil cans, tin cans, Smirnoff bottle, green plastic garbage bag)
3	Orange and brown sand, 3 cm thick	Overturnd deposit from Unit 2 excavation	
4	Black charcoal lense, 1 cm thick	Overturnd deposit from Unit 2 excavation	
5	Medium grey sand, 4–6 cm thick	Overturnd deposit from Unit 2 excavation	faunal bone (1); tools (1) local chert utilized flake #103; debitage (7) 1 clear quartz, 1 vein quartz, 5 misc; pottery (1); modern (32) foil, nail, bottle cap, clear glass, brown glass, clear glass with wire, Styrofoam
6	Charcoal and rotted wood, 2–4 cm thick	Forest fire deposits	tools (6) netsinkers #232; modern (5) brass shear pins, foil, wood screw
7	Grey ashy, hard-packed sand with cobbles, 3–25 cm thick	Precontact cobble hearths and living floors	LII: faunal bone (1); tools (10) 7 netsinkers #231, chert retouched flake #42, trapezoidal HBL scraper #43, vein quartz biface midsection #44; debitage (19) 3 HBL, 6 clear quartz, 4 vein quartz, 2 mudrock, 4 misc; pottery (3) LIII: tools (17) 7 netsinkers #232; trapezoidal HBL scrapers #78 and #49, vein quartz projectile point #45, chert retouched flake #46, trapezoidal chert scraper #47, triangular HBL scraper #48, HBL uniface edge #50, HBL scraper fragment #40, clear quartz utilized flake #41, rectangular mudshale biface #39; debitage (83) 20 HBL, 1 chert, 13 clear quartz, 14 vein quartz, 9 mudrock, 26 misc. including a large wacke split cobble with platform; pottery (153) 6 plain, 2 pseudo-scallop shell; other - 1 red ochre; soil samples #10 and #11 LIV: tools (2) HBL utilized flake #77, quadrilateral HBL scraper #79; debitage (13) 3 HBL, 1 chert, 2 vein quartz, 7 misc; pottery (108) 31 from rim vessel E; soil samples #8 and #9 LV: tools (1) trapezoidal HBL scraper #80; debitage (13) 1 HBL, 1 chert, 1 clear quartz, 5 vein quartz, 5 misc; pottery (75) 2 plain, 4 pseudo-scallop shell and 11 rim vessel E LVI: debitage (3) 2 vein quartz, 1 misc; 1 chert core; pottery (16) 1 pseudo-scallop shell LVII: debitage (4) - 1 mudrock, 3 misc.
8	Orange brown sand	Faded fire-reddened hearth remnant	Tools (1) siltstone biface #51
9	Yellow-brown subsoil		
10	Pit with brown and grey sand fill	Intrusive modern cooking pit	modern (20) foil, bottle cap, pull tab, clear and brown glass, plastic, Styrofoam
11	Mottled dark grey, light grey, yellow sand, 12 cm thick	Unit 7 extension under tree roots	LIV: pottery (15) 2 plain, 3 worn pseudo scallop shell; modern (1) plastic tent peg LV: debitage (4); pottery (7) 2 plain, 1 of rim vessel I LVI: debitage (1) LVII: tools (1) siltstone retouched flake #81, debitage (1); pottery (3) LVIII: pottery (1) plain
12	Charcoal-filled vertical intrusives and linear trench	Root burns, tree root growth, post moulds	

**Table 14.** *Soil micromorphology Feature Areas 15N/17 and Feature Area 7.*

Archaeological Description	Sample Identifier	Context	Soil Micromorphology	Munsell Colour
Grey ashy hard-packed sand with cobbles				
	Sample #10	FA15N-Unit 7/LIII	poorly sorted, medium sand; sub-rounded; rock fragments 10%	Brown 10YR 4/3
	Sample #11	FA15N-Unit 7/LIII	poorly sorted, fine sand; sub-angular to angular; rock fragments 5%; organics 10–15%	Grayish Brown 10YR 5/2
	Samples #8 and #9	FA15N-Unit 7/LIV	poorly sorted, fine to medium sand; sub-angular; trace rock fragments; organics <5%	Grayish Brown 10YR 5/2
Hard-packed mottled sand, grey, dark grey, and reddish brown changing to strong brown				
	Sample #7	FA7-Unit 7/LII	poorly sorted, fine sand; coated with limonite; sub-rounded; rock fragments 5%	Yellowish Brown 10YR 5/4
	Sample #6	FA7-Unit 7/LIII	poorly sorted, fine sand; coated ash and limonite mix; sub-rounded; rock fragments 5%	Strong Brown 7.5YR 5/6



**Figure 12.** *Three Pines site – Unit 7 of Feature Area 15N and 17. Lithic Tools and Pottery arranged in stratigraphic sequence (unmodified pebble netsinkers not shown). Level II: 42 chert retouched flake; 43 HBL scraper; 44 vein quartz biface midsection LIII: 46 chert retouched flake and 47 scraper; 40, 48, 49, 78 HBL scrapers and 50 uniface edge; 45 vein quartz projectile point; 41 clear quartz utilized flake; 39 mudshale biface. LIV: 77 HBL utilized flake and 79 scraper; Rim Vessel E. LV: 80 HBL scraper; Rim Vessel E.*

notched projectile point of vein quartz (Figure 12: #45) and a small vein quartz biface midsection (Figure 12: #44). A modern tree root protects this unit from modern activities.

In Unit 11, which may be an extension of Unit 7 that has been trapped under modern tree roots, a pottery cluster includes linear stamp Rim Vessel I (see Figure 22: I). Based on the localized pottery finds and tools, Unit 7 and 11 are assigned to the Middle Woodland Laurel period.

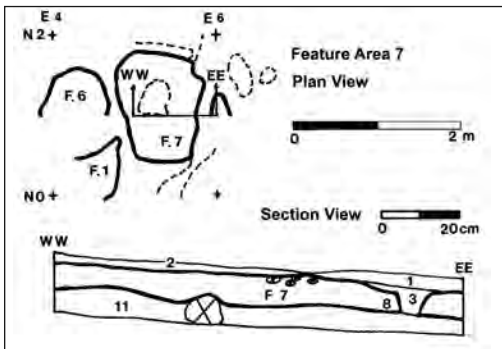
The orange-brown sand of Unit 8 is redder in hue than that of Unit 9, but it is not as saturated in colour as that in other hearths. Perhaps the original hue has faded due to podzolization. Stratigraphically, Unit 8 predates the Laurel pottery unit. It contains a leaf-shaped biface (Figure 13: #51) of light olive green siltstone—a tool unique on this site. It and the deeply buried large retouched flake (Figure 13: #81) of siltstone (base of Unit 11) may be the earliest deposits in this sequence. These tools are assigned to the Archaic period. Biface #51 resembles excruciate bifaces from the lowest stratum of the Abitibi Narrows site (Ridley 1966: e.g., Fig 4).

#### *Stratigraphic Column for Feature Area 7*

Field feature 7 is a 7 to 9 cm thick area of hard-packed reddish brown sand, measuring 120 by 140 cm (Figure 6). The overburden is thick on the west half, gradually thinning to leave the feature



**Figure 13.** Three Pines Site - Archaic Period tools by raw material. Metamorphosed olive grey quartz siltstone or quartzite from the Lorrain, Gordon Lake, or Bar River Formations includes: 51 leaf-shaped biface; 81 retouched flake; 169 side-notched projectile point. Gowganda Formation sandstone: 217 side-notched projectile point. Gowganda Formation mudshale: 144 rectangular flake knife. Local Milky Vein Quartz: 220 large flake or preform. Exotic unidentified Cherts: 142 snub-nosed scraper with incipient side-notching; 145 thick scraper fragment; 222 excurvate biface. Exotic blue Quartzite: 221 bi-pointed biface with slightly serrated edges. Exotic Clear Quartz: 143 biface tip.



**Figure 14.** Three Pines site - Feature Area 7 Profile.

exposed at the surface on the eastern edge. Ground squirrels have truncated and intruded into this feature with tunnels and a shaft. The northern margin is defined by a tent drainage ditch. Twelve units of stratification are identified and sequenced for Feature Area 7 (Figures 14 and 15; Tables 14 and 15).

Ground squirrel activity is represented by Unit 1, a mixed layer above Unit 3, a horizontal light yellow sand burrow and Unit 4, a vertical shaft, also of light yellow sand, with a short tunnel of light grey sand running beneath Unit 7. The shaft has caused vertical displacement of artifacts, and its infilling is dated as a modern event by the presence of a deeply buried metal grommet. A modern camper's drainage ditch (Unit 5) is at right angles to a similar ditch to the east. Unit 5 is underlain by a charcoal and dark grey sand-filled post hole (Unit 6). Modern artifacts are few. A nineteenth-century component is represented by a ball clay pipe stem on the surface, and three pipe bowl fragments in Unit 2, the thicker overburden on the west side (Figure 16). These bowl fragments fit a reconstructed pipe bowl (Figure 16) found in an adjacent historic hearth (FA22/23-Unit 6).

Unit 7 is an area of hard-packed mottled dark grey, light grey and reddish brown sand. Unit 7 is a unique settlement feature on the site. It is slightly built up. Its brownish sand has a greasy texture and it contains an exceptionally high quantity of rock fragments, broken tools and debitage. A wide variety of fauna is represented including beaver, white-tailed deer, moose, *Canis* sp. (wolf or dog), and black bear. All of the black bear bones, and most of the moose and *Canis* sp. (wolf or dog) identified from the Three Pines site occur in this unit (see Table 3).

Unit 8 is a cluster of siltstone flakes and a siltstone biface edge found below the fading base of Unit 7. At the southern margin of Unit 7, where the overburden is thicker, is an area of hard-packed grey ashy sand (Unit 9), also interrupted by the rodent tunnel (Unit 3). Unit 7 appears to cut abruptly into Unit 9 and does not extend beneath it. For these reasons it is placed stratigraphically above Unit 9. The western section of Unit 9 contains a concentration of mudrock



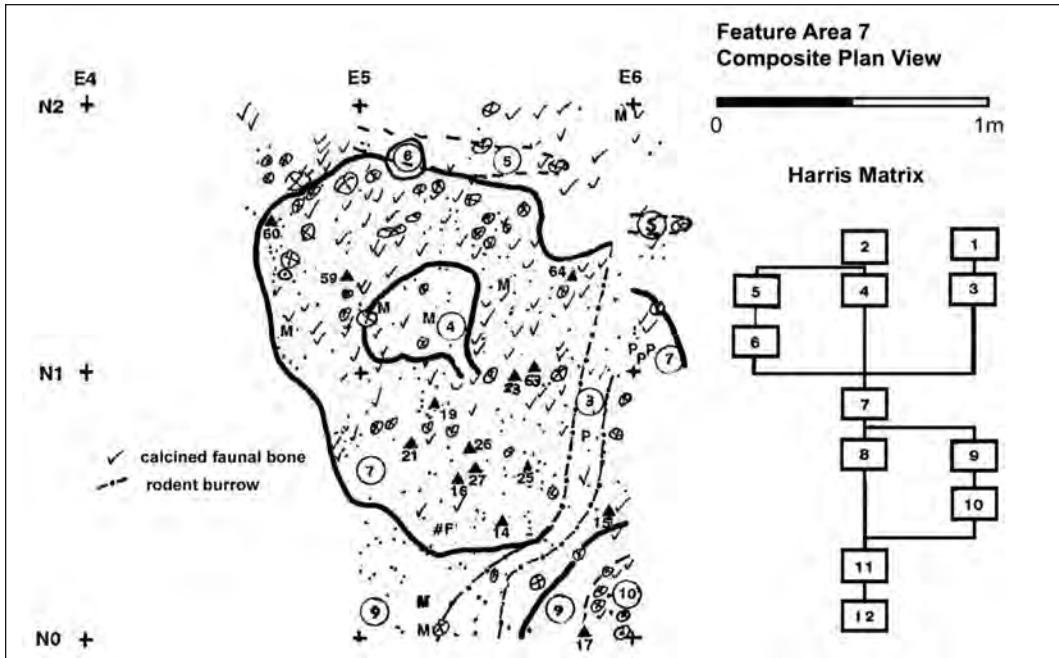


Figure 15. Three Pines site - Feature Area 7 Composite Plan View with Artifact Distribution (LI-VI) and Harris Matrix Stratigraphic Sequence (see Figure 11 for legend).

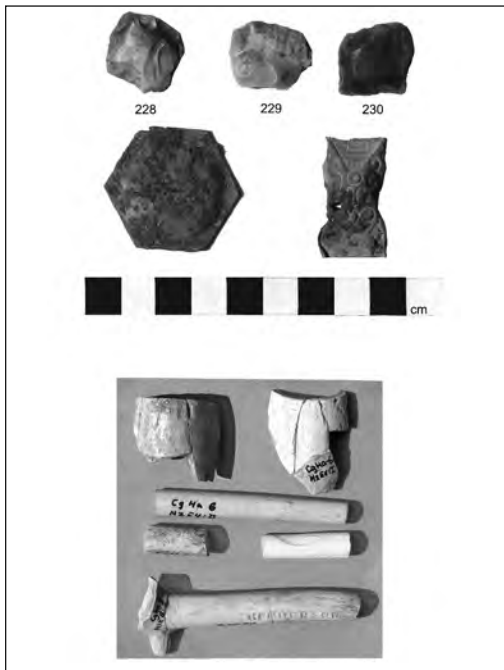


Figure 16. Three Pines site – Historic Period Artifacts: 228, 229 Gunspalls; 230 Gunflint; ball clay pipe bowls and stems including a “Henderson Montreal” stem; Decorative Metal.

flakes, while the eastern section has debitage of all raw materials and some calcined bone.

The distinctive nature of Unit 7 may be an example of redeposition (Butzer 1982; Schiffer 1987), whereby more recent occupants swept up previous deposits, then used this built-up area for cooking and disposal. In 1978 at Lac Washadimi, Gordon witnessed an Eastern James Bay Cree family from Fort George preparing the floor of a new conical tent (*michuap*). They gathered all the sharp stones and debris around the sleeping area and tossed them into a raised central hearth before laying down spruce-bough flooring (Gordon 1980, 1988b). This possibility of redeposition is further supported by the fact that the adjacent square is mostly exposed yellow-brown Bf horizon with few artifacts. The fact that the faunal bone is larger and better preserved hints at a more recent re-use of underlying archaeological sediments.

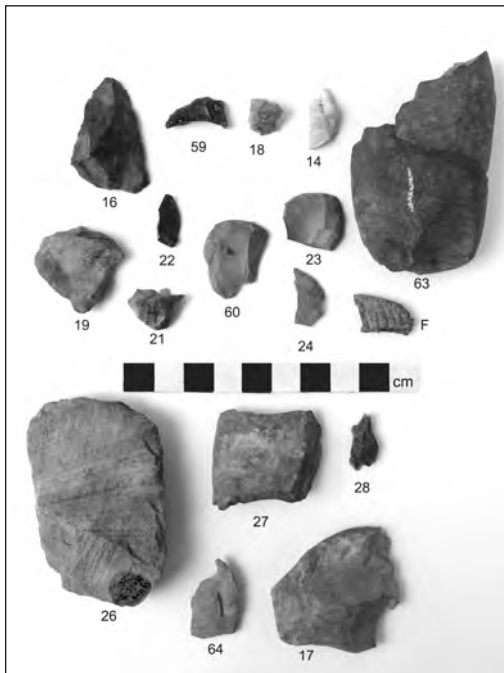
Based on stratigraphic position first, then similarities in lithic raw materials, I suggest the following reconstructed sequence of events. The oldest deposit, predating Unit 7 hearth formation, is localized knapping of mudrock, including a large utilized siltstone flake (Unit 9; Figure 17:

**Table 15.** *Feature Area 7 units of stratification.*

Unit	Deposit	Event	Artifact Content by Level
1	Grey and yellow sand overburden, 1–3 cm thick	Mixed modern and Smearing of exposed subsurface layers over top of ground squirrel tunnel (Unit 3)	faunal bone (30); tool (1) HBL retouched flake #15; debitage (35); modern (1) nail
2	Grey-brown overburden, 1–3 cm thick	Overburden, thicker over west section	<b>Surface:</b> historic (1) clay ball pipe stem LI: faunal bone (34) 3 beaver; tools (4) chert scraper #59, vein quartz uniface edge #14, HBL biface edge #18, chert utilized flake #16; chert core (1); debitage (82) mostly misc and HBL; historic (4) 1 clay ball pipe stem, 3 clay ball pipe bowl fragments; modern (1) radio pickup
3	Light yellow sand trench, 2–8 cm thick	Ground squirrel burrow	faunal bone (1); debitage (30); pottery (1) pseudo scallop shell; other (2) pine cone, peach pit
4	Circular vertical shaft of light yellow sand, 63 cm deep	Excavation and infilling of ground squirrel burrow	LI–IV: debitage (6); modern (2) cork, bottle cap LV–VI: faunal bone (7) 2 beaver, 1 deer, 1 bear; debitage (9) LXI–XXI: faunal bone (47) 3 beaver, 3 deer, 1 <i>Canis sp.</i> ; debitage (51) 5 HBL, 22 chert, 2 clear quartz, 1 vein quartz, 21 misc; modern (1) grommet; fire-cracked rock
5	Grey-brown sand linear depression, 4 cm thick	Tent drainage ditch excavation and infilling	
6	Circular stain of charcoal and black sand, 4–7 cm thick	Post hole infilled with organics	
7	Hard-packed, mottled grey, dark grey, reddish brown sand changing to strong brown with numerous fire-cracked rocks, 8 cm thick	Remnant cooking/disposal hearths	LI: faunal bone (59) 10 beaver, 3 moose; tools (1) sandstone celt fragment #63; debitage (35) 2 HBL, 8 chert, 4 clear quartz, 5 vein quartz, 1 mudrock, 15 misc. LII: faunal bone (634) 97 beaver, 9 deer, 2 moose, 3 <i>Canis sp.</i> , 3 bear; tools (6) snub-nosed HBL scraper #19, HBL biface edges #21 and #22, square chert scraper #23, siltstone retouched flake #24; quadrilateral HBL scraper #60, 1 chert core; debitage (281) 55 HBL, 53 chert, 13 clear quartz, 14 vein quartz, 8 mudrock, 136 misc; pottery (4) 1 rim vessel F; modern (1) bottle cap; soil sample #7 LIII: faunal bone (241) 26 beaver, 1 moose, 2 deer, 3 bear; tools (5) HBL utilized flake #65, sandstone hammer/grinding stone #25, rectangular mudshale biface #26, mudshale celt fragment #27, HBL uniface edge #28; debitage (166) 39 HBL, 19 chert, 4 clear quartz, 6 vein quartz, 6 mudrock, 92 misc; soil sample #6 LIV–VI: faunal bone (50) 2 beaver, 1 deer; debitage (24) 7 chert, 2 vein quartz, 2 mudrock, 13 misc.
8	Cluster of siltstone flakes and fire-cracked rock	Localized flintknapping	LIII: tool (1) siltstone biface edge #64; debitage (50) chert (siltstone) LIV: debitage (11) 1 HBL, 5 chert, 5 misc; modern (1) cigarillo tip
9	Grey ashy sand, very hard-packed, 5 cm thick	Localized mudrock knapping (west) and cooking/disposal hearth remnants (east)	faunal bone (36) 2 beaver, 1 deer; tools (1) siltstone large utilized flake #17; debitage (128) 39 HBL, 7 chert, 1 clear quartz, 4 vein quartz, 45 mudrock, 22 misc.
10	Slightly fire-reddened soil, 3 cm thick	Hearth remnants	faunal bone (13) 1 beaver; debitage (5)
11	Orange brown sand Bf horizon		
12	Light yellow sand C horizon		

#17), and localized flaking of siltstone, including the siltstone biface edge (Unit 8; Figure 17: #64). Tools situated deepest in Unit 7 itself include a sandstone hammerstone or grinding stone (#25) suitable for making groundstone tools, a mudshale celt fragment (#27), and a rectangular mudshale biface edge (Figure 17: #26). All of these tools and events are assigned to the Archaic period.

Over top of these deposits, Woodland hearths (Unit 7) were built, including one with a Middle Woodland occupation represented by Laurel pottery, a single pseudo-scallop shell Rim Vessel F (Figure 17: F), and a similar decorated sherd in the ground squirrel tunnel (Unit 3). If Unit 7 is



**Figure 17.** Three Pines site-Feature Area 7 Precontact Lithic tools and Pottery by stratigraphic sequence (with potential redeposition events). \* = assigned to Archaic Period. Unit 2: 16 chert utilized flake and 59 scraper; 18 HBL biface edge; 14 vein quartz uniface edge. Unit 7 Level II: 19 HBL snub-nosed scraper; 21 and 22 HBL biface edges and 60 scraper; 23 chert scraper; 24 siltstone retouched flake; pseudo scallop shell Rim Vessel F. Unit 7 Level III: (65 HBL utilized flake and 25\* sandstone grinding stone not shown); 26\* mudshale biface; 27\* mudshale celt fragment; 28 HBL uniface edge. Unit 8 LIII: 64\* siltstone biface edge. Unit 9: 17\* siltstone utilized flake.

the result of redeposition, the faunal bone may relate to a more recent, though undated, occupation. Remains of big game, such as moose and bear, and medium-sized game such as white-tailed deer, wolf, and beaver were disposed of in these hearths. These species could have been hunted during any season of the year, including hibernating bears, as suggested by analogy to contemporary James Bay Cree hunting practices (Feit 2004). Also disposed of in these hearths were a variety of scrapers, uniface and biface edges, retouched and utilized flakes of HBL chert, other cherts, and siltstone (Table 15; Figure 17).

#### *Stratigraphic Column for Feature Area 4*

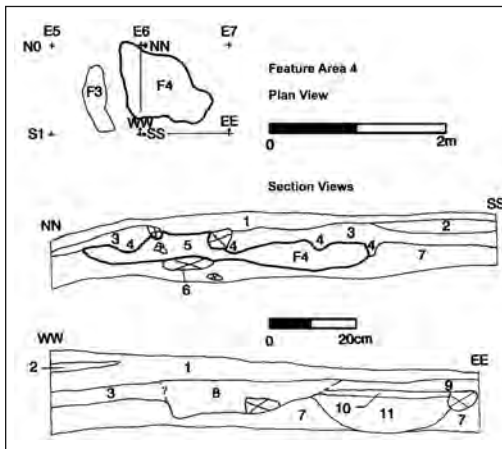
Field feature 4 is a 4–7 cm thick area of hard-packed grey ashy sand, 90 cm by 60 cm in size (Figure 6). It is on a stabilized flatter ridge between the west and central erosional gullies. Here the overburden is thicker and overlies a remnant H horizon and an Ae podzolic horizon. Eleven units of stratification are identified, sequenced, interpreted, and phased (Table 16).

A series of historic and more recent occupations overlies or intrude into the precontact units (Figures 18 and 19). These include recent camping and picnicking activities (Unit 1) and somewhat older recreational usage as indicated by the older style camera flashbulb, as well as rusting metal hardware (Unit 8). An older hunting camp hearth is indicated by the rock and charcoal hearth (Unit 3) containing rifle ammunition and several post moulds (Unit 4). A utilized mudshale flake (#141) may have been collected from elsewhere or used as found to build this modern stone hearth. Although interrupted by Unit 8, a trace of an H horizon of decomposing organics (Unit 9) contains a single hammer-and-chisel-cut English gunflint (Figure 16: #230). While Unit 8 clearly intrudes into Unit 9 and 10, its margin with Unit 3 is indistinct. It was therefore not identified as intruding into and predating Unit 3.

Unit 5 is interpreted as a remnant precontact living floor and/or hearths. It contains several large, distinctive tools found in a cluster: the broken tip of a clear quartz biface (Figure 13: #143); a complete, large, snub-nosed grey chert scraper with incipient side-notching (Figure 13:

**Table 16.** Feature Area 4 units of stratification (see text for Units 10 and 11).

Unit	Deposit	Event	Artifact Content by Level
1	Grey-brown sand overburden, 2–8 cm thick	Aeolian deposits, recent soil development	faunal bone (1); lithic debitage (23); modern (11) 1973 penny, nails, wood screw, zipper, clear glass, plastic
2	Yellow sand lenses, 1–3 cm thick	Wind-blown sand from active beach	
3	Large fire-cracked rocks, decayed wood, charcoal and dark grey sand, 2–4 cm thick	Modern 20th century hearths within H and Ah soil horizons	lithic tool (1) utilized mudshale flake #141; debitage (3); modern (2) .22 bullet, bag tag
4	Intrusive pits of dark grey sand	Infilled post moulds	
5	Grey ashy, hard-packed sand, 4–7 cm thick	Precontact living floors, hearth remnants, broken tool discard, HBL chert flintknapping	LII: debitage (21) mostly HBL chert LIII: faunal bone (6) 1 beaver; tools (4) large chert scraper #142, clear quartz biface tip #143, large mudshale flake knife #144, local chert scraper fragment #145; debitage (27) - mostly HBL LIV: debitage (28) - mostly HBL LV: tool (1) HBL chert retouched flake #146; debitage (1)
6	Rocks in yellow-brown subsoil	Precontact deposit related to Unit 5	
7	Yellow-brown subsoil		faunal bone (5)
8	Dark brown sand with organics and charcoal, 4–9 cm thick	Modern hearths, intrusive, dipping deep into underlying units	faunal bone (5); modern (17) - pull tabs, foil, rusty nails, wood screws, meat can key, bottle lid and cap, older camera flashbulb, tent pole cap, twist tie
9	Very dark brown sand and decomposing organics, 2–3 cm thick	Historic (18th–19th century) hearth in H horizon	tools (1) English gunflint #230



**Figure 18.** Three Pines site - Feature Area 4 Profiles.

#142); a complete, very large, rectangular mudshale flake knife (Figure 13: #144); and a fossiliferous blue-grey local chert scraper fragment made on a thick flake (Figure 13: #145). These tools suggest hide skinning, scraping, and butchering. While all raw material types are represented in the debitage of Unit 5 (HBL chert, other chert, clear quartz, vein quartz, mudrock, and others), HBL chert dominates. However, only one HBL chert tool, a retouched flake (#146), was recovered. At least two separate events are therefore represented: the discard or loss of the larger tools and HBL chert flintknapping.

Phasing the precontact units of this sequence of stratification is assisted by information from the

adjacent Feature Area 7. FA4-Unit 5 correlates with FA7-Unit 9, placing it stratigraphically below a built-up hearth (FA7-Unit 7) containing a Laurel pseudo-scallop shell rim (Figure 17: F). The cluster of large tools therefore predates a Middle Woodland occupation. The large snub-nosed chert scraper (Figure 13: #142) resembles a deeply buried Mattawan stratum tool from the Frank Bay site (Ridley 1950-53). The blue-grey local chert scraper (Figure 13: #145) resembles the dark blue chert-like debitage found in great quantities in the lower Archaic levels of the Montreal River site (Knight 1977).

A cooking and/or disposal hearth is represented by Unit 11, which contains fire-reddened sand, calcined beaver and other calcined mammal bone. This unit is separated from the overlying historic hearth (Unit 9) by a thin Ae and ash lens (Unit 10). It predates the historic occupation and is more likely associated with the precontact occupations.

*Three Pines Site Sequence of Occupations*

To develop a site-wide sequence, individual columns are correlated stratigraphically with each other where possible. An example is given for the SW corner of the site, where Feature Areas 7 and 4 occur (Figure 20). The result for this site is a series of columns, with only the overburden and yellow-brown horizon present in each one. The artifact contents are used to phase these combined units into temporal designations. The following is a summary of those broad temporal periods, presented from the top down. This brief summary of the relative sequence of occupation is based on information from all 24 stratigraphic columns, not just the 3 presented in detail here.

*Modern Period.* Modern (that is, twentieth-century) occupations of the Three Pines site fall into two categories: recreational use and hunting camps. Boaters and overnight campers have left

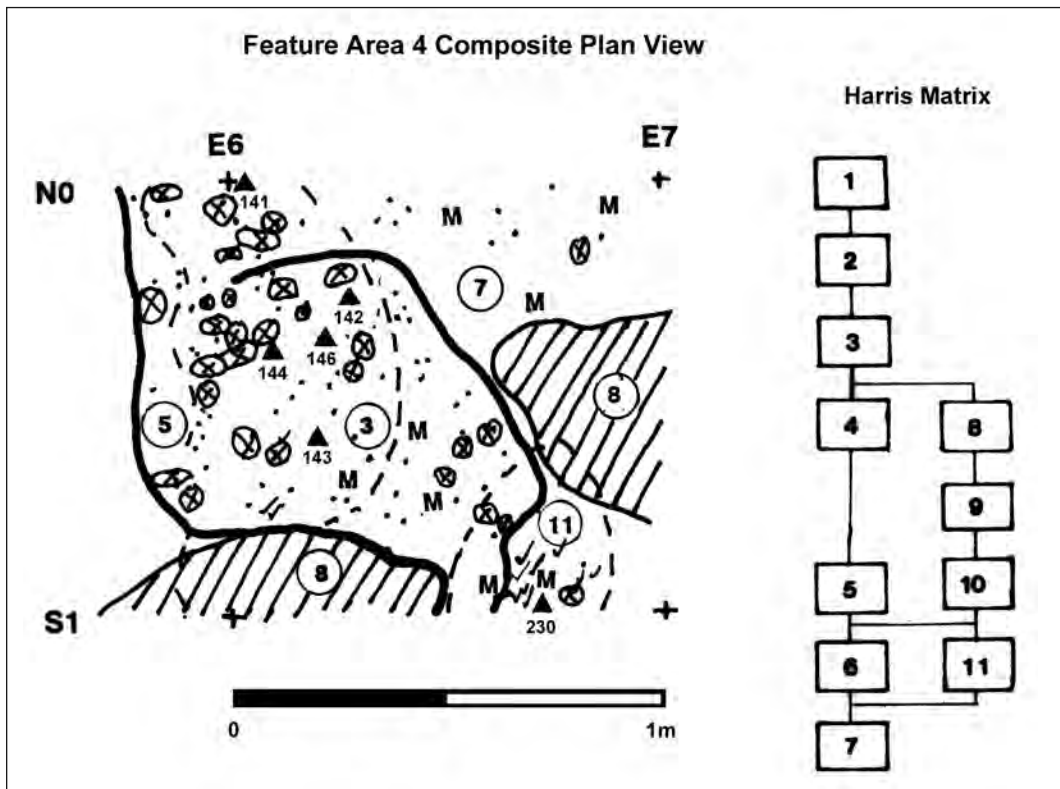


Figure 19. Three Pines site - Feature 4 Area Composite Plan View with Artifact Distribution (LI-V) and Harris Matrix Stratigraphic Sequence.

food containers, cameras parts, picnic refuse, boating refuse, and lightweight tent gear. Settlement features include tent drainage ditches, post moulds, garbage pits, and a possible roasting pit. Older hunting camp hearths contain coins dating to 1910–1936, 1945, and 1962; rifle and shotgun ammunition; meat can keys; and oil lamp chimney fragments. Thicker deposits of decayed wood, charcoal, dark grey sand, and blackened cobbles characterize these older hearths. Beaver and moose were trapped and hunted by these occupants, who also used A-frame canvas tents.

*Historic Period.* The Historic period has only a minor representation (Figure 16). Datable artifacts include an eighteenth- to nineteenth-century black English gunflint (Noël Hume 1980) and an

1846–1876 Henderson Montreal clay pipe stem (Smith 1986). This pipe was found together with two punched-out gunspalls and non-calcined beaver and deer bone in a hunting camp hearth. Other ball clay pipe fragments and two rusted decorative metal items are nearby. Historic period items occur in thin layers of dark brown decomposing organic matter over either fire-reddened soil with large fragments of calcined bone or very bright red soil patches. The bright red colour may be a temporal indicator. It gradually fades as iron compounds are leached out by acidic rainwater, part of podzolic soil formation.

Faunal bone is better preserved and in larger pieces in the Historic period units. Beaver, white-tailed deer, marten, ruffed grouse, and common

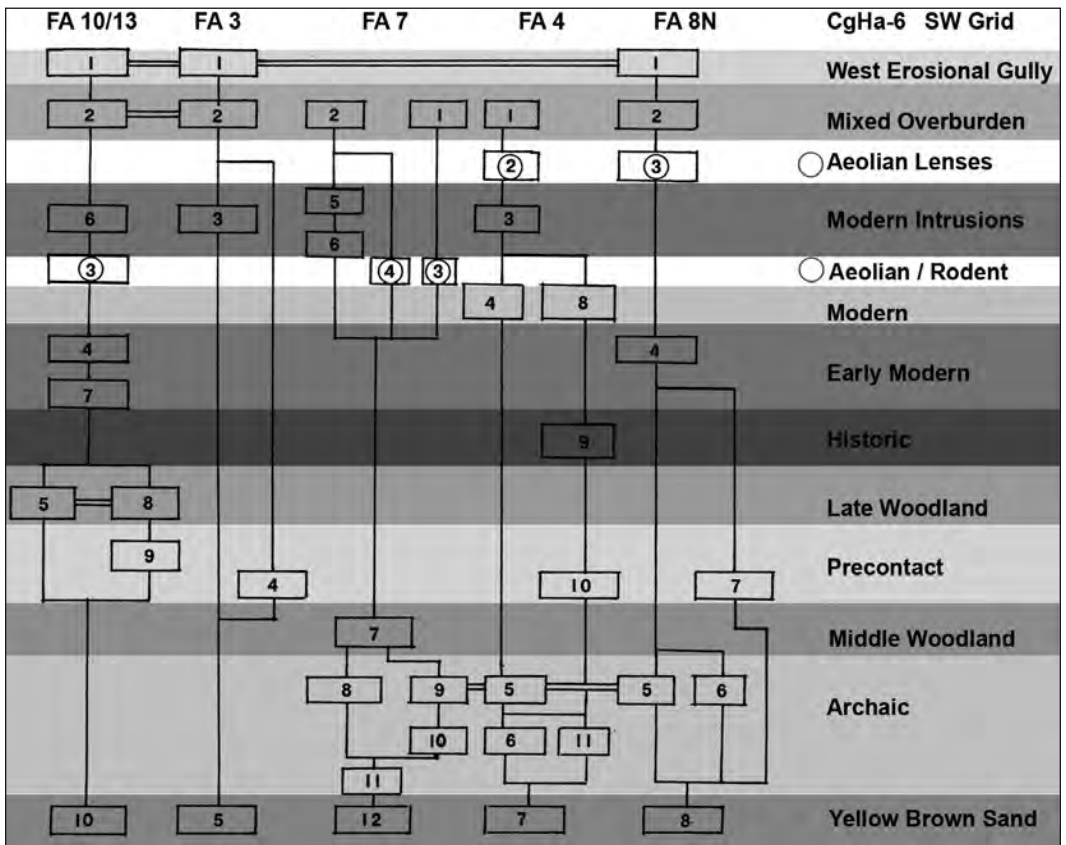


Figure 20. Three Pines site - Harris Matrix for the combined southwest section of the excavation grid including Feature Areas 7 and 4.

loon were exploited. Ruffed grouse and marten have more fragile bones than do beaver, white-tailed deer or the heavy bones of the common loon which enable it to dive deeply. Their presence supports the artifact dating for these deposits. Common loon bone means a spring to fall season of capture, while the other species could have been hunted during any season.

