RESEARCHING THE EARLY HOLOCENE OF THE MARITIME PROVINCES

BRENT M. MURPHY

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By

Brent M. Murphy

A thesis submitted to the

School of Graduate Studies

in partial fulfilment of the

requirements for the degree of

Master of Arts

Department of Anthropology

Memorial University of Newfoundland

May 1998

St. John's Newfoundland

ABSTRACT

This thesis features a review of the early Holocene period in Maritime Provinces prehistory. A reexamination of regional collections, paleoenvironmental evidence, and comparative archaeological information from the State of Maine has lead to the development of a new model for early Holocene occupation of this region. The new model replaces the former "Great hiatus" model which proposes a 5000-year gap in the cultural sequence (10,000-5000 B.P.). Implications of the model for interpreting regional cultural development, and for future research strategies are also addressed.

ACKNOWLEDGEMENTS

The present thesis could not have been completed without the generous support of various individuals and institutions. Financial support was provided by the Institute for Social and Economic Research (MUN) in the form of a research grant, and from the Department of Anthropology (MUN) in the form of a Graduate Fellowship and teaching assistantships.

There are many individuals who have in one way or another contributed to the present research and thesis. Most importantly, I would like to thank my thesis supervisor, Dr. Michael Deal, for his guidance and encouragement throughout the my thesis research and writing. I am also indebted to the Archaeology Unit's faculty and staff for their assistance and support during course work and in the preparation of my thesis. Special thanks goes to Dr. Jim Tuck, Cathy Mathias, Karen Woosley, Dr. Hartmut Krentz, and Dr. Peter Pope.

My fellow grad students provided for numerous discussions and good times. They are John Erwin, Elaine Anton, Sylvie LeBlanc, Paul McEachen, Jeannette Macey, Lisa Fogt, Amanda Crompton, Tim Rast, Doug Nixon, Dawn Laybolt, Tanya Von Hunnius and Steve Hull. I am especially indebted to Matthew Carter and Barry Gaulton for letting me tap into their superlative knowledge of method and theory, and to John Wicks for numerous discussions on ethics.

The present research required that I travel to New Brunswick, Nova Scotia, and Maine to look at collections. There are many people in all of these places that I owe my

gratitude. In New Brunswick I would like to thank Dr. Chris Turnbull, and Pat Allen at Archaeological Services New Brunswick, and Pam Dickinson, Vincent Bourgeois, Sam Gallagher, and the rest of the Jemseg crew. A special thanks goes to Jason Jeandron for his continued support. At the New Brunswick Museum I would like to extend my gratitude to Peter Laroque for helping me with accession numbers. Jamie Price provided me with a place to stay while in Fredericton

In Maine I would like to thank Dr. Jim Petersen and Brian Robinson at the University of Maine at Farmington, Dr. Arthur Spiess at the Maine Historic Preservation Commission, Dr. Bruce Bourque at the Maine State Museum, and Dr. David Sanger at the University of Maine at Orono. I would also like to take the opportunity to thank Jennifer McKinnon for her hospitality during my stay in Maine.

In Nova Scotia I would like to thank Steve Powell and Dave Christianson at the Nova Scotia Museum, Dr. Stephen Davis at St. Mary's University, Linda Refuse at the Queen's County Museum, and Eric Ruff and Jennie Pittman at the Yarmouth County Museum. A special thanks also goes to Jim Legge for providing access to his extensive collection from the Gaspereau Lake area. On my two trips to Halifax hospitality was provided by Micha Fardy, Terry McEachern, Derek Haggett, and Jamie Gouchie.

Several people helped out in the preparation of this thesis. I would like to thank Roy Ficken for several of the photographs, and Tim Rast for his assistance with the rest. My appreciation is extended to Latonia Hartery for helping out with some of the more mundane aspects of editing, and Lesley Breen for her expertise in map making. I am

especially indebted to Dawn Laybolt who took time out of her busy schedule to edit this thesis in one of its many final draft forms.

A special thanks goes out to Dr. Dave Keenlyside for his support of the present project, and for arranging the loan and shipment of the Gaspereau Lake collection from the Canadian Museum of Civilization.

I would also like to take the opportunity to thank Dr. David Black for introducing me to prehistoric archaeology, and having been a major influence, and bastion of support, ever since. Sue and Chris Blair are also deserving of thanks for their influence and support.

My brief stay in Newfoundland was facilitated by several groups and individuals. I would like to thank the field crews at the Cape Ray Archaeological Project, the Ferryland Archaeological Project, and the Fleur de Lys Archaeological Project for great field experiences. For making me feel at home in St John's I would especially like to thank Claudette Morris, Markus Brown, Mike LeBlanc, and the entire Cook Family.

Finally, I dedicate this thesis to my parents. For all of their support and patience during my extended university career.

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CHAPTER 1

INTRODUCTION

The primary objective of this study is to develop a model of early Holocene occupation of the Maritime Provinces. The cultures of the Archaic Period in Northeastern North America are believed to represent hunting, fishing, and gathering adaptations to the early post-glacial environment ca. 10,000-3500 B.P. Although the Archaic Period in the Northeast is usually divided into Early, Middle and Late manifestations (Funk 1978), researchers working in the Maine/Maritimes region have grouped the Early and Middle Archaic periods together to represent the time period between 10,000-5000 B.P. (Sanger 1979; Tuck 1984). In the prehistoric culture sequence of the Maritime Provinces there are no professionally excavated sites dating to the Early and Middle Archaic Period. This is problematic when we consider the significant evidence of earlier Palaeoindian and later Archaic and Ceramic Period cultures. Until the last couple of decades, this apparent hiatus in the archaeological record was a shared characteristic of all the Northeast and led to a variety of explanations and hypotheses by numerous researchers (Fitting 1968; Ritchie 1965; Sanger 1979; Tuck 1984).

Early and Middle Archaic complexes have been known from both Southern New England (Dincauze 1976; Ritchie 1985) and Labrador (McGhee and Tuck 1975; Renouf 1977; Tuck 1975) for the last twenty years. In the State of Maine it has only been in the last ten years that archaeologists have discovered and excavated sites of this antiquity (Petersen 1991; Petersen et al. 1986; Petersen and Putnam 1992; Sanger et al. 1992). The

recent research in Maine has demonstrated that the hiatus has persisted because of several factors, including noncompatible survey techniques and unrecognized diagnostic artifact forms in existing collections. The excavation of well dated sites and recognition of diagnostic artifacts from this period (Petersen 1991; Petersen and Putnam 1992; Robinson 1992, 1996; Sanger 1996; Sanger et al. 1992) has led to the formulation of the Gulf of Maine Archaic tradition and the elongation of the Moorehead burial tradition by Robinson (1987, 1992, 1996). In the Maritimes, except for one paper (Deal and Rutherford 1991), there has not been any serious investigation of the Early and Middle Archaic period, even with all the apparent evidence from neighbouring areas.

In a preliminary survey of Archaic artifact forms in Nova Scotia, Deal and Rutherford (1991) have shown that a substantial number of diagnostic Archaic artifacts indeed occur. They also point out that the Gaspereau Lake collection, excavated in the 1960s by John Erskine (1967) and now housed at the Canadian Museum of Civilization, contains a significant Middle Archaic component. In New Brunswick, although a few isolated Middle Archaic style projectile points have been reported (Deal 1984; Tuck 1991), the existing collections have not been examined. It is also likely that previously published reports contain reference to artifacts that have been misinterpreted as belonging to more recent cultural manifestations.

Research Objectives

The main focus of the present research is to examine existing collections in New Brunswick and Nova Scotia, and to reexamine the Archaic component of the Gaspereau Lake site in order to develop a model of early Holocene occupation for the Maritime Provinces. This model will then be used to address the existing hypotheses that have focused on explaining the lack of archaeological evidence from this period. This is the first attempt to review existing evidence for this period and will provide a working base upon which to build future research.

The specific goals of this thesis are:

1. To devise a working model of the Early and Middle Archaic cultural manifestations in the Maritimes. Evidence will be based on information on the early Holocene environment, the Gaspereau Lake site assemblage, and collections from New Brunswick and Nova Scotia.

2. To compare this model of cultural manifestations to earlier hypotheses for a low population threshold during the Early and Middle Archaic Period and to the proposed Gulf of Maine Archaic tradition; to assess its implications for interpreting early Holocene developments in the Maritime Provinces.

CHAPTER 2

HISTORY OF RESEARCH

In the literature concerning the archaeology of the Maritime Provinces the Early and Middle Archaic Period is only briefly mentioned, described as an occupational hiatus inferred from the lack of archaeological remains (Sanger 1979; Tuck 1984, 1991). However, in neighbouring Maine, recent research and excavations have shown that a similar occupational hiatus model is no longer valid. This has stimulated much research including the proposal of both a technological tradition and burial complexes for the occupants of Maine and adjacent areas during the early Holocene. This chapter will explore the history of research in the Maritimes, Maine, and introduce the currently proposed models.

Research in the Maritimes

In the prehistoric chronological sequence for the Maritime Provinces the Early and Middle Archaic Period is known as the "Great Hiatus" (Tuck 1984). This is reflected in the amount of literature dedicated to this period. Although few sources exists, those that do include: previous excavations that have been recently revised, artifacts from private collections that are similar to early Holocene forms from other regions, and hypotheses to explain what has been perceived as a hiatus in occupation during this period. It is the latter that has been given the most attention.

Recently, two previously excavated sites in the Maritimes have been re-interpreted as having assemblages that date to the Early and Middle Archaic Period. Sanger (1996) has reported artifacts that he uncovered in 1967 near the town of Meductic, along the St. John River in New Brunswick, could be of Middle Archaic age. This is based on morphological similarities to artifact forms from Maine of that antiquity, since the single radiocarbon sample in association with the artifacts returned a modern age. These artifacts were buried within fluvial deposits below the plowzone in an area that is still accessible today (Sanger 1996:23).

In Nova Scotia the Gaspereau Lake site (BfDd-5) has also been reinterpreted as containing evidence of Early and Middle Archaic Period manifestations. Originally excavated by avocational archaeologist John Erskine in 1965 (Erskine 1967), several researchers have since pointed out the similarities between some of the projectile points found in the assemblage to Middle Archaic forms from Southern New England (Deal and Rutherford 1991; Keenlyside 1984b, slide 7). The reexamination of this collection is part of the present study and will be discussed in further detail in Chapter Four.

Certain projectile points forms found in private collections from the Spednic Lake area of southwestern New Brunswick are also indicative of an Early and Middle Archaic occupation. Both Deal (1984) and Tuck (1991) have pointed out the similarity between two contracting stemmed projectile points in these collections to 'Stark' style points that have been dated between 7600 to 7000 B.P. at the Neville site in New Hampshire (Dincauze 1976). This has led Tuck to speculate that "the Maritimes, therefore *appear* to

be at the northern end of the distribution of small human groups who occupied the Northeast following the disappearance of Paleoindians" (1991:39, emphasis in original).

Most of the attention given to the Early and Middle Archaic Period has focused on possible hypotheses to explain the lack of archaeological evidence from this period. One of the most popular hypotheses is informally known as the "Ritchie-Fitting Hypothesis" (Petersen and Putnam 1992:15), named for its two leading proponents (Ritchie 1965; Fitting 1968). The Ritchie-Fitting hypothesis, or variants thereof, explains the gap in the archaeological record as being the result of the low biotic productivity of a Boreal type environment, analogous to that found today in the subarctic. This "unproductive" environment resulted in a low population density, that is inferred from the scarcity of remains from the Early and Middle Archaic Period. Fitting states that "People were probably present in the boreal forest, but with such a low population density that contemporary archaeologists find only the faintest traces of their presence" (1968:441). Although this was originally proposed to explain the lack of sites in Southern New England, and elsewhere westward to Michigan, researchers have applied it to the Maine/Maritimes region as well (Sanger 1979; Snow 1980; Tuck 1984, 1991). Sanger initially supported this theory pointing to pollen diagrams from central Maine that indicated a distinct shift from a conifer-hardwood forest to one with more hardwood trees ca. 5000 B.P.; this type of forest is thought to have increased the browse habitat suited to deer (1979:30), therefore increasing the population of people that relied on that resource.

Over the last couple of decades research has continued to question this hypothesis. In the mid 1970s, the Neville site in New Hampshire provided an Early and Middle Archaic sequence for Southern New England (Dincauze 1976). Research in Maine during the last decade (Petersen 1991; Robinson et al. 1992; Sanger 1996) also indicates that this hypothesis is no longer valid in Northern New England. Stemming from their research, Petersen and Putnam believe that there is no overwhelming evidence that suggests unfavourable environmental conditions for human habitation during the early Holocene, and that it may have been more favourable than later periods (1992:20). Sanger has changed his earlier stance as well, stating that claims for the presence or absence of Early Archaic populations based on the forest communities need to be revised (Sanger et al. 1992:158).

David Sanger has also proposed two hypotheses suggesting that the marine environment could not support a significant population. This first hypothesis proposes that the Bay of Fundy/Gulf of Maine was to shallow too allow for the circulation of sea water, which led to a suppression in marine resources (Sanger 1975). Although the history of the tidal amplification and relative sea level rise in the Bay of Fundy has been addressed (see Turnbull 1988 for overview), their effect on the availability of marine resources has not. It has also been pointed out that this hypothesis does not take into account sites along the Atlantic coast of the Maritime provinces (Tuck 1984:15).

Based on the high correlation between large prehistoric sites and productive fishing locations, Sanger has also proposed the "River Gradient Hypothesis" (Sanger

1979). This hypothesis suggests that with lower sea levels during early Holocene times, the gradient of certain rivers may have been too steep for certain "weak fish species" to ascend. As sea levels rose, these features were drowned out, therefore encouraging the migration of fish populations and the people who relied on this resource (Sanger 1979:30-32).

What might be termed the "Drowned Site Hypothesis" has been proposed by Tuck (1975, 1984, 1991) to explain the scarcity of Early and Middle Archaic sites in the Maritimes. This hypothesis is based on the belief that the coast supported populations throughout the Archaic Period, but that evidence for these occupations has been erased by rising sea levels. This theory stems from his research in Labrador where the land is actually rising, causing sites that were located on the coast during the early Holocene to be well away from the shoreline today, and safe from coastal erosion. The land in the Maritimes is slowly sinking about 30 centimeters per century, relative to sea level rise (Grant 1975; Shaw et al. 1993; see Chapter 3 for more in-depth discussion). This would result in sites located along the coast during the early Holocene to be inundated by the rising sea levels.

Using the Drowned Site Hypothesis to explain the lack of evidence of an Early and Middle Archaic occupation in the Maritimes, Tuck has proposed the "North Eastern Maritime Continuum" (1975). This continuum suggests that there was a biological, cultural, and linguistic continuity in the Maritimes from Palaeoindian times until the present day. He contends that once populated, the Eastern North American coastal plain

was never abandoned (Tuck 1975:140). Further validity of this hypothesis is supported by comparing Labrador and the Maritimes (Tuck 1991). Evidence from southern Labrador and adjacent Quebec suggests that the late Paleoindians and Maritime Archaic people lived and 'flourished' on the resources of the sea coast with their backs to a forest (Tuck 1991:41). Although Tuck warns that the amount of systematic surveys done in the interior of both Labrador and the Maritimes is not great, with what has been done, little has been found. If the coast of Labrador had been submerging rather than rising since early Holocene times, no archaeological evidence would exist for any but the most recent sites (Tuck 1991:41).

The Drowned Site Hypothesis has been criticized both on the basis that sites cannot "be *shown* to be eroded away, a virtually impossible thing to demonstrate" (Sanger 1979:27), and by the recently excavated early Holocene sites in Northern New England. In the State of Maine there are 22 sites that have been recently reported to date between 10,000 and 5000 B.P. Seventeen of these are situated along inland rivers.

Lastly, the "Data Too Incomplete" hypothesis has been proposed by Sanger (1979). This hypothesis suggests that a lack of systematic surveys of the interior portions of Maine and the Maritimes is responsible for the absence of evidence for Early and Middle Archaic occupations. This hypothesis holds that interior sites exist but the evidence has been washed away, or that pre 5000-year old artifacts are unlike contemporary forms from Southern new England. Sanger, however, cautions that collections containing 1000's of artifacts have been inspected, from both coastal and

inland sites, and do not contain artifacts similar to contemporary early specimens. Part of the current research will be to show that this is not the case. This thesis will attempt to demonstrate that certain classes of ground stone artifacts that have recently been characterized as diagnostic for the newly proposed occupational models for Northern New England do exist in the regional collections in the Maritimes.

It should be noted that the previous occupational hiatus hypotheses were not primarily intended to stand on their own and that several explanations, or combinations of explanations, are possible (Sanger 1979:32; Tuck 1991:40). This thesis will present new evidence of Early and Middle Archaic occupation in the Maritimes, and reconsider the applicability of the previous hypotheses. This new evidence is based on the recent research in Northern New England, and especially in Maine.

Research in Maine

In the last decade there have been 57 radiocarbon essays reported from 22 sites dating ca. 10,000-5000 B.P. in the State of Maine. Seventeen of these sites (77%) are situated inland on relatively deep riverine alluvium (Petersen and Putnam 1992). The results of this research have been published, including their implications generally (Petersen and Putnam 1992), site reports (i.e. Bunker 1992; Maymon and Bolian 1992; Petersen 1991; Sanger 1996; Sanger et al. 1992), subsistence studies (Spiess 1992), and mortuary and technological patterning (Robinson 1987, 1992, 1996).

The assemblages of two of these sites, Brigham and Sharrow, have been the most comprehensively published (Petersen 1986, 1991; Petersen and Putnam 1987, 1992; Petersen et al. 1986, 1988). These sites represent the longest chronology and best separated deposits attributable to the early Holocene in Northern New England and are the basis for most of the current interpretation and research. Both sites are located near the confluence of the Piscataquis and Sebec rivers in Milo, Piscataquis County, Maine (Figure 1). Testing has revealed that cultural deposits extending two meters below the modern ground surface, in deep alluvium, preserved a cultural sequence of approximately 10,300 and 9500 years in duration for the Brigham and Sharrow sites respectively (Petersen and Putnam 1992:27). Cultural remains from the sites include both lithic assemblages, as well as small faunal assemblages containing bone and antler tools.

The lithic assemblages of the Brigham and Sharrow sites are made from locally or regionally available stone, reflecting a limited degree of long-distance acquisition of material. Flaked stone tools are characterized by a core and uniface technology. Bifaces of any kind are rare in the early pre-5000 B.P. deposits, suggesting that early populations did not employ lithic biface technology to the same degree as in later times. The paucity of bifaces is also a feature of the other early Holocene radiocarbon dated sites in Maine and various other suspected early, but undated, sites (Petersen and Putnam 1992:37). Ground stone tools are relatively diverse and are considered the earliest known in the broader Northeast. They include choppers, celts, full-channeled gouges, ground stone rod

Figure 1. Location of sites mentioned in the text: 1) Neville/Table Land; 2) Morrill Point; 3) Wadleigh Falls; 4) Weirs Beach; 5) Turner Farm; 6) Brigham/Sharrow; 7) Blackman Stream; 8) Spednik Lake/Mud Lake Stream; 9) Gaspereau Lake.

fragments, ground slate points, and plummets. Of these tools, it is only the choppers that are known from other early Holocene sites in the Northeast. Gouges, small chisel celts, stone rods, and plummets may be unique to the Gulf of Maine Region by 8000-6000 B.P., relative to other portions of the Northeast (Petersen and Putnam 1992:49).

Evidence of a bone and antler tool technology from the Brigham and Sharrow sites is one of the earliest from the far Northeast. Calcined manufacture scraps of grooved and split longbone fragments, as well as one questionable tool fragment, have been identified from Feature 10, Stratum IV, and dated to ca. 8500 B.P. at the Brigham site (Petersen and Putnam 1992:43). At the Sharrow site over 60 individual fragments of calcined bone tools have been recorded from Features 16 and 17, dated ca. 6000-5800 B.P. These include a barbed antler point, an awl or point tip, a tool blank, the end of a notched antler artifact, a ground beveled shaft fragment, a perforated bone needle, and scraped shaft fragments (Petersen and Putnam 1992:42-43: also see Figure 16). It is due to the calcined nature of the faunal assemblages from the Brigham and Sharrow sites that any remains are preserved.

Using the information from the excavated sites, as well as reanalyzing existing collections, Robinson has proposed a model of technological and mortuary patterning for the early Holocene Period in Northern New England (1987, 1992, 1996). This model, the Gulf of Maine Archaic tradition, is defined as a broad technological pattern, while the Morrill Point and Table Land complexes, of the recently revised Moorehead burial tradition, represent the mortuary patterning during this period.

The Gulf of Maine Archaic

Both technological and burial traditions have been proposed by Robinson (1987, 1992, 1996) for the occupants of Maine and adjacent areas during the early Holocene. The Morrill Point burial complex and Gulf of Maine Archaic tradition have been proposed "as preliminary units for structuring the growing body of evidence for Early and Middle Archaic Period occupation in Northern New England" (Robinson 1992:63). The Morrill Point burial complex, and the recently added Table Lands complex (Robinson 1996), are dated ca. 8500-7000 B.P. (Robinson 1992:64). The Gulf of Maine Archaic tradition, a regional technological tradition, has been tentatively dated ca. 9500-6000 B.P. (Robinson 1992:64).

The Gulf of Maine Archaic tradition is defined only as a broad technological pattern that shows continuity through time, not as a whole culture unit (Robinson 1996:104). This tradition spans the Early and Middle Archaic Periods (ca. 9500-6000 B.P.) over the geographic area that includes the watershed of the Gulf of Maine between New Brunswick and the northern shore of Cape Cod in Massachusetts (Robinson 1992:96). Assemblages are characterized by three broad patterns: a flaked stone industry dominated by core, uniface, and flake technology; a relatively minor role for bifaces and flaked stone projectile points; and the early development of a diverse assemblage of ground stone tools, including ground stone rods, full-channeled gouges, celts and adzes, among other forms (Robinson 1992:96).

While some regional variation in materials occurs, it is local high quality quartz and quartz crystal that are selected for the uniface/core flake technology. This technology is characterized by steep-edged quartz unifaces, irregular cores, flake tools, blocky fragments, and flakes (Robinson 1992:96). The selection of quartz for this technology is considered one of the most characteristic attributes of the early assemblages. The high quality of material combined with the small size of some of the cores has led Robinson to speculate that it could represent a microflake technology, perhaps for the production of insets for organic hafts (Robinson 1992:97).

Bifaces are scarce in the tool assemblages of the Gulf of Maine Archaic and when they do occur they are often large, thick and partly unifacial (Robinson 1992:98). The lack of evidence for associated reduction sequences and the low number of bifaces in tool assemblages, has led Robinson to propose that they were not systematically employed as projectile points (Robinson 1992:98). Most of the projectile points associated with this period have been found in mortuary contexts and do not fall into clear cut typologies. The early development of woodworking tools in the Gulf of Maine Archaic tradition (see below), coupled with the low number of chipped stone projectile points, suggests that the Gulf of Maine Archaic tradition probably included a well developed technology in wood and bone (Robinson 1992:99-100). Projectile points made from wood and bone are suggested to be more advantageous for riverine and maritime hunting because the toughness of bone and wood barbs may be superior to the brittleness of sharp stone tangs when piercing and holding of prey is required (Robinson 1992:99).

The Gulf of Maine Archaic tradition includes a poorly defined, yet diverse, ground stone technology. It is comprised of miniature and full sized celts, adzes, full-channeled gouges, ground stone rods, whetstones, and possible ground slate tools (Robinson 1992:100). To date, artifact samples attributed to this period have been either small or imprecisely dated. Ground stone rods and full-channeled gouges are thought to be the most diagnostic artifact types. The earliest tool forms yet identified are the ground stone rods that have been dated ca. 9000 B.P. at the Weirs Beach site (Bolian 1980; Maymon and Bolian 1992; see Figure 1 for location). Full-channeled gouges have been dated ca. 8000-6000 B.P. (Robinson 1992:100). The diversity of forms and number of ground stone tools associated with the Gulf of Maine Archaic tradition suggests a heavy woodworking industry.

The Morrill Point and Table Land complexes of the recently revised Moorehead burial tradition correspond in time, and geographic region, to the Gulf of Maine Archaic tradition. The Moorehead burial tradition, until recently believed to be a Late Archaic phenomenon (5000-3700 B.P.), has been revised by Robinson (1996) to include the Early and Middle Archaic, extending it back to 8500 B.P. This was the result of reanalyzing most of the known mortuary assemblages (increasing the number of published assemblages from 25 to 37), more dating, and an increased attention to ground stone tools (Robinson 1996).

The continuity of the Moorehead burial tradition is based on the selection of artifact types, and the elaboration that is present on specialized mortuary artifacts. The

copious use of red ochre, and the association of whetstones and newly sharpened woodworking tools being the most consistent characteristic throughout the Moorehead burial tradition (Robinson 1996:127). These similarities are said to extend the Moorehead burial tradition back in time without necessarily implying that a single culture is represented (Robinson 1996:98).

The Table Land burial complex, ca. 8500 B.P., is represented by a single site in Manchester, New Hampshire, and a small number of red ochre-stained artifacts from other locations. The Table Land site, located on a gravel ridge 100 feet (30 meters) above Amoskeag Falls (Figure 1), was salvaged by an avocational archaeologist in 1937 and later briefly mentioned in an *American Antiquity* article (Marshall 1942). The described site consists of a large red ochre-stained feature containing up to nine bone deposits at different levels, most of which included ground stone rods. Among other artifacts recovered were five complete ground stone rods and seven fragments representing at least four more, including two with expanding heads (Robinson 1992:99-100). Although there were no datable remains in the Table Land assemblage, a ground stone rod with an expanding head was found in a feature at the Weirs Beach site that dated to 8985 +/- 210 B.P. (Bolian 1980:125).

Recently, another red ocher deposit that had been excavated in the immediate vicinity of the Table Land site, by another avocational archaeologist in 1940, has been 'discovered' and documented (Robinson 1996:100-102). Although this 'deposit' did not contain any ground stone rods or diagnostic tools, it did contain charcoal and calcined

bone. A piece of red ochre stained charcoal has recently returned an AMS radiocarbon date of 8490 +/- 60 B.P. (Robinson 1996:101), and the analysis of the calcined bone has resulted in the identification of both human and animal remains. Skeletal remains represent a middle aged female "... that had been cremated while still green and heavily stained with red ochre" (Sorg 1994:6, as quoted in Robinson 1996:102). The 35 fragments of animal bones are believed to represent a cremated bone tool kit that included, among other artifacts, a cut, gouge-shaped, bone shaft (see Robinson 1996:101-102 for a more complete description and photograph). This has led Robinson to speculate that the earlier ground stone rods may have been used to sharpen bone gouges, with the later ground stone full-channeled gouges being copies of the bone prototypes (Robinson 1996:102).

The Morrill Point burial complex, ca. 8000-7000 B.P., is represented by four multi-grave cemeteries, as well as isolated caches of artifacts that could possibly represent isolated burials (Robinson 1992, 1996). The two largest sites were excavated by experienced avocational archaeologists, and the other two were examined after being disturbed by gravel operations (see Robinson 1992 and 1996 for a more in depth description).

The Morrill Point burial complex is characterized by red ochre deposits containing full-channeled gouges, ground stone rods, and a variety of other ground stone tool forms. Bifaces are present in some cases but are not attributable to well defined regional types.

Cremations and non-cremation deposits occur with cemeteries being found on sand and gravel knolls and ridges, separate from occupation sites (Robinson 1992:94).