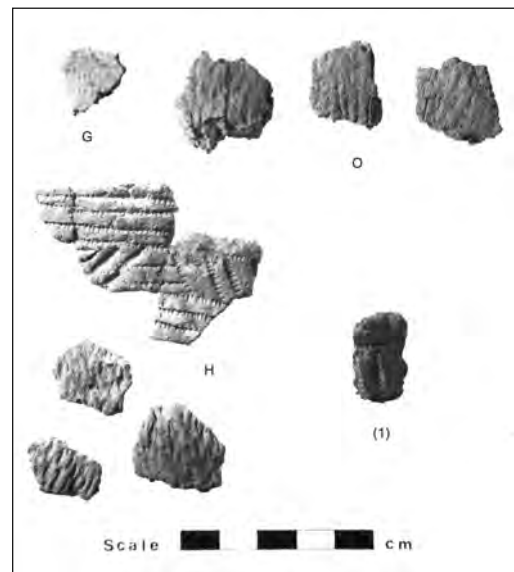
There is a strong correlation between the distribution of remnant dark brown F and H organic horizons and the distribution of Historic period settlement features and artifacts. These soil horizons have developed in the northwest corner of the site over at least the past 150 years. Their absence in other areas may be due to subsequent destructive activities (erosion, modern camping, and trampling).

*Late Woodland Period.* Only a few units of stratification could be phased to the Late Woodland period (Figure 21). Settlement traces included a semi-circular line of cobbles (hearth or windbreak), a line of rectangular stones (hearth platform or working surface), and fire-reddened hearths with calcined beaver and white-tailed deer bone. Associated pottery includes two Rim Vessels (G and H) with cord-wrapped stick-impressed designs and one Body Vessel (O) textured with a cord-wrapped paddle. Although fragmentary, neither of the Rim Vessel fit descriptions of Blackduck ware, which is widely distributed on the Canadian Shield farther west (Gordon 1985). Blackduck is also at the Frank Bay site (Brizinski 1980). All three vessels are speckled with dark grey temper. Two small, indistinct linear trailed sherds were also found.

Lithic tools included a small, triangular, side-notched HBL chert projectile point, rectangular scrapers of other cherts and of the local fossiliferous chert, as well as HBL chert retouched flakes. It was not always possible to separate lithic tools associated with Late Woodland pottery from those associated with Middle Woodland pottery, especially when these were found in the same stratigraphic unit.

*Middle Woodland Period.* Middle Woodland occupations are more extensive at the Three Pines site. Settlement traces include many grey sand with ash and cobble deposits that are interpreted as high temperature hearths and living floor smears. Localized areas of fire-reddened sand with calcined faunal bone are interpreted as either cooking or disposal hearths (Gordon 1980) or, perhaps, the cooler edges of such hearths. One deposit of brown clay, sand, and small stones is interpreted as a pottery-making area. A single post mould or pit was also identified.

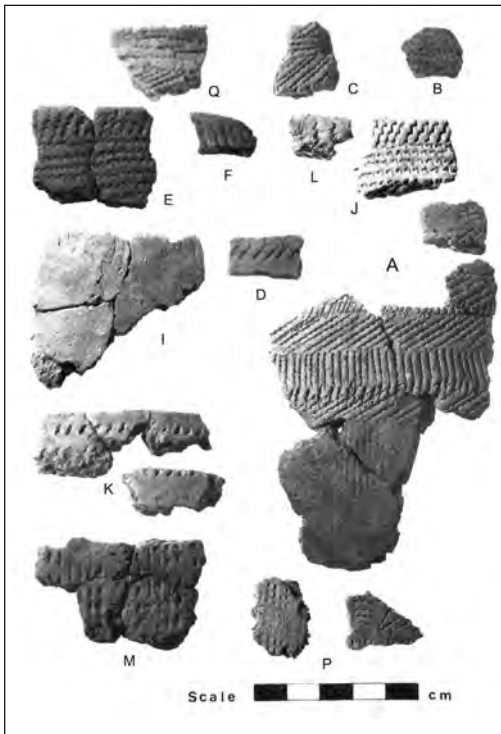
The extensive nature of these settlement traces suggests considerable time depth of repeated seasonal occupations by Middle Woodland hunter-gatherers. Beaver, moose, and white-tailed deer are three game species clearly associated with these occupations. The occupants may also have exploited black bear and wolf. These species are available year-round. One taxon, a pond turtle, is clearly a warm season indicator. Two clusters of unmodified pebbles, identified as netsinkers, suggest open water fishing.



**Figure 21.** *Three Pines site – Rim and Body Vessels assigned to the Late Woodland Period.*

*Rim Vessels G and H - cord-wrapped stick-impressed designs. Body Vessel O - textured with a cord-wrapped paddle. (1) cord-wrapped stick decorated sherd.*

Units of stratification are assigned to this period based on the presence of Laurel pottery vessels (Wright 1967b, 1972b). Middle Woodland Rim Vessels include eight pseudo-scallop shell stamp, two linear stamp, and one dentate stamp (see Table 9). Body Vessels including a thick dentate stamp vessel, one combined dentate and linear stamp vessel and a plain vessel with a conical base are also assigned to this period (Figure 22). One spatial pattern emerges based on pottery temper. Four of the pseudo-scallop shell vessels in the northwest excavation contain diabase temper. In the east and southeast, two different pseudo-scallop shell vessels and one linear stamp vessel contain granitoid temper. The speckled dark grey temper seen in all the Late Woodland vessels is only found in one dentate stamp vessel. While



**Figure 22.** Three Pine site - Pottery Rim and Body Vessels assigned to the Middle Woodland Period. Rim Vessels Q, C, B, E, F, L, J, A - pseudo-scallop shell stamped. Rim Vessels I and D - linear stamped. Rim Vessel K and Body Vessel M - dentate stamped. Body Vessel P - combined linear/dentate stamped designs. (Body Vessel N - plain conical base not shown).

functional, temporal and/or, individual preferences may be reflected in these different vessels and their spatial clustering, there is no clear stratigraphic basis for temporally ordering the different vessels.

Laurel ceramics were also found at the Frank Bay site (Brizinski 1980). In examining Ridley's (1950-1953, 1954) collection, I noted that the Point Peninsula assemblage had vessels similar to Three Pines pseudo-scallop shell Rim Vessel E and to linear stamp Rim Vessel I. Vessels from Ridley's Primary Transitional assemblage were closer to the dentate stamp Body Vessel (M). Vessel M bears similarities to southern Ontario Saugeen ware (James V. Wright, personal communication 1988).

Lithic tools include small triangular scrapers, retouched flakes, and small side-notched points, all of different types of chert (HBL, an unidentified chert, and a local grey chert). Local clayshale, mudshale, sandstone, and siltstone were used for flake knives, while cobbles and pebbles were used for grinding stones, abraders, and celts. Vein quartz was also used for the occasional side-notched projectile point and biface.

The discontinuous nature of the units of stratification did not allow for temporal separation of individual Middle Woodland units across the site.

*Archaic Period.* Several units of stratification are phased to the Archaic period. These are the deepest units, found stratigraphically below Middle Woodland; unidentified Woodland; and, in some cases, Historic period units. The distribution of Archaic period occupations may reflect differential preservation. Many are located in areas of thick deposits with intact podzolic soil horizons.

Settlement features include deep basins of grey ashy sand with cobbles and dark orange-brown sand deposits, often associated with calcined bone. One deposit contained beaver and mammal bone. The orange-brown sand deposits are redder in hue than the yellow-brown subsoil, and some have grains coated with ash. These may be the faded remnants of once brighter fire-reddened sand hearths.



Archaic period units contain predominantly larger flaked core tools of distinctive raw materials, siltstone, quartzite, fine-grained sandstones, clear quartz, vein quartz, and various grey and blue cherts (see Figure 13). Tools include larger side-notched projectile points; a large stemmed projectile point or drill; medium to large excurvate bifaces, including one bi-pointed biface; retouched flakes; flake knives; and a large snub-nosed scraper. Inferred tool functions suggest hunting, butchering, food preparation, and hide preparation. Tool making and primary lithic reduction were not major activities at Three Pines, judging by the low frequencies of decortication flakes, thinning flakes, large cores, or shatter of the above-mentioned lithic raw materials.

Several Three Pines tools have close matches in size, shape, tool morphology, and raw material with identified Shield Archaic tools from Lake Abitibi and Lake Nipissing. A large snub-nosed chert scraper (Figure 13: #142); a narrow-bladed, side-notched quartzite projectile point (Figure 13: #169); and a leaf-shaped siltstone biface (Figure 13: #51) all find counterparts in the lowest stratum of the Abitibi Narrows site (Ridley 1966), the Joseph Bérubé site (Marois and Gauthier 1989), and the Mattawan stratum of the Frank Bay site (Ridley 1954; Wright 1972a). While there is broad similarity in lithic raw materials and tool class between the Three Pines site and the much deeper Montreal River site Shield Archaic components (Knight 1977), there are no specific artifact matches.

### *Lithic Trends Through Time*

Stratigraphic analysis of the Three Pines site reveals changes in tool morphology, manufacture, lithic raw material usage, and lithic procurement strategies over time. Distinctive changes in tool manufacture and raw material usage occurs between the Archaic and Woodland periods. Large unifacial flake tools and bifacially-flaked core tools are prevalent in the Archaic units. A shift to smaller, unifacial and bifacial flake tools is evident in the Middle and Late Woodland units.

Vein quartz and greywacke (mudrocks) are suggested as temporal indicators for the nearby sites of Sand Point and Witch Point (Conway

1982, 1986). No stratigraphic evidence was found at Three Pines to support the hypothesis that reliance on vein quartz usage is characteristic of the Late Woodland period or that greywacke usage is an Archaic period indicator. Local vein quartz and mudrocks occur as tools and debitage in both Archaic and Middle Woodland contexts at the Three Pines site.

*Archaic Period Raw Materials.* Archaic toolmakers favoured sub-conchoidal fracture olive grey quartzite, siltstone, sandstone, mudshale, and wacke; all derived from local bedrock formations (see Bedrock Geology section above, and Table 1). A distinctive metamorphosed olive grey quartz siltstone or quartzite may be from the Lorrain, Gordon Lake, or Bar River Formations (e.g., Figure 13: #51, #81, #169). A very fine-grained light grey sandstone (e.g., Figure 13: #217) and softer greenish grey mudshale, mudstone, and clayshale (e.g., Figure 13: #144) come from the Gowganda Formation. These materials were either quarried directly at bedrock outcrops or gathered as rounded cobbles found in the glacial drift. The only local conchoidal fracture material used by Archaic tool makers is milky vein quartz (e.g., Figure 13: #220). One source is the Crystal site (CfHa-34), located 7.5 km south of Three Pines on the west-central mainland. It is a large lakeside vein of particularly homogenous material that has been extensively quarried and processed at the adjacent Blueberry site (CfHa-32) (see below).

Exotic to Lake Temagami are dark grey chert (e.g., Figure 13: #142), blue chert (Figure 13: #145), and light bluish-grey quartzite (Figure 13: #221). Their bedrock sources are not yet determined (Burbidge 1988). In the lower levels of the Montreal River site, Knight (1977:45) describes large quantities of thick, unfinished preforms made on a dark blue-grey chert. He suggests a local bedrock source, on Lake Timiskaming or the Montreal River. A clear quartz biface (Figure 13: #143) is also exotic to Lake Temagami.

*Woodland Period Raw Materials.* Woodland flaked tools tend to be much smaller in size and are made from flakes, not cores, which have been unifacially

or bifacially retouched. Woodland tool makers favoured hard, conchoidal fracture material, primarily Hudson Bay Lowland chert—a colourful, homogenous nodular material that is easily worked and produces very sharp edges. HBL chert tools include small trapezoidal or triangular scrapers, (e.g., Figure 12: #78, 79, 80, 49), retouched flakes, and small side-notched projectile points. A poorer quality fossiliferous “local” chert and other unidentified cherts were also used. Vein quartz tools are less common and include a biface midsection and a small side-notched point (e.g., Figure 12: #44, #45).

Woodland tool makers could only obtain chert in small nodules and pebbles from glacial fluvial and reworked beach deposits—the fossil-bearing “local” chert, originating in the Temiscaming Outlier that is found on Temagami beaches. However, HBL chert nodules are not local (Burbidge 1988). Lake Temagami lies well south of the “carbonate line” (Karrow and Geddes 1987), which marks the southern extent of reworked, glacially deposited sediments from Palaeozoic formations in the Hudson Bay Lowlands. To obtain the highly desirable HBL chert nodules, Woodland tool makers either travelled north or traded with northern groups. While changes in tool morphology and size, as well as a clear shift to the use of nodular cherts, have been suggested before for northeastern Ontario (Knight 1977; Kritsch-Armstrong 1982; Wright 1972a), this analysis offers stratigraphic corroboration from a shallow habitation site.

### *Occupations Moving Inland*

The Harris Matrix stratigraphic analysis also reveals a subtle difference in spatial distribution over time. Historic period occupations are several metres farther inland than some Archaic period ones. This shift raises the intriguing possibility that lake levels altered over time, possibly encroaching on the site’s front edge. Historic period settlement features and artifacts are localized in the northwest part of excavation in stratigraphic units from Feature Areas 4, 5, 7, 22/23, and 24 (Figure 6). These finds strongly correlate with buried remnant F and H soil horizons, which tend to be absent in the rest of

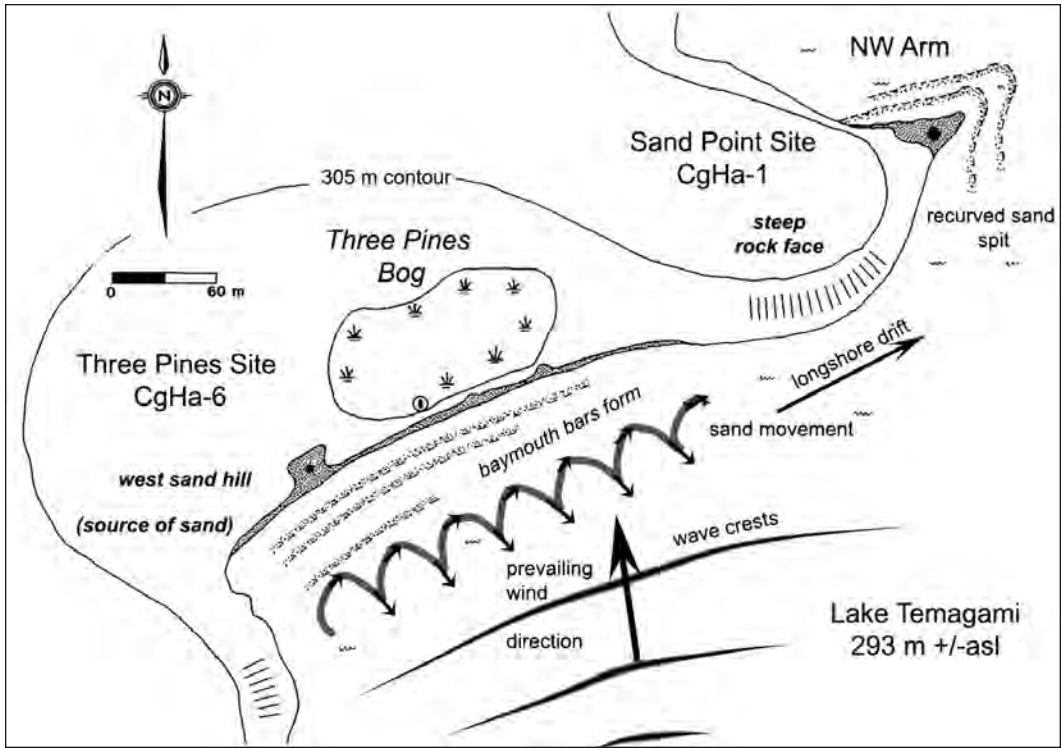
the excavation. Units assigned to the Archaic period are more evenly distributed across the Feature Areas, but several are near the erosional face of the upper terrace. These are FA8N-Units 5 and 6, grey ashy hearths with a siltstone projectile point (Figure 13: #169), and the deeply buried FA20-Unit 9, a series of grey ashy hard-packed hearths, with a cluster of distinctive tools, including an excurvate chert biface (Figure 13: #222) and a bi-pointed biface of light blue quartzite with slightly serrated edges (Figure 13: #221). Of course, the destructive effects of erosion and modern usage may have removed traces of historic occupations from other parts of the excavation. But, if this spatial difference is a true reflection of site usage, and assuming a preference for camping a uniform distance from the water, Lake Temagami may have been lower and the site may have been larger in the Archaic period.

### **The Three Pines Site: Landscape Context**

Exploring the natural and cultural formation processes that created the Three Pines site landscape context, or site mesoenvironment (Butzer 1982), was the focus of fieldwork in June and August 1987. Questions of particular interest were: how old is the site’s landscape, how did it change over time, and how would such change affect site occupations? To help answer these questions, off-site soil samples and soil profiles were collected from the west hill and lower terrace and a trench was dug to profile the beach berm–bog interface (Gordon 1989, 1991a).

### *Baymouth Bar Formation*

Analysis of soil micromorphology and surficial geology indicate that the Three Pines site is situated on a baymouth bar (Burbidge 1988). Spits, or baymouth bars, extend out from promontories formed by longshore drift (Figure 23), a process whereby waves hitting the shore at an oblique angle gradually move sediments along a beach (Bell and Wright 1987). The sub-angular sand grains of the west hill indicate unmodified glacial outwash. In contrast, the lower terrace sand grains are rounded, that is, tumbled smooth by wave action. Upper terrace samples include both sub-angular and sub-rounded clasts, showing some



**Figure 23.** *Three Pines site - Longshore Drift and Baymouth Bar Formation.* This illustrates how sand from the west hill has been redeposited northeastwards to form a baymouth bar on which the Three Pines Site is located and a recurved sand spit in the NW channel on which the Sand Point site is located. With gradual lake transgression from the mid-Holocene to the present, successive baymouth bars and sand spits have been inundated.

reworking, but to a lesser degree (Tables 10–12).

Burbidge (1988) postulates that during early post-glacial times, a lagoon occupied the basin between the west sand hill and the bedrock dome. Wave action caused by southwest winds gradually reworked and redeposited sand, forming a baymouth bar where the site is located. This sandbar eventually reached the rock dome, cutting the lagoon off from the lake. As the lagoon terrestrialized, it developed into the Three Pines Bog. Longshore drift continued to move sand eastward, creating a recurved sand spit extending into the Northwest Arm.

#### *Modern Lake Level Rise*

Lake level rise in the modern period is evident in a lower terrace soil profile (Table 12; Figure 7), where an Ah horizon is now buried under 10 cm of baymouth bar wash-over. This organically enriched soil horizon would have developed under

forest vegetation. Local visitors in 1986 said that pine trees used to grow on the lower terrace. As pine trees are intolerant of flooding, this indicates the lake has encroached on the lower terrace. Indeed, existing control gates for power generation and related activities on the Sturgeon River system, as well as earlier nineteenth-century wooden dams, can, or would have, elevated levels above the norm in more recent times (Gordon 1992).

#### **Mid-Holocene Lake Transgression: Evidence from the Three Pines Bog<sup>1</sup>**

In order to radiocarbon date baymouth bar (berm) formation and, by extension, more specifically, date when the Three Pines site was available for occupation, a peat core for pollen and plant macrofossil analyses was lifted from the adjacent Three Pines Bog and analyzed by McAndrews

(Gordon 1990a). As no palynological work had been done before 1987 on Lake Temagami, this peat analysis is important in reconstructing local vegetation history (see below). Subsequent research has been done by Liu (1990), Hall et al. (1994), and Boudreau et al. (2005). One of the key findings from the Three Pines Bog, which led to our 1991 palaeo-hydrological investigations of Lake Temagami, is evidence for a 4 m lake level rise from the mid-Holocene (7,500 years ago) to modern times.

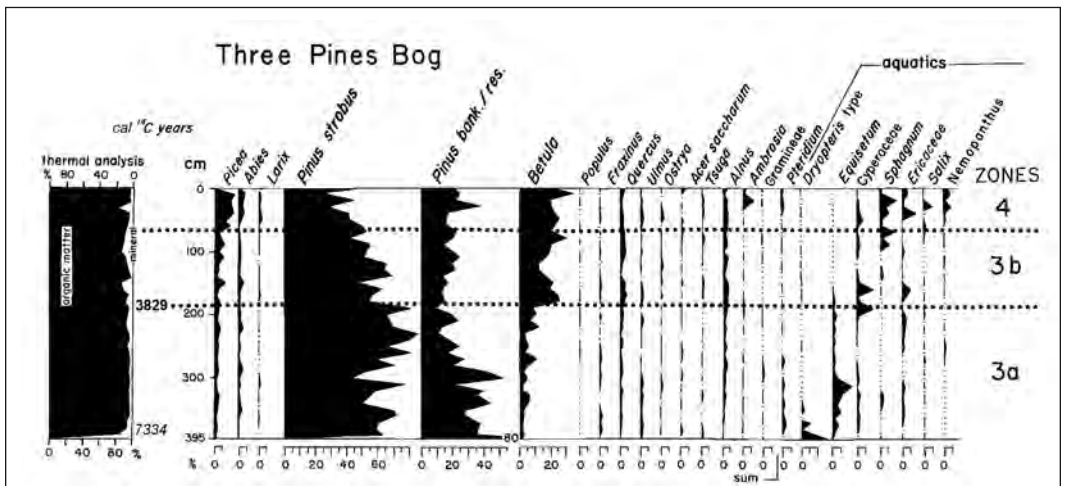
*Location*

The western margin of Three Pines Bog lies just 30 m east of the 1986 excavation (Figure 23). This *Sphagnum* moss and Labrador tea-covered wetland is crescent-shaped, measuring 126 m by 64 m, and has a surface elevation about 20 cm above the lake. It is separated from the lake to the south by a 4 m wide and 80 cm high beach berm. Using a metal rod, peat depth was probed along an east–west transect at the inner berm edge and along a north–south transect at the midline. In profile, the bog is basin-shaped, deepest in the centre beside the berm edge and gradually sloping

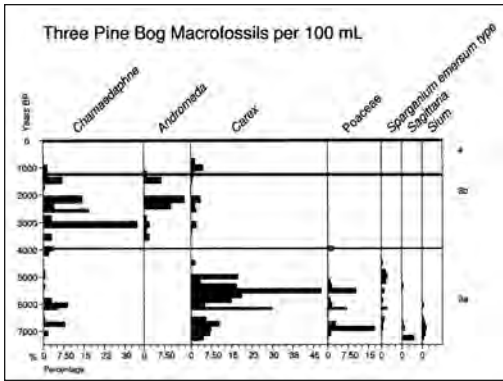
upward to the east, north, and west. A 395 cm core was lifted from the deepest peat using a Livingstone piston sampler (H. Wright 1967). Lithologic, thermal, and pollen analyses were conducted by McAndrews (Figure 24), plant macrofossil analysis by D. Siddiqi (Figure 25) and pollen zone correlations by K-B. Liu at the Royal Ontario Museum (Gordon 1987, 1990a, 1991a; Gordon and McAndrews 1992).

*Core Composition*

The core is peat (c. 95% organic matter), except for grey, silty sand in the basal 5 cm. Peat is composed of vascular plants and moss, which grow with their roots in the water. Over time, when these plants die, the water-logged conditions inhibit decomposition of their organic material as well as that of pollen from surrounding vegetation (Faegri and Iversen 1975). Lake sediment was absent, which means that the basin was not flooded by the lake. The mineral content at the base of the core may be from sand blown up from the beach. The slightly increasing mineral content in Zones 3b and 4 is also aeolian.



**Figure 24.** Pollen Diagram for the Three Pines Bog, Lake Temagami  
 The peat core spans 7,500 years. Pine (*Pinus*), birch (*Betula*) and spruce (*Picea*) are the dominant tree pollen. In Zone 3a white pine (*Pinus strobus*) dominates except at the base where jack pine/red pine (*Pinus banksiana/resinosa*) has a single peak. Horsetail (*Equisetum*) and marsh fern (*Dryopteris*) type together with sedge and grass seeds indicate a nutrient-rich fen. On the other hand, Zone 3b has much shrub pollen together with bog rosemary seeds, which indicate a relatively nutrient-poor bog comparable to the modern bog.



**Figure 25.** Plant Macrofossil Diagram from Three Pines Bog. Indicators of a fen in Zone 3a and a bog in Zone 3b are shown here. Chamaedaphne and Andromeda are small heath shrubs typical of acid bogs. Carex (sedge), Poaceae (grass), Sparganium emersum type (bur-reed), Sagittaria (arrowhead) and Sium (water parsnip) indicate a base-rich fen with pools of water. (D.Siddiqi, analyst).

*Radiocarbon Dates and Sedimentation Rates*

Peat accumulation begins at the coring location in the mid-Holocene. Table 17 gives calibrated radiocarbon dates for the basal peat and the middle of the core. Peat accumulation rates are calculated from these two dates as well as the rise of *Ambrosia* (ragweed) pollen at 25 cm and the bog surface. The rate of peat growth was nearly uniform, averaging 5.3 cm per century over the past 7,334 years. It slowed slightly as the peat level rose and the centre of the wetland became increasingly isolated from the surrounding landscape, as is normal in a terrestrializing sequence. The rate of peat accumulation is controlled by the water table, which in turn is controlled by the rate of lake level rise.

**Table 17.** Three Pines Bog radiocarbon dates and sedimentation rate. Overall average rate is 0.0528 cm/yr. (47°00' 09" N, 80° 07' 23" W; 294 m asl)

Core Depth (cm)	Date (cal B.P.)	Date (RCYBP)	<sup>13</sup> C (%)	Lab Identifier	Sedimentation Depth (cm)	Sedimentation Rate (cm/yr)
25	100			<i>Ambrosia</i> rise	0–25	0.1820
185–190	3829 ± 94	3540 ± 70	-28.56	WAT-2088	25–188	0.0436
385–393	7334 ± 71	6400 ± 80	-28.77	WAT-1987	188–389	0.0575

*Pollen Zones*

The pollen diagram was divided into three pollen zones (Zones 3a, 3b, and 4; Figure 24). These zones are numbered to correlate with those observed in other pollen diagrams (Liu 1990) from Nina Lake, Jack Lake, and Lake Six (Figure 26). The Three Pines Bog core does not span the entire period from deglaciation (12,000 cal B.P.) to the mid-Holocene. It does show forest succession brought by the warmer Hypsithermal (Zone 3a), followed by Neoglacial cooling (Zone 3b) and continued cooling (Zone 4) resulting in the modern Mixed Conifer–Hardwood Forest at Lake Temagami. The rise of *Ambrosia* pollen near the top of the core indicates nineteenth- and twentieth-century field clearance for farming in southern Ontario and the Little Clay Belt of northern Ontario (Hall et al. 1994; Hodgins and Benidickson 1989; Lovell 1977).

Pollen–climate transfer functions (Bartlein and Webb 1985) convert pollen data into estimated climatic data. They suggest this site was warmer and drier 7,500 years ago. The mean July temperature was 18.8 degrees Celsius, compared with 18.0 degrees Celsius today, and the mean annual precipitation was only 650 mm, compared with 820 mm today.

*Wetland Plant Composition*

Fossil pollen and plant macrofossils from wetland plants show a change in local vegetation (Figure 25). The basin at first supported a sedge fen (Zone 3a) with pools of water, succeeded by a *Sphagnum* peat bog (Zones 3b and 4). The fen stage is indicated by sedge (*Carex*) and grass (cf. *Glyceria*) seeds, as well as seeds of water parsnip (*Sium*), arrowhead (*Sagittaria*), and bur-reed (*Sparganium* cf. *emersum*). The bog state in Zone 3b is

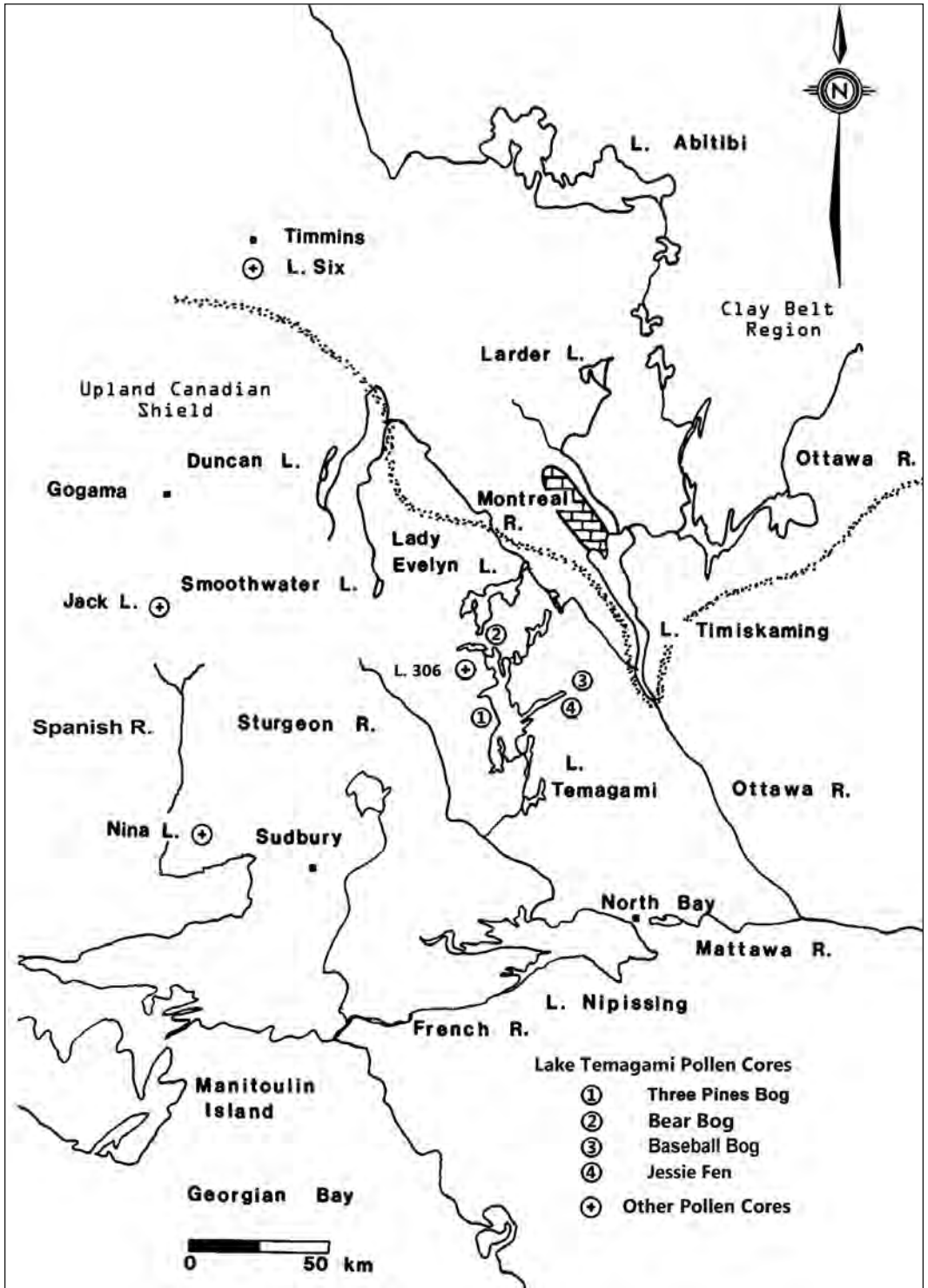


Figure 26. Location of Lake Temagami Pollen Cores and other key northeastern Ontario cores: Lake Six, Jack Lake and Nina Lake (Liu 1990; Liu and Lam 1985); Lake “306” (Hall et al. 1994).

indicated by seeds of bog rosemary (*Andromeda polifolia*).

#### *Mid-Holocene Lake Rise*

Based on the above data, the Three Pines Bog formation and its relationship to lake level change can be reconstructed. Peat began to accumulate at the coring location around 7,500 years ago. In the mid-continental climate of northeastern Ontario, peat grows at or just above the water table (Canadian Soil Classification 1978). Because the wetland is separated from Lake Temagami by only a narrow, permeable sand berm, the water table of the bog fluctuates with the lake level. Measurements of the bog water table in July 1986, June 1987, and September 1987 corresponded to variation in lake levels and ranged from 0 to 20 cm above the lake. In order for 4 m of peat to accumulate since the mid-Holocene, a corresponding rise in the bog water table and thus in the level of Lake Temagami itself is indicated. Furthermore, peat accumulation and the lake level have been rising at an average rate of 5.3 cm per century, consistent with isostatic rebound. The transition from fen to bog is consistent with the wetter climate indicated by the pollen–climate transfer function as well as with increasing isolation of the wetland from nutrient-rich runoff from the surrounding landscape.

#### *Revised Three Pines Site Landscape Formation*

Based on the current slope, a minus 4 m lake surface places the mid-Holocene shoreline at the Three Pines site 20 m farther south. The baymouth bar and peat bog complex could have started soon after deglaciation, but farther south. The absence of lake deposits indicates that the bog basin was not an embayment as earlier posited. Instead peat began to form in a low lying basin separate from the lake. As the lake rose, the bog spread farther inland. Longshore drift reworked new shorelines creating successive sandbars moving farther and farther northward. As the sandbar approached the coring location, more sandy sediment was blown up from the beach.

Evidence for lake transgression from the Three Pines Bog, supports the hypothesis that a slight difference in spatial distribution between Archaic

and Historic period occupations of the upper terrace at the Three Pines site relates to lake level change. The basal core date indicates that the baymouth bar and bog complex was in place by at least 7,500 years ago. A shoreline 20 m farther south would substantially increase the area of habitable space available to precontact occupants. A rising lake would continuously bury lower terrace soils, and erode upper terrace edges. Thus any early to mid-Holocene archaeological components in these locales would now be buried and inundated.