The most characteristic artifact types of the Morrill Point burial complex are the full-channeled gouges and ground stone rods. The gouges occur in two distinct forms: long parallel-sided gouges with deep rounded channels, and wide flared-bit gouges with full channels that are flat in cross-section (Robinson 1996:104-105). Variability in the form of the ground stone rods, usually in their end treatment, suggest multiple functions, but they apparently were meant to facilitate the sharpening of full-channeled gouges (Robinson 1992:91, 1996:105-106).

The Table Land and Morrill Point complexes of the Moorehead burial tradition correspond in time and geographic region to the Gulf of Maine Archaic tradition. It is the presence of ground stone rods with expanding heads, and the absence of both rods that are perforated and ground stone woodworking tools, that distinguish the Table Land complex from the later Morrill Point complex. Regionally, based on similarities in artifact forms and red ochre mortuary practices, the Table Land and Morrill Point burial complexes are believed to be broadly related to the early Maritime Archaic mortuary pattern of Labrador and Quebec (Robinson 1992:95).

It is both the Gulf of Maine Archaic tradition and the Table Land and Morrill Point complexes that currently represent populations in Maine during the early Holocene. These models have provided the structure of which the current research is built on. The first step of which is to review the environmental factors.

CHAPTER 3

ENVIRONMENTAL SETTING

The majority of the hypotheses proposed to explain the apparent occupational hiatus during the Early and Middle Archaic are based on environmental considerations, such as the environment not having the carrying capacity to support a significant population, or that rising sea levels have erased all evidence of a maritime-adapted culture who lived along the coast during this period. This chapter will look at the available evidence pertaining to the environmental setting of the Maritime Provinces during the early Holocene. First, the focus will be on reconstructing the terrestrial paleoenvironment using evidence from palynological studies, and comparing the results from within the Maritimes and regionally. Second, the focus will shift to the changes in the relative sea level and related effects on the geography of the Maritimes during the Holocene epoch. Lastly, implications for the present study will be discussed.

Paleoenvironmental Reconstruction

The paucity of Early and Middle Archaic archaeological remains from the Northeast, interpreted as an occupational hiatus, has led archaeologists to look for unfavourable environmental conditions during the early Holocene. Although this correlation has since been challenged elsewhere (e.g. Petersen and Putnam 1992), it has not yet been addressed for the Maritimes.

Paleoenvironmental reconstructions for the Northeast are, for the most part, based on palynological studies (e.g. Bradstreet and Davis 1975; Livingstone and Livingstone 1958; Livingstone 1968; Mott 1975a and 1975b; Sanger et al. 1977). In reconstructing paleoenvironments, palynologists attempt to correlate fossil pollen taken from ponds, lakes, and bogs to forest species at a particular time. There are, however, problems with this methodology, including the correlation of fossil pollen assemblages to climate (Terasmae 1973:203), the lack of radiocarbon-dated profiles for the Maritimes (Mott 1975b: 286-287; Sanger et al. 1977:462), and the correlation of fossil pollen studies with those of modern pollen rains (Livingstone 1968:87). Methodologies can also be biased by formation processes which create the pollen record (Butzer 1982:177-181). For a more general discussion of using paleoenvironmental reconstructions in archaeology see Dincauze (1987).

The limited amount of research, and problems inherent in the method, have made paleoenvironmental reconstructions of the early Holocene problematic. The available palynological evidence will be reviewed for both New Brunswick and Nova Scotia, as well as how they relate regionally. Only data available from the period representing the Early and Middle Archaic will be discussed (see Davis and Jacobson 1985, and Stea and Mott 1989 for discussion of the earlier environment and landscape).

The best paleoenvironmental evidence from New Brunswick is from two well dated pollen cores of lake sediments reflecting vegetational and climactic change since glaciation (Mott 1975b). Cores were taken from the Basswood Road Lake and Little Lake

in southwestern New Brunswick (Figure 2) which possess pollen sequences that have been divided into nine zones reflecting changes in species diversity over time (Figure 3).

For the purpose of the present discussion only Zones 4 and 5 will be discussed. These zones represent the period ca. 9500-5100 B.P. (Figure 3), with Zone 5, dating ca. 9500-6500 B.P., and Zone 4 dating ca. 6580-5120 B.P. Zone 5 begins with a large two. to threefold increase in absolute pollen frequencies and pollen influx rates. This increase is caused by an invasion of pine (*Pinus*) along with a concomitant increase in birch (*Betula*) and other hardwoods, including a sparse occurrence of spruce (*Picea*). This is indicative of a change from an open to a closed forest type that lasted throughout Zone 5 (Mott 1975b:285). This mixed forest of pine with an abundance of birch, oak (*Quercus*) and a minor proportion of other hardwoods, including blue beech/ironwood (*Carpinus/Ostrya*), ash (*Fraxinus*) and maple (*Acer*), remained until about 6600 B.P. (Mott 1975b:284).

Zone 4 is defined on the basis of an abrupt increase to a maximum occurrence of hemlock (*Tsuga canandensis)* and subsequent sharp drop thereafter. During this time pine pollen gradually declined, as did oak, while some hardwood genera (beech, maple and ash) increased (Mott 1975b:284-285). This created a mixed forest of hardwoods with an abundance of hemlock, and some pine and maple. Hemlock played a prominent role until 5100 B.P., when it abruptly declined in abundance, while beech (*Fagus*) began to increase until it dominated the forest, along with birch, maple, ash, and various other hardwoods (Mott 1975b:284-285).

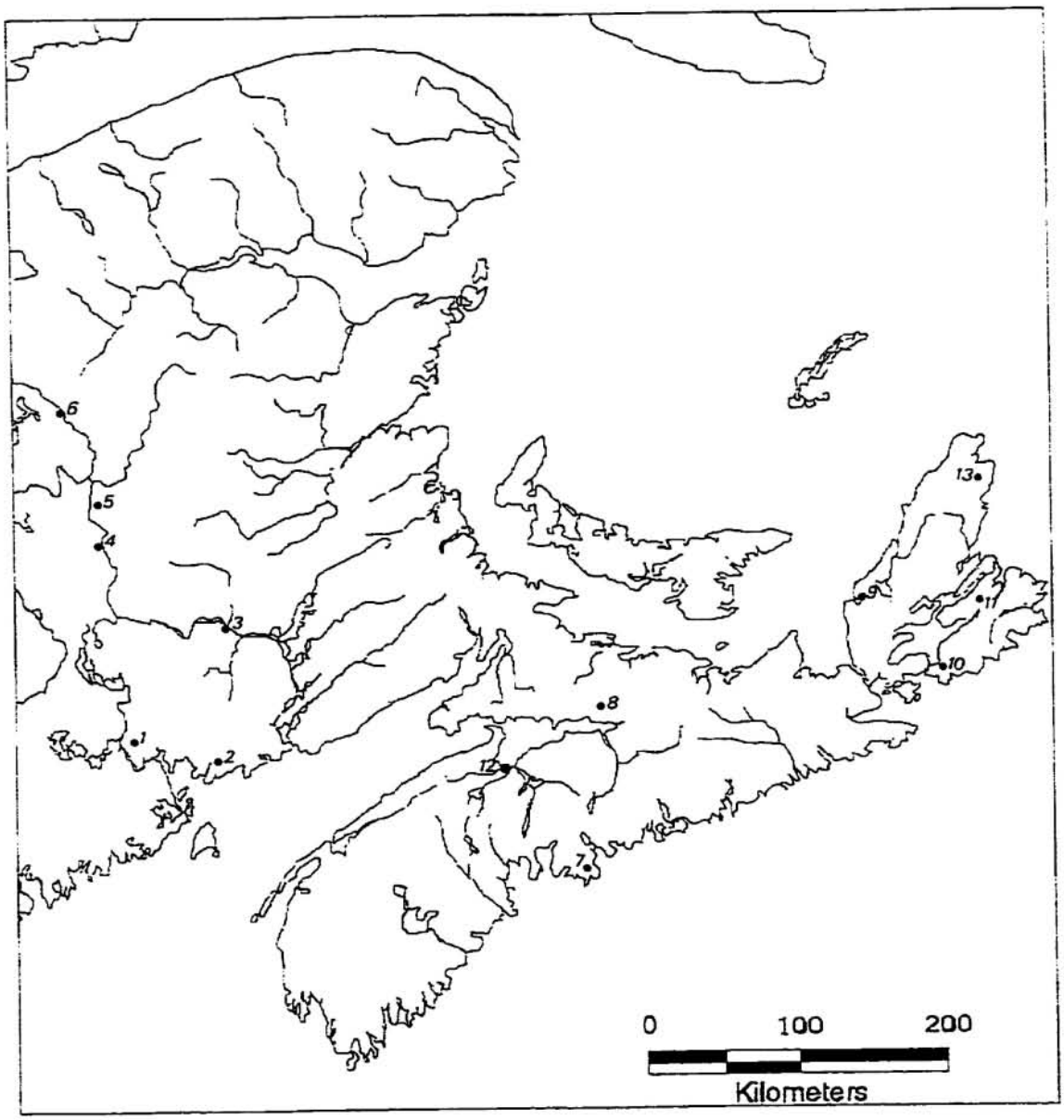

Figure 2. Location of sites used in paleoenvironmental reconstructions: 1) Basswood Road Lake; 2) Little Lake; 3) Fredericton Bog; 4) Hartland Bog; 5) Upper Kent; 6) Grand Falls Bog; 7) Bluff and Silver Lakes;8) Folly Bog; 9) Hillsborough Interstadial Deposit; 10) Gillis and Salmon River Lakes; 11) McDougal and Upper Gillis Lakes; 12) Shaws Bog; 13) Wreck Cove Lake.

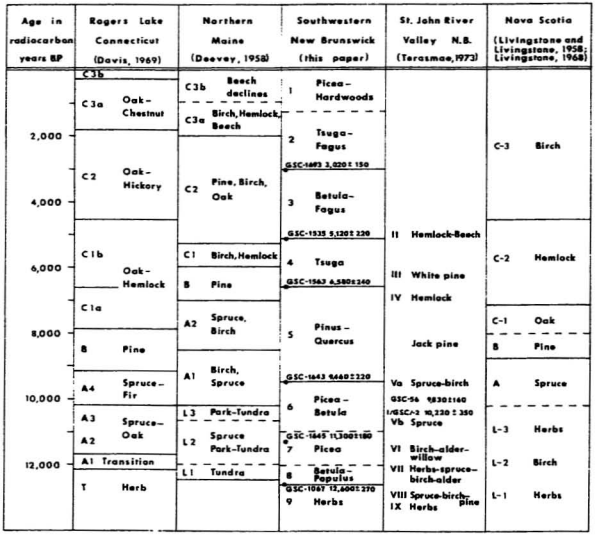

Figure 3. Palynostratigraphic correlations of selected profiles from Northeastern North America (After Mott 1975b).

Other data from New Brunswick include a sequence from the Saint John River Valley (Terasmae 1973), and undated sequences from the western part of the province (Mott 1975a). In Figure 3 zones II, III, and IV, given by Terasmae (1973) for the Saint John River Valley, are thought to be equivalent to Mott's zones 2, 3, and 4 (Mott 1975b:387). Four undated pollen sequences from sites located in the western part of the province (bogs in Fredericton, Hartland, Upper Kent, and Grand Falls; see Figure 2) are also similar to both the Basswood Road Lake, Little Lake, and the St. John River sequences. This indicates a general pattern in New Brunswick, with only slight variations within the sequences of specific localities.

The interpreted pattern for New Brunswick is that the increase in pollen deposited at the beginning of Mott's Zone 5, ca. 9500 B.P., indicates the beginning of a closed forest type with a warming climate. This warming continues until zones 4 and 3, when thermopholous hardwood genera are represented by greater amounts of pollen than any other time before or since (Mott 1975b:287). This abundance of hardwood is indicative of a climate warmer than present day, and is further indicated by the peak of hemlock ca. 5800 B.P. In comparison with other sequences from Northeast, Mott believes (1975b:284) the New Brunswick profile is similar to the sequence for Roger's Lake, Connecticut (Davis 1969), and that his Zone 5 is similar to the pine zone designated Zone B in all of New England (Mott 1975b:284). In an earlier study by Sanger (Sanger et al. 1977), Mott's data are considered equivalent to sequences from Maine. In a more recent

study. Sanger has continued to point out the similarities between the paleoenvironments of Maine and New Brunswick (Sanger et al. 1992).

The most comprehensive paleoenvironmental study for Nova Scotia is the analysis of six pollen sections by Livingstone (1968), based partially on previous research (Livingstone and Estes 1967; Livingstone and Livingstone 1958). Pollen diagrams were constructed using samples from the Bluff and Silver Lakes, Folly Bog, the Hillsborough interstadial deposit, Gillis and Salmon Lakes, McDougal and Upper Gillis Lakes, and Wreck Cove Lake (see Figure 2). These samples were then divided into four zones (Figure 3), which were arranged temporally, based on a few radiocarbon dates and similarities between assemblages.

In the pollen profile for Nova Scotia, Zones A, B, and C represent the Early and Middle Archaic Period (see Figure 3). Zones A and B are characterized by high percentages of coniferous pollen, with spruce and fir being relatively more important in Zone A, while pine is more important in Zone B. Zone A is thought to be similar to diagrams from modern day Riviere de Loop in Quebec, which is three or four degrees of latitude north of Nova Scotia, suggesting that the climate was not as warm as present day (Livingstone 1968:123). Taken generally, Zone A is also thought to be similar to the A Zone for New England, but might not have ended at the same time (Livingstone and Livingstone 1958:353).

Zone B is defined on the basis of an increase in pine pollen, indicating a forest in which pine trees became dominant. This forest is thought to be analogous to that reported

by Deevey (1951) from modern day Caribou Lake in Aroostook County, Maine (Livingstone 1968:123). In a comparison with other pollen diagrams, the Nova Scotia sequence is said to be stratigraphically, but not necessarily temporally, equivalent to the B Zone for Connecticut (Flint and Deevey 1951), and may not be vegetationally equivalent to the B Zone for Maine. These differences are based on how the B and C zones are defined in Nova Scotia, Connecticut, and Maine.