### **Palaeo-hydrological Investigations at Lake Temagami: Implications for Precontact Site Location<sup>1</sup>**

Evidence of a 4 m lake level rise since the mid-Holocene at the Three Pines site in the Central Hub of Lake Temagami led to new research questions concerning Lake Temagami as a whole. Was lake transgression localized or did it affect the entire lake basin? What was the underlying mechanism for lake transgression? Was it isostatic rebound altering drainage patterns, was it climatic change, or was it some other factor(s)? Lake transgression could have an impact on both the location and preservation of archaeological sites. Known lakeside sites, especially low-elevation ones like the Three Pines site, may have truncated sequences of occupation. Early to mid-Holocene sites in other locations may now be inundated or waterlogged (see Loewen et al. 2005 for similar findings at Lac Mégantic, Québec).

The configuration of Lake Temagami from early post-glacial to mid-Holocene (12,000–7,500 cal B.P.) is unknown; this period is not represented in the Three Pines Bog core, nor is it well represented by northeastern Ontario archaeological sites. For the Archaic period, the earliest radiocarbon dates are  $8488 \pm 105$  cal B.P. ( $7670 \pm 120$  RCYBP)<sup>4</sup> for an early Archaic component at the Foxie Otter site (Hanks 1988) and  $5791 \pm 275$  cal B.P. ( $5030 \pm 240$  RCYBP) for the lowest Shield Archaic stratum at the Montreal River site (Knight 1977). For the preceding Late

<sup>4</sup> All dates have been calibrated using CalPal 2014.

Palaeo-Indian period, there is no conclusive evidence north of the Great Lakes. Late Palaeo-Indian quarry and lithic reduction sites do occur on Lake Huron and Georgian Bay to the south (Greenman 1943; Julig 2002; Lee 1953; Storck 1984). In northwestern Ontario, surveys of proglacial Lake Minong yielded Late Palaeo-Indian Plano sites (Dawson 1983; Fox 1975; Julig 1995). Pollock (1976, 1984) has suggested that surveys of proglacial Lake Ojibway-Barlow shorelines might reveal potential Plano occupations in northeastern Ontario, although Julig (1989) cautioned that these palaeo-shorelines were not yet accurately mapped. These ancient lakes are usually associated with the Little and Great Clay Belts northeast of Lake Temagami (Dyke and Prest 1987; Lovell 1977).

Thus, it is necessary to look away from modern shorelines for evidence of early to mid-Holocene occupations at Lake Temagami. Are any palaeo-shorelines identifiable in the Lake Temagami basin? In this densely forested landscape it would be time-consuming to survey for ancient strandlines, because no actual palaeo-shorelines have been mapped (Card et al. 1973; Grant 1964; Roed and Hallett 1979; Simony 1964; Veillette 1986). Narrowing the search area would greatly increase the chance of success in locating early Holocene sites.

In 1991, we developed a computer model to manipulate one important variable: the differential effects of isostatic rebound along Lake Temagami's north-south axis. We created a digital model of the modern lake basin and surrounding terrain from topographic and bathymetric maps (OMNR 1969, 1982). We then applied isostatic rebound curves, developed for the neighbouring Timiskaming basin (Lewis and Anderson 1989), to the modelled Temagami basin, essentially tilting the landscape in response to ice retreat. The tilted values were used to identify probable palaeo-outlets and reconstruct likely palaeo-shorelines. Model predictions were tested in the field by coring upland bogs near two potential palaeo-outlets and documenting geomorphological evidence for palaeo-shorelines. Bear Bog, located near Sharp Rock Inlet, and Baseball Bog and Jessie

Fen, located within the town of Temagami, were then cored (see Figure 26). Results indicate dynamic post-glacial and early Holocene water levels, shorelines, and lake configurations (Table 18). During the earliest phase, three large lakes probably occupied the single modern basin. Some parts of the lake basin have emerged, while others have submerged (Gordon 1992; Gordon and McAndrews 1992; Gordon et al. 1992).

Systematic archaeological survey of these newly identified palaeo-shorelines has yet to be carried out. However, brief archaeological surveys near both palaeo-outlets offered some supporting evidence for lake level change. At the north end, rock paintings at the Deer Island pictographs site (CgHa-23) are high enough up a cliff that they would be hard to reach unless lake levels were higher than they are at present. At the northeast outlet, the landscape context of the inland Portage site (CgGw-4) could potentially be indicative of lake level change (Gordon 1992; Gordon and McAndrews 1992). Inland surveys, discussed below, also revealed several older hunting camps of the *Teme-Augama Anishnabai*.

One main reason we chose to present this palaeo-hydrological work here is to show archaeologists that they need not wait for geomorphologists to define palaeo-shorelines. This predictive modelling approach can be applied to any modern lake, and could be particularly useful for lakes with only a southern drainage. Digital terrain modelling software and Ontario government digital elevation maps (DEM) make mapping more efficient and precise, although bathymetric values would still need to be added by hand for most basins. This tilt model helps identify locales with a higher probability of emergent shorelines and therefore potential post-glacial and early Holocene archaeological sites.

#### *Previously Known Post-glacial History of Lake Temagami*

The Lake Temagami basin was deglaciated by 12,150 cal B.P. (10,400 ± 240 RCYBP) (Veillette 1988). It was immediately occupied at least in part by Lake Post-Algonquin, which extended northeast from the Lake Huron basin to cover Lake Nipissing and the southern end of Lake



**Table 18.** *Palaeo-hydrological events at Lake Temagami.*

Date (cal B.P.)	Lake Timiskaming Basin (Veillette 1988)	Baseball Bog, Lake Temagami (NE)	Bear Bog, Lake Temagami (N)	Three Pines Bog, Lake Temagami (Central Hub)	Pollen Zone	Vertical Displacement (m)
0		292 m asl	304 m asl	293 m asl	4	
1,200					4	
3,800				291 m asl	3b	0.22 m
5,000	Montreal River site (5,800 B.P.)				3a	0.45 m
6,300			Continued lake regression; pond changes to fen		3a	0.9 m
7,300				Lake transgression; peat begins forming at 289 m asl	3a	1.9 m
>7,600			Lake regression; pond separates from lake			
8,000					3a	3.75 m
9,000	ancestral Lake Timiskaming established				2	7.5 m
9,800			ancestral Lake Temagami established >300 m asl; high-energy spillway at Sharp Rock Inlet		1	15 m
>9,800			proglacial lake			
10,900		ancestral Lake Temagami established; >289 m asl				
11,000	Lake Barlow begins decline in Montreal River basin	proglacial lake; 319–330 m asl				30 m
11,500	Lake Post- Algonquin drains; early Lake Barlow established		Ice free			
12,000		Ice-free	Under ice	Ice-free		

Timiskaming, with a narrow channel up the Montreal River and into the Northeast Arm of Lake Temagami. This glacially-dammed lake inundated altitudes up to 310 m asl in the south Temagami basin and 330 m asl in the north end, which may still have been partially submerged under ice. By 11,500 cal B.P. (10,000 RCYBP), Lake Post-Algonquin drained as ice retreated from the Mattawa (North Bay) outlet (Veillette 1988).

Early proglacial Lake Barlow then established itself in the Lake Timiskaming basin, also extending a narrow arm along the Montreal River basin and 13 km into Lake Temagami (Veillette 1988). Evidence of proglacial lake deposits include the crustacean *Mysis relicta* in a lake core from the Northeast Arm and laminated glacial lake clay (varves) in a backhoe excavation in Finlayson Point Provincial Park, near the Temagami townsite

(Jean Veillette, personal communication 1990). By the undated McConnell Phase 1, the connection between Lake Temagami and Lake Barlow had been severed (Veillette 1988). Proglacial Lake Barlow began to decline in the Montreal River basin about 11,000 cal B.P. (9,500 BP), while ancestral Lake Timiskaming was established about 9,000 cal B.P. (8,000 BP) (Jean Veillette, personal communication 1990).

### *Developing a Predictive Model*

To simplify the estimation of palaeo-shoreline location, we focus on basin topography, specifically, outlet sill levels controlling lake levels. Other factors, such as climatic change, evapotranspiration, and sill erosion do play a role in lake level change. However, for this model, we assume that the region did not experience greater evapotranspiration than precipitation (i.e., did not become a closed-basin, evaporitic lake) and that the sills presently formed by Precambrian rock did not erode significantly. The basin topography, however, would have changed due to isostatic rebound.

Glacial isostatic rebound is the recovery of the Earth's crust from warping caused by the weight of continental ice sheets. It is most pronounced where ice sheets were thickest and caused the greatest downward warping, which in eastern North America is in the region of Hudson Bay (Andrews 1989). As the Late Wisconsinan ice sheet melted, the crust rebounded in the direction of ice retreat, which is northeast on the central Canadian Shield (Andrews 1989; Veillette 1988). Published isostatic rebound curves are available for the Lake Huron, Nipissing, and Timiskaming basins. The timing, rate, and direction of isostatic rebound is determined by radiocarbon dating raised glaciolacustrine deposits, plotting their elevations and locations on height/distance diagrams, and using regression analysis to infer a series of palaeo-shorelines and their gradients (Andrews 1989; Lewis and Anderson 1989; Veillette 1988).

Isostatic rebound normally follows a logistic decay function, with the greatest rate of rebound occurring shortly after deglaciation and the rate decreasing through time. Along Lake Temagami's

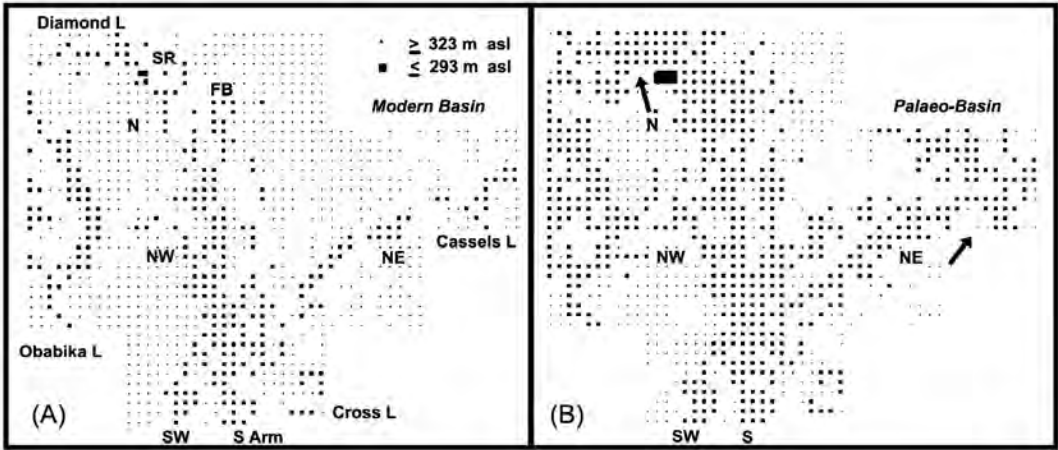
46 km length, the northeast portion was the last to be deglaciated, and therefore the south end had already partly rebounded by the time the north end was deglaciated and started rebounding. With the north end therefore rebounding more than the south end, the net effect is one of tilting the basin at a decreasing rate throughout the Holocene.

A digitized map of the modern lake basin and lake outlets was made by plotting altitudes on the military grid, every 1000 m for the whole basin and every 200 m in areas with potential outlets (Figure 27: A). Altitudes were taken from topographic maps, which have 10 m contour intervals (OMNR 1982 1:20,000 base maps), and bathymetric maps, which have 10 foot (3.048 m) contour intervals (OMNR 1969 1:64,000 fisheries maps). The precision with which palaeo-shorelines can be modelled is thus limited to about 10 m vertical displacement. An algorithm was applied to these values based on published isostatic rebound curves for nearby Lake Timiskaming (Lewis and Anderson 1989), assuming a smooth rate of change in isostatic rebound. Locations with the lowest sill, or pass out of the basin into outlet rivers, were identified as palaeo-sills, and their level was used to determine the palaeo-lake level.

### *Model Results*

The model predicts that 11,000 years ago, the north end of the basin was 30 m lower than the south end (Figure 27: B). The rate of crustal rebound has a half-life of about 1000 years, meaning it results in a 15 m relative vertical displacement at 10,000 years, 7.5 m at 9,000 years, 3.75 m at 8,000 years, and so forth (Figure 28). Clearly the basin was very dynamic between 11,000 and 10,000 years ago. The extreme displacement (30 m) suggests that palaeo-shorelines, particularly in earliest post-glacial times, may have little or no concordance with modern lakeshores. Such a displacement would have tilted the entire basin north toward Diamond Lake, resulting in a greater water flow and higher water level through Sharp Rock Inlet. Palaeo-sills for this ancestral water body probably occur well north of the study area, perhaps into the Lady Evelyn Lake basin.

Within the Temagami basin, however, there

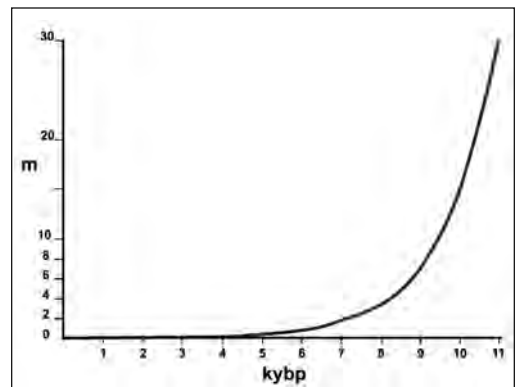


**Figure 27.** Lake Temagami – a digital map of the modern lake basin (A) shows elevations plotted every 1000 m. SR = Sharp Rock Inlet and FB = Ferguson Bay. To model the configuration of palaeo-Lake Temagami (B) at 11,000 years ago, elevations were adjusted according to published isostatic rebound curves (Lewis and Anderson 1989), resulting in a 30 m downward tilt of the north end of the basin relative to the south end. Arrows show the drainage direction of the two predicted palaeo-outlets.

would be two or possibly three lakes, instead of the single large lake that exists today. The entire northern half, including the Northwest and North Arms, formed a lake draining through Sharp Rock Inlet. This northern lake would have been separated from the southern basin by a sill across the Central Hub. This sill would have dammed higher water levels in the South and Northeast Arms. A second lake occurring in the Northeast Arm would have drained through a palaeo-outlet at the present-day Temagami townsite into the Timiskaming basin. The third lake comprises the Central Hub and both south arms draining through a now submerged canyon off Sand Point into the Northeast Arm. The major modern outlet for Lake Temagami through Outlet Bay–Cross Lake to the south was not originally active as an outlet, but it may have hosted an inflowing stream bringing in water from south of the modern basin.

This configuration would have been transitory, with the relative vertical displacement decreasing by 15 m over 1,000 years. By 10,000 years ago, the lake would have attained roughly its modern shorelines—that is, within the 10 m error range of the topographic and bathymetric maps. By this time, its modern outlets, including the main southern drainage would also have been established. As rebound continued, although at a

slower rate, lake levels would continue to decline in the northern half (lake regression) and rise in the southern half (lake transgression). In this



**Figure 28.** Relative Displacement due to isostatic rebound. As glacial ice retreated to the north, the north end of the Lake Temagami basin was slower to rebound than the south end of the basin, so that the north end was depressed relative to the south end. This graph shows the decreasing downward displacement of the North End relative to the South End over time. The rate of relative crustal rebound has a half-life of 1,000 years (i.e., in each thousand years, approximately half the remaining difference between the north and south ends is recovered), resulting in rapid shoreline change in the early Holocene, continuing more slowly through the mid-Holocene.

model most palaeo-shorelines in the southern end would now be flooded, because they lie below the current lake level (293 m asl). Some areas in the northern half of the basin, where the slope up from the present lake level is gentle, should have palaeo-shorelines inland from modern lakeshores.

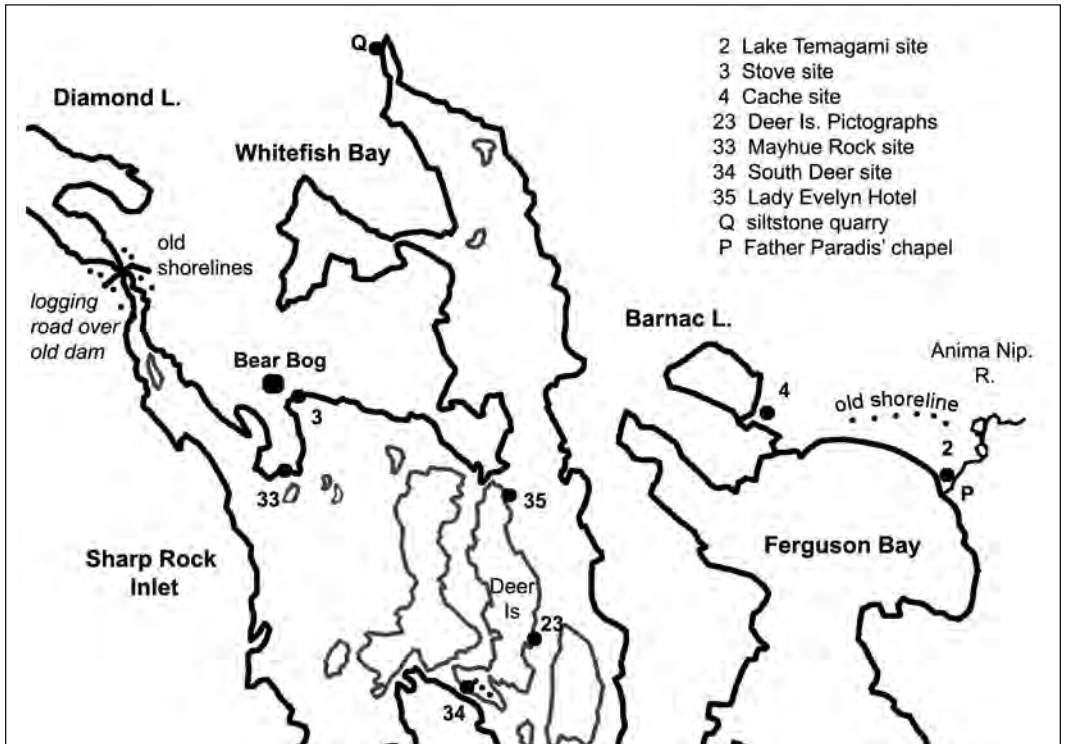
*Field Testing the Model Predictions: North Basin*

The model predicts lake regression near a palaeo-outlet at Sharp Rock Inlet in the north end of Lake Temagami. Sharp Rock Inlet was examined and a pollen core taken was from the upland Bear Bog in July 1991, while the Ferguson Bay outwash plain was examined in August 1991 (Figure 29).

*Sharp Rock Inlet.* In modern times, the rapids forming the northern outlet from Lake Temagami into Diamond Lake have been dammed, leaving a 14 m wide almost dry channel. On the northeastern side of the channel, above and inland from the former rapids, are two terraces, at 297 m and 298.5 m asl, respectively. The lower terrace

consists of large, rounded rectilinear boulders 53 to 156 cm in diameter. The higher terrace is marked by smaller, rounded boulders 36 cm in diameter. On the opposite shore, boulders are present up to 300 m asl. These boulders and terraces indicate a former spillway with sufficient high-energy water movement to remove all finer material. The water level in this spillway was probably close to the upper boulder line, at 300 m asl. This represents a water level 7 m above the current level, consistent with the model predictions of a higher water level at Sharp Rock Inlet.

*Bear Bog Pollen Core.* Bear Bog is located 2 km southeast of Sharp Rock Inlet (Figure 29). It is a large heath with black spruce snags, lying 100 to 400 m inland from the lake and 11 m above it (304 m asl). On the lake side, the water table is held up by a 6 m high moraine, or ice-push ridge, which is breached by a 1 m deep dry channel. The land slopes down to a 2 m high break in slope with large exposed boulders, then continues onto a flat



**Figure 29.** Lake Temagami North End archaeological site locations, Bear Bog pollen core and palaeoshoreline evidence.

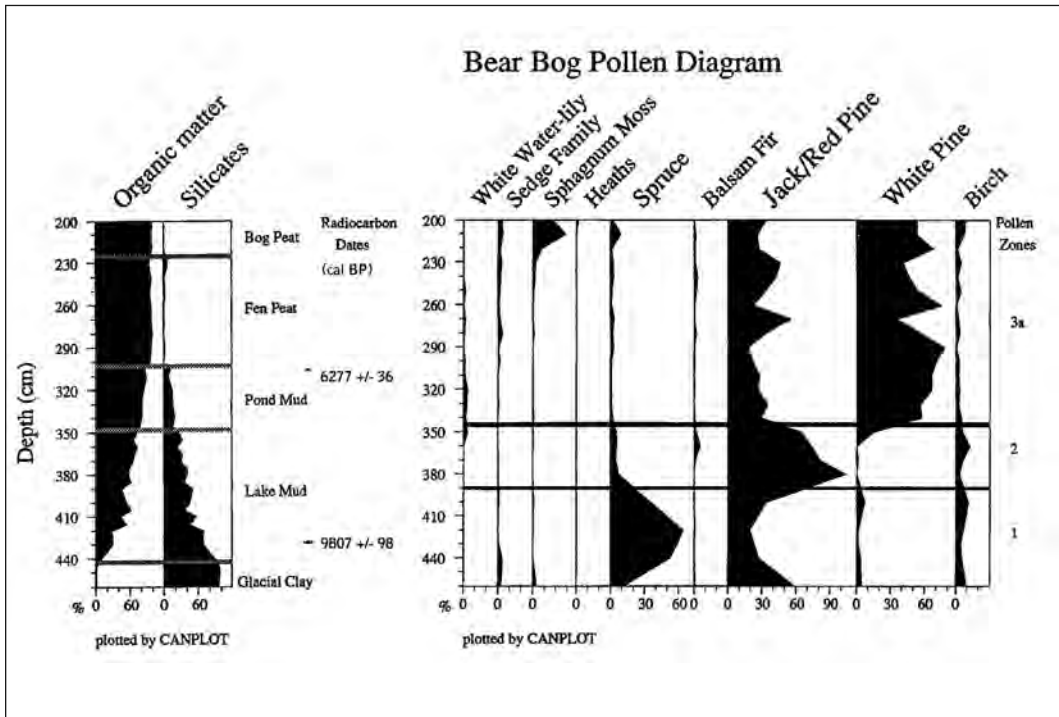
sandy area. Here the lake is quite shallow, with a sandy silty bottom. Stands of pine with tree falls occupy the upper slope, and a dense growth of small aspen, large birch and alder occupies the flat area.

Using a stationary piston sampler (H. Wright 1967), a 460 cm core was extracted from a location 77 m west of the ridge, about 177 m from the lakeshore. The core lithology from 460 cm to 200 cm deep shows a sequence of lake regression (Figure 30). Basal glaciolacustrine clay represents an initial proglacial lake. It is overlain by the lake mud from ancestral Lake Temagami established by  $9807 \pm 98$  cal B.P. ( $8720 \pm 120$  RCYBP; BGS-1515). Pond mud overlies the lake mud. It must have formed in isolation from the large water body of Lake

Temagami, which would have generated waves capable of removing pond mud. Assuming a steady rate of accumulation of sediments, this transition from lake mud to pond mud is estimated to have occurred by at least 7,600 years ago. The next change, from lily pond to fen peat, dates to  $6277 \pm 36$  cal B.P. ( $5,500 \pm 120$  RCYBP; BGS-1514).

At Bear Bog, the ancestral lake bed occurs at an elevation of 300 m asl. The water surface would have been several metres higher. This confirms the minimum 300 m level for Sharp Rock Inlet, dating it at 9,800 years ago (Figure 31).

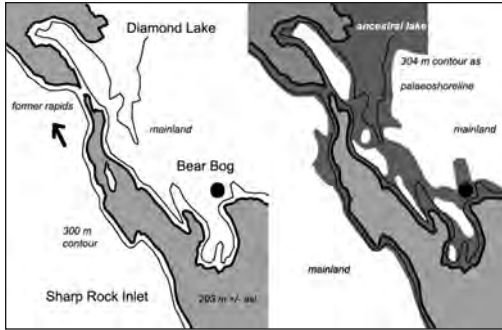
*Ferguson Bay Outwash Plain.* A flat sandy outwash plain and wide beach form the north side of Ferguson Bay (Figure 29). At 300 m inland, a



**Figure 30.**

*Pollen Diagram from Bear Bog, Lake Temagami (47° 10' 20" N, 80° 09' 44" W)*

*Sediments show a transition from deep proglacial lake clays, to lake mud of ancestral Lake Temagami to isolated pond mud to a peat fen; consistent with lake regression at the north end of the lake from early to mid-Holocene times. Spruce (Picea), Pine (Pinus) and Birch (Betula) are the dominant tree pollen. Pollen Zone 1 with high white spruce (Picea glauca) represents an early open Boreal Forest, changing to a closed Boreal Forest in Zone 2 with increase jack pine/red pine (Pinus banksiana/resinosa). Zone 3a (also seen in the Three Pines Bog core) shows a strong rise in white pine pollen (Pinus strobus) indicating the warmer Hypsithermal period.*



**Figure 31.**

*Sharp Rock Inlet, North End showing (Left) modern Lake Temagami with a 300 m asl palaeoshoreline and (Right) reconstructed ancestral Lake Temagami with a 304 m asl palaeoshoreline. Evidence from Bear Bog suggests this ancestral water plane was at least several metres higher.*

break in slope occurs at the edge of a regenerated jack pine stand. At 200 m inland, there is a shallow slope down to the wide sand beach. This area is characterized as “peat organic terrain/low plain wet” (Roed and Hallett 1979).

Two ridges were measured on the sandy substrate at a distance of 280 m inland, with elevations of 299 and 302 m asl (6 and 9 m above current lake level). These are probably palaeo-shoreline remnants. As the lake gradually regressed, peaty soils covered the shallow slope. These findings agree with the 300 m asl palaeo-shoreline at Sharp Rock Inlet and Bear Bog.<sup>5</sup>

### *North Basin Summary*

Field observations and coring results strongly favour the model’s prediction of early Holocene high water levels in the northern basin and palaeo-shorelines at the northern end, at or near the Sharp Rock palaeo-outlet. Field evidence provides additional details not predictable by the model due to the resolution of the topographic and bathymetric maps. The outlet channel at Sharp

Rock Inlet would have been at least 60 m wide, compared with the present width of 14 m, with water at or slightly above 300 m asl. This water planes dates to 9,800 years ago. The ancestral lake in the north basin experienced reduced water levels by at least 7,600 years ago, separating Bear Bog (now 100–400 m inland) from the main lake. It abandoned palaeo-shorelines now found as boulder beaches and beach ridges between 16 m (Sharp Rock) and 300 m inland (Ferguson Bay), depending on local topography. The absence of identifiable palaeo-shorelines between 300 m asl and the modern lake level, at 293 m asl, suggests a smooth transition to the new, lower levels, with no still-stands of significant duration and thus no major influences on lake levels in this basin other than isostasy.

### *Field Testing the Model Predictions: Northeast Basin*

The model predicted another outlet through Temagami at the end of the Northeast Arm (Figure 32). There is currently an 850 m portage between Lake Temagami (293 m asl) and Cassels Lake (289 m asl), which marks the divide between the Lake Timiskaming–Ottawa River drainage and the Lake Nipissing–Great Lakes drainage. This palaeo-outlet would have consisted of several narrow channels draining northeast into Cassels Lake.

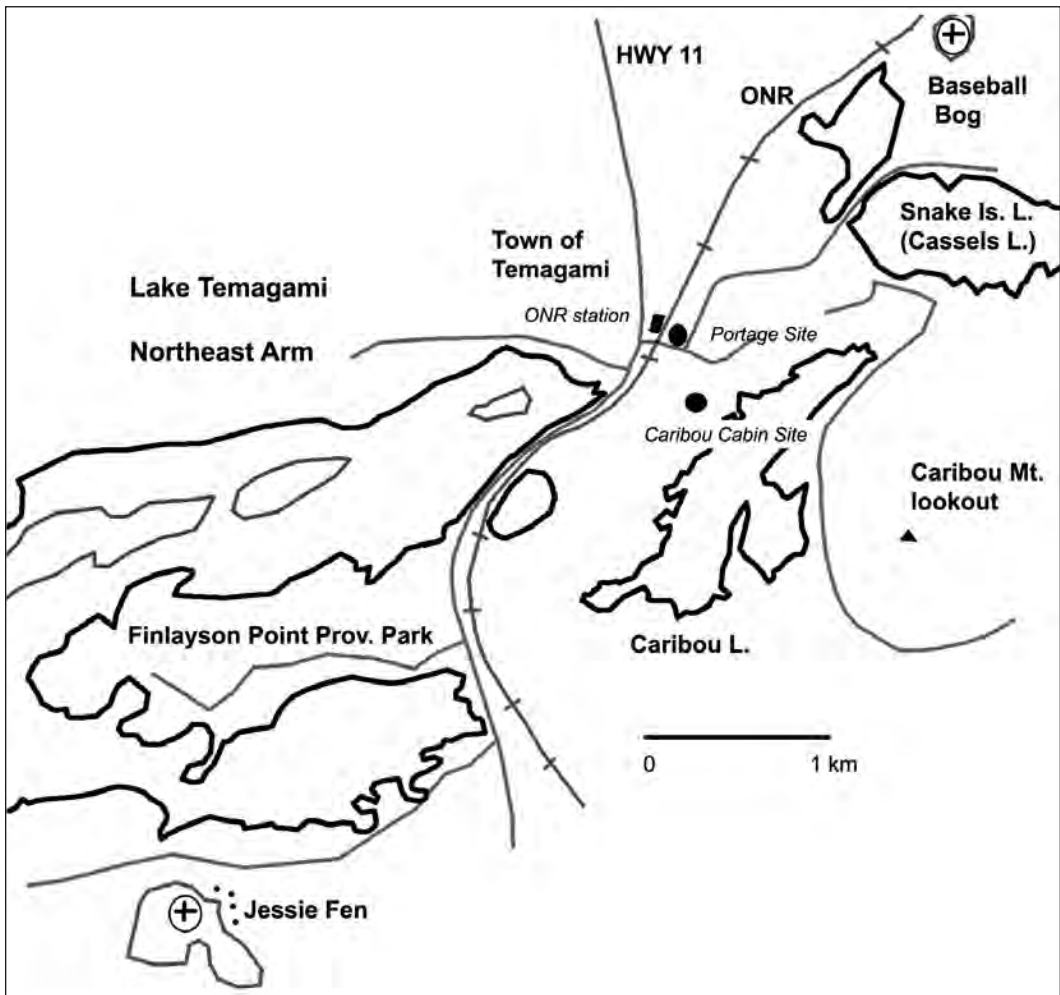
*Baseball Bog.* Baseball Bog is located 250 m north of Snake Island Lake (an extension of Cassels Lake; Figure 32). Situated between two steep bedrock hills, at an elevation of 292 m asl, this 60 by 110 m fen is covered with grasses and dogwood shrubs and fringed with cedar. A 570 cm long core shows a sequence similar to that of Bear Bog (Figure 33). It reveals basal varved glaciolacustrine clay (alternating bands of light grey and dark grey fine sediments deposited in a deep proglacial lake) overlain by massive light grey clay (the lake mud of ancestral Lake Temagami), (lowering water levels), then lake mud (ancestral Lake Temagami), and finally peat (near or above lake level). At locations nearby, Veillette (1988) suggests a water depth of 30 to 50 m to form rhythmites similar to the varves at the base of the Baseball Bog core.

<sup>5</sup> Survey in the field also showed a possible error in the topographic maps, placing the 300 m asl contour at 250 m inland, not 45 m inland as indicated on the OMNR (1982) 1:20,000 base maps, which are compiled from aerial photographs.

As the uppermost varves occur at 288.5 m asl, this places the proglacial water surface at 319–339 m asl (26–46 m above modern Lake Temagami). Massive clay above 288.5 m asl indicates a lowering of water level below the point where rhythmites can form, but still well above the modern lake level. This transition is dated at  $10,895 \pm 266$  cal B.P. ( $9,580 \pm 200$  RCYBP; BGS-1543) and likely represents the establishment of ancestral Lake Temagami.

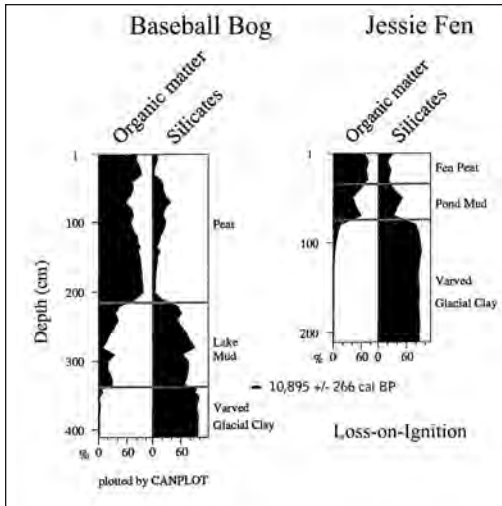
*Jessie Fen.* Nearby, on the south side of the Northeast Arm, Jessie Fen reveals an inconclusive sequence (Figures 32 and 33). The fen is bisected

by Jessie Creek, which flows from Jessie Lake north into Lake Temagami. The fen is grass-covered with some conifer snags in the centre. The 220 cm long core contains glaciolacustrine varves, then massive clay with no varves, then pond mud and a peat cap. Radiocarbon dating of the basal peat was not practical due to abundant root penetration from above. However, on the northeast edge of the fen is a boulder beach, and the fen is surrounded by smooth bedrock, reminiscent of the modern wave-washed shoreline. This boulder beach and washed bedrock lies 300 m inland from Lake Temagami at an elevation of 295 m asl (Figures 32 and 34).



**Figure 32.**

*Lake Temagami Northeast Arm and Town of Temagami – archaeological site locations and pollen coring locations.*



**Figure 33.** *Composition of Cores from Baseball Bog (47°04' 16" N, 79° 46' 40" W; 292 m asl) and Jessie Fen (47°02' 53" N, 79° 48' 24" W; 294 m asl), town of Temagami. These cores at the predicted northeast palaeo-outlet, show the transition from a deep proglacial lake of varved clays to ancestral Lake Temagami (Baseball Bog) and an isolated pond (Jessie Fen). Peatlands develop as the lake continues to recede.*

*Northeast Basin Summary*

Evidence from Baseball Bog supports Veillette’s (1988) reconstruction of proglacial lakes Post-Algonquin and Barlow inundating the Northeast Arm of the Temagami basin. It also dates the separation of ancestral Lake Temagami from proglacial Lake Barlow to 10,900 years ago (the McConnell Phase 1) (Veillette 1988). As Lake Barlow declined, ancestral Lake Temagami drained northeast, inundating at least several metres above the 290 m contour in the Cassels Lake basin (Figure 34). Differential isostatic rebound caused this lake to regress, eventually closing the northeast outlet. While the Jessie Fen core was inconclusive, evidence was found, 300 m inland, of a 295 m asl palaeo-shoreline.