Zone C represents a mixed temperate hardwood forest comprised of oak, ash, maple, beech, and elm (*Ulmus*), along with hemlock. Zone C has been divided into three subsections at all localities (Livingstone 1968:123). These subzones reflect similar pollen changes, principally the development of a marked hemlock peak in C-2, at all Nova Scotia localities. This hemlock peak suggests a change in conditions that were somewhat moister than those which prevailed in C-1, and warmer than present day. Zone C-3 represents a decline in hemlock and other coniferous species, with birch becoming the dominant species. Comparing the Nova Scotian C zones to other pollen profiles, Livingstone states that they are stratigraphically equivalent to those of southern New England, but only as a group, not zone for zone. Compared to Maine, Livingstone and Livingstone (1958:355) state that although the C zones cannot be stratigraphically or temporally equated with those of Nova Scotia; however, the return of terminocratic species, particularly spruce and fir, in the upper part of C-3 suggest very strongly a stratigraphic correspondence between part of this zone and Deevey's C-3 (Deevey 1951).

Other paleoenvironmental evidence from Nova Scotia includes the analysis of plant macrofossils from Gillis Lake (Shofield and Robinson 1960), and the pollen stratigraphy of a peat bog in Hants County (Hadden 1975). The plant macrofossils from Gillis Lake were from the same deposits that Livingstone and Livingstone (1958) used to construct their pollen diagrams. The results of Shofield and Robinson's study was that the macrofossil record largely supports the conclusions made from the pollen analysis (1960:521). The results of Hadden's analysis of the pollen stratigraphy of Shaws Bog (see Figure 2 for location), however, resulted in some differences.

Although Hadden's Zone A is similar to other studies, Zone B from Shaw Bog is different. In her Zone B, pine does not increase significantly as it does in other profiles. Instead, this zone is delimited at the base by an abrupt drop in spruce and at the top by a sharp rise in hemlock (Hadden 1975:44). This trend is thought to be correlated with some sites in Nova Scotia and Maine, but not with the overall trend. Zone C, having two peaks of hemlock, is thought to indicate a greater correlation to Maine and Massachusetts than most Nova Scotia sites, but the first hemlock peak is contemporaneous with the peak elsewhere in the Northeast (Hadden 1975:45).

Palynological evidence from New Brunswick and Nova Scotia shows broad similarities, albeit with some incongruities. Differences may be accounted for by the lack of radiocarbon dates and how these zones are defined. For the Early and Middle Archaic Period Mott's sequence is based on four radiocarbon dates from two sites, while Livingstone's sequence is based on three radiocarbon dates from two sites. Looking at

how the zones are defined, there is little vegetational difference between Mott's Zone 6 and Livingstone's Zone A, or Zone 5 and Zone B and C-1, and Zone 4 and C-2. Broad similarities include the change from open to closed forest type, as indicated by an increase in pine at the beginning of the Holocene, and a peak in hemlock ca. 5700 B.P. These characteristics are also shared with Northern New England. The latter is demonstrated by all of the available radiocarbon dates on the hemlock peak falling within a narrow range in Nova Scotia, New Brunswick, and New England (Mott 1975a:79). In all locations the peak in hemlock has been interpreted as representing a warmer period than today.

This trend also fits in with a warming trend throughout the Northeast. Bradstreet and Davis (1975) state that the available palynological data from New England indicate a possible xerothermic period occurring ca. 8500-6000 B.P., coinciding with the early portion of the Hypothermal. The Hypothermal is a period of postglacial warming extending from 8500-7500 to 4000-3300 B.P. A thermal maximum has been proposed for approximately 5000 B.P. There are several other paleoenvironmental indicators that denote a climactic optimum, or Hypothermal, generally occurring ca. 8000-4000 B.P One example is the analysis of foraminiferans in cores of sediments from the Atlantic Ocean, indicating a generally warm interval for the past 11,000 years, with a thermal maximum occurring ca. 7000-6000 B.P., after which temperatures declined irregularly to the present day (Bradstreet and Davis 1975).

While the evidence for a warming trend does not tell us that the Maritimes were occupied by humans during the early Holocene, it does indicate that environmental

conditions were more favourable than previously believed. Similarities between paleoenvironmental reconstructions of locations in the Maritimes and New England, where there is indisputable evidence of an early Holocene occupation, is cause to re-evaluate previous environmentally deterministic hiatus hypotheses. The terrestrial biotic productivity of the early Holocene environment should no longer be considered a factor in limiting human subsistence. Another environmental factor which may have affected the archaeological visibility of Early and Middle Archaic populations are changes in the relative sea level.

Relative Sea Level

Change in the relative sea level and its effects on the geography of the Maritimes also affects our interpretation of the prehistoric archaeological record. During the early Holocene, the landscape was vastly different than today. In fact, it would hardly be recognizable. With much lower relative sea levels, ca. 9000 B.P., the Atlantic coast of Nova Scotia was up to 10 km seaward of its present position (Shaw et al. 1993), the Gulf of Maine was an inland sea (Kellogg 1988), and Prince Edward Island was connected to New Brunswick and Nova Scotia, only becoming a separate island ca. 6000 B.P. (Keenlyside 1983, 1984a, 1985a, 1985b, 1991).

Changes in the relative sea level are caused by many factors. Eighteen thousand years ago the earth's crust was compressed and deformed by the sheer weight of the Laurentide ice sheet. This pressure caused the mantle below the crust to flow outward

around the edge of the ice, which in turn caused the earth to bulge around the circumference of the ice sheet. As ablation occurred and glacial meltwater flowed back into the oceans, global sea levels rose. Simultaneously, the crust that had previously supported the great weight of the ice sheet sprang back, with the viscous mantle creeping back under land previously depressed by ice, collapsing the bulge.

Changes in the relative sea level are produced by eustacy and isostacy simultaneously (Quinlan and Beaumont 1981:1154). Eustatic change is caused by the removal of water from or addition of water to the ocean's basins. The warming of the global climate in modern times is believed to be causing global sea levels to rise eustatically at a rate of approximately six centimetres per century (Grant 1975:83). When the weight of the water in the oceans, or the ice on land, deforms the crust and underlying mantle, it causes the crust to sink or rise isostatically relative to sea level. In the Maritimes excessive isostatic change, when compared to world-wide rates, is believed to be caused by subsidence of the earth's crust as a former glacier-marginal bulge collapses (Clark et. al. 1978; Grant 1970, 1975, Quinlan and Beaumont 1981). The bulge around the ice sheet parameter, caused by a displacement of sublithopheric mantle, is called a forebulge (Quinlan and Beaumont 1981:1148). The Maritime Provinces sit on such a forebulge and are effected by its collapse, as it slowly retreats towards the center of the former ice mass.

Change in relative sea level can be illustrated as a curve that is created from field observations. Such curves can be constructed by observing and dating markers that

exhibit a known relationship to a past sea level. Marine markers may include such things as marine shells, driftwood, beached whale bones, peat beds, raised or submerged marine deltas, freshwater lake sediments containing marine deposits, or marine sediments containing freshwater deposits (Quinlan and Beaumont 1981:1160). There are, however, specific problems associated with indicators of past sea levels that have to be taken into consideration when constructing sea level curves (see Kellogg 1988 for a comprehensive review of the problems in the use of sea level data in constructing sea level curves).

Using 47 age and depth determinations, which include submerged tree stumps and other freshwater vegetation overridden by transgressing barrier beaches and buried beneath tidal marshes, supplementary evidence of drowned Indian campsites, colonial artifacts buried in tidal mud, and the rise of high tide at the historic site of Louisbourg, Grant (1975) constructed a relative sea level curve for the Maritime Provinces (Figure 4). Grant found that the resulting relative movement of the shoreline began with the sea being 75 m higher in the Bay of Fundy and Gulf of St. Lawrence when glaciers began to recede ca. 12,000-14,000 years ago. Since then, as the land rebounded from the weight of the glaciers, the coast emerged and sea levels appeared to fall for several thousand years. During the last 8000-6000 years the trend has been reversed with the sea rising, causing a renewed drowning throughout the Maritimes. Based on geological data from the past 4500 years, Grant has concluded that the Maritimes are being inundated at a rate of 30 cm per century (1975:97). This is perceived not as a single linear event, but a series of fluctuations with different localities submerging at different rates. The average world-

wide rate of sea level rise is six centimetres per century. The excessive submergence in the Maritimes, being five times the world rate, is due to subsidence of the earth's crust as the former glacier-marginal bulge collapses.

The relative sea level curve for the Bay of Fundy, and Gulf of Maine, is quite different from that of the Maritimes. Figure 5 demonstrates the relative sea level curve for the Gulf of Maine, where 9000 years ago the sea level was approximately 65 m lower than modern levels, as compared to the maximum of 20-30 m for the Maritimes (Grant 1975). The additional water levels in the Gulf of Maine and Bay of Fundy are due to the amplification of the tidal range. This amplification has been caused by the rise in sea level which has widened and deepened their entrances, and optimized basin geometry. Studies on the development of the Gulf of Maine and Bay of Fundy tides have conflicting interpretations regarding the inception of tidal conditions and rates of amplitude change (Turnbull 1988:95; e.g., Grant 1970; Amos 1978; Scott and Greenberg 1983). Generally, relative sea level changed rapidly as the water level became deeper over George's Bank with comparatively quick and rapid development of tides (see Turnbull 1988 for a more in-depth discussion).

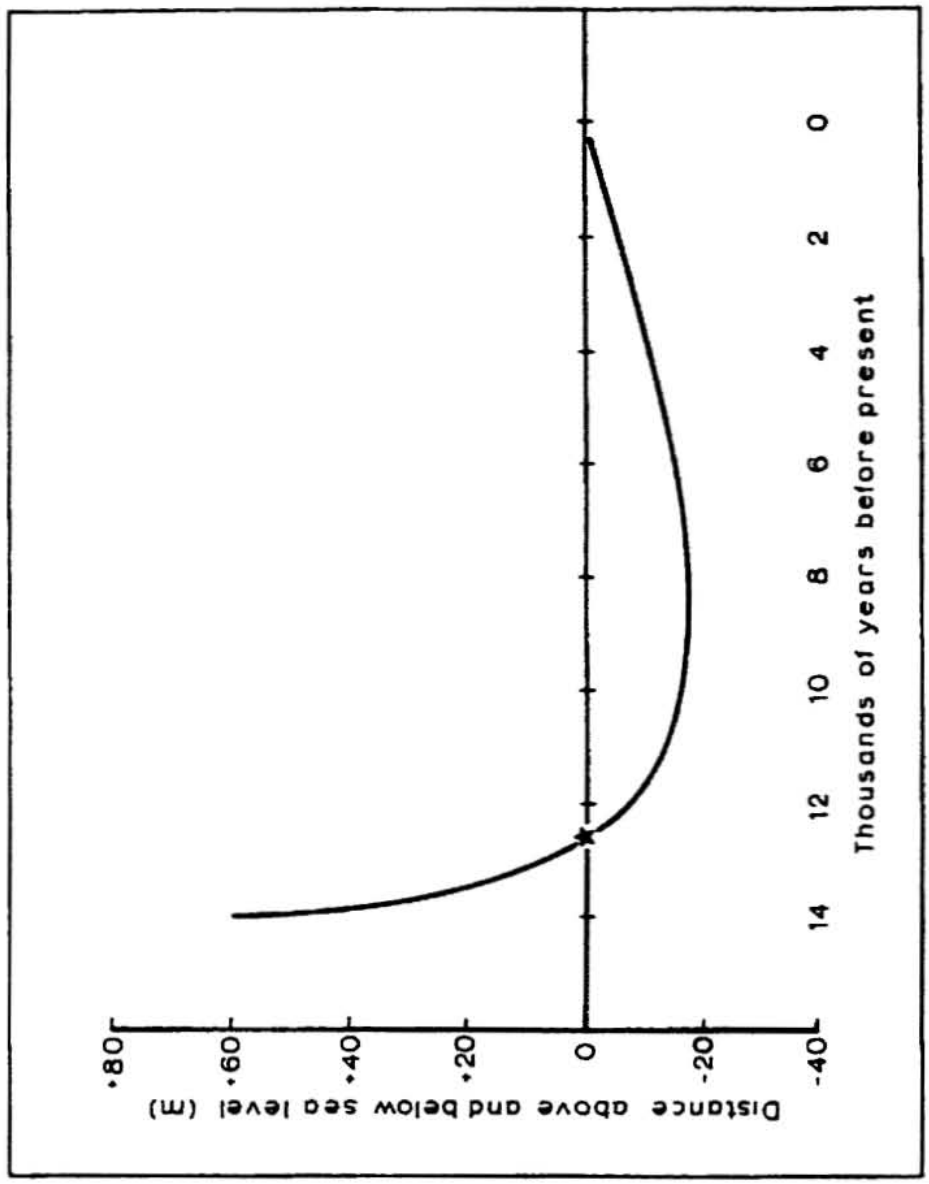

Figure 4. A relative sea level curve for the Maritimes Provinces generalized for the Bay of Fundy and Gulf of St. Lawrence (after Grant 1975).