*Archaeological Sites and Lake Level Change*

During the 1991 project, several archaeological sites were recorded in the north and northeast basins (Figures 29 and 32), but none had clear evidence for early occupations (Gordon 1992). As noted earlier, the Deer Island pictographs are the

one clear archaeological indicator of higher water levels found in the North Arm. These are drawn on an east-facing rock face that is not accessible from above, extending from 1.7 to 3.1 m above the modern lake level. The modern high-water mark at the site is only 40 cm, placing the pictographs at 1.3 to 2.7 m above it. In contrast, rock paintings in the Central Hub are about 1 m above the water (Gordon 1995a). While it is possible that the pictographs were made from a snow-drift in winter, it is more likely they were made when the lake levels in the North Arm were 1 to 2 m higher than today. The estimated rate of rebound suggests this may have occurred between 1,000 and 4,000 years ago.

The nearby South Deer site (CgHa-34) had surface finds of chert and vein quartz flakes in a canoe camper’s clearing 2 m above the lake (295 m asl) and 7 m inland. A side-notched projectile point with a convex blade and rounded base was found along the exposed sloping bedrock near the water. This point is thin, made on a flake, and of high-quality red opaque (burnt) chert. It resembles Middle Woodland points from the Three Pines site. Two palaeo-shorelines are evident behind this clearing. A break in slope occurs 30 m inland at 3 m above the lake (296 m asl), where a lag boulder beach is found. Behind it, an upper terrace forested with birch and hazel rises to 7.5 m above the lake (300.5 m asl). A second break in slope, up to 305 m asl, is formed by a steep scarp. Testing of these interior palaeo-shorelines, especially those inland from lakeside precontact sites in the north basin, may prove to be a useful strategy in finding older components.

Within the town of Temagami, contract work for Algonquin Associates was undertaken along the existing TransCanada pipeline corridor and proposed deviation (Gordon 1992). Survey concentrated on areas above the 300 m contour, which intersected former drainage channels for this palaeo-outlet, including the palaeo-shoreline on the north side of Caribou Lake (Figure 34). All erosional features were examined along a 3 km segment of the pipeline right-of-way with test pitting in selected undisturbed areas. Two sites were recorded: a traditional use camp west of Caribou Lake (CgGw-6) and a single bipolar flake



(CgGw-4) east of the Ontario Northland Railway Station.

Designated the Portage site (CgGw-4), this isolated find spot is in an open grassy area. An 8 cm long, bipolar decortication flake (Susan Jamieson, personal communication 1991) of a dark brown metasediment was found in eroding soil at the edge of a flat bedrock outcrop. This type of raw material is similar to the mudrock tools assigned to the Archaic period at the Three Pines site, to lithic debitage from the lowest stratum of the Montreal River site dated at 5,800 years ago, and to a greywacke flake cluster at the Foxie Otter site, dated to 8,500 years ago (Hanks 1988; Knight 1977). Dating by raw material alone is of course tenuous. This stretch of land between Lake Temagami 300 m to the southwest and Cassels Lake 600 m to the northeast was maintained by the *Teme-Augama Anishnabai* as a winter trail (MacDonald 1993) and may have served a similar function in the past. However, when ancestral Lake Temagami was at the 300 m asl contour, this location would have consisted of level terrain, 40 m inland from the water, on the southwest corner of an island; common characteristics of precontact sites on Lake Temagami (Figure 34).

### *Summary of Palaeo-hydrology*

Evidence of lake transgression in the Central Hub, from the mid-Holocene to the present, led us to examine the palaeo-hydrology of Lake Temagami as a whole. Differential post-glacial isostatic rebound was one possible explanation for lake level rise, with the newly deglaciated north end of this 46 km long lake basin, rebounding faster than the south end. We developed a predictive model of palaeo-shoreline location by computer digitizing altitudes in the Temagami basin from topographic and bathymetric maps available in 1991. We applied published isostatic rebound curves from the adjacent Timiskaming basin to tilt the landscape in order to identify likely former sills and outlets and thus former water levels and palaeo-shorelines. The model predicted a maximum 30 m relative vertical displacement, resulting in three separate lakes, draining north and northeast through two palaeo-outlets.

The model results appear to match well with sedimentary and geomorphological evidence (see Table 18). Palaeo-shorelines for ancestral Lake Temagami found at Sharp Rock Inlet and at the Northeast Arm are consistent with the highest water levels predicted by the model. Lithostratigraphy of pollen cores from the Bear Bog (N) and Baseball Bog (NE) shows deep proglacial lake inundation, findings in accord with Veillette's (1988) reconstruction of post-glacial lakes Post-Algonquin and Barlow in the Timiskaming basin. Shorelines for these ancient lakes have little or no correspondence with modern lakeshores. Their altitudes are estimated from 310 m asl to 339 m asl, or 17 to 46 m above the current elevation of Lake Temagami.

The establishment of ancestral Lake Temagami dates to 10,900 years ago in the northeast lake basin, with a multi-channel outlet into the Timiskaming basin, and to 9,800 years ago in the north lake basin, with a high-energy spillway out through Sharp Rock Inlet. Associated palaeo-shorelines were observed as far inland as 400 m (Bear Bog), ranging from 2 to 9 m above the modern lake depending on slope. As rebound continued, the ancestral lakes regressed from these shorelines, causing lake transgression in other parts of the basins, eventually forming one large lake body with a southern outlet. While climatic change, as evidenced by the pollen cores from Bear Bog and Three Pines Bog, may have caused some lake level fluctuation, we suggest that it did not have as strong an impact on the Temagami basin as did isostasy.

Our research into reconstructing the palaeo-hydrology of Lake Temagami has several implications for precontact site location. Assuming that early colonizers preferred lakeshore encampments, early Holocene habitation sites would be distributed in substantially different landscape locations than are likely to be found by archaeological surveys along modern lake and river shores. However, archaeologists need not wait for geomorphologists to define palaeo-shorelines. This predictive model reduces the potential search area to those locales with a higher probability for yielding early sites, that is, emergent and often inland palaeo-shorelines. This method could easily

be applied to other lakes. Lake Temagami today has a shallow sill across the Central Hub and drains both to the north and the south. In earlier times, this central sill may have divided the lake into separate basins, draining exclusively to the north through two palaeo-outlets. With modern digital modelling software and digital elevation maps, greater accuracy can be achieved than was possible with the topographic base maps used here.

Knowing which areas have submerging shorelines also informs modern shoreline surveys and archaeological interpretation (Loewen et al. 2005). Timing archaeological survey to periods of naturally lower water (April) or co-ordinating with hydroelectric companies might be feasible. Certain landforms are differentially affected by lake transgression. A substantial area of the low-elevation Three Pines site has been inundated. In contrast, rising lake levels may have had a less destructive impact on the Witch Point site, located above a steep slope. Furthermore, rising water levels would make different landscape features more attractive for occupation at different time intervals. Reconstructing the local effects of changing water levels can add a rich complexity and time depth to our reconstructions of precontact land use. Altered drainage patterns, travel routes, portage locations, flooded bedrock resources, changing wetlands, and lake depths would all have impacted subsistence, settlement, and other procurement strategies of precontact inhabitants.

### Vegetation and Climatic History of Lake Temagami<sup>1</sup>

Analyses of the pollen cores from Bear Bog (Figure 30) and Three Pines Bog (Figure 24) together provide the entire vegetation history of Lake Temagami from soon after deglaciation to the present (Table 19). These correlate well with other pollen cores (Figure 26) from Nina Lake 110 km southwest; Jack Lake 130 km northwest (Liu 1990; Liu and Lam 1985); and “Lake 306,” located near Bob Lake, 7 km west of Bear Bog (Hall et al. 1994).

Zone 1 represents an early open Boreal Forest, established soon after glacial retreat. It is dominated by white spruce with balsam fir, aspen, and tamarack, perhaps along with more deciduous hardwoods (oak, elm) than the modern Boreal Forest growing on the newly formed rich soils (Liu 1990). The nearby ice front created a periglacial climate, with warmer, drier winters and cooler, windier summers than the climate of today’s Boreal Forest (Hall et al. 1994; Liu 1990). Charcoal data from “Lake 306” suggest a low incidence of forest fire in this patchy, open forest (Hall et al. 1994).

In Zone 2, jack pine increases while spruce decreases, reflecting a closed Boreal Forest much like that around Jack Lake today (Liu 1990). Along with jack pine, spruce, birch, poplar, and alder dominate. In Zone 3a, a strong rise in white pine pollen, along with oak and elm, signals the replacement of the Boreal Forest by a Great Lakes–

**Table 19.** *Regional vegetation and climatic history.*

Pollen Zone	Nina Lake, Sudbury, Date (cal B.P.) (Liu 1990)	Date (cal B.P.), Three Pines Bog (TP)/ Bear Bog (BB)	Forest Composition	Climate
4		100–0 (TP)	Ragweed/birch from cleared land	Modified continental
4		1,200–100 (TP)	Mixed Conifer–Hardwood Forest	Cooling continues
3b		3,800–1,200 (TP)	Boreal Forest/Mixed Forest ecotone stabilizes north of Temagami (decrease in white pine)	Neoglacial cooling
3a	8,200–4,500	8,200–3,800 (TP) >6,300 (BB)	Great Lakes–St. Lawrence Forest spreads 140 km farther north (increased white pine)	Hypsithermal
2	10,000–8,200		Closed Boreal Forest (jack pine)	Warming climate
1	11,000–10,000	>9,800 (BB)	Open Early Boreal Forest (white spruce)	Periglacial climate
		12,000	Tundra?	Ice-free

St. Lawrence Forest. In this Hypsithermal Period, with temperatures 1 to 2 degrees higher than present, the Boreal Forest–Mixed Forest ecotone migrated 140 km north to the edge of the Canadian Shield (Liu 1990).

The onset of Neoglacial cooling is indicated by Zone 3b, with declining white pine, increasing jack and red pine, birch, and slightly increasing spruce, as seen in the Three Pines Bog. This zone reflects the southward expansion of boreal forest species. Compared with Jack Lake, the Three Pines Bog shows higher white pine and lower jack/red pine values in the upper levels of Zone 3b, supporting a stabilized Boreal Forest–Mixed Forest ecotone, which is now 50 km north of Lake Temagami (Liu 1990).

In the Three Pines Bog Zone 4, white pine slightly decreases, with an increase in spruce and fir. A Mixed Conifer–Hardwood Forest profile characterizes this zone. Increased ragweed and birch, seen near the top of the core and in the “Lake 306” core, are indicative of human disturbance of the vegetation. These colonizing species reflect forest clearances for farming in the Little Clay Belt and for mining and logging on the upland Canadian Shield since the mid-1800s (Hall et al. 1994; Hodgins and Benidickson 1989; Mitchell 1977).

Thus, soon after deglaciation at Lake Temagami (12,000 B.P.), an early open Boreal Woodland was established, followed by a closed Boreal Forest. Climate warming in the Hypsithermal allowed white pine to expand, creating a mixed conifer–hardwood forest with more white pine than today (Liu 1990). Neoglacial cooling introduced more boreal forest species into this mixed forest. Cooling continued to the present, with white pine gradually decreasing while white spruce, fir, and birch increased. Lake Temagami remains at the northern edge of the Great Lakes–St. Lawrence Forest today.

### Surveyed Sites and Settlement Patterns

Precontact, historic, and traditional use sites were found by survey in the Central Hub, the north end, the northeast end, and the south end of Lake Temagami. Several previously registered sites were

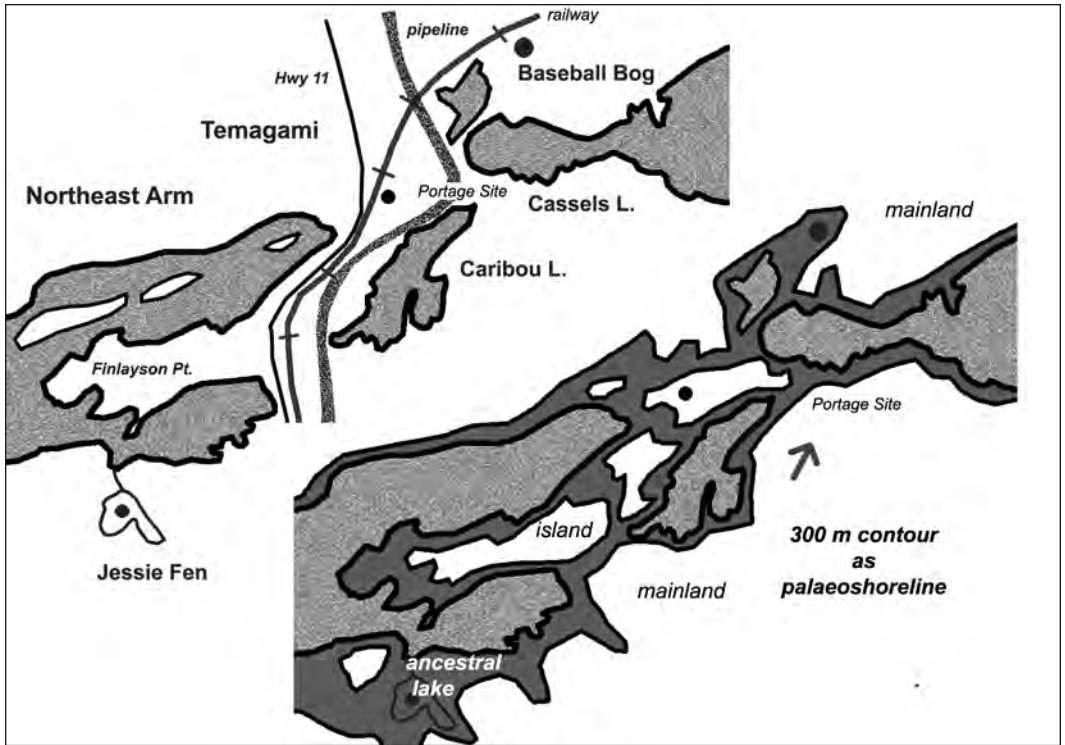
also re-examined. This section broadens the research to the next level of analysis. Previous sections dealt with artifacts in their stratigraphic context and a single site in its local context, or site microenvironment, to use Butzer’s (1982) terminology. The landscape context of multiple sites, or sites’ mesoenvironment, is now the focus.

To understand hunter-gatherers’ seasonal economic round, ethnographic information is presented first. Then, the landscape context of surveyed sites with precontact components are examined to determine what site selection criteria may be operating (Gordon 1990a). Data are also compared with site characteristics at North Caribou Lake, a closed boreal forest lake in northwestern Ontario (Gordon 1985, 1988a, 1988b) and Lac Caniapiscau, an open boreal forest lake in north-central Québec (Hanks 1983). Criteria such as southern exposure, protection from cold winds and storm tracks, well-drained soil, and accessible shorelines are clearly preferred. The differential impact of lake level change on precontact Lake Temagami sites from the north end (lake regression) is compared with those from the south end (lake transgression).

Many precontact locales continued to be occupied in the Historic period (pre-twentieth century). Archaeological findings are compared and contrasted with campsite and trail information in Macdonald’s (1993) *Historical Map of Temagami*, an important ethnographic resource for understanding the relationships between habitation sites and their connecting networks of open water and winter trails. The landscape context of several twentieth-century traditional use sites is also discussed.

### Archaeological Survey Locations

Archaeological survey between 1985 and 1994 documented a wide variety of precontact, nineteenth-century, and traditional use sites (Gordon 1986, 1987, 1989, 1990a, 1990b, 1991a, 1992, 1995a; Gordon and McAndrews 1992). In 1985, a Cessna overflight was taken around the entire lake. Landscape features such as protected bays, points of land, sand beaches, and river outlets were noted on topographic maps and photographed as potential precontact site areas.



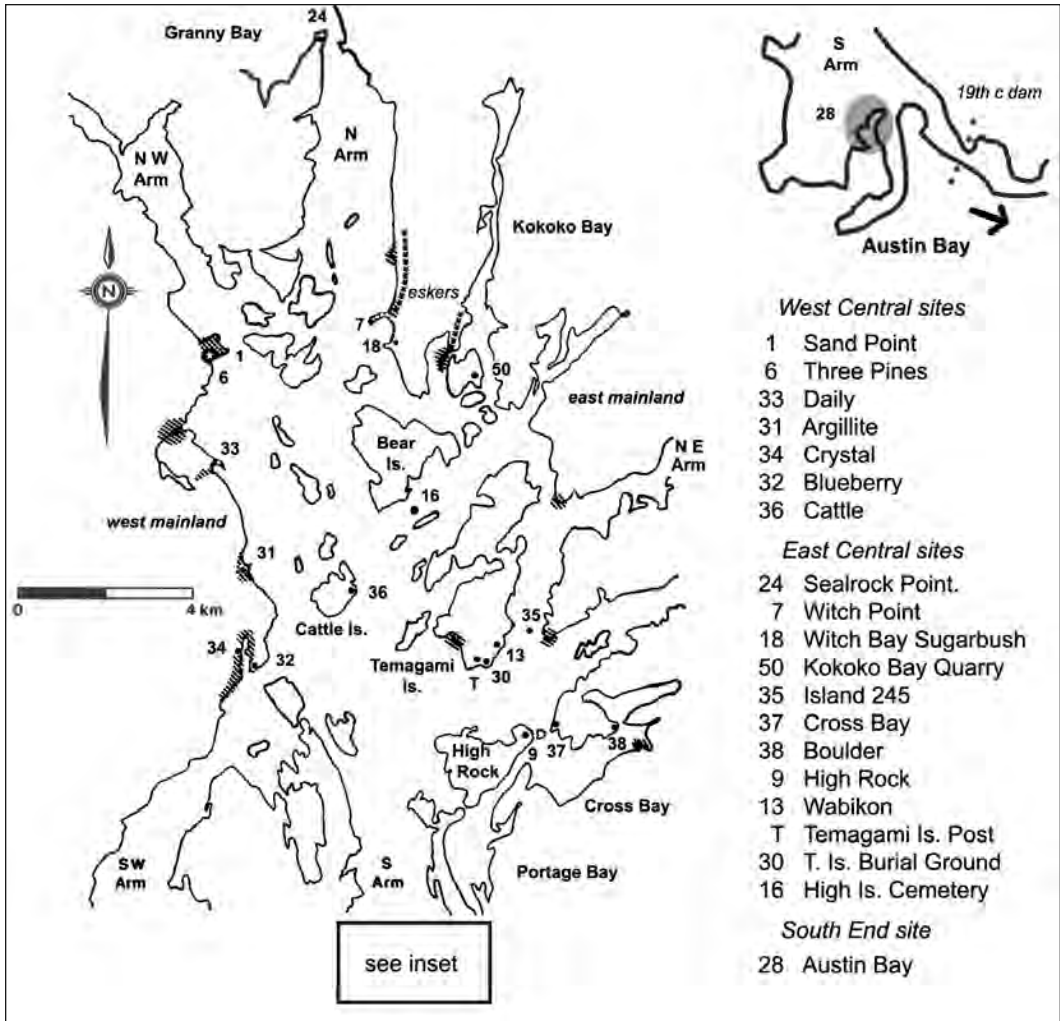
**Figure 34.** Northeast End of Lake Temagami showing peat coring locations at Jessie Fen and Baseball Bog in the town of Temagami. (Upper Left) Modern lake configuration and (Bottom Right) reconstructed ancestral Lake Temagami with a palaeoshoreline at 300 m asl. While this multi-channelled palaeo-outlet drained northeast, the Portage site would have been on an island.

Raised water levels at Cross Lake due to the twentieth-century dam appeared to extend into the South Arm. For this reason, survey concentrated on the Central Hub of Lake Temagami, particularly the undeveloped mainland, as many islands contained cottages and recreational camps.

In 1986 and 1987, modern shorelines to the north and south of the Three Pines and Witch Point sites were surveyed by boat, to compare site landscape and usage with these large, multi-component sites (Figure 35). The focus was on lakeside locales with enough flat ground to pitch a tent. These were surface-examined and test pitted using 0.4 m squares. Precontact habitation sites were found at six locations with lithic scatters (CfHa-31, -33, -35, -36, -37, -38). A vein quartz quarry (CfHa-34) and an associated lithic workshop (CfHa-32) were also identified. The three previously registered

sites that were re-examined include the Sand Point site (CgHa-1), the High Rock Island site (CfHa-9), and the Lake Temagami site at Ferguson Bay (Carscallen 1994b; Conway 1986; Gordon 1986, 1987, 1989, 1990a, 1991a).

Brief inland survey was conducted in 1991 at the north and northeast ends of the lake, in conjunction with the palaeo-hydrological fieldwork described above (Figures 29 and 32). Survey was too limited in scope to uncover clear archaeological evidence of early palaeo-shoreline occupations. However, at the north end, three new lithic sites (CgHa-33, -34, -35), one potential bedrock quarry, and an early twentieth-century hotel (CgHa-35) were found at the lakeside. Farther inland, two traditional use sites (ChHa-3 and 4) were recorded. During contract work along the TransCanada Pipeline, a sawmill site (CgGw-2) at Owaissa, north of Temagami; a precontact



**Figure 35.** Lake Temagami Central Hub archaeological site locations. Inset shows South Arm. Hatched lines indicate 1985-1987 survey areas.

find spot within town (CgGw-4); and a traditional use site (CgGw-6) west of Caribou Lake were documented (Gordon 1992; Gordon and McAndrews 1992). One benefit of inland research was encountering many twentieth-century traditional use sites.

To gain a better understanding of the traditional use sites, boat surveys in 1994 with Bill Twain focused on known pictographs and previously registered nineteenth- and twentieth-century sites. A new vein quartz quarry site (CfHa-50) and nine pictograph sites (CfHa-3,

CfHa-6, -7, -8, CgHa-8, -9, -10, -21, -28) were re-examined (see Zawadzka, this volume). We also visited two historic cemetery sites (CfHa-16 and CfHa-30), the 1834 Hudson's Bay Company Outpost (CfHa-1) on Temagami Island, a Katt family camp with precontact lithics (CgHa-24), and the large nineteenth-century village at Austin Bay (CfHa-28). Bill's stories and historical information about other *Teme-Augama Anishnabai* sites were also recorded (Gordon 1995a).

### *West-Central Hub Sites*

On the west mainland, 13 km of shoreline was surveyed by boat from the forest fire–denuded Northwest Arm, north of the Three Pines site, to the entrance to the Southwest Arm (Figure 35). The Sand Point site (CgHa-1) lies on a low point with a wide sand and gravel beach, east of the Three Pines site. This landform is a recurved sand spit that is building out into the deep channel at the entrance to the Northwest Arm. The 40 by 30 m clearing is used as a canoers' campsite. A total of 14.5 square metres was excavated by Conway (1986), resulting in the recovery of 57 lithic tools, 818 lithic debitage, 1 copper knife, and sherds from 3 pottery vessels. Two 3.0 m long by 0.50 m deep hearth features were found, containing fire-cracked rock and fire-reddened sand. Calcined faunal bone was adjacent to but not in these features. Raw material usage is predominantly HBL chert, other cherts, and quartz. Based on the pottery designs, a cord-wrapped stick vessel, a horizontal push-pull vessel, and low-collared vessel with trailed horizontals over obliques, Conway assigns most of this collection to the Late Woodland period. Two large, rectilinear greywacke tools found at the exposed tip of the point are assigned to the Archaic period (Conway 1986). This site has been subject to the same longshore drift and lake transgression as the Three Pines site 500 m west, resulting in potentially inundated Archaic period components.

Farther south, the Daily site (CfHa-33) is a 3 m high rocky promontory overlooking a very small shoreline indentation. Modern camping use is indicated by a stone fireplace and lumber left by cottagers for canoe campers to burn. One small 12 by 14 m area is flat enough for pitching a tent. Ten test pits yielded only two HBL chert retouch flakes.

Bedrock cliffs rise steeply from the shore south of the Daily site until a small bay is reached. The Argillite site (CfHa-31) lies on a small point of land at the south end of this bay. The point is notable for a natural, canoe-sized slot in its smooth bedrock margin. Modern camping has left the shallow soil denuded of vegetation. Test pits (11) produced three flakes and modern refuse. In the northwest corner of the bay is an old logging

road. A logging boom can be seen in a 1977 aerial photograph.

At the entrance to the Southwest Arm, four quartz veins were examined (Simony 1964). Three were vertical, difficult to reach, and less homogenous than the Crystal site (CfHa-34). This quarry site is a 20 m long vein of milky white quartz extending horizontally into a V-shaped embayment. The exposed portion is 1.4 m above the water and 0.75 m wide, while the deep underwater portion is wider. Hammering scars are evident above water, in contrast to the smooth surface below. With lower lake levels in the past, much more of this vein would have been exposed. Quartz shatter is evident all around and on a small island opposite.

The Blueberry site (CfHa-32) is an associated lithic workshop 200 m south. Large chunks of fine-grained vein quartz debitage, flakes, and chert flakes were found on the surface and in test pits (14). This modern campsite on a south-facing point gets blasted by the prevailing southwest winds funnelled up the long, open Southwest Arm. Angular bedrock encircles the point, making access difficult from the water.

The Cattle site (CfHa-36) is the only island site with deep sand deposits that was test pitted. It is a large, grassy expanse strewn with boulders on a promontory with steep rocky shorelines. One small cobble beach on the south side offers access to the site. Test pits (10) revealed only one plain pottery sherd and one flake. Local informants said that cattle had once been pastured here.

### *East-Central Hub Sites*

Along the east mainland (Figure 35), four km of shoreline was examined, from 1 km north of the Witch Point site to Mule Bay (Gordon 1986, 1987). Sealrock Point at Granny Bay and the Kokoko Bay entrance were also examined (Gordon 1995a). A stretch of 11 km from Matagama Point into Cross Bay and down to Pelican Point was also briefly examined (Gordon 1989, 1995).

Sealrock Point (CgHa-24) is a previously registered site. Here a 100 m x 50 m point of land juts into Granny Bay. It has a rocky shoreline and thin deposits of soil, with jack pine near the point

and white pine farther inland. Vein quartz flakes were found in the north campers' clearing, with a chert scraper in the south clearing. According to Bill Twain, this point was formerly called Squirrel Point and is a known stopover camp for the Katt family (Gordon 1995a). The Katt family lived on Diamond Lake, to the north (Pollock 1992), and would gather here when they came down to Lake Temagami.

According to Bill Twain, people would frequently stop at Sealrock Point, which lies at the intersection of the open west channel (Granny Bay and Devil's Bay) and the North Arm of Lake Temagami. A traveller could easily get caught by winds from any direction. He noted that people would live on this point especially during fly season, as it gets a lot of wind. In his terminology Sealrock was not a "long time camp," not a "permanent camp," just a stopover for a few days (Gordon 1995a).

The Witch Bay Sugarbush site (CgHa-18) was registered by Conway as a maple sugarbush site, based on information from Bear Island residents (Ontario Ministry of Tourism, Culture and Sport, Site Record Form). When the site was visited in 1986, probable remnants of a square wooden structure consisting of lumber and tar paper were noted. Near the shore were metal and glass artifacts and unburned moose bones. The structure may have served as a temporary cookhouse, but could also be a winter trap cabin. Revisited in 1994, the cabin remains were either hidden under new growth or washed out and redeposited by storms.

The Kokoko Bay quarry site (CfHa-50) is a large, horizontal vein of milky quartz. It extends for 15 m along the east shore of an island at the entrance to Kokoko Bay. The exposed portion is 2 m high, with another 1 m extending below the water. Cedar and jack pine grow in shallow soil atop the vein. Chunks and chips of all sizes are found in the water (Gordon 1995a). It is a good-quality, homogenous material, unlike the narrow veins in the pink Archean granite on the opposite mainland shore (Simony 1964). This site may be the primary source for the milky vein quartz flakes and core fragments found at the Witch Point site.

The Island 245 site (CfHa-35) is on a very

small, exposed bedrock island with a few pockets of soil and trees. It lies in the channel between Temagami Island and the east mainland. Three test pits yielded two flakes. A side-notched grey chert projectile point lay on the bedrock surface at the north end.

The Cross Bay site (CfHa-37) occupies a relatively flat clearing beside an expanse of smooth bedrock on the north side of a narrow channel connecting the Central Hub to Cross Bay. The site is frequented by campers and lacks both ground cover and a humus horizon. Most of the artifact recoveries were surface finds. The eight tools are two chert biface fragments, four chert scraper fragments, a vein quartz side-notched point base, and a vein quartz scraper fragment. Of the 293 lithic debitage, 60 percent was vein quartz, followed by chert, mudrock, and HBL chert. A high proportion of vein quartz debitage is due in part to a large rock with a quartz inclusion uncovered in one of two test pits. One ball clay pipe stem was also recovered. This channel would offer a strategic place for fishing. The site also has a commanding view of both Cross Bay and Lake Temagami.

The Boulder site (CfHa-38) is a small point of smooth bedrock forming the west side of the narrow channel into northern Cross Bay. It is a small modern campers' clearing, 26 m by 22 m. Two of five test pits yielded 4 broken tools, 17 debitage of mostly vein quartz, and 5 calcined faunal bone. Vein quartz tools include two biface fragments and a scraper fragment, along with an HBL chert scraper fragment.

Another small lithic site in Cross Bay is the High Rock Island site (CfHa-9), at the base of the lookout path. This modern campers' site is easily accessible because a smooth rock ledge slopes into the lake. It is well protected by a small island directly opposite, occupying the narrow southern channel between Cross Bay and the open water of Lake Temagami. Surface collecting produced a vein quartz biface fragment, a piece of vein quartz shatter, and a chert flake.

The lookout path climbs a steep Nipissing Diabase dyke at the northeast tip of High Rock Island. It offers a commanding view of the Central Hub of Lake Temagami. Along the path and at the

top are numerous depressions and rocks, identified by Conway based on informant information as human-made structures for defensive purposes (Ontario Ministry of Tourism, Culture and Sport, Archaeological Site Record Form). Bill Twain said the lookout point served as a watchtower. The following paraphrases his words:

Before the HBC outpost was built in 1834, Temagami people used to camp at Wabikon on the southeast corner of Temagami Island. High Rock Island is directly southeast across the channel. When Iroquois raiders came up to Temagami, the Temagami People used smoke signals to tell if the Iroquois were coming from the south or north. Ottawa and Montreal River People would say if the Iroquois were coming and warn the Temagami People. So the Temagami People posted lookouts on High Rock Island [Gordon 1995a:17].

Temagami Island is the largest island in the Central Hub. The Wabikon site (CfHa-13) lies within the privately-owned wilderness camp of the same name, where Conway observed several precontact hearths and a few slate flakes. Based on an oral history from Bill Twain, collected by Conway in July 1984, Wabikon is described as a “summer Indian village pre-1850, an historic and precontact Temagami Indian village (Ontario Ministry of Tourism, Culture and Sport, Site Record Form).

The Temagami Island Post (CfHa-1) lies just southeast of Wabikon. At the head of a small bay are two rectilinear depressions lined with cobbles, but no timbers. One measures 2 by 3 m. Farther inland are the caved-in remains of walk-in cold storage cellar dug into the sandy hill. The exterior dimension is 6 m by 4 m. The interior walls are lined with vertical squared timbers, 8 inches (20.3 cm) wide. The structure is about 2 m high from the sand floor to the roof, made of 2 inch by 6 inch (5.1 x 15.2 cm) planks. For insulation, a deep layer of sand covered the roof, atop which a live white pine is now growing (Gordon 1995a).

These structural remains may be the 1834 outpost or part of its later expansion in 1857. The

Hudson’s Bay Company opened an outpost on Lake Temagami in September 1834. “The ‘Temagamingue’ post was thus established on the south side to *Katay-Teme-augama*, ‘Old Temagami Island’ just beyond the ancient Wabikon, the summer ‘Flower’ settlement of the Temagamis” (Hodgins and Benidickson 1989:30). It was operated intermittently between 1834 and 1857.

[T]he Temagami outpost was supplied from Timiskaming and open only from autumn to spring, with three or four hands hired to transport the outfit, to tend the potato garden and to make the fall fishery [...] Indians from Temagami continued to trade at neighbouring HBC posts including Fort Timiskaming, Nipissing and Matawagamingue. They also dealt with opposition traders [Hodgins and Benidickson 1989:30].

In 1876 a new HBC post (CfHa-2) was built at Bear Island (Hodgins and Benidickson 1989; Mitchell 1977).

The large Temagami Island Indian Burial Ground (CfHa-30) is located atop an 8 to 9 m high sandy hill, southeast of the HBC outpost. Posts and rails from a split rail fence and a large fallen white cross marks its boundaries. These were erected by a former owner of Wabikon who maintained this cemetery. Two weathered headstones with embossed inscriptions for Louis Egwina, 1891, and Peter Keewagano, 1892, face south–southwest across the bay. The east-facing headstone for a child, George Paul, 1889, is erected within a wooden picket fence enclosure. Other graves have fallen enclosures, have blue-painted crosses, or are unmarked. Bill Twain said that he had records and genealogies for all the marked graves (Gordon 1995a).

High Island Cemetery (CfHa-16) was identified by Bill Twain as several unmarked graves on the east central side of a sand and gravel island, south of Bear Island. Only one possible depression was noted in this flat area of dense underbrush in a grove of tall poplars. It is located about 12 m above the lake. Several paths lead uphill from a lakeside clearing on the north end of



the island toward the cemetery. To paraphrase Bill Twain:

People from the Southwest Arm of Lake Temagami came up to Bear Island and buried their dead on the east side of this island. They chose a place with a view of the rising sun. The graves were just pits dug in the sandy ground. People would cut trees down for a burial area, but they did not erect grave markers. They did not maintain the graves but just “left them alone” [Gordon 1995a:9].

#### *South End Site*

The Austin Bay site (CfHa-28) includes the structural and artifactual remains of a large nineteenth- to early twentieth-century village of the *Teme-Augama Anishnabai* (Gordon 1995a; Pollock 1992; Pollock and Koistinen 1993). It occupies the mainland peninsula and secluded western bay between Austin Bay and the South Arm (Figure 35). Among its above-ground and semi-subterranean structures are remnants of dovetail-jointed log cabins, a barn for a horse and cow, cold storage structures, and root cellars. There are also trails and cleared land for potato gardens. Large artifacts include the remains of a Camp Matagami barge, a more recent cedar strip canoe, a wooden sled with screw-fastened steel



**Figure 36.** William (Bill) Twain, former Chief and *Teme-Augama Anishnabai* Elder, took the 1994 archaeology crew to visit many traditional use sites, including these log cabin remains at the Austin Bay site on the South Arm of Lake Temagami.

runners, a collection of old vehicles, heating and cook stoves, metal bed frames, clear glass bottles, glazed plates, and also deer and moose bone. The various cabins are difficult to locate as they were mostly burned down by the Ministry of Natural Resources in the 1970s. With Bill Twain, the archaeology field crew visited the cabins of Alec Paul, Neass Twain (Bill’s grandfather), Michel Twain, and Donald Mckenzie, as well as “Temagami Ned’s” campsite (Figure 36). The shrubby undergrowth on these former clearings is quite distinctive from the surrounding groves of birch, poplar, and pine that cover the sandy soil of the large Austin Bay site (Gordon 1995a).

#### *Northeast End Sites*

The precontact lithic find spot, the Portage site (CgGw-4), has been described earlier. A second site, a twentieth-century hunting camp, was also found inland from the Northeast Arm of Lake Temagami (Figure 32). The Caribou Cabin site (CgGw-6) is located on a narrow bedrock ridge 100 m west of Caribou Lake. This log structure, 2.5 m square, has seven courses of unpeeled, unnotched logs of 12 to 14 cm in diameter. Round metal spikes with a length of 6 inches (15.2 cm) are driven into the corners, and several large cobbles are at the interior corners. Crumbling clear plastic sheeting covers the walls, which are 56 cm high. One wall continues 2.5 m south of the main square. A plastic vase and flowers, a two-person bow saw without a blade, and a black rubber floor mat were noted outside. I have seen similar arrangements at the family camp of Job Halfaday at North Caribou Lake (Gordon 1985, 1988a). Job first built low log cabin walls, wrapped in plastic sheeting to keep out the wind. He then pitched a prospector’s canvas A-frame tent over top, with an entranceway in which to store firewood and tools, and the sleeping quarters at the far interior of the tent.

#### *North End Sites*

In 1991, in conjunction with palaeo-shoreline research, selected locales at the north end were examined by boat, including Sharp Rock Inlet, Bear Bog, Deer Island, and Whitefish Bay, while Barnac Lake was accessed by logging road

(Gordon 1992). Three new lakeside precontact sites were discovered (Figure 29). Mayhue Rock (CgHa-33) is a low, grassy promontory at the northeast entrance to Sharp Rock Inlet. It is a favoured stopover for canoers accessing the Lady Evelyn-Smoothwater Wilderness Park via Diamond Lake to the north. Test pits (6) revealed a 7 cm thick layer of fire-reddened sand with two chert flakes and one calcined bone, near surface finds of one chert flake and three vein quartz shatter fragments.

The Deer Island pictographs (CgHa-23) and the South Deer site (CgHa-34) have been described above. At the northeast corner of Deer Island are the melted and twisted remains of the Lady Evelyn Hotel (CgHa-35), a three-and-a-half storey, 108-bed tourist hotel built in 1904, which burnt down in 1912 (Hodgins and Benidickson 1989:119-121). Just northeast of the hotel, a scatter of HBL chert and vein quartz flakes were noted in the shallow soil beside a rocky point.

One possible lithic tool source lies in the far northwest corner of Whitefish Bay. It is a vertical rock face of Gowganda Formation, with a stratum of greywacke (conglomerate) over a sub-conchoidal- fracture, medium grey siltstone. As quarrying marks were not evident, it was not registered as a site. However, this is the only flakeable siltstone I have seen at the lake edge, and grey siltstone debitage does occur at the Three Pines site.

Two inland hunting camps of the *Teme-Augama Anishnabai* were recorded (Gordon 1992). The Stove site (ChHa-3) is on a flat terrace below Bear Bog, containing a collection of older items, such as a rectangular wood-burning stove, an oil lamp base, an old jug, and a rusted steel wash basin. Similar artifacts were found inland at a 1939 winter base camp on North Caribou Lake (Gordon 1985, 1988a) and at older winter travel camps in James Bay (Chism 1978; Gordon 1980). The Cache site (ChHa-4) is located 40 m east of Barnac Lake on the same sandy outwash plain seen at Ferguson Bay. Here a semi-subterranean wood structure was found. It is 1.5 by 2.5 m in size, built of slender vertical poles for the walls, roof, and floor, topped by a 30 cm high mound of dirt. This may have been a winter cache or

small ice house associated with an older hunting camp (Gordon 1992).

The Lake Temagami site is located at the mouth of the Anima Nipissing River, at the northeast corner of Ferguson Bay. This part of the outwash plain and sandy beach lies within the grounds of Camp Wanapitei, a wilderness camp. In the nineteenth century this was used as a summer gathering area by the *Teme-Augama Anishnabai*, and it is here that Father Paradis built his *Mission du Sacre Coeur* in 1891 (Hodgins 1976; Hodgins and Benidickson 1989). Remains of the log chapel were visible in 1986, east of the river, while nine surface-collected areas within the camp area produced vein quartz debitage (Gordon 1986, 1987). Subsequent excavations by Carscallen (1994a, 1994b) show a large, multi-component site with four discrete clusters of lithic artifacts of quartz, rhyolite, and greywacke over 40,000 m<sup>2</sup>, as well as pottery and a dog burial.

#### *Ethnographic Studies on the Seasonal Economic Round*

To help interpret these surveyed sites, it is worth summarizing anthropological information on the seasonal economic round. Ethnographic and ethnohistorical studies of Cree and Ojibwa peoples in northern Ontario and Québec (Jenkins 1939; Rogers 1962, 1963a, 1963b, 1966, 1969, 1973; Rogers and Black 1976; Speck 1915a, 1915b; Tanner 1979) describe techniques of hunting, trapping, and gathering seasonally available food resources. From fall to spring, small, kin-based groups periodically moved to different camping locations to exploit the fish, mammal, bird, and plant resources as these became available. In summer, when food was more accessible, small groups would assemble into larger gatherings for several weeks to socialize, trade, and prepare again for the long winter. Ethnographic studies emphasize the importance of “the ecotone occurring along the boundary between land and water” (Rogers and Black 1976:5) in choosing camp locations, for hunter-gatherer mobility, communication, resource procurement, subsistence, and habitation.

Open water in summer, lake ice in winter, and the intermediate “no travel” periods affect modes

and methods of transportation, as well as hunting and fishing activities (Jenkins 1939; Rogers 1962, 1973; Rogers and Black 1976; Tanner 1979). A ready supply of firewood for heating and cooking; constructional resources, such as tent poles, saplings, and spruce roots; as well as access to fish, a dependable food staple, are additional factors in choosing camp locations (Irimoto 1980; Rogers 1966, 1973; Tanner 1979). These near-camp resources are short term and quickly exhausted, resulting in frequent moves (Rogers and Black 1976; Tanner 1979).

#### *Previous Studies on Boreal Forest Settlement Patterns*

How does this seasonal economic round translate into site selection criteria? Are there specific landscape features which influence the choice of one location over another? Certain criteria have emerged from ethno-archaeological research at Lac Washadimi in northwestern Québec (Chism 1978; Gordon 1980; Tanner 1978a, 1978b) and North Caribou Lake in northwestern Ontario (Gordon 1985, 1988a, 1988b). At North Caribou Lake, a closed Boreal Forest environment, several key factors underlie site selection. This information is based on discussions with Job Halfaday of Weagamow (Round Lake) and a comparison of 13 traditional use and 10 precontact sites. Locations protected from cold north and northwest winds were chosen in both summer and winter, in particular those with sunny, southern direct exposures. Wind exposure was particularly important in the bug-infested warm months, with a preference for islands. Islands also offered greater protection from forest fires and bears and greater access to fish resources in warmer, open water seasons. Flat ground with well-drained soil, particularly sand, was preferred for both winter and summer sites. Winter sites, from freeze-up to break-up, tended to be on the mainland, from 5 to 50 m inland. For shoreline access, sand beaches or low slopes were preferred, while deep water was avoided as being too dangerous for children (Gordon 1985, 1988a, 1988b).

These criteria mirror many of those noted for north-central Québec, based on information from

Sam and Williams Rabbitskin of Mistassini and 131 surveyed sites, including traditional use sites and 19 precontact sites (Hanks 1983). In the Lac Caniapiscou open Boreal Forest, campsites were selected for comfort and survival. Protection from west and northwest winds was afforded by dense stands of trees, especially in winter, rather than ridges or other landforms. Year-round proximity to major bodies of water was emphasized as net fishing provided the most dependable food source even in winter (Hanks 1983:352). Locales with southerly exposure and those mostly free of surface boulders and cobbles were favoured. Precontact lithic sites averaged 30 m inland and 3 m above water compared with 19 to 22 m inland and 1.2 m above water for traditional use sites (Hanks 1983).

#### *Precontact Habitation Sites*

The Lake Temagami precontact sites found or re-examined in this research are categorized by function and size, depending on amount of level ground and artifact recoveries (Gordon 1990a). Categories include vein quartz quarry (2), lithic reduction workshop/habitation site (1), very small camp (3); small to medium habitation camp (8), large habitation camp (3), and very large habitation camp (1). Tables 20 and 21 present direct wind exposure, soil type, and shoreline access for 18 lakeside sites, of which 12 are habitation sites in the Central Hub and 4 are habitation sites at the north end.

*Wind Exposure.* Direct wind exposure means over open water (or lake ice) unblocked by islands or landforms. Twelve of 16 sites have southerly wind exposure. Two are islands directly opposite other bodies of land and have no direct wind exposure. However South Deer Island (CgHa-34) faces south, while and High Rock Island (CfHa-9) faces east. Only three sites have direct wind exposure to the north or northwest. These are Sand Point (CgHa-1), oriented east–west at the entrance to the Northwest Arm; Sealrock Point (CgHa-24); on a north-facing point in Granny Bay; and the lithic scatter at the Lady Evelyn Hotel site (CgHa-35), on the northeast point of Deer Island. Two also have southeastern exposures. Sealrock Point

**Table 20.** *Landscape characteristics of precontact habitation sites, Central Hub, Lake Temagami.*

Site Type, Name, and Borden Number	Soil	Direct Wind Exposure	Estimated Artifact Area (m2)	Area of Level Ground (m2)	Height Above Lake (m)	Shoreline Access
Large habitation (excavated, multi-component)						
Sand Point CgHa-1	deep sand	NW; S-SE	400	1,200	1	sand and cobble beach
Three Pines CgHa-6	deep sand	S-SE	520	875	2	sand and cobble beach
Witch Point CgHa-7	deep sand	W-SW-S	1,120	1,500	4	sand and cobble beach
Very small camp (2-11 lithics)						
Argillite CfHa-31	shallow sand over bedrock	NE; SE	32	468	2	smooth low bedrock; cobble beach
Daily CfHa-33	shallow silt over bedrock promontory	NE	1	163	3	smooth low bedrock
Island 245 CfHa-35	shallow sand over bedrock	S	50	600	2	smooth low bedrock
Small to medium camp ( 1-350 lithics)						
Sealrock Point CgHa-24	silty sand over bedrock	W-NW-N	90	600	2.5	low bedrock
High Rock Island CfHa-9	shallow silty sand over bedrock	none (east-facing)	-	400	1	low smooth bedrock
Cattle Island CfHa-36	deep sand	S- SW	75	1,800	2.5	cobble beach
Cross Bay CfHa-37	shallow silty sand over bedrock	SE	120	1,000	2.5	low smooth bedrock; cobble beach
Boulder CfHa-38	shallow fine sand over bedrock	SE	3	192	1.5	low smooth bedrock; cobble beach
Lithic workshop/habitation (530 lithics)						
Blueberry CfHa-32	shallow silt over bedrock	SW	585	1,350	2.5	angular bedrock
Quartz veins /quarry site (50 lithics)						
Crystal CfHa-34	shallow fine sand over bedrock on adjacent island	S	10	200	2.5	smooth low bedrock
Kokoko Bay CfHa-50	lakeside quartz vein	E	-	-	2	

is the only site with a north-facing exposure. Test pits were dug at two other mainland locales with direct north wind exposure: the northwest corner of the Sand Point peninsula and the sandy baymouth bar at the northeast corner of Witch Point, both without results. Southern exposures were probably favoured year-round for warmth and dryness, while locales with more wind would be more desired in the bug season. It is unlikely

that locales with little or no direct wind would be early summer sites.

*Soil Type.* Five of the 16 sites are located on deep sand, while the rest are shallow silty sand over bedrock. As described previously, glaciofluvial deposits, such as baymouth bars, outwash plains, or eskers, are relatively rare in this rugged landscape. Thin till over bedrock is much more

**Table 21.** *Landscape characteristics of precontact habitation sites, North end, Lake Temagami.*

Site Type, Name, and Borden Number	Soil	Direct Wind Exposure	Estimated Artifact Area (m <sup>2</sup> )	Area of Level Ground (m <sup>2</sup> )	Height Above Lake (m)	Shoreline Access
Very large habitation site (excavated, multi-component)						
Lake Temagami CgHa-2	deep sandy outwash plain	SW	40,000	100,000	1	sand beach
Small to medium camp (3–10 lithics)						
Mayhue Rock CgHa-33	fine silt over bedrock	W–SW	100	1,250	2	low smooth bedrock
South Deer site CgHa-34	silty sand over bedrock	none (south-facing)	40	450	2	low smooth bedrock
Lady Evelyn Hotel CgHa-35	silty sand over bedrock	N–SE	–	750	1	low smooth bedrock

common. Sand offers flat expanses of well-drained soil in all seasons, with few rocks or cobbles. The largest mainland habitation sites are all on sand, have all been chosen for excavation, and have yielded high artifact densities. As noted above, two other sandy locales with north-facing exposures yielded no lithics; neither did the narrow, south-facing Mule Bay esker.

*Shoreline Access.* Related to site terrain is access from water to land and land to water. Clearly it is easier to alight from watercraft or pull up sleds where there is a low, sloping sandy beach or sand and cobble beach. On all the shallow silt over bedrock sites, access is made easier by low-sloping, smooth bedrock. Only one site, the Blueberry site (CgHa-32), had angular bedrock at the shore. Its use as a processing site for vein quartz from the nearby Crystal site (CfHa-34) may have been a mitigating factor.

*Narrows for Fishing.* Other local features of these sites are worth noting. Five sites (Sand Point, Cross Bay, Boulder, South Deer, and High Rock) form one shore of deep, narrow bedrock channels. Such channels would serve to funnel fish, making these good fishing locales. Ethnographic sources show that fishing is a dependable year-round subsistence activity, even in winter with the use of nets. Hanks (1988) questions whether winter net fishing is a post-contact technique. Unmodified cobble netsinkers were noted at the Three Pines site in a Woodland context. Shallow water fishing

with seine nets in the Middle Woodland period and deep water fishing with improved gill nets in the Late Woodland period are suggested by Cleland (1982) for Upper Great Lakes fisheries sites. However, fishing through winter ice remains uncertain for precontact occupants of the survey area.

*Points of Land.* Five precontact sites are on larger points of land jutting into the main body of the lake (Sand Point, Sealrock Point, Witch Point, Mayhue Rock, Lady Evelyn Hotel). These offer natural quays to open water travellers approaching from several directions, particularly useful at times when bad winds or stormy weather arise suddenly. Several sites are on small points of land that also create indentations or small bays, such as the Argillite site with its natural bedrock dock, the slight indentation at the Daily site and the V-shaped channel of the Blueberry site. These landforms offer travellers some measure of protection, localized sections of calmer water, and lee shore access depending on wind direction.

#### *Summary of Site Selection Factors*

These 16 sites suggests that southern exposures, protection from cold winds and storm tracks, sufficient flat and well-drained ground, and convenient shoreline access are landscape features of habitation sites deliberately chosen by precontact occupants of Lake Temagami. These same selection criteria are noted for lakes much farther north in the open and closed Boreal Forest.

While deep sand deposits show repeated use over time, lakeside sites may be found anywhere there is enough flat ground to pitch a tent (e.g., Daily, Island 245). In predicting or finding sites, using broad locational parameters, such as shoreline orientation, may be inadequate. Very localized features are important to site location. As Hanks (1988) points out, a stand of trees is sufficient wind protection.

It is important to note that this analysis is based on archaeological sites in the modern landscape context. How might past environmental change have altered precontact campsite selection? Climate change may have involved changes in prevailing wind direction, but not southern exposures. A warmer, drier climate would result in longer periods of open water and possibly changes in fishing patterns. Changes in forest composition suggests local and regional faunal resource differences, affecting subsistence patterns but not necessarily habitation site locational choices. The most significant effect on archaeological sites along the modern shoreline would be lake level change.

#### *Precontact Surveyed Sites and Lake Level Change*

The palaeo-hydrology research described above shows that lake level change has had a differential effect on Lake Temagami shorelines. The lake has pulled back from shorelines at or near the former northern and northeastern outlets while flooding shorelines in the central and southern sections of the modern lake. Dams in the twentieth century have both raised and lowered lakes levels, but to a far lesser degree than isostatic rebound. Lake regression would have impacted precontact occupations at Mayhue Rock, South Deer Island, Lady Evelyn Hotel, and the Lake Temagami site. As noted previously, old beaches were noted at two of these sites. It is possible that the lithics found in test pits near the lake on these sites represent the most recent precontact occupations, with potential older ones farther inland. For example, at the very large Lake Temagami site it may be possible to develop a relative chronology of the discrete artifact clusters noted by Carscallen (1994a, 1994b), particularly for artifacts at the deepest stratigraphic levels, as the area of habitable

space expanded southward.

In the central and southern sections of Lake Temagami, lake transgression since the mid-Holocene has been a factor, flooding the sill between once-separate lake basins in the Central Hub and encroaching on living space at Sand Point; Three Pines; and the other smaller, low-elevation sites in this part of the lake. Some Archaic period artifacts at Three Pines and Sand Point lie closer to the current lakeshore than more recent occupations, a situation that may also be true for other surveyed habitation sites in the Central Hub. Lower lake levels would have exposed more of the lakeside veins of milky white quartz at Crystal and Kokoko Quarry, making these lithic raw materials more accessible in the past. Underwater examination may be worthwhile. Relative geochronology may also become useful in dating northern versus southern rock painting sites on Lake Temagami and adjacent Obabika Lake.

*Historic Period Habitation Sites and Linkages*  
Artifacts datable to the nineteenth century were recovered from Three Pines, Witch Point, and Cross Bay. Summer gathering sites at Wabikon on Temagami Island and Sandy Inlet on Ferguson Bay are known from written and oral history. Four of these five locales are on sandy subsoil. All of them have southern exposures and are protected from northern winds. This is also true for the summer gathering place on the southwest corner of Bear Island.

For the Historic (pre-1900) period, the *Historical Map of Temagami* (Macdonald 1993) depicts hundreds of campsites; 600 geographic place names used by the *Anishnawbeg* (Ojibway); and a vast network of 1,300 *nastawagan*, or travel routes (Macdonald 1987). The map is based on interviews conducted by Craig Macdonald with 200 elders from Bear Island and other reserves over 20 years, starting in the 1970s, along with primary source material (Macdonald 1987). He also has traversed many of these winter trails and portage routes (Jenish 2006). The importance of this map is both in its content and its applicability to the archaeological record. Archaeological sites maps give the impression of separated places,

whereas this ethnographic-based map shows the linkages, presenting campsites as “beads on a string”: a series of short stops within the continuous, integrated movement of hunter-gatherers over the entire landscape.

The map encompasses Lake Temagami and region, including Lake Wanapitei to the southeast, Lake Timiskaming to the east, and Lady Evelyn Lake to the north (see Figure 1). The *nastawagan* include travel routes along lakes, using canoes in open water or using toboggans and snowshoes on lake ice in winter. Cross-country trails include shorter summer portage trails across narrow stretches of land or longer portages along rivers and creeks connecting large and small lakes. Summer portage trails were also used in winter. Specific winter-only trails called *bō n-ka-nah* were used solely for travel by snowshoe, sleigh, or toboggan. These winter trails were well maintained up until the 1940s, with the longer ones showing “a skillful use of swamps and geological faults to keep the trails direct and to minimize climbing” (Macdonald 1987:187). The map depicts regional topography before 35 lakes and rivers in the area were flooded by modern dams. The geographical place names describe either topographical features or food resources that could be obtained in specific locales (Macdonald 1993; Jenish 2006).

Most precontact sites described above are included in the *Historical Map of Temagami*, demonstrating continuity in land use and site selection criteria. On the west-Central Hub, the very small habitation sites of Argillite and Daily, as well as the Crystal quarry, are not included. There are, however, two portage trails marked, leading west from the small bay at Argillite: one to a small interior lake, the other to Gull Lake, which runs parallel to the Southwest Arm of Lake Temagami (Macdonald 1993). The open water or lake ice along steep cliffs between Argillite and Daily was not used as a north–south travel route. It can be subject to strong prevailing southwest winds, funnelled up the Southwest Arm.

For the east-Central Hub, Gordon (1991a) suggested that north–south travellers would probably use Cross Bay and other protected bays farther south, rather than risk the open water of

Lake Temagami. The map confirms this inference, showing no travel routes on the west, or open water side, of High Rock Island. At the northeast end, the find spot called Portage site lies on a winter-only trail between the Northeast Arm and Cassels Lake. The Caribou Cabin site lies along a portage route between the two lakes. Neither of these sites, one precontact, the other one twentieth century, are marked on this pre-1900 map.

At the north end all the precontact sites are marked, but not the siltstone source at Whitefish Bay. Mayhue Rock and environs was used to access an old portage route between Lake Temagami and Diamond Lake, past the rapids at Sharp Rock Inlet (Macdonald 1993). The traditional use sites, Stove site and Cache site, both with indicators of cold weather usage, are not marked on the historical map, lending support that they are indeed twentieth-century traditional use sites. The cold weather structure at the Cache site bears constructional similarities with a deadfall trap built of vertical posts illustrated on the map. A portage route south of the Cache site follows a stream connecting Barnac Lake with Ferguson Bay. Numerous campsites are marked around the north end of Ferguson Bay, not just the Lake Temagami site near the outlet of the Anima Nipissing River (Macdonald 1993).

#### *Traditional Use Habitation Sites*

Traditional use sites of the late nineteenth to early twentieth century encountered in these surveys are characterized by remnants of above-ground and in-ground wooden structures, such as cabins and barns, and traditional and mass-manufactured material goods. Subsistence resources indicated by artifacts and informant data include moose and deer hunting; tapping of occasional stands of maple trees, such as the sugarbush at Austin Bay and Witch Bay; potato gardens; and cows. Remains of canoes for open water travel and sleds for ice and snow travel were noted. Sites range from the large village at the mainland Austin Bay, with semi-permanent log cabin structures; to isolated cold weather mainland camps, such as the Stove site and Cache site; to possible trap cabins at Witch Bay Sugarbush and Caribou Lake Cabin; to stopover camps, such as Sealrock Point.

Material remains were found lakeside as well as up to 40 m inland. Similar selection criteria were used as in the precontact sites, emphasizing level, well-drained substrate, southern exposures, and windy points in fly season, and more protected locales in colder weather (Table 22).

*Cemetery Sites*

The two cemetery sites, one with unmarked graves and one with headstones or picket fence enclosures, have similar landscape attributes to those noted for cemeteries at North Caribou Lake in northwestern Ontario and described by Job Halfaday (Gordon 1985, 1988a). These attributes include a sandy substrate, a markedly higher elevation, and a good view over the lake facing east to south, “to face the rising sun.” Grave sites are distant from habitation areas and well above the lake in elevation (see Table 22).

While the question of dating grave styles requires further research, one possible sequence can be suggested. Graves with headstones on Temagami Island (CfHa-30) date from 1889 to 1892. The unmarked depressions here and at High Island Cemetery site (CfHa-16) are likely older. The picket enclosures could be intermediate in age. However, wooden picket fence enclosures are also found at Bear Island, which is a more recent settlement. Therefore the picket fence enclosure may be an alternative to headstones and perhaps the preferred style of the late nineteenth century and early twentieth century, depending on the Bear Island grave dates. According to Bill Twain, he has never heard of the use of a tiny log cabin structure (*wa-ha-gen*), which was used in the early twentieth century at Pekangekum (Dunning 1959: Plate 5) and North Caribou Lake in northwestern Ontario (Gordon 1985, 1988a).

**Table 22.** *Traditional use sites, Lake Temagami.*

Location, Name, and Borden Number	Direct Wind Exposure	Terrain	Distance inland (m)	Elevation above Lake (m)	Structures/Materials
North Arm					
Stove site ChHa-3 (near Bear Bog)	S	flat silty sand terrace	40	4	Winter Camp - oil lamp base, older style metal jug and wash basin, wood-burning stove
Cache site ChHa-4 (Barnac Lake)	W	sandy flat outwash plain	40	4	Cold season cache - semi-subterranean structure, 1.5 by 2.5 m, slender vertical poles
Northeast Arm					
Caribou Cabin CgGw-6 (Caribou Lake)	S	flat low ridge, thin till over bedrock	100	2	A-frame tent base - log structure, 5 by 2.5 m, 7 courses, plastic flowers, 2-person bow saw
Central Hub					
Witch Bay Sugarbush CgHa-18	W	low sand, shallow bay	10	1	wooden cabin structure; tar paper, brown Javex bottle, wash tub, moose vertebrae
1834 HBC Outpost CfHa-1 (Temagami Island)	S	low sand, shallow bay	10–20	3 to 4	2 cobble-lined foundations, 2 by 3 m; cold cellar 8 by 4 m
High Island Cemetery CfHa-16	E	high sand hill	40	12	unmarked graves
Temagami Island Burial Ground CfHa-30	S	high sand hill	15	9	1889–1892 headstones, picket fences, several unmarked graves
South Arm					
Austin Bay CfHa-28 (19th cent. village)	E, W	sand, protected shallow bay	20–50	0 to 4	log cabins, barns, root cellars, trails, gardens, canoes, sleds, old vehicles, stoves and bed frames



### Witch Point Site Preliminary Results: Explaining Variation with the Three Pines Site

To further develop an archaeological sequence for Lake Temagami, a second site was selected for controlled excavations in 1993 and 1994 (Gordon 1993, 1994a, 1994b, 1995a, 1995b). The palaeo-hydrological reconstruction of Lake Temagami helped inform the choice of sites. It was reasoned that the earliest precontact occupations at the north end of the lake would be distributed over a series of inland shorelines, while those toward the south end would now be submerged. So ideally, a site in the Central Hub of the lake would be the best candidate. The Witch Point site fit the requirements. It is 3.6 km directly east of Three Pines, on the eastern mainland shore of Lake Temagami, at the entrance to the North Arm (Figures 35 and 37). The site is located at the southwest tip of a 4 m high sand and gravel esker, forming a long point of land around the shallow Witch Bay. What is most interesting, and the focus of this section, is explaining the strong structural, temporal, and cultural differences

between these two multi-component mainland sites.

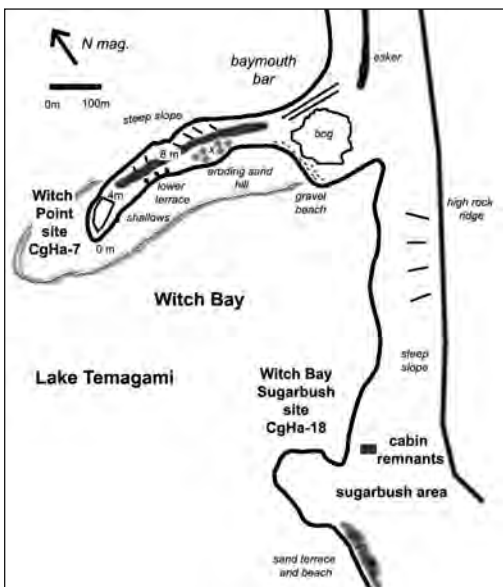
#### *Previous Research*

In 1982, a two-week salvage excavation was conducted at the Witch Point site by Conway (1982; Smith 1983). An excavation block of 45 m<sup>2</sup> oriented along the west side of the clearing was opened (Figure 38). This work revealed a “long and intensive use” as “all areas contain virtually uninterrupted hearths and ash bands” (Conway 1982:2), including calcined faunal bone “confined to the hearths” (Smith 1983:1). A total of 5880 cultural items was recovered, along with quantities of red and yellow ochre.

Conway identified five components based on artifact attributes and comparison with other site assemblages. Slate and greywacke choppers, scrapers, and knives and two stemmed points were assigned to a Middle Archaic component, based on similarities with the Montreal River site lower levels (Knight 1977). Other slate tools, apparently made on local beach cobbles and including a cache of pecked axes, were assigned to the Late Archaic, based on similarities to finds from the Smoothwater Lake site (Conway 1982:3; Pollock 1976). The Middle Woodland was represented by a single dentate stamp vessel. “Flat slate knives, side-notched Temagami style arrowheads, extensive use of red ochre and local pottery which is loosely based on Iroquoian motifs” were assigned to the Late Woodland period (Conway 1982:3). Representing the postcontact period were several artifacts, including a “Davidson-Glasgow clay pipe (1863-1891)” and “an 1871 nickel” (Conway 1982:2).

#### *Modern Landscape Setting*

Witch Point is a sand and gravel esker that extends westward 1.25 km into the lake, with a maximum width of 0.25 km (Simony 1964). Its finger-like shape creates the north shore of the protected Witch Bay. A smaller point of land marks the south end of the bay. Four metres high at its tip, the esker climbs sharply higher to a steep face on the north side and a sandy erosional face on the south side. Post-glacial wave action and erosion have reworked the esker, as indicated by a small



**Figure 37.** Location of the Witch Point Site (CgHa-7) atop a sand and gravel esker, east-Central Hub of Lake Temagami.

baymouth bar and peat bog at the northeast corner, a series of storm beaches on the south side, and a shallow sandbar extending into the lake from the tip (Figure 37).

The extreme tip of the esker curves to the southwest. Here an MNR-designated campsite occupies the upper portion: a flat grass-covered triangular clearing from 4 to 19 m wide by 19.5 m

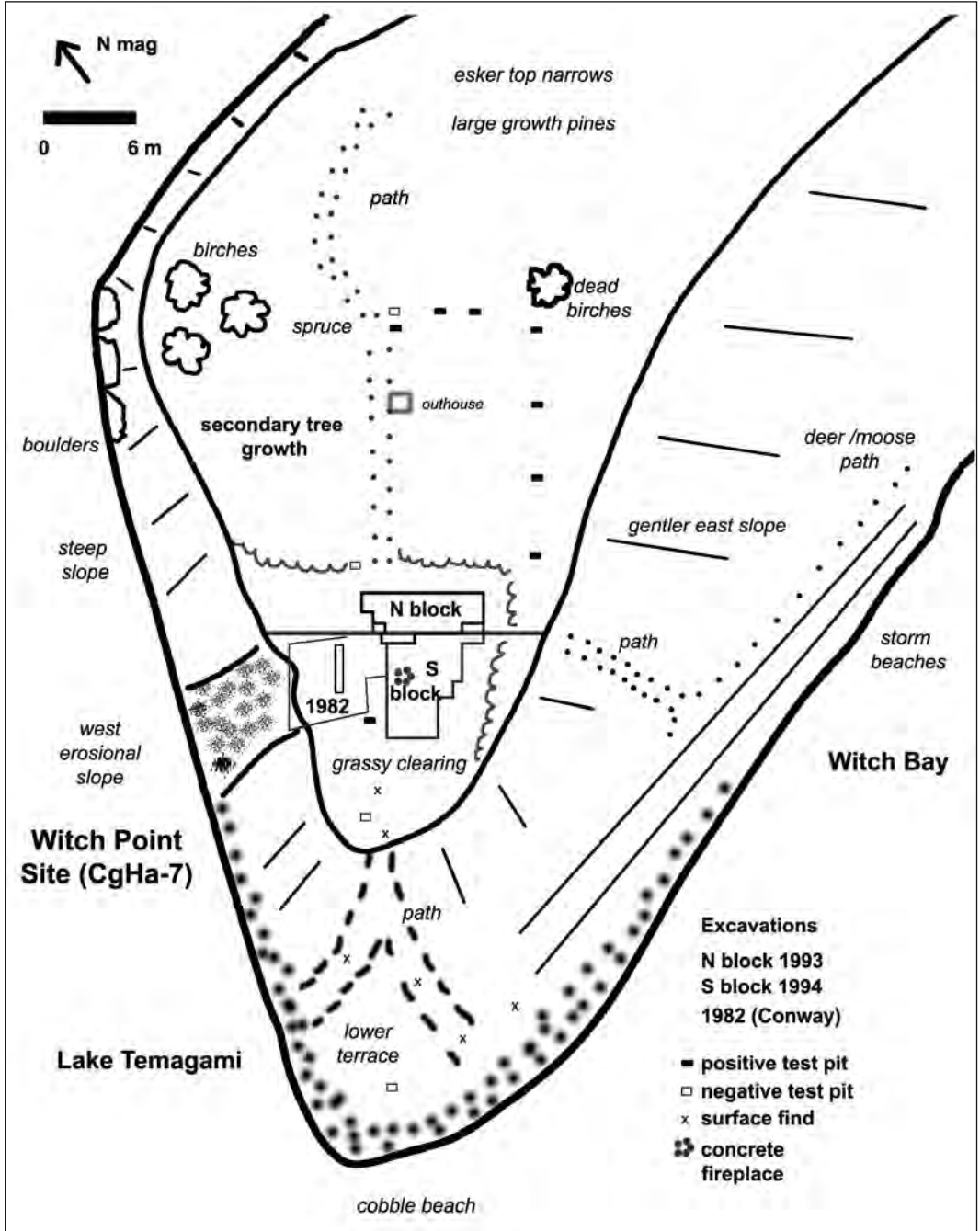


Figure 38. Witch Point site esker morphology and excavation grids.

long. The west side has a steep slope, part of which has an active erosional face. To the east, a gentler forested slope leads to a narrow terrace marked by deer and moose trails. An eroded pathway leads southward to a small lower terrace. Cobble and sand beaches encircle the point (Figure 38).

The site area comprises the small lower terrace at the tip and the triangular clearing, and extends northward into an open mixed forest of small choke cherry with some poplar, paper birch, and spruce. Based on positive test pits in the open forest and lower terrace, and on surface finds on erosional faces and pathways, the minimum areal extent of the site is 1,120 m<sup>2</sup> (56 m from the lower terrace up into the open forest by 20 m wide).

#### *Excavation Methods and Artifact Recoveries*

Excavation focused on the east half of the clearing. In 1993, a north block of 22.5 one-metre-square units was opened, while in 1994, an adjacent south block of 30 units extended toward the esker tip. Excavation and recording methods were the same as those described for the Three Pines site, using one-metre-square units subdivided into quadrants, with 3 cm vertical levels. At Witch Point, all unit walls were profiled and photographed. All soil was screened through a ¼ inch (6 mm) mesh, with a 1/16 inch (1.6 mm) mesh screen used occasionally. Units were dug to an average depth of 24 cm, generally slightly deeper in the north block, becoming slightly shallower as the land slopes southward toward the esker tip. Several units were taken down to a depth of 54 cm.