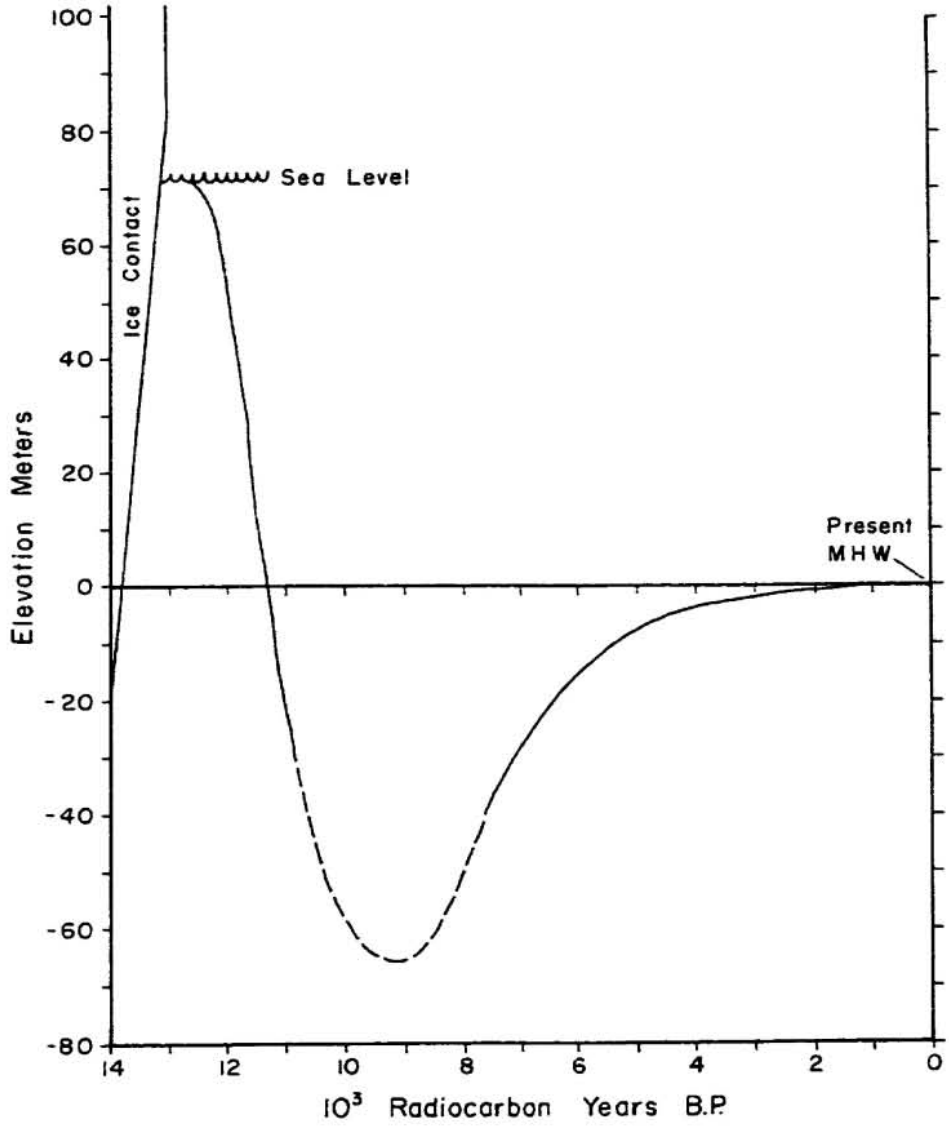

Figure 5. A relative sea level curve for the coast of Maine (after Sanger 1988).

Due to the location of the Maritimes on the periphery of the Laurentide ice sheet and its resulting forebulge, as well as other factors such as the development of the famous Bay of Fundy Tidal system, the geography of the Maritimes has changed drastically in the last 10,000 years. The combination of eustatic and isostatic factors, causing the relative sea level to be abnormally high for the Maritimes, would have inundated any evidence of early Holocene sites along the coast. As a result, Early and Middle Archaic settlement patterns are forever skewed, leaving only data from interior sites and artifact distributions.

Implications and Discussion

With most of the hypotheses proposed to explain the apparent occupational hiatus during the Early and Middle Archaic based on reduced carrying capacity or coastal site inundation, this chapter has served to review the related literature. It becomes apparent that when looking at paleoenvironmental reconstructions and changes in the relative sea level, general statements can be deceptive. This is because of many area and site-specific factors. However, in this regional study only the more general patterns will be discussed.

Evidence from palynological studies indicates that the paleoenvironment of the Maritimes was more favourable to habitation than previously interpreted by archaeologists. The pattern that emerges between 10,000-5000 B.P. is that earlier conditions were less boreal while later periods were warmer than previously believed.

While this alone does not serve as evidence that the Maritimes were populated by humans during this period, it does tend to favour the possibility of such occupation. It is the similarities between the paleoenvironments of the Maritimes and New England that will be emphasized in the present study. It should follow that: if the environment of the Maritimes were similar to that of New England, where there is no overwhelming evidence to suggest that the early Holocene environmental conditions were unfavourable for human habitation (Petersen and Putnam 1992), then the situation in the Maritimes should be the same. These similarities suggest that population occupational hiatus models based on environmental conditions, such as the Ritchie-Fitting Hypothesis, need to be revised.

The changes in the relative sea level drastically changed the geography of the Maritime Provinces during the Holocene epoch. Although some research indicates that a few specific modern areas are actually emerging (Vanick 1976:664-665; Bird 1980:119), generally it is suggested that the Maritimes are sinking at a rate of 30 cm per century (Grant 1975), as noted above. This submergence has resulted in the 'drowning' of Early and Middle Archaic sites which may have been located along the coast. Evidence for the existence of such sites exists in the form of discrete artifacts found by scallop draggers and divers, and it will be discussed in Chapters 6 and 7.

The previous review of the available literature concerning the paleoenvironment of the Maritimes has served to both strengthen the Drowned Site Hypothesis, and weaken the Ritchie-Fitting hypothesis. These are the two more popular hypotheses proposed to explain the lack of Early and Middle Archaic sites. Within this reconstructed

environmental pattern an early Holocene occupation model will be advanced, which is based on available archaeological material.

CHAPTER 4

THE GASPEREAU LAKE SITE

The Gaspereau Lake site (BfDb-5) was excavated in the mid 1960s by an avocational archaeologist. Included in the site assemblage are artifact types that are similar to Early and Middle Archaic forms found in Northern New England. Using excavation notes, which include provenience data on most of the artifacts, the Archaic component of the Gaspereau Lake site has been reexamined and reinterpreted as representing use of the site for the entire Archaic Period.

The Gaspereau Lake Site

The Gaspereau Lake site (BfDb-5) is located on the north shore of Gaspereau Lake in Kings County, Nova Scotia (see Figure 1). The lake drains into the Gaspereau River, so named for the run of gaspereau, an anadromous herring, which swims upstream during May and June to spawn (Erskine 1967, 1998). Since 1929, Gaspereau Lake has been dammed for the production of hydro electric power, with all outlets diked except one. This remaining outlet has been deepened and reduced to a sluice feeding water into a fish ladder, near the Gaspereau Lake site.

The lake area had been test pitted by John Erskine initially in 1957, producing only blackened soil and a few flakes of quartzite. Erskine was an avocational archaeologist who worked under auspices of both the Nova Scotia Museum and later the

National Museum of Man between 1957 and 1967, and whose work represents almost all of the archaeological research conducted in Nova Scotia during that time. In 1964, James Legge, a local collector, reported to Erskine that he had picked up numerous projectile points and some Archaic material around the lake. In 1965, George MacDonald, National Museum of Man, reported to Erskine that he had also found some Archaic artifacts while testing around the lake. This prompted Erskine to return to the lake in September of 1965 to excavate what is now known as the Gaspereau Lake site (or the Erskine site).

The site is 70 m southeast of the sluice gate at the head of the fish ladder in an indentation of the shoreline. The location consists of a flat area 8 m wide and 15 m long sloping evenly about 1 m from north to south, with tumbled boulders at the sides. At the landward end, the ground rises rapidly to a forest of second growth hardwoods and white pine. The soil of the site was reported to be a yellow clay similar to that of the Melanson site downstream (Erskine 1967).

For excavation, the site was divided into five foot (1.5 m) squares. All artifacts were collected and levels recorded from the natural surface (Figure 6). Features were numerous and included a line of occupation floors, interpreted as wigwam-like structures, with shallow hearths dug in their centers. Numerous hearths, often overlapping, suggested that the position of occupation floors had shifted from occupation to occupation. Hearths on the west side were dug to a depth of about 15 inches (38 cm), surrounded with boulders and lined with stone or with clay baked almost to the

consistency of brick, and therefore interpreted as having been smoking hearths (Erskine 1967).

West of the smoking hearths the site ran out into superficial cooking hearths among boulders, and eastward from the occupation floors it ran out similarly. At the north end of the site, Late Ceramic style projectile points were found in an eroding shallow occupation layer. At the south end of the site, digging deeper, Erskine found more Archaic material and less ceramic material until the site ran out at the edge of the slope. The artifact distribution, with the earliest artifacts being buried deeper in the southern portion of the site and more recent material culture shallower at the north end, gave the site a discernable horizontal stratigraphy. This suggests a slow northward shift of occupation floors as the forest encroached upon the drying beach. The horizontal stratigraphy/distribution is illustrated as a schematic in Figure 7.

During the initial excavation Erskine uncovered numerous Archaic artifacts, including some that he attributed to his "Blue-whin phase". Blue-whin being a name for the material culture that he attributed to an indigenous fishing people inhabiting the south shore of Nova Scotia during the thaw of the local glaciers (Erskine 1964, 1969). The Blue-whin occupation of the Gaspereau Lake site was based on the recovery of two 'very primitive' stemmed projectile points (Erskine 1967).

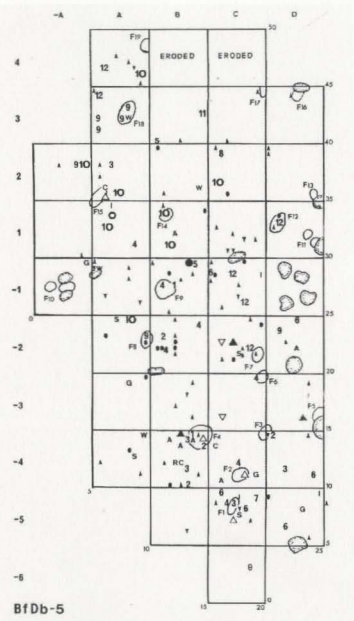

Figure 6. Excavation grid map for the Gaspereau Lake site (BfDb 5). Rocks are shaded and features are not. Features are preceded by an "F." Projectile points are indicated by their Group numbers. The following symbols and letters are used to designate other artifacts: small solid triangle = slate knife: large white triangle = plummet; large inverted triangle = ulu; large solid inverted triangle = axe; small ellipse = gouge (in A1); small solid circle = scraper; vertical ellipse with center bar = atlatl weight (C-6); A = adze; B = borer; C = chopper; G = ground stone fragment; I = chisel; S = whetstone; W = wedge. (after Deal and Rutherford 1991).

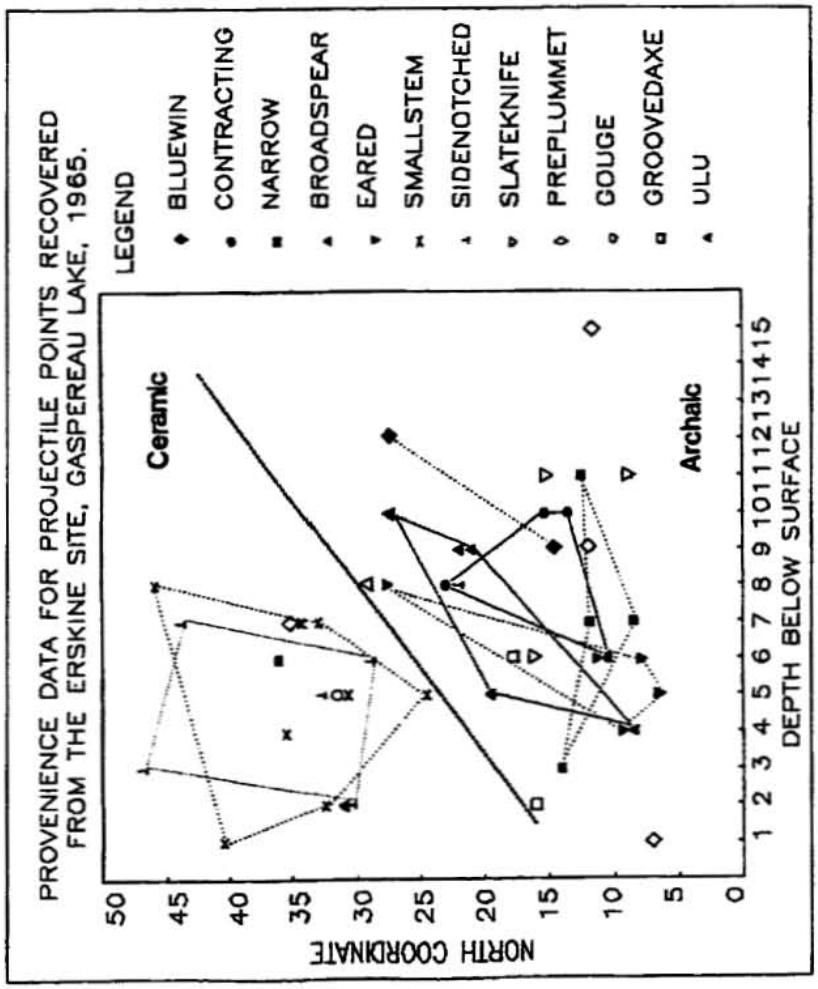

Figure 7. Distribution of diagnostic projectile points and ground stone artifacts at the Gaspereau Lake site (BfDb 5). Provenience data for the North Co-ordinate (in feet) and the Depth Below Surface (in inches) is taken from Erskine 1967. The dashed line represents the approximate division between Archaic and Ceramic Period deposits. Dotted and solid lines link specimens within projectile point groups identified by Erskine within the two deposits (i.e., excluding outliers).

Projectile point groups include 1. Blue-win, 2. Contracting stemmed, 3. Narrow bladed, 4. Broad blades (Broadspear), 5. Eared, 6. Small stemmed and 7. Corner-notched. Ground stone tools include A. atlatl weight, G. gouge, K. slate knife, P. plummet (or pre-plummet), U. ulu and X. fully-grooved axe (after Deal and Rutherford 1991).

It was the discovery of the two Blue-whin projectile points that convinced Erskine to continue excavating at the site. Leading him to uncover two Archaic hearth features that dropped to only a few inches above the glacial lake bottom. It also became apparent that the soil in the Archaic area of the site was well stratified. This was attributed to the site having been water-laid with occasional discontinuous layers of sand or gravel silting up the hearths. Although his methodology did not include excavation by stratigraphic layer their presence suggests that the Archaic portion of the site was undisturbed.