Preliminary artifact identifications are presented in Table 23. Cataloguing of the artifacts is still ongoing, as is a formal Harris Matrix stratigraphic analysis. Information presented here is based on field observations summarized in preliminary reports (Gordon 1993, 1994a, 1994b, 1995a, 1995b). Artifact associations and phasing are therefore subject to revision.

#### *Characteristics of and Contrasts between Witch Point and Three Pines*

While preliminary, the work at the Witch Point site is summarized here because of the strong contrasts with the Three Pines site. The 1993–

1994 excavations revealed significantly deeper anthropogenic deposits, including a thick dark grey-brown organic-enriched layer, extensive fire-cracked rock deposits, and a greater overall artifact density. In the lower, probably Archaic levels of the north and south blocks, there was substantial mudrock and vein quartz primary reduction activity. Fewer Middle Woodland Laurel pottery vessels were recovered compared to Three Pines, but a similar number of Late Woodland, cord-impressed, pottery vessels were found. Also recovered were additional pottery vessels with Iroquoian tradition stylistic elements, a style of pottery absent at Three Pines. These combined factors give the impression that Witch Point is a larger site used more intensively or extensively, particularly in the Archaic and Late Woodland periods. In addition, several Witch Point finds suggest ritual or ceremonial activities in the Late Woodland period.

#### *Culturally Modified Soils and Cobble Structures*

Table 24 shows an off-site soil profile of a humo-ferric podzol, 25 m north of the clearing at Witch Point. The humus-enriched mineral horizon (Ah) is quite thick, but lacks an Ae eluvial horizon. The parent materials are lenses of sand, gravel, and small cobbles deposited during deglaciation. They show different periods of low- versus high-energy meltwater flow under the glacial ice forming the Witch Point esker.

On-site soils at the Witch Point site show similar natural podzolic soil development, including L, F, and H organic horizons, over a dark brown Ah horizon, a weakly developed light grey eluvial Ae horizon, and a yellow-brown Bf sand horizon. Added to the Ah layer are anthropogenic deposits of burnt wood and charcoal, creating a thick dark brown to dark grey silty sand layer that was quite compacted. From the middle to the base of this layer are fire-cracked rock and large, well-rounded cobbles, often increasing in size with depth (Figure 39). These rocks and cobbles are much larger than the naturally occurring well-rounded gravel and small cobbles of the esker substrate. In some areas, rocks are densely packed (Figure 40). Below this are discrete areas of grey ashy sand and patches of fire-

**Table 23.** *Witch Point site preliminary artifact identifications*

Modern/recreational camping	<p>Glass - medicine bottle, clear and brown bottle glass</p> <p>Metal - aluminum foil, 1980s coins, beer and other bottle caps, bent modern nails</p> <p>Plastic - bread bag tags; fishing rod parts</p> <p>Soil Features: Intrusive pits with food containers</p>
Modern/older hunting, fishing, prospecting camps	<p>Faunal - unburned beaver and moose bone</p> <p>Metal - .22 long rifle and shotgun cartridges, 44 Magnum cartridge, 1930s line sinkers, 1940s coins, prospectors' claim tags, pen knife</p> <p>Glass - older style Pepsi bottles</p> <p>Soil Features: thick organic deposits, fresh charcoal, small fire-cracked rock hearths, intrusive pits with very dark grey silty sand</p>
19th–early 20th cent./construction	<p>Metal - square nails</p> <p>Soil Features: post moulds, one with an old concrete base</p>
Historic fur trade	<p>Lithics - gunflint</p> <p>Glass - white, red, green, blue small beads,</p> <p>Metal - rolled copper bead, copper crooked knife, tinkling cones</p>
Late Woodland	<p>Pottery - Iroquoian-like vessels with castellations, oblique incised collars and shoulder punctates; channelled rim vessels; bright orange-red paste plain pottery; plain pipes, cord-marked vessels</p> <p>Lithic tools - small side-notched HBL chert and other chert projectile points, end scrapers, flake knives,</p> <p>Lithic debitage - small flakes of HBL chert, other chert, vein quartz, clear quartz</p> <p>Faunal bone - calcined</p> <p>Mineral - red ochre</p> <p>Soil features: fire-cracked rock concentrations, rock and calcined bone hearths, charcoal and fire-reddened soil deposits</p>
Middle Woodland (eastern edge of excavation)	<p>Pottery - dentate stamp and pseudo–scallop shell decorated sherds</p> <p>Lithics tools - HBL chert and Gordon Lake chert triangular end scrapers, large cobble with parallel grooves</p> <p>Lithic debitage - vein quartz, clear quartz flakes</p> <p>Soil features: small fire-cracked rock concentrations</p>
Archaic/lower levels	<p>Lithic tools - mudrock excurvate biface, celt, large bifacial flake knives, flaked cobble axe, large crescentic mudrock unifacial flake knife</p> <p>Lithic debitage - large cores or preforms of vein quartz, vein quartz flakes and shatter</p> <p>Metal - native copper (?)</p> <p>Soil features: Concentrations of large mudrock cobbles, many fire-cracked; grey ashy hearth remnants</p>



**Figure 39.** *Witch Point site – A unit profile showing the density of fire-cracked rock, all imported by precontact inhabitants onto the sandy esker top, mostly from the cobble beaches below.*



**Figure 40.** *Witch Point site – A plan view of a one-metre square showing the top of a densely packed “rock pavement” found in the north excavation block near the dog burial.*

**Table 24.** *Witch Point site “off-site” soil profile.*

Depth (cm)	Description
1–0	L horizon; forest litter
0–15	Ah horizon; humus-enriched sand; dark brown
15–32	Upper Bf horizon; iron-enriched sand; medium yellow-brown
32–45	Lower Bf horizon; iron-enriched sand; light yellow-brown
45–54	C horizon; esker formation; lenses of medium grey coarse sand, some with gravel (low-energy meltwater)
54–103	C horizon; esker formation; dark grey coarse sand with well-rounded, very coarse gravel and cobbles 30–110 mm diameter (high-energy meltwater)

reddened sand, some with calcined faunal bone, underlain by yellow-brown sand (Figure 41). Sterile levels are found at 24–27 cm deep.

Witch Point occupants from all time periods spent considerable time and effort hauling cobbles up from the beaches below. In the upper levels, probably Late Woodland, fire-cracked rocks are densely packed. In some squares the net effect is a rock pavement with more rock than soil (Figure 40). Cobbles may have served a variety of purposes, such as roasting pits; hide smoking hearths; and sweat baths—a function suggested by several Bear Island residents who visited the excavations. Middle Woodland pottery is associated with smaller cobbles for hearths. In the lower levels, the type of fire-cracked rock changes to rather massive pieces of laminated Gowganda Formation mudrock. By adding these cultural deposits to the natural sandy matrix, Witch Point inhabitants contributed to the site’s thicker deposits. The rock would have trapped wind-blown sediments and protected underlying layers from damage by successive occupations.

In contrast, the Three Pines site is shallower, with sterile levels in the yellow-brown sand at 15–18 cm deep. It has a thin, discontinuous, organic-enriched dark brown deposits, underlain by more extensive areas of grey ashy sand and fire-reddened sand, often containing calcined faunal bone. It has only discontinuous, small

concentrations of fire-cracked rock, even though cobbles are numerous at the lake edge. Settlement structures include a Late Woodland rectangular rock platform, a Late Woodland semi-circular hearth windbreak, and numerous Middle Woodland cooking and disposal hearths with fire-cracked rock and grey ashy sand.

#### *Depth and Artifact Densities*

At Witch Point artifact-bearing deposits are deeper, an average of 24 cm compared with 18 cm for Three Pines. Artifact densities are also higher. Preliminary counts show an average of 350 items per one-metre-square unit in the north block and 290 in the south block. The overall site average is 299 items per unit compared with 153 at Three Pines. By dividing these counts by the average depth of the excavation units, Witch Point shows a 47% higher artifact density than does Three Pines ( $299/24 = 12.5$  versus  $153/18 = 8.5$ ).

#### *Archaic Lithic Reduction Activities*

Artifacts in the lower levels of the Witch Point site, assigned to the Archaic period, include large mudrock tools, such as excurvate bifaces, and large bifacial and unifacial flake knives. One huge mudrock cobble was pecked into an axe. As noted above, the fire-cracked rock in the lower levels is mostly very large pieces of Gowganda Formation laminated mudrock, easily obtained as beach cobbles or quarried from the numerous bedrock outcrops. I suggest that primary lithic reduction of this softer, sub-conchoidal fracture raw material occurred on site, with the possibility of thermal alteration being used to produce smaller cores and preforms.

Large vein quartz cores, preforms, and shatter are also numerous in these lower levels, suggesting primary lithic reduction of this harder material. Vein quartz is found both in and beside discrete areas of grey ashy sand. One possible source is the large horizontal vein of milky coloured quartz, the Kokoko Bay quarry site (CfHa-50), 7 km southwest of Witch Point.

In contrast, at the Three Pines site, primary stage lithic reduction is not evident in the Archaic period units. While it has several large mudrock tools, large cores or chunks of Gowganda



**Figure 41.** *Witch Point site - 1994 excavation looking northeast across south block to 1993 north block.*

Formation mudrock are absent. Three Pines Archaic tools are fashioned on a wide range of other local raw materials, such as siltstone, quartzite, sandstone, and vein quartz, as well as non-local blue and grey cherts and clear quartz. However, flakes, shatter, and preforms of these materials, including vein quartz, are minor (see Table 7).

### *Laurel Pottery*

The Witch Point site has far fewer Middle Woodland Laurel pottery vessels than the Three Pines site. Laurel dentate stamp in the north block and pseudo-scallop shell pottery fragments in the south block are confined to the eastern edge of the clearing. Several Laurel-style scrapers are scattered in other areas, but these are not associated with pottery. The preliminary impression is that Middle Woodland usage of Witch Point is minor.

In contrast, Three Pines was extensively used by Middle Woodland groups, leaving traces of cooking and faunal bone disposal hearths, extensive grey ashy living floor remnants, and a

pottery-making area. Pseudo-scallop shell, dentate stamp, and linear stamp vessels are associated with small, triangular scrapers; retouched flakes; small side-notched points; and a variety of celts, abraders, and grinding stones.

### *Cord-marked Pottery*

Like Three Pines, Witch Point had very few Late Woodland cord-wrapped stick-impressed or cord-marked pottery sherds. One vessel was found in the N21 test pit, along with HBL chert flakes. A second was noted in the south block. Further analysis will determine if these are Blackduck vessels.

### *Late Woodland Pottery with Iroquoian Tradition Traits*

Witch Point contains a strong representation of Late Woodland, Iroquoian-like pottery vessels. The north and south blocks both produced collared vessels, some with castellations, decorated with shoulder punctates and with oblique and horizontal incised lines. While several vessels resemble Sidey Notched and Huron Incised designs, they do not exactly match southern Ontario Iroquoian tradition pottery in construction, paste, or overall form (Rick Sutton, personal communication 1994; Alicia Hawkins, personal communication 1994). Associated Late Woodland lithic tools include small, side-notched HBL projectile points; end scrapers; and flake knives. In contrast, no such vessels were recovered at Three Pines.

### *Possible Ritual Items*

Several interesting items at the Witch Point site may be associated with Late Woodland rituals and ceremonies. These include "red ochre paste" pottery, quantities of red ochre nodules, clear quartz crystals, and a burial of a young dog. Both the dog burial and the bright orange, thin-walled pottery vessels were found in the north block, where the density of cobbles was high. Except for a few red ochre nodules, these types of finds are absent at Three Pines.

### *Explaining Variation*

The Witch Point and Three Pines sites, both

mainland sites in the same section of Lake Temagami, exhibit significant differences in site structure, settlement features, and cultural components. Witch Point revealed deep anthropogenic sediments, including extensive cobble structures, from the Archaic to Woodland to Historic periods. It has a strong Late Woodland representation seen in its Iroquoian-derived pottery designs. Of special interest are other Late Woodland features which, through ethnographic analogy, suggest ritual activities. Such findings were absent in the thinner, discontinuous sediments of the Three Pines site, with its predominantly Middle Woodland occupations. What could account for the marked differences between these two sites? Comparing the landscape context of these two sites in light of the previous geochronological and palaeo-hydrological research may offer some insights into their differences. Ecological change and seasonal differences based on faunal bone comparison and site locational factors are also considered.

#### *Geochronology and Lake Transgression*

The Witch Point site may contain older components than the Three Pines site. The potential for a greater time depth is supported by two palaeo-environmental factors. First, the Witch Point esker is an older, more stable land form than the Three Pines baymouth bar. Second, the steep-sided esker was less susceptible to lake transgression than the lower-elevation Three Pines site. The esker formed during a period of rapid deglaciation by at least 12,000 years ago, when Lake Temagami was ice-free (Veillette 1988). Whether Witch Point was suitable for occupation at such an early date is unknown. It is possible that Witch Point was part of the central sill separating two of the ancient lake basins. Ancestral Lake Temagami formed in the northeast basin by 10,900 years ago and in the north basin by 9,800 years ago (Table 18).

As noted earlier, the two earliest radiocarbon dates in northeastern Ontario are c. 8,500 and 5,800 years ago (Hanks 1988; Knight 1977). Between these dates, Lake Temagami was gradually regressing from its former northern and northeastern outlets while encroaching on palaeo-

shorelines in the rest of the basin, including the Witch Point and the Three Pines sites in the Central Hub.

Post-glacial wave action and erosion reworked the Witch Point esker, but these processes acted on the steep margins, not on the esker top, where precontact activity was concentrated. In contrast, the Three Pines site is on a less stable, post-glacial landform. A combination of erosion and longshore drift formed the baymouth bar in early post-glacial times. As lake levels rose in the central lake basin, the sandbar and peat bog configuration shifted northward, reaching its present-day location by 7,500 years ago. Any potential early Archaic period occupations of the front edge of the Three Pines site have now been inundated by a 4 m lake level rise.

At 7,500 years ago, although the 8 m climb up to the Witch Point site would have been considerable, the site did offer a well-drained flat location along an otherwise rocky mainland shoreline. As lake levels rose, any nearby lower-elevation sites flooded, rendering Witch Point more accessible and desirable. Perhaps rising water levels also played a factor in the later spatial distribution of Woodland components at the Witch Point site. For example, Middle Woodland Laurel and Late Woodland cord-marked vessels were found somewhat closer to the esker edges than were the Iroquoian-like Late Woodland vessels.

#### *Ecological and Seasonal Variation*

Could there be ecological or seasonal variation between the two sites that might explain the cultural variation? The regional vegetation history presented earlier (Table 19) shows that most of the Archaic period enjoyed a warmer, drier climate (Zone 3a Hypsithermal), while the Woodland period as a whole is characterized by a cooling trend (Zone 3b and 4 Neoglacial). In the Hypsithermal, warmer temperatures would mean longer periods of open water, and drier conditions would lead to a greater incidence of forest fires. The relatively rapid shift to cooling temperatures falls in the Late Archaic period, with a dramatic crash in white pine pollen. In Liu's (1990) reconstruction, the Boreal Forest–Mixed Forest



ecotone, which had reached the northern edge of the Canadian Shield in the Hypsithermal, retreated southward to stabilize at its current location, 50 km north of Lake Temagami, in the Neoglacial period. Slight cooling and increased precipitation continues throughout the Woodland period. There is no obvious correlation between climate change and cultural change that would help explain site variation at Lake Temagami.

Determining seasonal variation through faunal bone identification is difficult on Canadian Shield sites. Unburned bone usually does not survive long because of soil acidity, while calcined bone is fragile. Dense bone with distinctive skeletal features, such as common loon, beaver and ungulates, tends to be easier to recognize as fragments in faunal assemblages. More delicate bird and fish bone, which include some warm season indicators may be under-represented. In comparing the taxa identified from the Witch Point salvage excavation (Smith 1983) with those from the 1986 Three Pines excavation (see Table 3), no major seasonal difference can be seen. The 1982 collection contains 2 fish as well as 55 elements identified to species, mostly beaver, with some lynx, muskrat, striped skunk, caribou, and moose (Smith 1983). From Three Pines, 842 elements could be identified below the taxonomic level of class. These include beaver, white-tailed deer, moose, black bear, marten, pond turtle, ruffed grouse, and common loon. Only the single loon bone and three pond turtle bones relate to warm weather usage at Three Pines (Prevec 1987).

Seasonal variation through ethnographic analogy may be more useful. Witch Point shares with Three Pines many desirable characteristics for a good camping locale. It has well-drained, flat terrain and ease of access from water to shore. The east–west trending esker curves to the southwest at its tip. This offers some protection from cold north winds while still providing southern exposure. The shallow water around the margins and cobble beach provides a good landing place for watercraft.

Witch Point may have attracted more people because of its location, particularly in the open water season. It is a unique topographic feature on the lake. Jutting out into the lake, it forms a

natural quay, accessible from all sides, creating a sheltered bay. In the summers of 1993–94, local visitors to the site used whichever side of the point was in the lee shore when landing their boats. North of Witch Point, the lake narrows to a long channel with steeply rising cliffs formed by Nipissing Diabase dykes along the eastern shore. Compared with this channel and the wide open Granny Bay farther north, Witch Point would have offered a welcomed respite to open water travellers. Also, Witch Point lies at the beginning of a major travel route to and from Diamond Lake and the Montreal River-Lake Timiskaming drainage. Bill Twain reported that Witch Point was used as an assembly point for families going to and from the large summer gatherings at nearby Bear Island (Gordon 1994b). These landscape features alone may account for a higher artifact yield and density of precontact occupations at Witch Point.

The Three Pines site is on a broad peninsula and therefore has a greater land mass than the narrow Witch Point esker. It has a larger near-site hinterland for resources such as firewood and sphagnum moss from the peat bog. It also enjoys greater north wind protection. This evidence suggests that the Three Pines site would be suitable for both warm season and cold season usage, and for longer term usage. In contrast, Witch Point probably witnessed shorter term, intensive usage, mostly in periods of open water, over a longer time span than the Three Pines site.

### **Late Woodland Rituals, Alliance Formation, and Models of Social Change**

Archaeological evidence suggests that the Witch Point site was not only a stopover campsite for hunting and gathering, but also a place of social interaction and ceremonial expression for its precontact inhabitants. As described above, several unusual items plus the dog burial were uncovered in the 1993 north block excavation (Gordon 1993, 1994a, 1994b, 1995a, 1995b). These finds are tentatively assigned to the Late Woodland, based on field observation of spatial association with Iroquoian-influenced pottery designs. The temporal assignment awaits verification through a Harris Matrix stratigraphic analysis and absolute

dating of the dog bones. What makes these findings of interest, and worthy of this preliminary discussion, is that, first, ethnographic analogy suggests they may be associated with rituals and, second, such items are absent at the Three Pines site, with its predominantly Middle Woodland occupations.

This aspect of the Lake Temagami research broadens further to consider questions of hunter-gather behaviour in the context of the human ecosystem (Butzer 1982), leading to questions of long-term cultural change. Focus turns to the more elusive, but interesting, changing social context. Hunter-gatherer populations interact “not only with the physical environment and biological one, but also with the social environment” (Bailey 1983:187). This section examines material evidence for ritual behaviour at Witch Point in comparison with other regional sites. Identifying ritual behaviour archaeologically has certain pitfalls, but ethnographic and ethnohistorical studies provide some clarification (Brück 1999). Examining seventeenth-century written accounts of hunter-gatherer groups in proximity to Lake Temagami elucidates some of the forms and functions of rituals, which may have continuity from the Late Woodland period. Finally, the role of ritual in alliance formation is considered, both as possible explanations for the Witch Point evidence and as an underlying theme in models of long-term social change (Gilman 1983; Madden 1983). It is tentatively proposed that such models may help explain certain Middle Woodland to Lake Woodland changes seen in northeastern Ontario.

#### *Witch Point Ritual Evidence*

In the north block, the unburned, partial skeleton of a dog was found without artifacts in a small pit of fine sand. This pit lies below the dark grey-brown layer and intrudes into the sterile yellow-brown B horizon. Skeletal elements include both mandibles, a maxilla fragment, one extremity, and several vertebrae. Epiphyses are unfused, indicating a young animal. Cut marks were observed only on one long bone.

The burial lies beside a particularly dense accumulation of fire-cracked cobbles, which form

a type of rock pavement. As stated above, on visiting the site in 1993, several Bear Island residents suggested that this rock pavement may have been for sweat baths. In north-central Québec, small cobble structures were found in two modern Cree winter camps (Hanks 1983). These small sweat lodges were 0.5 m in diameter. Hanks (1983) classified these as specialized socio-religious structures, called *atutson*, because physical and spiritual healing are integral practices for the Cree.

The bright orange, thin-walled pottery vessels from the 1993 block have not been seen anywhere else on the lake or in the region. Perhaps red ochre was mixed into the clay before firing, or a specific iron-rich clay was used. These unique and delicate vessels may have had a special purpose. Unflaked, exotic clear quartz crystals were also found in the north block. Clear quartz flakes occur at Witch Point in Woodland period assemblages, while a clear quartz biface fragment fashioned from a very large crystal was assigned to the Archaic period at the Three Pines site (see Figure 13: #143).

Quantities of red ochre nodules were found in both the 1993 and 1994 Witch Point excavations. Conway (1982) reported 556 g of red and yellow ochre. While a rare commodity regionally, it was mined locally south of Lake Temagami, according to native informants (Conway and Conway 1989). From Craig Macdonald's interviews with Bear Island elders, we learn that “The *Anishinaubeg* named one of their rivers *Wu-num-man Zipi* or the red mud river. They would go there to collect a rouge-coloured material, actually iron oxide, from rocks and they would use it as paint or dye” (Jenish 2006). Red ochre in a habitation context may have been used for tent markings or coat markings (Skinner 1911). A bear skull marked with vermilion paint is illustrated on Macdonald's (1993) *Historical Map of Temagami*. Suspending animal skulls and other bones in trees is a symbolic ritual of respect by traditional hunters to the animal spirits (Gordon 1980; Tanner 1979).

This extensive occurrence of red ochre suggests a potential Late Woodland context for some of the Lake Temagami rock art. Of the 36 known rock painting sites in the area (Dewdney and Kidd 1967; Conway and Conway 1989), 21 are on

Lake Temagami itself (see Zawadska, this volume) and several are near Witch Point (Gordon 1995a). Lake level research suggests that pictographs at the north end of Lake Temagami date between 1,000 and 4,000 years ago. Rock paintings may be individual expressions of narrative events or dream quests (Rajnovich 1994), but regardless of the meaning assigned by the maker or subsequent interpretations by later inhabitants, rock painting sites serve as localized, public expressions of presence, on view to all who pass by.

The plausible inference through ethnographic analogy is that some artifacts and settlement features at the Witch Point site: the densely packed cobbles; the dog burial; red and yellow ochre; unmodified clear quartz crystals; and delicate, bright red pottery vessels, are related to Late Woodland rituals and ceremonial expression.

#### *Evidence from Other Sites*

Only a few dog burials have been reported in northeastern Ontario sites. According to Bev Smith (see Oberholtzer 2002), this rarity may be more a problem of recognition than of presence. At the Lake Temagami site Carscallen (1994b, personal communication 2012) excavated a single dog burial with red ochre. More numerous are the dog burials at the Frank Bay site, on Lake Nipissing. Three were reported by Ridley (1954:49) and six by Brizinski (1980). These six dog bundles were found in the middle to upper strata (Brizinski and Savage 1983). All the dog skeletons were unburned and dismembered, with two underlain by charred birch bark. Four of the bundles were associated with red ochre, and one burial (number 4) was “accompanied by an exquisitely formed quartz crystal” (Brizinski and Savage 1983:35).

Densely packed fire-cracked rock occurs at the Witch Point site adjacent to the north block dog burial. Such “rock pavement” was not seen on other sites excavated or tested by me on Lake Temagami. However, Carscallen (personal communication, 1994) reports heavy rock concentrations at the sandy Lake Temagami site that also yielded a dog burial. Brizinski (1980) found a pavement of fire-cracked rock, measuring 1.3 by 0.8 m, in the same excavation area as the six

dog bundle burials at the Frank Bay site.

Most dog burials on Upper Great Lakes sites date to younger than 600 years ago (i.e. after A.D. 1400) (Bev Smith, personal communication 1993; Oberholtzer 2002) but dates on charcoal beneath two of the Frank Bay dog burials (numbers 1 and 2) indicate a greater antiquity, namely,  $995 \pm 50$  RCYBP (S-1685) and  $895 \pm 60$  RCYBP (S-1686) (Brizinski and Savage 1983:35). The Lake Temagami site dog skeleton is somewhat younger at  $760 \pm 60$  RCYBP (TO-4334) ( $700 \pm 35$  cal. B.P. Liam Kieser, personal communication 2014). Perhaps the practice of dog burial is somewhat older in the Lake Nipissing- Lake Temagami area.

On the Mattawa River east of Lake Nipissing is the Port de l'Enfer site (CbGr-1). This red ochre mine is rather inaccessible place, as it is located within a deep cave, high up a cliff face (Tyyska and Burns 1973). Red ochre, or haematite, is a chalky, deep red-coloured mineral that can be easily ground into a powder and mixed with a binder of fish oil to form a durable pigment (Rajnovich 1994). On its own, it served as a powerful medicine (Rajnovich 1994). Brizinski (1980:139) identifies the red ochre and quartz crystal as “exotic or ceremonial goods,” with the latter “acknowledged as having ‘power’ among Algonkians” (Brizinski and Savage 1983:35).

Thus, archaeological evidence from both Lake Temagami and Lake Nipissing supports a sequence of the deliberate killing (cut marks on cervical vertebrae), dismemberment (cut marks on joints and long bones), and specialized interment (birch bark covering or in a pit of clean fill) of individual, young dogs (Brizinski and Savage 1983; Carscallen 1994b; Gordon 1993). Red ochre, clear quartz crystals, and rock pavement structures also occur on sites with dog burials, some in association, some not. Elsewhere, dog burials occur in single-household sites, such as Isle Royale in Lake Superior (Clark 1990), and within larger “village” sites with longhouses, such as the Providence Bay site (BkHn-3) on Manitoulin Island (Fox 1990; Smith and Prevec 2000). Dog burials occur on large sandy sites connecting major Great Lakes travel routes, such as the Frank Bay site, which may have functioned as a Late Woodland trading village (Bandow 2012). Upland

from the Great Lakes, dog burials occur on a large, longer term, possibly a summer gathering site, the Lake Temagami site, and on a much smaller, short-term travel site, the Witch Point site.

### *Defining Ritual Behaviour*

According to Brück (1999:314-315), anthropologists and archaeologists agree on certain characteristics that define rituals, including highly structured, repetitive, and prescribed modes of behaviour, using symbols or having a symbolic or expressive nature. She cautions that “a recurrent yet unspoken theme underlying many archaeological discussions of ritual is the equation of ritual with non-functional action” (Brück 1999:317). Drawing from ethnographic examples, including Brightman’s (1993) research on the Rock Cree of northwestern Manitoba, Brück reminds archaeologists that in many societies “where people do not draw such a [modern Western] categorical distinction between the sacred and the profane, ritual action may not be spatially or temporally distinguished from more ‘mundane’ or secular activities” (Brück 1999:319).

One contemporary example from a James Bay Cree winter camp suggests that the distribution of faunal bone on an archaeological site may indeed reflect ritual behaviour (Gordon 1980). Specific, repetitive disposal practices of sacred animal bones show respect and gratitude of human hunters for the animal spirits (Feit 1973; Rogers 1973; Tanner 1979). Ethnohistorical studies of the Rock Cree (Brightman 1993), and contemporary studies of James Bay and Mistassini Cree hunting practices (Feit 1973, 2004; Tanner 1979) show that,

in the Cree view of the natural world, the hunter is part of a system and key Cree values (such as respect, sharing, reciprocity, generosity, taking care) apply to relationships between animals and peoples as well as to those among people [...] Customs and rituals help people remember the rules and interpret signals from the environment appropriately [Berkes 1998:111, 125].

So it is plausible that these uncommon archaeological artifacts, dog burials, and structural

features are not the only expressions of ritual activity on Late Woodland sites, but that some, if not all, played a symbolic role in formalized social practices. The next question is, “What meaning and functions might such rituals have expressed?” Documentary evidence from the seventeenth century, the early contact period, offers some clues.

### *Early Contact Period Accounts*

The arrival of European explorers, Jesuits missionaries, and fur traders in northern North America resulted in the first documentary accounts of northern forest (Canadian Shield) hunter-gatherers. These accounts are, of course, written from and for a European perspective, but relied on informant information. Like artifacts, they may represent single events or observations; how far can they be generalized is thus a matter of interpretation.

Lake Temagami people were likely in direct contact with Lake Nipissing people who attended formal ceremonies with dog feasts (Thwaites 1896-1910:23:221). On the pre-1900s map (Macdonald 1993), two separate routes to Lake Nipissing are marked on rivers flowing south from Lake Temagami, part of the Sturgeon River drainage. Lake Nipissing people were in direct contact with early French fur traders, Huron horticultural groups to the south, and Algonquian hunting-gathering groups to the north (Champlain 1922:3:41; Thwaites 1896-1910:21:230-240).

The *Rivière d Estarjon* [sic] is marked on a 1616 map draughted by Samuel de Champlain (Heindenreich 1971:24). In his 1615 account, Lake Nipissing people go up the Sturgeon River to trade.

This lake is some eight leagues wide and twenty-five long [Lake Nipissing, whose dimensions are overstated] and into it flows a river [the Sturgeon River] which comes from the north-west up which they go to trade the goods which we give them in barter and exchange for their furs, with those who dwell here, who live by the chase and fishing [Champlain 1922:3:41].

In 1640, Father Jerome Lalemant offers this description of the Nipissings' seasonal economic round and long-distance trading relations.

Nipissiriniens [...] form a Nation of the Algonquin tongue which contains more wandering than settled people. They seem to have as many abodes as the year has seasons, —in the Spring a part of them remain for fishing, where they consider it the best; a part go away to trade with the tribes which gather on the shore of the North or icy sea [James Bay], upon which they voyage ten days, after having spent thirty days upon the rivers, in order to reach it. In summer, they all gather together, on the road of the Hurons to the French, on the border of a large lake which bears their name [...] About the middle of Autumn, they begin to approach our Hurons, upon whose lands they generally spend the winter; but, before reaching them, they catch as many fish as possible, which they dry. This is the ordinary money with which they buy their main stock of corn, although they come supplied with all other goods, as they are a rich people and live in comfort. They cultivate a little land near [Page 239] their Summer dwelling; but it is more for pleasure, and that they may have fresh food to eat, than for their support [Thwaites 1896-1910:21:230-240].

Another 1640 account from the *Jesuit Relations* identifies localized named groups in northeastern Ontario, of which two can be reliably associated with the study area (Bishop 1994a). This is the first time the name *Outimagami* appears in written documents.

Leaving the River des Prairies [Ottawa River] when it turns directly to the North, that we may go to the Southwest, we come to Lake Nipisin, where the Nipissiriniens are found. These have upon their North the Timiscimi, the Outimagami, the

Ouachegami, the Mitchitamou, the Outurbi, the Kiristinon, who live on the shores of the North sea whither the Nipissiriniens go to trade [Thwaites 1896-1910:18:227-229].

Note that trading relations between Lake Nipissing and James Bay groups predate the 1668 English fur trade on James Bay and the earliest interior French posts: 1673 at Nighthawk Lake near Timmins and 1679 at Lake Timiskaming (Bishop 1994a; Mitchell 1977). As Arthur Ray (1974) has advocated for the English fur trade in northwestern Ontario and the Prairies, the early French fur trade may have overlain and made use of pre-existing social alliance networks among Algonquian-speaking groups (Hickerson 1960).

The *Jesuit Relations* also provide several seventeenth-century accounts of formal ceremonies conducted to reaffirm existing alliances and initiate new ones among groups in the upper Great Lakes (Hickerson 1960). Father Jerome Lalemant's description is the most detailed of these early accounts (Thwaites 1896-1910:23:209-223). In this account, the Nipissings were the host, inviting the Sault and the Huron, among other groups, to participate in elaborate rituals over several days (Thwaites 1896-1910:23:209-223; Hickerson 1960). These ceremonies involved reciprocal gift exchange to solidify social alliances between linguistically related groups and with unrelated groups. Higher levels of social-political integration are suggested by the elections of chiefs, as well as by possible "early totemic organization" (Hickerson 1960:62).

The event took place in September 1641. As part of the Huron contingent, Father Jerome Lalemant witnessed a deliberately planned assembly of 2,000 people in a large bay on the shores of northern Georgian Bay (Thwaites 1896-1910:23:209-223). He described the location as being 20 leagues (110 km) from the House of Ste. Marie, placing it perhaps in the modern-day Parry Sound area. Activities included gift exchanges, theatrical dances with drumming and music, individual sport competitions, the election of *Nipissiriniens* Chiefs, and the transfer of names from those who had died since the last feast to the living (Thwaites 1896-1910:23:209-217).

According to Lalemant (Thwaites 1896-1910:23:217-219) the most solemn and sacred were the ceremonies for the dead. The women built an arched cabin of 100 paces long, bringing in bones of the deceased in birchbark containers covered with beaver robes. A feast was held for the women only and they chanted throughout the night. Additional activities were held in this long cabin the next day, after which came a dog feast.

Algonquin Captains, who acted as Masters of Ceremonies, entered ten or twelve in line, bearing flour, beavers, and some dogs still alive, with which they prepared a splendid Feast for the Hurons. The Algonquin Nations were served apart, as their Language is entirely different from the Huron.

Afterward, two Meetings were held; one consisted of the Algonquins who had been invited to this Solemnity, to whom various presents were given, according to the extent of the Alliance that existed between the Nipissiriniens and them [...] The second Assembly was that of the Huron Nations, at which the Nipissiriniens gave us the highest Seat, the first titles of honor, and marks of affection above all their Confederates [Thwaites 1896-1910:23:221].

Lalemant (Thwaites 1896-1910:23:209) himself noted that this “feast of the dead” differed greatly from those of the Huron, described by Gabriel Sagard in 1623-24. Hickerson (1960:81, 87) suggests these pre-burial practices were borrowed from the Huron only by those Algonquian groups in direct contact. Rajnovich (1994) disagrees, arguing that this is the earliest account of a Ghost Lodge ceremony, one of many elaborate ceremonies related to the widespread Algonquian *Midewiwin*, or Society of Good Hearted Ones, which persists throughout the historic period and into the twentieth century.