When reconstructing the sequence of site occupation, Erskine cautions that the levels of artifacts can sometimes be unreliable, due to continuous digging of hearths, which often moved artifacts either above or below their relative position. Therefore, artifacts found away from hearths should belong to the level in which they were found, while specimens found close to, or in, hearths can be misleading. These factors, along with the small amount of sediment accumulation, led to poor vertical stratigraphic separation of artifacts, and are important considerations for any interpretation of the site.

Material culture

The Gaspereau Lake site assemblage contains numerous artifacts that are similar to established Archaic Period forms. These similarities, coupled with Erskine's own interpretations and excavation notes, will be used to reinterpret the Archaic component of this assemblage. Originally, all of the recorded artifacts were grouped into categories

based on material and technology (chipped stone tools, ground stone, and nonlithic artifacts). Projectile points were further categorized into 12 sequential groups representing the archaeological cultures that had utilized the Gaspereau Lake site. For the purpose of the present discussion, only artifacts associated with the Archaic portion of the site, or artifacts that are considered characteristic of the Archaic Period, will be considered. The following discussion is based on Erskine's original description of the artifacts, and follows his categories. Groups are based on chronology (position within the site), morphology, and cultural affiliation.

The two Blue-whin projectile points make up Erskine's Group 1, the earliest inhabitants of the Gaspereau Lake site. This is based on their position within the site, and the crudity of their manufacture. These included the base of a crude stemmed projectile point (#202; Plate 1) found in Unit B-4 at a depth of nine inches (23 cm), and a stemmed projectile point (#294; Plate 1) with a broken tip found in Unit B-1 at a depth of 12 inches (30 cm), the first was the deepest buried point in Unit B-4, and the latter was found below a Late Archaic hearth with a chopper. The chopper was jammed under a boulder in a way in which Erskine reported that Archaic hearths were lined with tools not worth carrying away (Erskine 1967).

It is likely that the Blue-whin artifacts actually belong to a Late Archaic group. Blue-whin point #294 likely belongs to the Late Archaic Broadspear or Susquehanna group, Erskine's Group 4, of which it not only shares morphological attributes, but was

found stratigraphically close to four other Group 4 points. Artifact #202, in its fragmentary state, appears too amorphous to assign it to any specific archaeological culture.

Evidence for a Palaeoindian occupation of the Gaspereau Lake site is inferred on two artifacts whose antiquity is based solely on morphology, not provenience. Neither artifact was originally recognized as Palaeoindian by Erskine (1967). Number 158 is a small fluted chert point with a broken tip and ear (Plate 2). The flutes are clearly visible and the morphology of the point closely resembles specimens illustrated by Bonnichson et al. (1991) from the Amherst Shore, Nova Scotia, and at least one of the points illustrated from Debert (1991:15 Figure 1.2 e and d) where the Palaeoindian occupation has been dated ca. 10,600 B.P. (MacDonald 1968). There is no provenience for this Gaspereau Lake artifact.

The other specimen, #193, is a finely parallel-flaked quartzite point with a broken base (Plate 2). Recorded as being from the Ceramic Period portion of the site, this artifact has been recognized as a Plano style point by David Keenlyside (1984b: slide 7). A similar undated parallel flaked projectile point has been reported from Nova Scotia (Davis and Christianson 1988), while a parallel flaked projectile point fragment from the Blackman Stream site in Maine was recovered from a context predating ca. 8000 B.P. (Sanger et al. 1992). The Gaspereau Lake specimen was found in Unit C-2 at a depth of 4

inches (10 cm). This context is obviously the result of either a disturbance, such as the digging of a hearth, curation, or a combination of the two.

The contracting stemmed points that make up Erskine's Group 2 (Plate 3) were recovered from the oldest areas of the site. Specimens 201 and 308 were found in Unit B-4 at a depth of 6 and 10 inches (15 and 25 cm), respectively. 230 was found in Unit B-2 at a depth of 8 inches (20 cm), and 314 in Unit D-4 at a depth of 10 inches (25 cm), but measurement is less certain since the point was recovered from a hearth. Morphologically, point #308 is more similar to the Late Archaic Susquehanna forms, or Erskine's Group 4, than to the group of contracting stemmed points. Looking at the site map (see Figure 6) specimen 308 appears to be in hearth Feature 4 which may explain its depth, and which in turn, may be the reason for its inclusion in Group 2. Specimen 314 is a large, broad-bladed knife with a contracting stem which was also recovered from a hearth. Its inclusion within a hearth makes it difficult to affiliate it within a definite culture group, but it is somewhat reminiscent of the Susquehanna forms as well.

It is the large contracting stemmed bifaces, #201 and 230, that are the most interesting in Group 2. These closely resemble the Middle Archaic Neville and Stark forms originally identified at the Neville site in New Hampshire (Dincauze 1976), and more recently in collections from Maine (Spiess et al. 1983) and southwestern New Brunswick (Deal 1984). These forms from the Neville site have been dated ca. 7600-

7000 B.P. (Dincauze 1976:106). These two points represent, without a doubt, a Middle Archaic presence at the Gaspereau Lake site.

The third of Erskine's Groups is made up of four narrow bladed style points (Plate 4). Specimens numbered 167, 310, 218, and 203 were found in Units C-5, B-4, D-4, and B-4, respectively. Again, only two of the points in this group are thought to be diagnostic. Number 167, with its straight stem, is more similar to Middle Archaic Merrimack style projectile points illustrated by Snow (1980:175), than to the narrow stemmed points of the Maritime Archaic, or Moorehead phase. Merrimack points from the Neville site date ca. 6000 B.P., while the narrow stemmed points of the Maritime Archaic or Moorehead phase date from ca. 3700 B.P. in New Brunswick (Sanger 1973), and to ca. 4400 from Occupation 2 at the Turner Farm site (Bourque 1995). Specimen 167 also fits better with Dincauze's original description of Merrimack points, including a dull blade, sharp tip, and thinned base (Dincauze 1976:45-47) than to Bourque's Occupation 2 Moorehead phase points that, for the most part, had unthinned bases which still retained the remnants of a striking platform (Bourque 1995:44). Dincauze believed that these points were hafted and used to pierce rather than cut, with many of them having damaged tips. Point 310 also has a thinned base, although slightly expanding, with the tip broken off from an impact fracture, suggesting that it may also fit into the Merrimack category.

The two slate bifaces, #218 and 233 (Plate 4), that Erskine included in Group 3 appear to simply be bifaces that, although they might belong with the straight stemmed

points, are not characteristic in any way of either Merrimack or any other archaeological culture. Both are quite thick with broken tips, which is probably more indicative of the quality of their material of manufacture, rather than their being used to pierce.

Group 4 projectile points have stems that are either straight or slightly contracting towards their broad triangular blades (Plate 5). Found at depths between 2 and 10 inches (5 and 25 cm) in Units C-4 (315), B-2 (182), C-5 (165), A1 (264), C-3 (228), B-1 (295), B-2 (190), their distribution includes the oldest areas of the site, but they are distinctly later than the contracting stemmed points (Erskine 1967). Related forms are known from the end of the Late Archaic Period in New Brunswick, Nova Scotia, and New England, dating between 4000–3400 B.P. (e.g. Bourque 1995; Deal 1986; Sanger and Davis 1991; Spiess et al 1983). They are associated with the Susquehanna or Broadspear tradition. With the exception of #190, which appears to simply be a broken biface, all of Group 4 would easily fit within the Susquehanna assemblage from the Mud Lake Stream site in New Brunswick (Deal 1986).

Group 5 from the Gaspereau Lake assemblage is made up of a single leaf-shaped point, # 325 (Plate 6). This point was found at a depth of 11 inches (28 cm) in Unit B-1. This specimen does not have the characteristics of any specific culture and is simply a biface.

Group 6 is made up of six 'eared' and side notched projectile points (Plate 7). Resembling long triangles, Group 6 points are broadest at the base and have dull tips.

They were distributed within the site in Units C-5 (166), D-2 (220), D-4 (217), D-5 (181), C-1 (322), C-5 (168), with all but one in the oldest Archaic area. Depths varied between 4 and 8 inches (10 and 20 cm). These are similar to both Ritchie's (1961) eared-notched Brewerton points and side notched Otter Creek points from New York State which are related to the Laurentian tradition. In Southern New England the side notched 'Otter Creek' type points date ca. 6500-4500 B.P. (Ritchie 1980:89), while the eared-notched type date ca. 5000-4000 B.P. (Ritchie 1980:91).

Groups 7 and 8 each consist of a single projectile points. Group 7 is represented by the tip of a serrated projectile point found at a depth of 2 inches (5 cm) in Unit C-5 (Plate 6) in the same position as a plummet (#2). Lacking a base, it is difficult to attribute this point to any archaeological culture, although the serrations are interesting and reminiscent of Early Archaic forms from Southern New England.

A single side notched point, #240 (Plate 6), makes up Erskine's Group 8. Considered Archaic based on its size, it was recovered in Unit C-2 surrounded by Middle Ceramic Period side notched points. This designation is considered erroneous and therefore Group 8 is not relevant to the present research.

Other than chipped stone projectile points the Gaspereau Lake site assemblage also includes a wide array of artifact forms considered to be diagnostic of the Archaic Period. In the Gaspereau Lake site assemblage these artifacts include choppers, ground

slate knives, plummets and pre-plummets, gouges, adzes, grooved axes, and ground stone rods.

Erskine reported a small number of choppers that he described as quartzite and slate chunks with sharp edges. Recovered mainly from the Archaic portion of the site, they were usually cached or discarded in Archaic Period hearths (Erskine 1967). These choppers were considered to be too variable to classify precisely.

Fragments of three ground slate knives were recovered from the Gaspereau Lake site. They included specimens 320, 309, and 210 (Plate 8). Number 320 is rhombic in cross-section and appears to be the oldest, having been found at a depth of 11 inches (28 cm) in Unit C-1. Erskine believed that it was associated with the Archaic occupation because of its depth, and not being associated with any hearth features, even though it was recovered from the Late Archaic portion of the site. Specimen 309 is the tip of a ground slate bayonet with a flat hexagonal cross-section. Recovered from a depth of 11 inches (28 cm) from hearth Feature 4 in Unit B-4, it was found in association with projectile point #308. Specimen 308 (Plate 3) was originally attributed to Group 2 but it should be reassigned to Group 4 (see above). The third, #210, is a medial section of a slate knife with a rhombic cross-section. Found at a depth of 6 inches in Unit D-3, it was not associated with any other artifacts.

Ground slate knives and bayonets are known from all over the Maritime Provinces and Northern New England. Believed to have been used for the killing and processing of

marine resources, they are often associated with mortuary contexts. These artifacts are associated with the Late Archaic Moorehead or Maritime Archaic traditions and date ca. 4000-3700 B.P. (Robinson 1996; Sanger 1973). Slate point and other biface forms date back to ca. 6000 B.P. and older in some Maine contexts, however (e.g. Petersen 1991).

Plummets are quite common in the Maritimes and New England in the Late Archaic. They are usually described as net sinkers or bolas stones. A single plummet from the Gaspereau Lake site, #2, was recovered from Unit C-5, at a depth of 1 inch (3 cm). It is made of slate, rounded on one side, flat on the other, with a narrow groove scratched around the neck (Plate 9). Plummets found in dated contexts in Northern New England usually date to the Late Archaic, but they have been found in a context dated ca. 6000 B.P. at the Brigham site, and nearly as old or older at the Sharrow site, both in Maine (Petersen and Putnam 1992:39).

The Gaspereau Lake site assemblage also included three 'pre-plummets' (Plate 9). Erskine believed that these large notched stones, #21, 354, and 231, although not having any resemblance to conventional plummets, served the same purpose. Number 21 was found in Unit C-4 at a depth of 9 inches (23 cm), in the same Archaic hearth as slate knife number 309. 231 was recovered in Unit D-5 at a depth of 5 inches (13 cm) and # 354 in Unit B-4 at a depth of 9 inches (23 cm). Although there are no regional analogies for the pre-plummets in the Maritimes, they do closely resemble the bilaterally notched netsinker

from the Sharrow site recovered in Stratum III, dated ca. 7500 to 5000 B.P. (Petersen 1991:112, Figure 85).

The sole artifact included in the gouge category is the bit end of a full-channeled gouge. Number 266 was found at a depth of 5 inches (13 cm) in Unit A1, in the Ceramic area of the site. Erskine reported that this artifact was recovered from undisturbed clay near a deep hearth which may be responsible for its provenience. In Maine full-channeled gouges are associated with the Gulf of Maine Archaic tradition and date as early as ca. 8000 B.P. and later to ca. 6000 B.P. (Robinson 1992, 1996)

There were five adzes and adze blanks recovered from the Gaspereau Lake site (Plate 10). They are from Units B-2 (14), A-2 (44), A-1 (317), D-4 (9), and B-4 (26), all in the Archaic portion of the site. Their context suggested to Erskine that they were cached in hearths between visits to the site (Erskine 1967). These artifacts are rather amorphous. Some seem to be badly weathered and not easily diagnostic. Adzes are associated with all manifestations of the Archaic Period, as well as the Early Ceramic Period.

There are two grooved axes included in the Gaspereau Lake assemblage (Plate 10). Number 6 was found in Unit C-2 at a depth of 6 inches (15 cm) above a Late Ceramic projectile point fragment. Specimen 27, which is shallowly grooved on one face only, was found at a depth of 2 inches (5 cm) in Unit C-3. Both were recovered from the

Ceramic Period portion of the site, which is obviously the result of a disturbance such as the enlarging of hearths, since grooved axes are associated with the Late Archaic.