Throughout the historic period, ritual dog sacrifices were documented among Algonquian-speakers of the Great Lakes (Brizinski and Savage 1983; Oberholtzer 2002). The purpose of these rituals varied. Dog sacrifices were done to appease

or ask favour from spirits, to accomplish success in hunting or war, and to ward off disease (Oberholtzer 2002). A *Teme-Augama Anishnabai* elder told heritage consultant Judy Gouin (personal communication 1993) that at the naming ceremony, young children are fed the meat of a puppy to ward off diseases (Gordon 1993). Ritual killing and consumption of dogs was also a special part of the rites of passage, such as adoption and initiation into the *Midewiwin* or medicine lodge ceremonies (Brizinski and Savage 1983; Long 1974; Oberholtzer 2002; Skinner 1911), and, in the 1641 example mentioned above, as part of an alliance-reinforcing feast.

In 1701, a major gathering of Great Lakes people occurred in Montreal, to make a peace agreement between, on the one hand, the French and their allies and, on the other hand, the Iroquois Confederacy (Bohaker 2006). Among the 25 political entities the French named in the treaty were the “nepissingues [Nipissings], algonquins, Temiskamingues [Lake Temiskaming people]” (Bohaker 2006:24). Native signatories used 38 or 39 pictograph images of mammals, reptiles, fish, and flora on the document itself, making it the earliest known example of such symbolic writing on a treaty document (Bohaker 2006:24).<sup>6</sup>

In the eighteenth and nineteenth centuries, 20 of these animal figures are associated with the totem clan groups, or *nindoodemag* (kinship networks), of Algonquian speakers: Ojibwa, Ottawa, Potawatomi, and Algonquin.

*Nindoodemag* shaped marriage and alliance patterns and facilitated long-distance travel; access to community resources was also negotiated through these networks. Sources dating from the seventeenth century suggest that in this earlier period and likely before contact, *nindoodemag* operated as an important component of *Anishinaabe* collective identities, fulfilling similar social and political functions [Bohaker 2006:26, 29].

<sup>6</sup> In the author’s opinion as an artist, there is a remarkable stylistic similarity between these images on the 1701 Great Peace (Bohaker 2006:Figures II and III) and the pictographs illustrated in Rajnovich’s 1994 book on northern Ontario rock art.

Bishop (1994a, 1994b) notes that clans were present by 1770, while Hickerson (1960) sees hints of totemic evidence in the early contact period. *Teme-Augama Anishnabai* families currently are part of 14 clan names and totems (*Teme-Augama Anishnabai/Temagami First Nation* 2007).

### *Rituals and Alliances*

Thus, documents from the 1600s and early 1700s reveal events and social, economic, and political practices among Algonquian-speakers in proximity to Lake Temagami. They show the extensive mobility of these hunter-gatherers, including long-distance trading that probably predates the French fur trade (Hickerson 1960). Direct or indirect contact between coastal James Bay, the upland Canadian Shield, and horticultural regions farther south are indicated (Champlain 1922:3:41; Thwaites 1896-1910:21:230-240; Bishop 1994a) leading to trade exchanges and other interactions between linguistically related and unrelated groups (Hickerson 1960). Localized name groups are evident, more than those represented in the 1701 French tally, including the *Outimagami* (Bishop 1994a; Bohaker 2006). Extensive social networks called *nindodemag*; intensified communal activity within autonomous groups; and group integration between allied and/or confederated groups also existed (Bohaker 2006; Hickerson 1960:95).

The dog feast is one element in alliance-reaffirming ceremonies among upper Great Lakes Algonquian groups and their Iroquoian-speaking allies to the south (Hickerson 1960; Thwaites 1896-1910:23:209-223). Alliances ceremonies were also conducted among allied groups and their enemies, at the behest of the French (Bohaker 2006). One key reason for formalized social alliances is to help groups in times of distress, enabling them to gain access to new territory and resources through reciprocal social and economic obligations (Bailey 1983; Bohaker 2006; Gilman 1983; Hickerson 1960; Madden 1983). With the stress of epidemics in the mid-seventeenth century and Iroquois raiding attacks, these strong kinship and inter-group alliances clearly served their purpose. Iroquois raiding stories are still part of

*Teme-Augama Anishnabai* oral history (Conway and Conway 1989; Gordon 1995a).

In the early post-contact period one impetus for forming new alliances would have been to access trade goods, either directly from the French or through middlemen, such as the Nipissing (Hickerson 1960) and Odawa (Fox 1990). So it could be argued that the social, economic, political, and ritual practices described in these early documents are new forms—a direct result of the introduction of rare, highly valued commodities and the influx of distinct linguistic and cultural groups (e.g., White 1991).

However, others have argued for continuity between the precontact and historic periods. Hickerson (1960) argues for a florescence of pre-existing social patterns in the 1600s, rather than a new response to the early European fur trade. Bohaker (2006) suggests that clan- or totem-based alliance networks extended back into the seventeenth century and perhaps earlier. Oberholtzer (2002) proposes that dog sacrifice in historic times may be a continuity of precontact dog burial practices. Rajnovich (1994) contends that both precontact and historic period rock paintings can be related to totems, power dreams of medicine people, and *Midewiwin* ceremonies (e.g., the lattice glyph at Keso Park on the French River).

Thus it can be inferred that one key function of rituals in the Late Woodland period was to symbolically express social and economic alliances, between local groups, distant groups, and even those speaking different languages. This possibility offers one plausible explanation for ritual evidence at the Witch Point site. Witch Point was a favourable habitation site for precontact groups travelling north and south past the steep cliffs and windy open water of the North Arm. As a traditional use site, according to Bill Twain, it was an assembly point for families on their way to and from the large summer gatherings at nearby Bear Island (Figure 42). The rock pavement may represent successive large hearths in rituals involving feasting, dog sacrifice, and dog burial. Cobble structures for sweat baths are another possible ritual function. These rituals may have served to reintegrate dispersed families, reinforcing reciprocal obligations.

Groups travelling long distances who were passing through Lake Temagami may also have met here to ritually exchange goods and information with local groups. It may not be possible to get to the specific meaning or forms of these rituals, or to the specific groups involved (see Bandow 2012 for an alternative viewpoint). However, the same artifacts and structural features that are present on large sandy gathering sites, such as Frank Bay and the Lake Temagami sites, are also repeated on this smaller travel camp at Witch Point. This evidence suggests that certain Late Woodland rituals had a similar, prescribed format, whether practised externally, in elaborate, large-scale meetings such as described by Lalemant (Thwaites 1896-1910:23:209-223) for the purpose of reaffirming alliances between locally named groups, adjacent neighbours, and allies from different linguistic groups, or internally, between families and local groups to reinforce mutual social, spiritual, and economic support.



**Figure 42.**

*Bear Island Pow Wow July 1994, Lake Temagami.*

### *Alliances and Models of Social Change*

The evidence for ritual behaviour found at the Witch Point is absent from the Three Pines site, which contains no Iroquoian-like pottery vessels but does have a strong Middle Woodland Laurel pottery component. There are no specific locational, ecological, or seasonal factors that help explain this variation. So, perhaps these differences relate to broader social-cultural trajectories from the Middle Woodland to the Late Woodland periods reflected in this admittedly insufficient sample of two upland Canadian Shield sites.

Nonetheless it is worth examining several models of long-term culture which consider the role of ritual in social alliances.

Several archaeologists have emphasized the importance and application of alliance and reciprocal exchange theories developed in anthropology (e.g., Levi-Strauss 1969; Sahlins 1972) to explanations of long term culture change in the prehistory of hunter-gatherers (Bender 1978; Gilman 1983; Madden 1983). To summarize briefly: the domestic household or local group cannot survive in isolation, but needs to form alliances with others in order to practise a seasonal subsistence economy across a wide geographic area (Bender 1978). One way of creating alliances is by exchanging spouses, thus forming kinship groups or mating networks (Bailey 1983). Alliances between households or local groups involve reciprocal exchange and obligations. One obligation is to produce more than the household needs in order to create surplus goods for exchange (Bender 1978), for example, trade in high-value material goods (Walthall and Koldehoff 1998). Alliances allow access to the territory and resources of other groups, particularly in times of shortage and stress; offer economic assistance; provide security; and help to reduce and resolve conflict (Bailey 1983; Gilman 1983). Alliance networks (Gamble 1983) or social network systems (Madden 1983) rely on various means of communication, such as spoken language, information exchange about environmental conditions, the visual media of material culture, and ritual (Gamble 1983:203). Increased emphasis on social rituals helps to reinforce long-distance exchange and symbolizes group affiliation and role differentiation (Bailey 1983).

Gilman (1983) uses alliance and reciprocal exchange theory to develop a two-stage model of social change occasioned by technological change from the Middle to Upper Palaeolithic in Europe. He postulates that the Middle Palaeolithic, with a lower level of technology, had very low population densities. Hunting groups would welcome help from any and all others to prevent food shortages. Therefore there would be no social boundaries. Technological improvements in the Upper



Palaeolithic led to increased hunting efficiency; a wider range of species exploited; higher population densities; increased ritual, particularly associated with human burial; and greater artistic and stylistic expression. The local group now has more neighbours, but needs less subsistence aid, given increased production. As households must balance the costs against the benefits of external alliances, each group would therefore restrict the scope of its alliances (Gilman 1983:122-123). Alliances become more fragile and therefore require rituals to hold them together.

Maintaining the necessary web of social relations requires the balancing of contradictory interests and it is this that makes ritual reinforcement of reciprocity necessary [...] [In the Upper Palaeolithic] the closed connubium of friends-in-need would require ceremonies to symbolize and cement their alliance and style to represent it, not because innovations in technique had made mutual aid more necessary, but because higher production security [...] had made social co-operation more unstable [and] [...] liable to breakdown [Gilman 1983:122-123].

Similarly, to explain regional variation in Norwegian Mesolithic sites, Madden (1983:192) develops three models of unbounded and bounded “social networks systems”. Key variables include population density, geographic distance between groups, and degree of interactions resulting in anticipated differences in material culture. The first model is of an unbounded, undifferentiated social network system with a low population density spread over an extensive area. Interactions would be continuous but uneven across the whole system, with the expectation of material culture homogeneity. The second model is of differentiated networks because the distances between them are too great to maintain social interactions. The third model is “differentiated due to imposed social boundaries [...] imposed division to preserve exclusivity of the exploitation territories and/or resources” (Madden 1983:193). Traits include greater internal integration of

groups and corresponding external differentiation between groups in a region, as well as “more formal and structured linkages” (Madden 1983:193). This would be reflected in material culture as distinct “differences in stylistic behaviour, discrete stylistic zones,” more exchange interactions between bounded groups, as well as “increased symbolic/stylistic behaviour” (Madden 1983:194).

#### *Evidence of Change in Upper Great Lake Fisheries*

Cleland (1982:772-775) notes similar characteristics in comparing variation between Middle Woodland and Late Woodland fishing sites in the Upper Great Lakes. He provides evidence for improved technology, greater efficiency of production, greater resource exploitation, increased communal activity with labour-intensive practices, greater subsistence security, and increased population. Middle Woodland peoples seasonally inhabited the shores of the Great Lakes to exploit shallow-water, spring-spawning fish runs, with new technologies and techniques, including seine nets with netsinkers and harpoons. Late Woodland groups were able to increase production and exploit different fish species by developing a variant of the seine net. The gill net using netsinkers and floats was employed in deep-water fall fisheries. Fall fisheries provided greater returns, both in quantity and nutritional value, than the spring ones. Surplus fish could be dried, stored, and used into the winter months. Increased size, number, and duration of lakeshore sites suggests a substantial increase in Late Woodland population. A labour-intensive practice, the fall fisheries required communal co-operation because they were of short duration, a few weeks only, compared with several months for the spring fisheries (Cleland 1982:772-775). Cleland’s work supports the possibility that a shift from open, unbounded social networks with more stable alliances toward more closed social networks with imposed boundaries and unstable alliances (Gilman 1983; Madden 1983) may be applicable to northeastern Ontario, albeit on a much smaller time scale.

*Middle Woodland:**Undifferentiated Social Networks*

If the Middle Woodland social network system corresponds to an undifferentiated one, with no social boundaries, this might account for uniformity in Middle Woodland assemblages across northern Ontario. Other researchers see enough variation to propose a distinct stylistic zone of “Eastern Laurel” in northeastern Ontario (Pollock 1975; Reid and Rajnovich 1991), but the view here is that there are strong, overriding similarities in lithic raw material choices, tool types and frequency, method of lithic and pottery manufacture, and pottery designs and motifs. These are evident when comparing Laurel sites on North Caribou Lake in northwestern Ontario (Gordon 1985) with collections from across northern Ontario (e.g., Wright 1967a, 1967b, 1968) and the Middle Woodland occupations at the Three Pines site (Gordon 1991a).

*Late Woodland:**Toward Differentiated Social Networks*

One anticipated material culture aspect resulting from a shift from unbounded to bounded social network systems is increased distinctions in stylistic behaviour (Madden 1983). This shift may be seen in increased regional variation in Late Woodland pottery. Blackduck pottery occurs on many Middle Woodland Laurel pottery sites, but new designs and forms also appear. In northwestern Ontario these include, for example, Sandy Lake Ware (Arthurs 1978; Taylor-Hollings 1999), Selkirk Ware (Koezur and Wright 1976; Rajnovich and Reid 1978), and Bird Lake Ware (Lenius and Olynyk 1990). In northeastern Ontario, later pottery forms are predominantly Iroquoian-like motifs. From Lake Abitibi (Ridley 1956, 1958, 1963, 1966) to Lake Temagami to Lake Nipissing there is a shared pottery tradition, with the greatest diversity of vessels on the southern sites, such as Frank Bay (Ridley 1954; Brizinski 1980).

From an examination of Ridley’s Abitibi and Frank Bay collections (Gordon 1991a), it appears that some of these vessels may be direct imports from southern Ontario, while others, like the

Witch Point vessels, appear to be copies of Iroquoian pottery motifs, such as Sidey Notched and Huron Incised designs. In the adjacent Abitibi-Témiscamingue area, Côté and Inksetter (2001) define a “Blackduck episode” as a relatively short period, dating between A.D. 1000 and 1350, completely superseded by “proto-Huronian” vessels, dating between A.D. 1300 and 1650. Neutron activation chemical analyses of Laurel and Blackduck vessels show locally used clay sources, while those with Iroquoian Tradition stylistic affinities were manufactured from a greater number of sources (Côté and Inksetter 2001).

Increased regional variation in pottery styles may be associated with increasing social boundaries across northern Ontario. In northeastern Ontario, north–south lake and river travel routes served to connect historically known distinct groups. The occurrence of “exotic” vessels and the replacement of Blackduck vessels with Iroquoian-like vessels on upland Canadian Shield sites supports more formalized trade, direct or indirect, and other forms of interactions between groups of different economic, social, and (potentially) linguistic affiliations (i.e., northern hunter-gatherers with southern horticulturalists) in the later part of the Late Woodland period. Pottery appears infrequently on upland sites in the James Bay region of northern Québec (e.g., Chism 1977, 1978), suggesting that these trade relations had a finite distance.

What is in the pottery vessels may have been more important than the vessels themselves. At the Frank Bay site the presence of burned corn cobs dating to at least A.D. 1000 (Brizinski and Savage 1983), indicates contact with maize cultivation or cultivators. By this date, intensive corn, bean, and squash horticulture is clearly in place in the lower Great Lakes (Jamieson 1992), although the usage of maize (Hart and Lovis 2013) and squash (Fox and Garrad 2004) in precontact diets may be considerably older. At some point, tobacco may also have been a highly valued commodity for long-distance trade, as suggested by the presence of Late Woodland period ceramic pipes at the Frank Bay and Witch Point sites. The functional practicality of fragile ceramic vessels on the rocky

Canadian Shield has always been questionable in my view. Perhaps the vessels themselves became valued symbols of a household's alliance networks, long after the contents were consumed.

On the upland Canadian Shield of northeastern Ontario in the Late Woodland, there is evidence of food surplus from Great Lakes fisheries, population increase, increased stylistic variation in pottery, a new pottery tradition with southern traits, long distance trade, and presumably other interactions with different economic modes (i.e., maize cultivation), as well as different linguistic groups (i.e., Iroquoian speakers). Southern-tier Algonquian speakers may themselves have practised horticulture (Fox and Garrad 2004:124). Longhouse villages, such as seen at Providence Bay on Manitoulin Island (Fox 1990), or even potential Algonquian villages within Huronia itself (Fox and Garrad 2004) may be one result of these newly developing alliances and interactions. Another result may be increased ceremonialism, as seen in the dog burials after A.D. 1000, as mobile groups had wider choices and greater reasons to form alliances using the symbols and practice of ritual to keep fragile ties from falling apart (Gilman 1983). Trends begun in the Late Woodland period toward more socially bounded networks may also account for early post-contact evidence of higher levels of socio-political organization noted above (Hickerson 1960:62; Bohaker 2006). These potential socio-cultural trajectories in the Late Woodland in northeastern Ontario would not have taken place in a vacuum. They may have been influenced by broader regional—if not continental—developments, such as suggested by Jamieson (1992:70), who relates Iroquoian development in southern Ontario to a process of “Mississippification,” resulting in networks of sedentary fortified villages, cultivating maize, linked by lineage and clan affiliation, and engaged in warfare and raiding. Such developments may be another impetus for increased Late Woodland ceremonialism to symbolize alliance formation on Canadian Shield sites in northeastern Ontario.

## Summary

### *Proglacial Lakes Post-Algonquin and Barlow*

Glacial ice retreated from Lake Temagami around 12,150 cal B.P. (10,400 ± 240 RCYBP) (Veillette 1988). Deep proglacial lakes, held up by the ice margin to the northeast, inundated the Temagami basin, as seen by varved clays in peat cores extracted from Bear Bog, near Sharp Rock Inlet (North Arm), and Baseball Bog (Northeast Arm), near Cassels Lake. The lithology and radiocarbon dates from Baseball Bog correlate well with Veillette's (1988) post-glacial reconstruction. Lake Post-Algonquin reached northward from the Lake Huron basin into southern Lake Timiskaming, extending a narrow arm into the Temagami basin. This proglacial lake drained southward around 11,500 cal B.P. Early proglacial Lake Barlow followed. It reached out of the Timiskaming basin and into the Northeast Arm. Cold, deep water varves in Baseball Bog indicate a water depth of 30 to 50 m (Veillette 1988). Thus proglacial Lake Barlow inundated altitudes from 319 up to 338 m asl, creating palaeo-shorelines as high as 46 m above the current elevation of 293 m asl for Lake Temagami.

### *Ancestral Lake Temagami*

Early Lake Temagami separates from proglacial Lake Barlow, as seen in a shift from proglacial sediments to lake muds in the pollen cores. This change dates the establishment of ancestral Lake Temagami to 10,900 cal B.P. at Baseball Bog and 9,800 cal B.P. at Bear Bog. Isostatic rebound played a significant role in the levels and drainage patterns of this early lake.

A predictive model for locating ancestral shorelines was developed by applying isostatic rebound curves extrapolated from adjacent Lake Timiskaming (Lewis and Anderson 1989) to the 50 km long Temagami basin. It predicted that the Temagami basin was tilted significantly in the direction of continental ice retreat. A displacement of 30 m at the north end, relative to the south end of the lake basin 11,000 years ago, rebounded to a 15 m displacement at 10,000 years ago. The “tilt” model also predicted that ancestral Lake Temagami comprised three separate lakes: one in the north half from the Central Hub northward,

a second lake in the Northeast Arm, and a third in the Central Hub, South and Southwest Arms.

Fieldwork confirmed two predicted palaeo-outlets; a 60 m wide, high-energy spillway draining north through Sharp Rock Inlet toward Diamond Lake and a multi-channelled outlet draining northeast from the Northeast Arm into Cassels Lake. The modern southern outlet through Outlet Bay-Cross Lake was not active at this time. Water levels in these ancestral lakes were not deep enough to form varves, but were still above the modern level of 293 m asl. Palaeo-shorelines in the form of water-washed boulders and sand ridges were observed at altitudes of 295 m to 305 m asl at Sharp Rock Inlet, Bear Bog, Deer Island, and Ferguson Bay (North Arm) and at Caribou Lake and Jessie Fen (Northeast Arm). These old lakeshores are 2 to 12 m above the modern lake, ranging from 16 to 400 m inland depending on slope.

#### *Holocene Lake Regression (North) and Lake Transgression (South)*

As the earth's crust continued to rebound throughout the Holocene, lake levels declined in the north and northeast basins and began flooding palaeo-shorelines in the central and south basins of ancestral Lake Temagami. This is seen in a transition from lake mud to pond mud or peat in the Baseball Bog and Bear Bog peat cores, estimated at 7,600 years ago. Eventually the northeast palaeo-outlet closed, while the northern outlet had a much reduced water flow. At some point, the sill across the Central Hub was inundated, creating one large lake and opening a major southern outlet, which operates today, through Cross Lake.

Evidence for rising water levels in the central basin is seen in the peat core extracted from the Three Pines Bog, beside the Three Pines site. This sphagnum peat bog is separated from the lake by a narrow, permeable sandbar. Its water table fluctuates with lake levels. The depth and rate of peat growth in the core reflects changes in the level of Lake Temagami itself. Peat began forming at the Three Pines Bog in the mid-Holocene, dated at 7,500 cal B.P. The accumulation of 4 m of peat in the bog at a rate of 5.3 cm per century,

corresponds to a 4 m rise in lake over 7,500 years: evidence of continuing lake transgression in the central basin due to differential isostatic rebound.

#### *Palaeo-hydrology and Potential Palaeo-Indian Occupations*

Palaeo-hydrological reconstructions for Lake Temagami accord well with those from Lac Mégantic, a finger lake in southeastern Québec, which has a 12,000-year record of occupation, from Early Palaeo-Indian times onward (Loewen et al. 2005). The key evidence from both lakes, of relevance to finding Palaeo-Indian period sites, is that early post-glacial palaeo-shorelines are well inland from modern lakeshores. At Lake Temagami, palaeo-shorelines are found near the old outlets identified in the north and northeast, where lake regression has occurred. In contrast, away and farther south of these palaeo-outlets lake transgression has occurred. Early to mid-Holocene sites that once occupied these former lakeshores may now be partially or completely inundated, depending on slope and elevation.

There is, as yet, no evidence of Palaeo-Indian occupations in northeastern Ontario inland from the Great Lakes. Late Palaeo-Indian components have been identified southwest of Lake Temagami, at Killarney and Manitoulin Island on Georgian Bay (Greenman 1943; Julig 2002; Lee 1957; Storck 1984). In northwestern Ontario, surveys of proglacial Lake Minong have found late Palaeo-Indian Plano sites (Dawson 1983; Fox 1975; Julig 1995). Based on site landscape and geochronology, Pollock (1984) suggests that the Lake Abitibi Jordan site (DeHa-8) could have been occupied in the late Palaeo-Indian period following the drainage of proglacial Lake Ojibway.

Systematic archaeological survey of palaeo-shorelines of proglacial lakes or ancestral Lake Temagami remains to be done. Brief inland surveys near both palaeo-outlets produced no specific evidence of Palaeo-Indian occupations. Inland survey in the town of Temagami, which straddles the former northeast outlet, produced a single bipolar decortication flake struck from a cobble of a dark brown metasediment (the Portage site). One clear archaeological indicator of higher water levels in the North Arm is the Deer Island

Pictographs site, with glyphs ranging from 1.7 to 3.1 m above the modern lake level, compared with those in the Central Hub, which are about 1 m above the water.

One intriguing hint of Palaeo-Indian presence comes from the Gillies Depot I site (CiGw-3), 25 km northeast of Lake Temagami (Knight 1977). Paul Racher (1988) identified a lanceolate Agate Basin-style point. It has very fine collateral flaking and is manufactured from a thin blade of brownish red chalcidony. One face has a large detached flake, while the other shows extensive water and sand abrasion (Knight 1977:186). This sandy site was excavated when Ontario Hydro lowered the water levels in the Montreal River. Although a possible import by a precontact collector, the site landscape lends support to the tool's antiquity. It is identified as "nearshore and beach sediments, 1–20 m thick, deposited during regression of glacial lakes in less than 50 m of water" (Veillette 1986).

If this region was colonized in early post-glacial times by Palaeo-Indian hunter-gatherers, they faced relatively rapid landscape change. Cold, proglacial lakes formed and drained due to continued ice retreat and significant isostatic rebound. Settlement choices, travel routes, and resource usage would have been in a state of considerable flux. Tundra vegetation may have existed for a relatively short period (Saarnisto 1974), followed by an open, patchy early Boreal Forest with more hardwoods than today (Hall et al. 1994 ; Liu 1990). Zone 1 in the Bear Bog pollen diagram shows white spruce and jack/red pine with some balsam fir and birch in the composition of this early forest. Campsites along palaeo-shorelines would have a relatively short time depth, producing few artifacts. The exception would be quarry sites where specific bedrock sources were exploited for tool making, as seen in the use of Lorrain quartzite at Sheguiandah (Lee 1953, 1957; Julig 2002), the same Lorrain Formation which outcrops on Lake Temagami, and of a silicious welded tuff or "green chert" from the nearby the Mt. Goldsmith quarry at the Jordan site, Lake Abitibi (Pollock 1984, personal communication 2014).

### *Archaic Occupations*

An early Archaic component at the Foxie Otter site dated to c. 8500 cal B.P. (Hanks 1988), or near the beginning of the Hypsithermal warming period. A date of c. 5800 cal B.P. was obtained in the lowest Shield Archaic stratum at the Montreal River site (Knight 1977). Cores from Bear Bog and Three Pines Bog show Pollen Zone 3a, dating between 8,200 and 3,800 cal B.P., with high levels of white pine and much lower levels of jack/red pine. Climatic warming caused a shift from a Closed Boreal Forest to a Mixed Conifer–Hardwood Forest. In Liu's (1990) reconstruction, a Great Lakes–St. Lawrence mixed forest reached the edge of the Hudson Bay Lowlands. Physiographic differences underlay forest composition, with a prolific increase of white pine on the Canadian Shield uplands and an expansion of white cedar in the Great Clay Belt region. Mean annual temperatures were 1 to 2 degrees Celsius higher than today, and conditions were likely drier.

Archaic period hunter-gatherers may have enjoyed an increase in biomass, different animal species such as deer instead of moose and caribou, and an increase in plant growth and plant resources. Warmer temperatures meant a longer period between freeze-up and break-up. Sites associated with open water could have been occupied for longer periods. Slightly drier conditions would mean an increase in forest fire frequency and possibly lower lake levels. Using pollen-climate transfer functions (Bartlein and Webb 1985), the Three Pines Bog pollen data indicate a higher mean annual temperature (18.8, compared with 18.0 degrees C today) with a lower mean annual precipitation (650 mm compared with 820 mm today) at 7,500 years ago. Bearing in mind the constraints of the Canadian Shield topography on settlement patterns and travel routes, Archaic period hunter-gatherers nonetheless enjoyed warmer, drier, and generally more favourable environments than did any earlier Palaeo-Indian groups or later Woodland groups. Previously held views that associated Shield Archaic hunter-gatherers with marginal, harsh Boreal Forest conditions (e.g., Wright 1972a) can now be rejected for northeastern Ontario.

The Witch Point site, on the east central mainland, is situated on top of a high sand and gravel esker. It may have older Archaic occupations than the Three Pines site, as the landform itself is older and its physiography made the area less vulnerable to rising lake levels. From a preliminary analysis of Witch Point, Archaic period hearth remnants appear as discrete areas of grey ashy sand, slightly intruding into the yellow-brown Bf soil horizon. Artifacts in the deepest layers, tentatively assigned to the Archaic period, include large tools, such as excurvate bifaces and large bifacial and unifacial flake knives on Gowganda Formation mudrock collected locally. One huge cobble was pecked into an axe. Conway's (1982:3) salvage work collected similar large tools. Vein quartz cores, preforms, and shatter are also prevalent in deeper deposits. The Kokoko Bay quartz vein (CfHa-50), 7 km to the southwest, may be one source. It is a horizontal lakeside vein of milky coloured, homogenous quartz.

The Three Pines site is situated on a sandy baymouth bar on the west mainland of central Lake Temagami. It was available for occupation by at least 7,500 years ago, based on the beginning of peat formation in the adjacent Three Pines Bog. Extrapolating from the present slope, the lower terrace and active beach may have extended 20 m farther south. Lake transgression and longshore drift have gradually reworked and inundated the front edge of the site. Therefore, in the Archaic period, the Three Pines site provided hunter-gatherers with a larger area of flat, well-drained terrain for camping and working. Any archaeological remains near its old lake margins would now be inundated.

These processes did not, however, effect the upper terrace occupations. Settlement traces include deep basins of grey sand with cobbles; dark orange-brown sand, often with calcined faunal bone; including one hearth with beaver and mammal bone. Discrete areas of orange-brown sand in which several Archaic tools were located, may be the faded remnants of once brighter fire-reddened hearths. Hearths were used for cooking, warmth, and faunal bone disposal.

Archaic period tools include various larger side-notched projectile points; a large stemmed

projectile point or drill; medium to large excurvate bifaces, including one bi-pointed biface; retouched flakes; flake knives; and a large snub-nosed scraper. Archaic period toolmakers used locally available raw materials that have sub-conchoidal fracture properties. These include a distinctive metamorphosed olive-grey quartz siltstone or quartzite from the Lorrain, Gordon Lake, or Bar River Formations (leaf-shaped biface, a stemmed projectile point or drill); a very fine-grained light grey Gowganda Formation sandstone (side-notched projectile point); softer greenish grey Gowganda Formation mudshale, mudstone, and clayshale (flake knives and a large leaf-shaped biface); and vein quartz (preform). These materials were either quarried directly at bedrock outcrops and/or gathered as rounded cobbles found in the glacial drift. While the Three Pines site contained several Archaic period large mudrock tools, large cores or chunks of Gowganda Formation mudrock were absent.

The tools recovered suggest hunting, butchering, and food and hide preparation. Only mammals and beaver bone were identified from the one calcined bone deposit associated with the Archaic occupations. Tool making and primary lithic reduction were not major activities at Three Pines, judging by the low frequencies of decortication flakes, thinning flakes, large cores, or shatter of the above-mentioned lithic raw materials. If Archaic toolmakers did quarry rock from local outcrops on Lake Temagami, these were not in proximity to the Three Pines site. The large size of the bifacial tools suggests use of core, rather than flake, tools. The need for large cores and preforms underlies the use of local sub-conchoidal fracture material. Some of the local raw material is prone to step fractures, giving a visual impression of crude manufacture. In reality, many of these Archaic period tools were made with skill and precise control. Nodules of conchoidally fracturing chert, either HBL or local chert, may have been too small for the needs of Archaic knappers.

#### *Middle Woodland Occupations*

Neoglacial cooling is represented by Zone 3b in the Three Pines Bog core, dating from 3,800 to

1,200 years ago. A rapid decline in white pine occurs, while cooler boreal species, such as jack/red pine, birch, and some spruce, increase. The Boreal Forest–Mixed Forest ecotone began to migrate southward from the present day Timmins area, eventually stabilizing 50 km north of Lake Temagami where it currently remains (Liu 1990; Liu and Lam 1985).

The landscape setting of the Three Pines site would have offered Middle Woodland period hunter-gatherers many features favourable to seasonal settlements. The relatively flat upper sand terrace provided well-drained, level terrain for erecting habitation and work structures. The gentle slope of the sand beach provided ease of access from land to water and a good landing place for canoes. It is warmer and sheltered, being located on an L-shaped section of the shoreline facing south and southeast. It is protected from the cold north and northwest winds and from the prevailing southwest winds. A 120-degree vista of the west central section of Lake Temagami allows for inhabitants to observe mobile game and people entering or leaving the Northwest Arm. Fish could be obtained beyond the shallows and especially in the deep northwest channel. The adjacent peat bog and the upland forest would provide plant resources for subsistence, construction purposes, and fuel. Middle Woodland period hunter-gatherers probably selected this locale for the same reasons that earlier Archaic groups did. However, the amount of usable space was much reduced for Middle Woodland groups due to lake transgression.

Middle Woodland occupations are well represented at Three Pines. Settlement traces include extensive grey ash and cobble deposits, representing traces of high-temperature hearths and living floor smears. Localized areas of fire-reddened sand with calcined faunal bone indicate cooking or disposal hearths or perhaps their cooler edges. A pottery-making area is suggested by a unique deposit of brown clay, sand, and small stones. A single post mould or pit was also identified. Ground squirrel burrows, tree root growth, erosion, and subsequent cultural activities (e.g., modern garbage pits) have affected the preservation, boundaries, and spatial distribution

of these remnant settlement structures.

The extensive nature of these settlement traces suggests considerable time depth and repeated seasonal occupations by Middle Woodland hunter-gatherers. Based on the landscape setting and identified faunal taxa, the Three Pines site was probably suitable for occupation at any time of the year. This interpretation is consistent with the faunal taxa identified from specific Middle Woodland contexts, including beaver, moose, and white-tailed deer—three game species that could have been captured during any season of the year. Beaver was better tasting in the colder months and their winter pelts thicker (Job Halfaday, personal communication 1981). The inhabitants probably also exploited bear, wolf, pond turtles, and fish. The latter resource is inferred from two clusters of unmodified pebbles identified as net sinkers. Of these taxa, pond turtles are a warm season indicator. Thus, Middle Woodland groups may have used the Three Pines site during both the warmer and the colder seasons.

The Middle Woodland period is marked by the introduction of ceramic technology. At the Three Pines site, pottery vessels include pseudo-scallop shell stamped, linear stamped, dentate stamped, and combination linear and dentate stamped designs on the lip and/or exterior. Rim vessels show slightly outflaring rims and straight walls, while one plain body vessel shows a conical base and straight walls. The identification of pottery temper lithology was a useful adjunct to decorative motif as a means of separating pottery sherds into individual vessels. For temper, potters used granitoid rock, or mixed sand and granitoid rock. Only one vessel had the dark grey speckled Nipissing diabase temper common to the Late Woodland pottery.

Laurel pottery tended to be in spatially distinct groups of different pottery designs and temper. In some cases, tree roots, rodent tunnels, and modern backfill from pits served to protect the pottery clusters from erosion and subsequent cultural activities. While functional differences and the preferences of individual potmakers may be reflected in the different pottery vessels and in the spatial clusters, there is little clear stratigraphic basis for temporally ordering the different pottery

vessel deposits. The Point Peninsula pottery assemblage at the Frank Bay site included vessels similar to certain pseudo-scallop shell and linear stamp Rim Vessels from Three Pines, while vessels from Ridley's Primary Transitional stratum were closer to a dentate stamped Body Vessel. As noted, this latter vessel may bear similarities with southern Ontario Saugeen ware.

Middle Woodland flintknappers made extensive use of fine-quality, colourful, non-local HBL chert from farther north obtained by trade or travel. There is also some use of a poorer quality "local" chert and other unidentified cherts. All these hard, conchoidal-fracturing rocks, available only in small nodules, were used for small triangular and trapezoidal scrapers, retouched flakes, and small side-notched projectile points.