The last artifact class to be discussed from the Gaspereau Lake site is that of ground stone rods. There are two such artifacts in the Gaspereau Lake site assemblage, sharing the same catalogue number, #28 (Plate 12). Both were recovered from Unit -A-1 with no depth recorded. Both are made of slate and are badly weathered. The specimen at the top of Plate 12 has an oval cross-section and was probably a finished rod at one time, while the bottom specimen may represent a rod preform. Neither would seem out of place among the rods and rod preforms illustrated from the Gillman Falls site in Maine, dating ca. 6300-7300 B.P. (Sanger 1996: Plate 6). Ground stone rods from both mortuary and non-mortuary assemblages associated with the Gulf of Maine Archaic tradition have been dated as early as 9000 B.P. (Robinson 1992, 1996).

Gaspereau Lake Assemblage Reconsidered

The previous discussion has served to review Erskine's chronology, the artifacts responsible for his groups, and other artifacts considered significant. It was felt that including Erskine's original categories would provide better insight into the re-interpretation of the Gaspereau Lake site since they reflect the excavator's thoughts and impressions. The present interpretation closely follows that of Erskine, only with the

advantage of the wealth of research that has been accomplished in the three decades since the site was excavated.

Erskine believed that the site's location was chosen because the outlet of the lake formed a natural weir for netting gaspereau, salmon, and eels. This location was also thought to provide canoe access to the coast, other interior lakes, and miles of hunting country (Erskine 1967). Based on the Blue-whin projectile points, that looked older than anything he had seen in his experience, Erskine believed that the Gaspereau Lake site was initially inhabited before 5000 B.P. The Archaic occupation that followed included at least three hearths lined with discarded tools. There was no clear break between the earliest and later Archaic components, with some of the hearths having been used by both. In the Archaic sequence of the Gaspereau Lake site, contracting stemmed projectile points and slate knives gave way to stemmed and eared points as the site moved northward.

In a later projectile point sequence and typology for all of Nova Scotia, Erskine classified the Gaspereau Lake contracting stemmed points (Group 2) and Gaspereau Lake narrow points (Group 3) as belonging to the Archaic Period dating between 7000-5000 B.P. The Gaspereau Lake side notched points (Group 6) and the Gaspereau Lake straight stemmed points (Group 4) were included in his Late Archaic group, ca. 5000 BC to 2500 B.P. (Erskine 1998:88).

There are several reasons to believe that the Gaspereau Lake site was initially inhabited before 5000 B.P. The first is the two Palaeoindian points that apparently represent two separate phases of the Palaeoindian Period in the Northeast. The fluted point (#158; Plate 2) is similar to the smaller fluted points from the Debert site in Nova Scotia ca. 10,600 B.P. Based on form and technology, the Plano point is suggested to date ca. 8000-10,000 B.P. in the Northeast (Doyle et al. 1985:15). The second reason is the presence of the ground stone rods and full-channeled gouge fragment. Both of these artifact classes are considered to be characteristic of the Gulf of Maine Archaic tradition ca. 8000 B.P. (Robinson 1992). This relationship is based solely on morphology since their provenience places them in the Ceramic Period portion of the site. This may be like the Palaeoindian points, the result of low sediment accumulation and disturbances caused by the numerous re-occupations of the site. Characteristic artifact forms of the Gulf of Maine Archaic tradition, aside from ground stone rods and full-channeled gouges, include a core and uniface technology, and the paucity of bifaces of any kind (see Chapter 3). One of the earliest uniface tool forms from the Sharrow site are choppers, described as " made from tabular breaking material with poor conchoidal fracture, roughly shaped, often with relatively blunt edges" that were "expediently made... restricted to the Early and Middle Archaic Period strata" (Petersen and Putnam 1992:39). From the Gaspereau Lake site, choppers and what Erskine considered to be adze blanks recovered from the earliest areas could easily fit into the above description. Adze blank #9 (Plate 10) recovered in

Unit D-4 at a depth of 12 inches (30 cm), would easily fit in with the choppers pictured from the Sharrow site (Petersen and Putnam 1992:41, Figure 10).

Similarities between the Gaspereau Lake site assemblage and that of the Sharrow site are derived on rather speculative evidence, but are intriguing. Based on the artifact forms and their position recovered within the Gaspereau Lake site, an Early Archaic occupation is a definite possibility. The comparison of the rest of the Gaspereau Lake site chronology to that of the Sharrow site may serve to strengthen this comparison.

The two contracting stemmed points that make up Erskine's Group 2 represent the next occupants, chronologically, at the Gaspereau Lake site. These were both found in the earliest portions of the site and are similar to Middle Archaic forms that date ca. 7600-7000 B.P. at the Neville site (Dincauze 1976:106). Their presence establishes, without a doubt, a Middle Archaic occupation of the Gaspereau Lake site.

Similar to the sequence of the Neville site, the next projectile point form from the Gaspereau Lake site is the Group 3 narrow bladed straight stemmed Merrimack style (see Plate 4). Dated ca. 6000 B.P., they are considered to be part of a single developing cultural tradition with the earlier Neville and Stark style points at the Neville site (Dincauze 1976:123). This is also thought to be the case at the Gaspereau Lake site. Unlike the assemblage at the Neville site, however, Erskine has grouped the ground slate knives in with the earliest Archaic inhabitants. This becomes interesting when we again turn to the Sharrow site in Maine.

At the Sharrow site the oldest projectile point recovered in situ is dated ca. 6400 B.P., and is thought to be analogous to Merrimack style points (Petersen 1991:60). Contemporaneous with the Merrimack point were six fragments of ground slate points dated ca. 6300 B.P. and a stemmed point dated ca. 6000 B.P. that is similar to Middle Archaic styles at the Neville site (Petersen and Putnam 1992:39). Together with the two Stark points that were collected from the eroding riverbank at the Sharrow site (Petersen and Putnam 1992:35) it has striking similarities to the assemblage of the Gaspereau Lake site.

Chronologically the next point type at the Sharrow site consists of five side notched points that are similar to the Brewerton and Otter Creek style dated ca. 5800-5300 B.P. This is then followed by several projectile points and primary ovate bifaces attributed to the Late Archaic Susquehanna tradition after 4000 B.P. (Petersen 1991:63). This is also the case for the Gaspereau Lake site.

Upon closer examination, it is believed that Erskine's projectile point Group 4 and Group 6 are in reverse order. Although Group 4 points are, on average, found at greater depths than Group 6 points, the later are found further south in the site (see Figures 6 and 7). It was probably the depth that convinced Erskine to attribute the Eared points as being chronologically earlier than the Broadspear points, and in this case the distribution is definitely more indicative of their true relationship than the depth of the artifacts. This is further strengthened by the fact that typologically in the Northeast, Brewerton eared and

side notched points always date earlier than Susquehanna Broadspear types. Peoples associated with Group 4, or the Susquehanna archaeological culture, projectile points were the last Archaic group to use the Gaspereau Lake site.

Conclusion

The Gaspereau Lake site assemblage contains artifact forms that indicate one of the of the longest cultural chronologies in Eastern Canada. The presence of Palaeoindian and Early and Middle Archaic populations is based on artifact form alone, without much contextual data to back it up. But even a conservative interpretation suggests the contracting stemmed points (Group 2) are representative of a Middle Archaic occupation of the site, which in the scope of the present research would accomplish at least part of the main goal, to demonstrate that the Maritimes were inhabited during the early Holocene. The Group 2 stemmed points alone indicate, through their similarity with dated examples from other sites, that the Gaspereau Lake site was occupied by ca. 7600–7000 B.P.

A more liberal interpretation of the Gaspereau Lake site assemblage, as above, would indicate an occupation spanning the entire Holocene epoch. This is based on artifact forms and the similarities between the Gaspereau Lake assemblage and that of the Sharrow site in Maine. The similarities between the assemblages of the two sites is uncanny and it may have only been depositional regimes at work that were different.

The goal of the analysis of the Gaspereau Lake site assemblage was to reevaluate the assemblage in light of the research that has been accomplished since its excavation. The purpose of the present thesis is to reevaluate the 'Great Hiatus' in Maritime Provinces prehistory. A very conservative interpretation would seem to accomplish both these goals, while a more liberal one would prove it beyond a doubt.

CHAPTER 5

COLLECTIONS ANALYSIS

A collections analysis methodology was undertaken in order to identify artifact forms recently established as characteristic of early Holocene cultures in Northern New England. Collections in New Brunswick and Nova Scotia held by museums, educational institutions, provincial government departments, and private collectors were examined, followed by an extensive search of the existing literature. This exercise resulted in the identification of 122 artifacts, in three classes, that are believed to represent the archaeological remains of early Holocene occupation within the Maritime Provinces. The artifacts, their context, distribution, and implications for the archaeological record of the Maritimes are discussed below.

Current Research

In order to demonstrate an occupation of the Maritimes during the early Holocene, an extensive search of regional collections was undertaken. Following an established methodology (e.g. Dincauze and Mullholland 1977; Spiess et al. 1983), existing collections were re-examined in light of new information. The present research was based on the recently defined Gulf of Maine Archaic tradition and the earlier complexes of the recently re-defined Moorehead burial tradition by Robinson (1987, 1992, 1996).

Artifact forms that are considered the most characteristic and most easily recognizable of these traditions were the basis of the collections analysis.

Six weeks were spent traveling in Maine, Nova Scotia, and New Brunswick examining collections held by educational institutions, museums, government departments, and private collectors. In Maine, early Holocene site assemblages were examined and researchers were interviewed. Time in Maine was divided between the University of Maine at Farmington, the University of Maine at Orono, the Maine State Museum, and the Maine Historic Commission. In Nova Scotia, collections held at the Nova Scotia Museum, Yarmouth County Museum, Queens County Museum, and one private collection were analyzed. In New Brunswick, collections held at Archaeological Services New Brunswick, and the New Brunswick Museum's collection housed in the National Exhibition Center were examined.

When analyzing collections, it was primarily full-channeled gouges, ground stone rods, and Neville and Stark style stemmed projectile points that were sought out. These are the most easily recognized and characteristic artifacts of the Early and Middle Archaic Period in Northern New England (Petersen and Putnam 1992; Robinson 1992, 1996). Additional Early and Middle Archaic artifacts from Northern New England include a flaked stone industry which is dominated by core and uniface tools. These were considered too ambiguous for this type of research. Due to the 'crudity' of the core and uniface tools, untrained individuals are unlikely to recognize them as artifacts, in comparison to the more obvious artifacts such as full-channeled gouges and ground stone

rods. This difference in identification was a significant factor since almost all of the artifacts used in the present study were surface collected by private collectors.

Artifacts that were examined were photographed, and their basic metric attributes measured. Both black and white and colour slide film was used for the purpose of publication and presentations, and all provenience information available was recorded. This information has since been catalogued on 5 x 3 inch cards that crosslist related slides, prints, negatives, metric attributes, and provenience information.

None of the artifacts in the collections examined from Nova Scotia and New Brunswick were from professionally excavated sites. Provenience information available on the artifacts varied: from Borden numbers from surveys; to individual donor's names; or no provenience recorded (see Appendix A for the available data on the individual artifacts used in this study).

An extensive search of the existing literature was also undertaken. This consisted of reviewing survey reports, documented private collections, and other related literature. Artifacts used in the present study from these sources are indicated in Appendix A. Both the artifacts and some of these sources will be discussed in more detail below.

The only chipped stone artifacts included in the present study were Neville and Stark style projectile points. These large contracting stemmed bifaces were originally identified at the Neville site in New Hampshire (Dincauze 1971, 1976), and more recently in collections from Maine (Spiess et al. 1983) and southwestern New Brunswick (Deal 1984). At the Neville site these forms have been dated ca. 7600-7000 B.P. (Dincauze

1976:106), as noted above. It was the Stark and Neville complexes from the Neville site that were responsible for initially revising an occupational hiatus for the Middle Archaic in New Hampshire and Southern New England (Dincauze 1976). These point forms were also used in two distribution studies which the present research methodology is based on for Southern New England (Dincauze and Mullholland 1977), and Maine (Spiess et al. 1983).

There are seven contracting stemmed Stark style points known from the Maritimes. Of the five points from New Brunswick, four are from the Spednic Lake area and one is from the Grand Lake area (Figure 8). Specimens from Spednic Lake were found by private collectors, whose collections have been catalogued and Borden numbers have been assigned to findspots. Both of the Stark style points from Nova Scotia are from the Gaspereau Lake site (Plate 3). John Erskine mentions that these points are rare in Nova Scotia and that he had seen only one other specimen that was collected at Melanson (Erskine 1967). No evidence of this artifact has been found.

Stark style points are distributed along three of the biggest lake systems in the Maritimes. Their limited numbers make any interpretation of their distribution rather speculative, but what has been observed does suggest strong affinities with Northern New England. Typically, in New England, Middle Archaic Period points cluster at lake inlet-outlet locations (Yesner et al. 1983), interpreted as settlements at optimal locations for the exploitation of anadromous fish (Spiess et al. 1983:237).