Local clayshale, mudshale, sandstone, and siltstone were used for flake knives, while cobbles and pebbles were used for grinding implements, abraders, celts, netsinkers, and utilized cobbles. This material occurs as beach cobbles and as bedrock outcrops. Vein quartz was also used for the occasional side-notched projectile point and biface. One source of this material occurs within 8 km (the Crystal site).

#### *Late Woodland Occupations*

Continued climatic cooling characterizes this period. Zone 4 (c. 1,200–0 cal B.P.) of the Three Pines Bog pollen diagram shows an increase in spruce and fir, with a slight decrease in white pine. A Mixed Conifer and Hardwood Forest occupied the Lake Temagami area, while the Boreal Forest–Mixed Forest ecotone remained farther north up to the present day. Lake levels were only slightly lower than today.

Although they have been more subject to erosion and other processes, Late Woodland occupations of the Three Pines site are less intense and of shallower time depth than those of the Middle Woodland period. Settlement traces include two rock structures. One is a deliberately placed line of rectangular rocks that may have been used for a working surface, hearth platform, or windbreak. Another is a semi-circle of cobble around an ash and sand deposit. This may have been a hearth with a stone outline or a hearth

windbreak, as the cobbles are situated on the southeast. Ethnographic examples of Cree and Ojibway bush camps show that the doorways of conical tents are oriented to the southeast (Chism 1978; Gordon 1980, 1985). The remnants of several fire-reddened sand cooking and calcined bone disposal hearths also contain Late Woodland components.

Late Woodland pottery at the Three Pines site includes cord-wrapped stick-impressed rim designs and a cord-wrapped paddle-textured body design. One distinctive characteristic of the three vessels is the use of a dark, speckled temper, the result of a high percentage of grey mafic minerals in the Nipissing Diabase temper. While Blackduck vessels are found at the Frank Bay site (Brizinski 1980) and at Lake Abitibi (Ridley 1966), these Three Pines vessels do not have characteristic Blackduck motifs. However, at least one Blackduck vessel was identified at Witch Point.

At Three Pines, HBL chert, unidentified chert, and "local" chert were used for small side-notched projectile points; scrapers, generally square in form; and retouched flakes. The lack of clearly visible stratigraphic separation of Late Woodland occupations at Three Pines from other precontact occupations makes it difficult to assign additional lithic tools to this period. As Late Woodland occupations units of stratification were spatially discontinuous, there was no stratigraphic basis for temporal ordering these occupation traces.

Another type of Late Woodland pottery vessel, linear-trailed collars and castellations, is found at the nearby Sand Point (Conway 1986) and Witch Point sites. The linear trailed sherds from Three Pines site are too small to determine whether they are from similar vessels. The Witch Point excavations produced collared vessels, some with castellations, decorated with shoulder punctates and oblique and horizontal incised lines. While several resemble Sidey Notched and Huron Incised designs, they do not exactly match southern Ontario vessels in construction, paste, or overall form. This ware is generally cross-dated with the pottery sequences of horticultural Iroquoian sites in southern Ontario (Conway 1982, 1986; Ridley 1966). Such vessels are well



represented in the upper strata of the Abitibi Narrows, Ghost River Garden, and Frank Bay sites (Ridley 1954, 1958, 1966; Brizinski 1980). Recent work in the Abitibi-Témiscamingue area of Québec dates these vessels with affinities to Iroquoian Tradition stylistic traits to between A.D. 1300 and 1650 (Côté and Inksetter 2001). Direct and indirect trade, overwintering of Canadian Shield hunter-gatherers with horticultural Huron groups, and Iroquois raiding are all possible social interactions underlying this late precontact shared pottery tradition (Côté and Inksetter 2001; Fox 1990; Fox and Garrad 2004; Heidenreich 1971).

The Witch Point site revealed certain items that suggest ceremonial or ritual activities. These include red ochre paste, thin-walled pottery vessels, red ochre nodules, and clear quartz crystals. Of particular interest are the dense cobble structures, including a rock pavement with a nearby burial of the unburned partial skeleton of a young dog in a sterile small pit of fine sand. The Witch Point landscape offers a natural quay for groups travelling up and down the lake and a flat, well-drained living area for short- but not long-term duration. It may well have served as a meeting place for families who practised rituals to symbolize and reaffirm group alliances.

#### *Early Contact Period: 1600s*

The arrival of European explorers, Jesuit missionaries, and fur traders in northern North America brought durable material items as trade goods. Manufactured items of sixteenth- or seventeenth-century European origin have not yet been identified in artifact assemblages on Lake Temagami. The lake is upland from early major fur trade routes between the St. Lawrence River and the upper Great Lakes. Prior to 1615, Huron people traded with the French via Algonquian middlemen using the Lake Huron-Lake Nipissing-Ottawa River trade route (Fox 1990; Heidenreich 1971). Lake Temagami people may not have directly encountered French explorers and fur traders at this time, but probably had trade relations with the Nipissings, who did (Champlain 1922:3:41). A 1640 account from the *Jesuit Relations* identifies localized named groups in northeastern Ontario, of which two, the

*Outimagami* and the *Timiscimi* can be reliably associated with the study area (Bishop 1994a; Thwaites 1896-1910:18:227-229). The French opened a northern inland post at Nighthawk Lake in 1673 and operated another at Lake Timiskaming from 1679 to 1688 (Bishop 1994a). This latter post was located at the mouth of Montreal River. It was visited in 1686 by Chevalier de Troyes on his overland excursion from Montreal to capture English Hudson's Bay Company posts on James Bay (Mitchell 1977:8). The English had established earlier fur trade posts between 1668 and 1673 at the mouths of the Rupert, Moose, and Albany rivers (Bishop 1994a).

#### *Historic Period: 1700s*

With the objective of ending hostilities between the French and their allies and the Iroquoians, the Great Peace was held in Montreal in 1701. This gathering of 1,300 Natives and 1,200 French included Nipissing and Temiskaming people, according to the French classification of 25 signatories. However, as Bohaker (2006) points out, the pictograph signatures on the treaty actually number between 38 and 39 Native groupings. Perhaps some of these signatures represented groups inhabiting the Lake Temagami area. Certainly stories of hostile Iroquoian raids are part of the oral history of Temagami people and surrounding groups (Conway and Conway 1989). Stories told by Bear Island elder Bill Twain are associated with specific locales, such as High Rock Island and nearby Portage Bay (Gordon 1995a).

The fur trade continued under French control with a Timiskaming post operating intermittently from 1720 until 1760. In 1785, the Hudson's Bay Company also built a Timiskaming post (Mitchell 1977). One artifact from the Three Pines site may date to this period: an eighteenth- to nineteenth-century black English musket flint (Noël Hume 1980).

#### *Historic Period: 1800s*

At the Three Pines site, an 1846-1876 Henderson-Montreal clay pipe stem (Smith 1986) was found with two punched-out gunspalls, non-calcined beaver, and deer bone in a hunting camp

hearth. Ball clay pipe fragments and two rusted decorative metal items were nearby. Another pipe stem was collected from the Cross Bay site. At the Witch Point site small glass beads, a crooked knife, and two rolled copper tinkling cones were retrieved in the 1993 excavations, while Conway (1982) reported other mass-made objects of this age obtained through the fur trade.

Fur trade establishments on Lake Temagami itself appear quite late (Hodgins and Benidickson 1989:29-35). An official HBC outpost operated sporadically on Temagami Island from 1834 to 1857 (Hodgins and Benidickson 1989; Mitchell 1977).

In 1833 Samuel Peck and Charles Harris, two free traders working from Penetanguishene who had been regularly trading on Nipissing, moved up to Lake Temagami and wintered over there into 1834 "with a large outfit." [...] Peck and Harris were probably the first Europeans to winter on Lake Temagami. Chief Trader Angus Cameron at Fort Timiskaming moved quickly to have Harris bought off and enlisted into the service of the HBC [...] After the winter of 1834-5, the harassed Peck left Temagami for good [Hodgins and Benidickson 1989:29-30].

Bill Twain told a story which explains some difficulties in operating this early outpost:

One day some Indians traded at the post, but they lost what they had purchased in the water when their boats overturned. So the Indians went back for more goods at the post. The trader refused to replace the lost items and threatened to shoot them. So the Indians did not go back to this post. Instead they went to Ville Marie [Timiskaming] and to Nipissing. The trader reported that there were no longer any Indians at Temagami, and the post was closed. It was a long time before the next post was built [Gordon 1995a:13].

An expanded HBC post was established in 1857 also on Temagami Island. Further research will be needed to date the cobble structures and walk-in cold storage observed at CfHa-1 and determine if this was the location of both the early outpost and the later enlarged HBC post (see Gordon 1995a for discussion). The HBC post moved to Bear Island (CfHa-2) in 1876 (Hodgins and Benidickson 1989; Mitchell 1977).

Euro-Canadians located their commercial and religious establishments near *Teme-Augama Anishnabai* summer gathering areas characterized by large expanses of flat, well-drained sand. One was at Wabikon on the south shore of Temagami Island, another at the southwest corner of Bear Island. In 1891, Father Paradis built his *Mission du Sacre Coeur* on the sandy outwash plain of Ferguson Bay, also a summer gathering area, beside the Anima Nipissing River outlet (Lake Temagami site). The headstones from the Temagami Island Burial Ground date from 1889 to 1892. One is carved with a rose, a second with a cross and the monogram "IHS," all Christian symbols. Father Paradis continued the mission and a farm until 1924, when St. Ursula's Roman Catholic Church was built on Bear Island (Hodgins 1976).

In Bill Twain's words, people camped all over the land, as seen in the hundreds of campsites identified by Bear Island residents and other native informants for the pre-1900 period illustrated in Macdonald's (1993) *Historical Map of Temagami*. These camps are on large lakes and small interior lakes, and on islands and the mainland. They were linked by *nastawgan*, a vast web of travel routes, including summer portages, winter-only interior trails, and open water or lake ice trails (Macdonald 1987).

The traditional way of life described below is reminiscent of Father Jerome Lalemant's description of the Nipissings in 1640 (Thwaites 1896-1910:21:230-240).

Many of them [Craig Macdonald's informants] had been born and raised in the bush and learned to hunt and trap from their elders, but by the 1970s those ageing trappers were the last link

with the ancient world of the *Anishinaubeg*. For centuries, the *Anishinaubeg* people would spend the winters in small camps of two or, at most, three families and work their traplines. In the spring they would harvest maple syrup and in the summer families from throughout the territory would gather on *Ka-tay Te-mee-ay-ga-maw Minis*, an island in Lake Temagami. They harvested whitefish and cultivated maize, a small, hardy variety of corn, and in the fall returned to their winter camps [Jenish 2006].

#### *Modern Period: 1900s*

*Traditional Use Campsites.* From a material culture perspective, change is seen in the increased frequency of durable and datable, mass-produced items at hunting and fishing campsites. Twentieth-century hunting camps at the Three Pines site could be identified by a range of goods, including coins. At the Witch Point site older hunting camp hearths were indicated by unburned beaver and moose bone and artifacts in charcoal-laden deposits. Surface remains at the Stove site include, among other things, a metal wood-burning stove, a steel wash basin, and an oil lamp base, suggesting a winter hunting camp (1930-40s?) situated 40 m in from the current lakeshore. Traditional construction techniques are seen in a small, semi-subterranean structure of vertical wooden poles with a dirt-covered roof for cold storage at the Cache site, 40 m inland from Barnac Lake. All of these sites suggest mobile hunting camps, in contrast to the contemporaneous, but more permanent settlement at Austin Bay with its log cabins and root cellars. The traditional way of life was changing, especially by the 1940s when the interior, winter-only trails ceased to be maintained (Macdonald 1987). Today, although most families no longer live “on the land,” the *Temé-Augama Anishnabai* maintain a strong relationship with *n'Daki Menan* and their history.

*Euro-Canadian Development.* Major changes occur in the twentieth century. Along with the introduction of new artifacts, there are different types of sites and landscape transformations, occasioned by the arrival of larger groups of Euro-Canadians. These new groups came north using new transportation methods, to work in large-scale resource extraction industries such as logging and mining. The pollen record shows a rise in ragweed pollen (*Ambrosia*) in the top part of the Three Pines pollen core and in the “Lake 306” core (Hall et al. 1994). This reflects the impact on regional vegetation of late nineteenth- and twentieth-century land clearance for logging and mining at Lake Temagami itself and, farming in the Little Clay Belt. Lake levels also changed as earthen dams of the late nineteenth century were replaced with wooden and later concrete dams for hydroelectric power. Accessibility to the area by rail (TNOR) and the islands by paddle wheel steamer led to a tourist industry (Hodgins and Benidickson 1989). Sites and finds indicative of all these activities include the Owaissa Sawmill site north of Temagami; prospectors’ metal claim tags recovered from the Witch Point site; and the melted and twisted remains of the Lady Evelyn Hotel, which burned down in 1912.

Wilderness recreational use became a major activity on Lake Temagami with the development of wilderness camps for Canadian and American youths in the 1930s at Ferguson Bay and Wabikon, among others (Hodgins 1987). Shorter-term tourist activities are indicated at the Three Pines site by food containers, cameras parts, picnic refuse, boating refuse, and lightweight tent parts. Picnickers, boaters, and overnight campers dug garbage pits and tent drainage ditches and built a series of picnic hearths, eventually resulting in the large picnic fire mound. These activities served in some cases to destroy and in other cases to protect the underlying precontact remains. Canoe campers and others often use the same portages, trails, and campsites as were once traversed and occupied by families of hunter-gatherers throughout the long prehistory and history of the area—one of change and continuity, witnessed by this beautiful deep water lake.

## Approaches to the Archaeological Record: Discussion and Implications for Future Research

### *The “Constraints” of Canadian Shield Archaeology*

In northeastern Ontario and adjacent areas, the northern forested (Canadian Shield) landscape presents many constraints and challenges to archaeologists in finding, analyzing, and interpreting archaeological sites (e.g., Brizinski 1980; Hanks 1988; Knight 1977; Kritsch-Armstrong 1982; Marois and Gauthier 1989; Pollock 1976, 1984). Sites tend to be thinly dispersed over vast areas. The rugged terrain, exposed bedrock, and dense forest cover make finding them difficult. The podzolic soils of the Boreal Forest have weakly developed soil horizons, generally characterized as thin, shallow, and compressed (Canadian Soil Survey Committee 1978). Periodic forest fires destroy the organic content and further serve to collapse archaeological soil layers (Hinshelwood 1997). Over time, soil acidity disintegrates most organic material, leaving only lithics, ceramics, and calcined faunal bone, often in minute quantities. Finally, archaeological sites are easily disturbed by modern development, recreational activities, and seasonal lake level changes, both natural and human-made (e.g., Knight 1977; Pollock 1984; Ridley 1954, 1966).

In contrast to southern Ontario, at the time of this fieldwork, only a dozen sites from Lake Nipissing to Lake Abitibi had been fully excavated and published. They are geographically widespread and differ in function (e.g., quarry sites vs. habitation sites) and time depth, making it difficult to compare and correlate artifacts. As a result, artifact comparisons reveal few similarities with other site assemblages. Furthermore, it is difficult to obtain organic material from reliable precontact contexts for radiocarbon dating (Hinshelwood 1997); hence, absolute dates are rare. All of these factors complicate attempts to sort the archaeological record into meaningful temporal and cultural components. How then can we get to bigger questions of long-term culture change with such a sporadic and discontinuous record?

### *Using a Harris Matrix on Precontact Sites*

Research conducted at Lake Temagami has attempted to overcome some of the limitations on the archaeological record noted above. Investigations at the Three Pines site focused on the natural and cultural formations processes that have interacted to create the site and its landscape setting over time. In this approach, the archaeological record is a time series of physical deposits, whose form and nature reflect the cumulative total of all events, activities, and processes that have *interacted* to create the archaeological site as it exists today (Gordon 1991a, 1991b). The archaeological site is a present-day phenomenon, but its past can only be known through its stratigraphic record (Butzer 1982; Schiffer 1987), similar to other stratigraphic sources of information about the past, such as the lithological column or the pollen core.

At the time of this field research (Gordon 1990a, 1991a), a “stratigraphic/contextual approach” required a complete shift in perception, as northern sites had been viewed in more conventional terms (e.g., Gordon 1985). The term “stratified” had been reserved for specific landscape contexts in northern Ontario (James V. Wright, personal communication 1991), such as the Pic River or Frank Bay sites (Ridley 1954; J. Wright 1967a). In these locales, riverine-deposited sediments form lenses of sterile soil between buried dark Ah soil horizons and serve to separate artifact-bearing lenses (Ridley 1950-53; Wright 1972b). Because some sites were thought to lack “cultural stratigraphy” (Brizinski 1980), excavated artifacts had been temporally sorted by depth, varying from 4 cm to 12 cm thick arbitrary levels (e.g., Brizinski 1980; Knight 1977); by discrete artifact clusters, referred to as “horizontal stratigraphy” (Pollock 1976); or by continuous soil horizons, as is the case for the Mattawan stratum of the Frank Bay site (Ridley 1950-53). However, by viewing the Three Pines site as a time series of minute physical deposits and cultural modifications, it became feasible to use a Harris Matrix stratigraphic analysis (Harris 1979a). It is not that the Three Pines site is an exceptional site because of its stratigraphy, but rather that a systematic stratigraphic approach has been

explicitly employed to reveal the sequence of occupations.

A Harris Matrix analysis, combined with detailed excavation procedures and geoarchaeological analyses, provides a powerful tool to sort out artifacts and other archaeological sediments into a relative temporal framework. Although constructing the matrix is time-consuming, it has many tangible benefits. It helps overcome some of the challenges of collapsed or compressed stratigraphy (Hinselwood 1997; Pollock 1976) and spatial discontinuity (Pollock 1976; Brizinski 1980). Modern “disturbances” can now be included as part of the archaeological record. Stratigraphically examining occupations with a known time depth, such as the Modern (at the time of the field work covering 86 years) and Historic periods (150 years), gives an appreciation of the minute scale of these physical traces. This approach also assisted in determining which natural and cultural site formation processes were acting uniformly over the site area, versus those that were localized. Some served to destroy and others to protect the older deposits. Despite its shallowness, the Three Pines site reflects certain artifact patterns evident on sites with much deeper deposits and conventionally defined stratigraphy, such as the Frank Bay site (Ridley 1954) and the Montreal River site (Knight 1977). At the Three Pines site subtle settlement and disposal patterns through time are evident, while lithic tool trends and changes in procurement strategies can be stratigraphically verified.

Clearly this method alone cannot overcome all limitations on interpretations imposed by shallow deposits, seasonal reuse, multilineal sequences, the (in)visibility of strata, and artifact movement in a sandy matrix. However, it does offer a systematic and objective approach to these conditions. One problem at Three Pines is that the discontinuous nature of the units of stratification did not allow for temporal separation of individual Middle Woodland units or individual Archaic period units across the site. Soil micromorphological analyses (Courty et al. 1989) might help detect more minute patterns of stratification. Absolute dating would also be useful, provided samples could be obtained from reliable stratigraphic contexts.

Would different excavation procedures have been more compatible with applying a Harris Matrix analysis in the laboratory? At the Three Pines site systematic recording procedures using 3 cm vertical levels and horizontal one-metre squares subdivided into quadrants were employed. For consistency, the same excavation and recording techniques, but with more emphasis on recording soil changes, more vertical profiles, and more photographs, were employed at Witch Point. Harris (1979b) later proposed an excavation strategy which defines single-layer plans coupled with stratigraphic sequencing at the time of excavation, identifying the soil or architectural matrix first, then its dimensions. In contrast, the Reid method used here, started with the spatial dimension (quadrant/level) and then identified soil matrix second. Which is better is not known. Certainly applying Harris Matrix principles during field excavation would be more advantageous. But what matters most is flexibility in systematically recording and collecting a wide range of data in order to reproduce a three-dimensional model of the site, its soil contexts, and its contents in the lab. Many individual observations in the field only became repetitive patterns after considerable comparative analysis in the lab. All field information—vertical depth, horizontal distribution, and soil context—needs to be recorded in a systematic and sensitive fashion, at a scale appropriate to a podzolic soil matrix being used seasonally, by small groups, for a few days or weeks, over years and centuries.

Certain minor modifications were made when applying the Harris Matrix analysis to the Three Pines site. The generic term “unit of stratification” was used for all deposits, and the interpretation of events and/or processes was placed in accompanying charts and text. There was no *a priori* equation of any one unit of stratification with a single deposition event or cultural or temporal period. Thus the 3 cm vertical recording levels were used as depth indicators, separating artifacts in one 3 cm level from those in another, even within the same unit of stratification. What causes some confusion for Harris Matrix scholars is that “interfaces,” or the sharp contact between different deposits, were not separately numbered.

However, the important role of interfaces in determining stratigraphic succession was maintained. For example, in the accompanying text and charts, pits are described as two separate events—their excavation and subsequent infilling. The reason this minor modification was adopted when first presenting this material (see Gordon 1991b) was that separately numbering interfaces would 1) over-represent modern or historic period units of stratification where interface boundaries were more visible and 2) give the incorrect impression that natural boundaries, such as soil colour shifts due to weathering in the lower levels, were being treated as culturally created interfaces. Perhaps complexity is not a bad thing, however, and now that more researchers are familiar with the Harris Matrix, one might recommend adhering more strictly to Harris's numbering system.

One of the key reasons for doing detailed stratigraphic analyses is to allow for a more solid chronological sequencing of artifacts by which to test and revise “diagnostic” and other artifact patterns. Where historically documented, architectural sites are at an advantage is in the identification and dating of artifacts. I hope that in the future, as the Harris Matrix is applied to more precontact sites, there will be considerable interaction between stratigraphic and artifact analyses, to sort out and identify temporally significant artifacts.

This method could be applied retroactively to excavated sites. Ridley's (1950-1953) field notes indicate that the Frank Bay site would make an excellent candidate, with its long sequence of occupations, buried Ah horizons, and settlement features. For example, the Mattawan stratum could be subdivided into different depositional events, separating shallow from deeply buried tools, which may help to better distinguish Middle Woodland from Archaic period tools (e.g., Wright 1967b). Stratigraphic analysis could potentially help with the dog burials, first assigned to the Historic period, based on spatial proximity to fur trade items, but later radiocarbon dated to 600 years earlier (Brizinski and Savage 1983). One key lesson from the Three Pines site analysis is that one soil horizon or vertical level is not necessarily

equivalent to one depositional phase or time period, and that spatial association used by itself as a temporal indicator can be misleading.

#### *Lake Level Change, Archaeological Survey Methods, and Site Interpretation*

Lake level change has long been recognized as important to northeastern Ontario archaeological sites. For example, Ridley (1954) noted that the Mattawan Stratum (mostly Archaic period) of the Frank Bay site on Lake Nipissing had evidence of seasonal or intermittent inundation, which he postulated resulted from northeast storms. It is plausible that the water-smoothed, white quartzite tools with iron staining in the Mattawan collection actually relate more to sustained high water levels in early post-glacial or mid-Holocene times. Ridley also suggested that “the history of lake levels may have significance in the location of early habitation sites on the [Lake Abitibi] shores” (Ridley 1966:18). In modern times, fluctuating water levels have had destructive effects on Lake Abitibi sites, particularly the Abitibi Narrows site (Ridley 1966), the Jessup site (Kritsh-Armstrong 1982), and the Jordan site (Pollock 1984). Artificially lowered levels in the Montreal River led to the discovery of a lanceolate point at Gilles Depot of Late Palaeo-Indian origin (Knight 1977; Racher 1988).

At the Three Pines site some Archaic period components were just a few metres closer to the lakeshore than Historic period ones. A pollen core from the adjacent Three Pines Bog showed a 4 m lake level rise steadily inundating the site over 7,500 years. However, as detailed herein, predictive palaeo-hydrological modelling and resulting pollen core analyses have shown that isostatic rebound has been a major cause of lake level change in the Temagami basin. Other factors do of course play a role in lake level variability. Loewen et al. (2005) point out the complex interplay of factors, such as isostatic rebound, hydro-climatic changes in seasonal precipitation and evapo-transpiration, local vegetation differences, and aquifer characteristics of each watershed. They advocate a basin-by-basin approach to reconstructing lake levels over time.

The predictive “tilt model” employed here

offers archaeologists a relatively simple, easily adapted approach for reconstructing ancient shorelines. It concentrates inland survey to areas with a higher probability of yielding Palaeo-Indian or early Archaic sites—that is, emergent shorelines. Modern lakes with only a southward drainage would make the best candidates for applying this tilt model, as such lakes are likely to show the greatest isostatic rebound—related changes in shorelines over time. Lake Temagami drains both to the north and south from a central sill, adding complexity to the model. While digital terrain maps (DEM) are now available to researchers, bathymetric values still need to be taken from base maps for most Ontario lakes. We did note several errors in the topographic mapping, which are best corrected by field survey. Geologists and archaeologists work on quite different scales, meaning a lake level rise of 17 m may be considered slight by the former, while it can be substantial for the latter. For heritage resource planning or GIS predictive modelling (e.g., Dalla Bona 2000; Hamilton 2000), using a standard inland distance from modern lakeshores would not be appropriate for site prediction. Palaeo-shorelines at Lake Temagami were noted at widely varying distances inland depending on local topography and location with respect to palaeo-outlets.

Palaeo-hydrological research on Lake Temagami reveals emerging shorelines near the northern palaeo-outlets while the rest of the basin is submerging. This has significance for how future archaeological surveys will be designed and how known precontact sites on Lake Temagami could be interpreted (e.g., Dalla Bona 2000). While surveys along modern shorelines are successful in locating very small to very large habitation sites, gaps in the cultural sequences will result if only this method is used. Potential habitation sites of early colonizers of Lake Temagami are likely to have low artifact counts (except at bedrock quarry sites), be more deeply buried, and be found inland near the palaeo-outlets. Perhaps the site selection criteria identified in this research for lakeside sites (well-drained level ground, north wind protection, ease of access to water) may extend to these hypothetical early sites.

With modern logging roads, mining, and pipelines, inland areas are increasingly accessible. Not all interior locales have been impacted by these activities.

One benefit of inland survey at Lake Temagami has been recording numerous traditional use sites of the *Teme-Augama Anishnabai*. These twentieth-century sites, traces of traditional land use and settlement patterns, are rapidly disappearing. Containing both above-ground and in-ground wooden structures, they are subject to the destructive effects of weathering, forest fires, and modern development. In my view, one important obligation for archaeologists is to document all material traces of human occupation, both Native and non-Native, through all time periods—precontact, historic, and modern.

Examining traditional use sites, especially with the help of local informants, also suggests alternative places to look for precontact sites beyond the modern lakeshore. Inland traditional use sites are not easily spotted from open water by boat survey. In summer, dense vegetation at the shore often conceals inland flat areas. When the lake, bogs, and ground are frozen, alternative choices are available for hunter-gatherers, which can influence winter trail and camp site locations (Macdonald 1987, 1993). Repeated human usage directly impacts forest regeneration, creating areas of open vegetation or secondary regrowth: another clue to finding archaeological sites.

Researchers will need to be very imaginative in designing survey strategies. It is easier to see landscape features when there are no deciduous leaves but also no snow cover. Fall or spring pre-survey, even after freeze-up, may be useful in conjunction with testing in open water periods. In designing surveys, the importance of lake transgression since the mid-Holocene is also critical. Lake cores taken near bogs would show lake sediments over peat bog deposits in submerging parts of the lake basin. Surveys at natural low water levels in April or in coordination with hydro-electric companies may prove helpful in finding lost edges of lakeside sites. One useful approach might be to compare maps such as Macdonald's (1993) *Historical Map of*

*Temagami*, which shows water levels before hydro-electric development, with modern shoreline data. This might reveal differences in the *nastawgan* placement and traditional use locales (Macdonald 1987, 1993) compared with modern recreational maps of canoe routes, portages, and canoe camp sites. Underwater work is also an option (Loewen et al. 2005).

Understanding the local effects of lake level change is important for site interpretation. Lake level change may provide a method of relatively dating rock art, such as the higher-elevation Deer Island pictographs at the north end compared with the lower-elevation pictographs in the Central Hub. Receding lakeshores may help relatively date deeply deposited artifact clusters on low-elevation emerging shorelines, such as the Lake Temagami site. Lake level change has a differential impact on artifact distribution depending on landscape context and slope. Witch Point is an esker, an older and higher landform, less affected by rising water levels than the lower-elevation Three Pines and Sand Point baymouth bars. On these two sites, lake transgression may provide a method of relatively dating specific archaeological deposits. Lithic raw material sources, such as the grey siltstone at Whitefish Bay and the lakeside quartz veins at the Kokoko Bay and Crystal sites, are also differentially affected by lake level change, depending on their location relative to palaeo-outlets. In the absence of specific palaeo-hydrological reconstructions, one needs to thoroughly examine any site landscape as if it was both emerging and submerging, to cover all possibilities.

### *The “Strengths” of Canadian Shield Archaeology*

Many of the “constraints” on the archaeological record of the northern forest (Canadian Shield) described above are actually clear reflections of how groups utilized the precontact landscape. From an examination of Ojibwa and Cree hunter-gatherer adaptive strategies (Feit 1973, 1993, 2004; Irimoto 1980; Jenkins 1939; Rogers 1962, 1963a, 1963b, 1966, 1969, 1973; Rogers and Black 1976; Speck 1915a, 1915b; Tanner 1979), certain features emerge that are of critical

importance to conceptualizing the specific nature of this archaeological record. These include the

- 1) extreme mobility of northern hunter-gatherers;
- 2) small size of habitation/hunting groups;
- 3) seasonal nature of the economic round;
- 4) importance of the land–water ecotone;
- 5) desirability of certain types of locales; and
- 6) short-term usefulness of any one locale.

Any one site could only be occupied briefly, measured in days or a few weeks. A site’s usefulness would be dependent not only on local, seasonally available resources, but also on the short-term, near-camp resources such as fish, snowshoe hare, and firewood. The number of occupants at any one locale would be quite low. While summer gathering locations may support a larger number of inhabitants, the family or kin groups would occupy spatially discrete areas. In all cases, only minor, discontinuous traces of each occupation would be evident at any one site.

From archaeological surveys on Lake Temagami, it appears that precontact human activity is concentrated at or near lake or river shores, both ancient and modern. The choice of camp sites is seriously constrained by topography. While a small travel camp can occur wherever there is enough ground to pitch one tent, such as the Daily site or Island 245, only certain places on each lake are likely to have repeat occupations. Gaps in usage would be anticipated to allow for regeneration of required resources. Highly desirable places for habitation are those that offer a reasonable expanse of well-drained, level ground; north wind protection; and ease of access. Owing to surficial geology, these are rare, occurring on sand points, eskers, and outwash plains (e.g., Three Pines, Sand Point, Witch Point, and Lake Temagami sites).

These sites contain remnants of occupations over different seasons, years, and centuries. It is for these reasons that such sites are selected for excavation. They are easier to excavate, yield higher artifact counts, offer a multi-component sequence of occupations, and provide information on long-term culture change. However, archaeological survey, ethnohistorical sources, and



local informant information show a much wider range of site type, site usage, and site location. The point is that if only highly desirable habitation locales are chosen for excavation, our understanding of the minute scale of deposition, density of artifacts, temporal scale, diversity of sites, and wide-ranging use of the landscape and settlement patterns will be constrained, if not skewed.

Any archaeological site is but one stop in a whole series of habitation and special purpose sites. Basic daily activities may be the same, but site-specific or seasonally derived activities would vary. Differential preservation of organic versus inorganic materials eliminates evidence for entire types of activities. Therefore each archaeological site contains only minor traces of material culture and other evidence of site usage, representing but a fraction of all the human activity that occurred on the site, which in turn is but a small part of all human activity on the lake or in the wider region. Each site therefore offers a tiny but unique snapshot of the complex dynamics of hunter-gatherer economic, social, and spiritual behaviour.

Although the challenges are many, we can appreciate the distinctive qualities of northeastern Ontario archaeological sites. These are as follows:

- 1) The landscape concentrates potential habitation locations to shorelines, both ancient and modern.
- 2) The most desirable locations could potentially hold thousands of years of human history, from soon after deglaciation to modern times.
- 3) The archaeological site reveals a time series of subtle traces of past human behaviour, both individual and collective.
- 4) In these shallow deposits, “modern,” “historic,” and “precontact” tend to form a contiguous record, giving us the opportunity to document all cultural occupations of a site.
- 5) Each archaeological site will offer its own unique temporal and stratigraphic record.

Thus each site as a whole can be viewed as a unique record and given an equal role in the developing mosaic of Canadian Shield prehistory, history, and cultural transformation.

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*Les enquêtes de sites préhistoriques et historiques, l'excavation des sites à composants multiples de Three Pines (CgHa-6) et de Witch Point (CgHa-7) et le carottage de pollen de trois tourbières fournissent des renseignements étendus quant à l'histoire culturelle et naturelle en évolution du lac Temagami. Une meilleure connaissance de l'évolution des paléorivages modifie l'interprétation des sites connus et la méthodologie d'enquête. Des enquêtes des rivages modernes, premièrement ceux le long des rivages et deuxièmement ceux internes, ont engendré des sites de campement préhistoriques, des ateliers lithiques, des carrières de veine de quartz et des sites d'utilisation traditionnelle de la Première nation Teme-Augama Anishnabai datant des XIXe et XXe siècles. Compte tenu des contraintes topographiques du lac Temagami, les chasseurs-cueilleurs favorisaient ces endroits limités ayant un terrain plat et bien drainé, une protection contre les vents froids et une facilité d'accès au rivage.*

*Le site Three Pines possède un sol mince et comprimé qui est typique des sites préhistoriques de la région du Bouclier canadien, mais une analyse modifiée du diagramme stratigraphique (de la version originale Harris matrix) permet un aperçu de la séquence stratigraphique des occupations de la période Archaïque à celle moderne. Des changements significatifs au niveau du paysage sur le site semblent avoir affecté la configuration spatiale de l'utilisation du site et potentiellement avoir conduit à la perte de composants primitifs. Contrairement au site Three Pines, les résultats préliminaires du site Witch Point (CgHa-7) montrent des gisements plus profonds, une plus grande densité d'artéfacts, de nombreux vestiges de galet et des activités de façonnage. Ces différences structurelles sont liées aux variations relatifs en lien avec le paysage du site, l'altitude, la saisonnalité et l'utilisation culturelle. Un comportement rituel du Sylvicole supérieur, suggéré par un enterrement de chien et par de l'ocre rouge au site Witch Point, est examiné dans un contexte de rites primitifs postcontacts où les rituels renforçaient les alliances de groupe.*

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