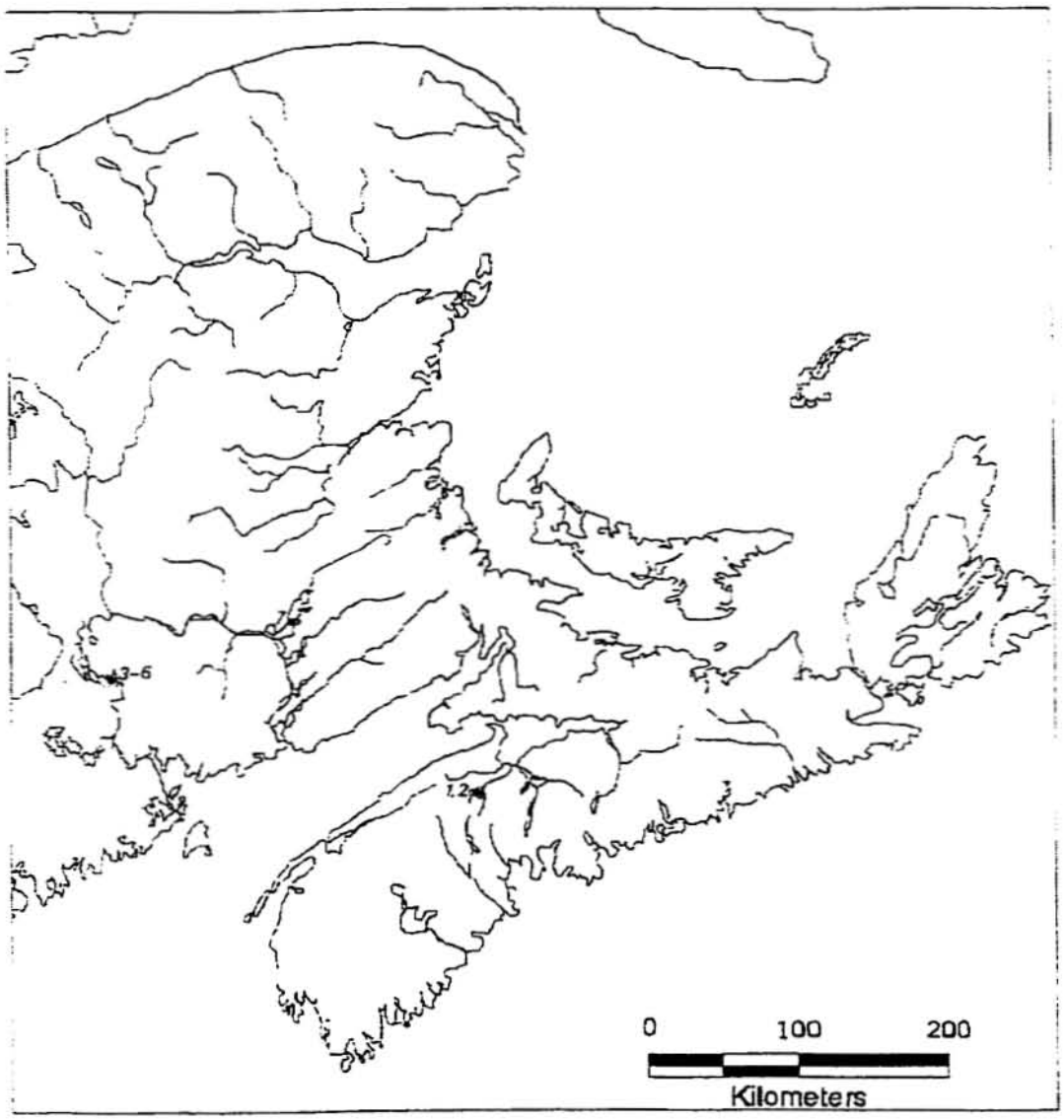

Figure 8. Distribution of contracting stemmed projectile points in the Maritimes: 1-2) Gaspereau Lake site; 3-6) Spednic Lake/Star Island; 7) Grand Lake. See Appendix A for additional information on individual artifacts.

Distribution of Stark and Neville style points in New England, where their numbers dramatically drop from south to north, was originally thought to reflect population differences with northern Maine having been less densely populated. This has recently been re-interpreted as representing the established projectile point distributions bordering an area of contrasting technology, with the Gulf of Maine Archaic tradition, rather then being indicative of population size (Robinson 1992:76). The distribution in the Maritimes is thought to reflect this as well.

It is ground stone, rather than flaked stone, artifacts that form the core of the present study. Specifically, it is the identification and distribution of full-channeled gouges and ground stone rods that is the basis for the early Holocene occupational model developed in the present thesis. Although Robinson states that for the Gulf of Maine Archaic tradition "at present full channeled gouges and long well finished ground stone rods are perhaps most diagnostic of the Gulf of Maine Archaic" (1992:100), and that the "most characteristic artifact types of the Morrill Point burial complex are the full channeled gouges and rods" (1996:104), he quickly warns that "neither tool form is demonstrated to be exclusive to the tradition" (1992:100); it is the combination of broad lithic patterns that form a polythetic set that is considered to be diagnostic of the Gulf of Maine Archaic tradition. This is based on these distinctive ground stone tool forms having been found in comparatively small numbers and typically in fragmentary states (Robinson 1992:100). For the present study, however, circumstances did not permit this broader consideration.

None of the artifacts used in the present study came from professionally excavated sites. Although provenience information places some artifacts as being from the same area, there is, with one possible exception, no evidence of any being found together in what might constitute an assemblage. Most of the artifacts were donated to museums individually by private collectors around the turn of the 20th century.

As previously stated, the flake core/uniface tools, tabular choppers, and adzes that are also considered part of the Gulf of Maine Archaic broad scale technological tradition, and round out the polythetic set, were considered too ambiguous for the present research. Therefore, it is only the distribution of full-channeled gouges and ground stone rods that were used for the present analysis.

It is the sheer number of ground stone full-channeled gouges in the collections of the Maritimes that is the most convincing evidence of an early Holocene occupation. A total of 94 gouges, 34 from New Brunswick, 59 from Nova Scotia and one from Prince Edward Island, were accounted for. Full-channeled gouges are considered one of the most characteristic artifact types of both the Gulf of Maine Archaic tradition (Robinson 1992:100) and the Morrill Point burial complex (Robinson 1992:100, 1996:104). They have been recovered in professionally excavated sites and reliably dated ca. 8000-6000 B.P. (e.g., Petersen and Putnam 1992; Sanger 1996: Sanger et al. 1992).

Twenty-three of the 34 gouges from New Brunswick were found in the collections analyzed, and 11 were from other sources. One of these sources was notes made by Michael Deal (1983) on artifacts from private collections around the Spednic Lake area.

These notes included information on eight full-channeled gouges, two of which were not available in the collections. The other major source was an untitled document from the Canadian Museum of Civilization that consisted of some of William Wintemberg's notes (Wintemberg 1913), including a photograph taken in 1913 of the gouges that were on display then at the Museum of the Natural History Society of New Brunswick. This display included 18 gouges, 12 of them with full channels, of which three were not available in the studied collections. All except one of the specimens in the photo were from the Grand Lake area.

From Nova Scotia there were 59 gouges accounted for, with 18 from the literature. The most significant paper for the present research was Deal and Rutherford's "The Distribution and Diversity of Nova Scotian Archaic Sites and Materials: A Re-examination" (1991). This research expanded on Piers' 1895 article "Relics of the Stone Age in Nova Scotia", and is an inventory of Archaic Period material culture and site locations for Nova Scotia that includes all the available published and unpublished sources to 1990, as well as personally communicated information on private collections. It is interesting to note that of the 365 chipped and ground stone artifacts included, only two were excavated by professional archaeologists and none have associated radiocarbon dates (Deal and Rutherford 1991). Artifacts reported in this study included 29 full-channeled gouges.

Piers' original article was a paper read to the Nova Scotia Natural History Society describing a number of 'aboriginal relics' found in the Nova Scotia Provincial Museum

(Piers 1895). Included in this inventory were 17 gouges, seven of which had full channels, illustrated from the Charles Fairbanks collection. Most of this collection is thought to originate from William King's farm at the head of Grand Lake (Piers 1895:26).

Morphologically, gouges occur in two distinct forms: long parallel-sided gouges with deep rounded channels; and wide flared bit gouges with full channels that are flat in cross-section (Robinson 1996:105). The parallel-sided form is characteristically narrow with a uniform deep channel running the full length of the tool. This channel is usually fully polished with the dorsal side sometimes polished as well (Robinson 1992:86). Flared bit gouges are in the form of an isosceles triangle with the widest point at the bit, and are usually fully polished (Robinson 1992:86-87). Robinson states that although the two forms have occurred together at the Sunkhaze Ridge site, the flared bit forms appear to have a more limited distribution in time and space than the narrow full-channeled forms (Robinson 1992:87). This is also the case in the collections for the Maritimes, where both parallel sided gouge and wide flared bit gouge forms were represented.

Sixty-five of the gouges from the Maritimes were the parallel sided form (21 from New Brunswick and 44 from Nova Scotia) and 19 had wide flared bits (12 from New Brunswick and 7 from Nova Scotia). The parallel form varied and could further be subdivided, upon visual inspection, into those with sides either narrow parallel (n=31), wide parallel (n=22), and slightly expanding towards the bit end (n=12).

Of the 57 gouges that appeared complete, most were well worn, with seven exhibiting obvious evidence of having been hammered on the pole end. Only one,

number 16, appears too delicate to have been manufactured for utilitarian purposes. This flared bit gouge is beautifully made, fully polished and consistently approximately 10 mm thick (Plate 13). Although there is evidence of use wear on the bit end of this specimen, it was probably produced as a mortuary artifact. Other gouges that were interesting included two that appeared to have constrictions to facilitate hafting (#7 and 8), and one with deep incised lines that did not appear to serve any function (#29). The specimen from the Rouen Island site (#29) has a wide shallow channel and two grooves pecked into the dorsal side. This artifact was originally identified as an adze but has the characteristics of a full-channeled gouge and was therefore used in this study.

In New Brunswick most of the gouges are from the southern portion of the province, along the lakes and river systems. They are concentrated in three areas (Figure 9). There are 11 from the Spednic Lake area (#1-11), 13 from the Grand Lake and lower St John River area (#16-28), and four from the Passamaquoddy Bay area (#12-15). There is also a single specimen from the northern part of the province and another from the southeast. One of the specimens from Passamaquoddy Bay (#15) was recovered off the coast of Indian Island at a depth of 38 m by a scallop dragger (Black 1997).

The distribution of gouges in Nova Scotia is also along the lakes and river systems, although not as concentrated as in New Brunswick (Figure 9). Thirty-one of the 46 gouges that have provenience information are from the Lake Rossignol area (#59-72), Gaspereau Lake (#50-54), and Grand Lake (#36-47). Six of the gouges from Lake Rossignol were surface collected by members of the Nova Scotia Museum when the lake

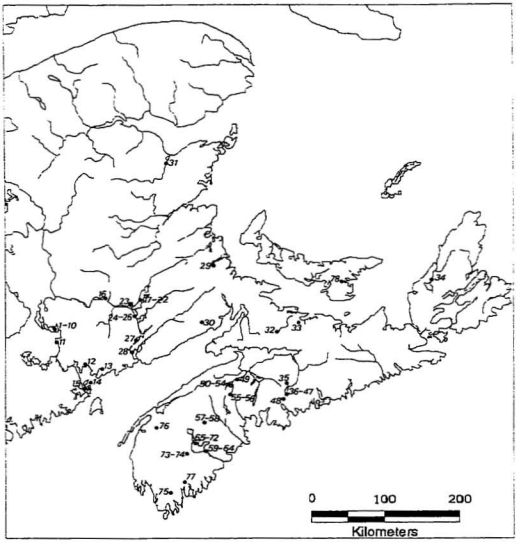

Figure 9. Distribution of full-channeled gouges in the Maritimes: 1-10) Spednic Lake/Palfrey Lake/Diggity Stream; 11) St. Croix; 12) Phil's Beach; 13) Lake Utopia; 14) the Rouen Island site; 15) Off the coast of Indian Island; 16) St. John River above Fredericton; 17-20) Grand Lake; 21-22) Indian Point; 23) French Lake; 24-26) Jemseg; 27) Big Lake Musquash; 28) Westfield Beach; 29) the Wentworth site; 34) Scottsville; 35) Enfield; 36-47) King's Farm, Grand Lake; 48) Lake Thomas; 49) Melanson; 50-54) Gaspereau Lake; 55-56) Salmontail Lake; 57-58) McGowan Lake; 59-64) Indian Gardens; 65-72) Lake Rossignol; 73-74) Shelbourne River; 75) Barren lake; 76) Eel Lake; 77) Clyde River; 78) Montague. See Appendix A for additional information on individual artifacts.

was drained to its pre-dammed levels to facilitate dam repairs (Christianson 1985; Rossignol Survey 1985). Four of the gouges from Gaspereau Lake were from private collections, and one was from the Gaspereau Lake site assemblage. The entire Charles Fairbanks collections that included seven full-channeled gouges was reportedly found on the King Farm at the head of Grand Lake (Piers 1895:26). Also of interest is the gouge from Clyde River (#77) that was reportedly recovered from a depth of 10 feet (3 m) below the surface (Piers 1911:206).

The only specimen from Prince Edward Island was a narrow parallel style gouge that was recently found along the Montague River, near the town of Montague (#78, see Figure 9). This specimen was found by a bottle collector at a reported depth of 5 feet (1.5 meters) below the surface (Cunningham 1998).

Gouges are usually attributed to a heavy wood working industry. Inferred from the present distribution of findspots along rivers and lakes, they may have functioned in a dugout boating technology. Dugout canoes were constructed by continuously charring and scraping a selected log until the desired form was achieved. Preservation factors weigh heavily against the chances of recovering evidence of dugouts but in some cases they have been discovered. Such specimens include three from Savannah Lake in Ohio where the peat bottom has served to preserved them. All three are close to seven meters long and one meter wide and date to the Late Archaic Period (Brose and Gruber 1982). The distribution and number of gouges and round stone rods may represent evidence of a similar technology in the Maritimes.

Ground stone rods are considered the earliest tool forms yet identified for the Gulf of Maine Archaic tradition (Robinson 1992:100). They are also considered characteristic of the assemblages of the two earliest complexes of the recently re-defined Moorehead burial tradition. Rods, especially those with expanded heads and lacking perforations, are considered to be one of the defining characteristics of the Table Land burial complex ca. 8500 B.P. (Robinson 1996:100) and, along with full-channeled gouges, the characteristic artifact types of the Morrill Point burial complex ca. 8000-7000 B.P. (Robinson 1996:104).

Rods found in Northern New England consist of metamorphics that range from friable schists to slate-like stone and occur in two forms: those made from naturally rod-like pebbles with some grinding; and fully ground specimens (Robinson 1992:92). Fully ground specimens are usually widest near the center and contract toward the ends. Cross sections are round, oval, or flattened, and they vary in length, with the longest being 36 cm (Robinson 1992:92). The most variable attribute of the rods is their end treatment. This includes specimens that are semi finished, blunt, contracting to a dull point, beveling of one end, notched, perforated, and having expanded heads (Robinson 1992:92). The expanded head form is thought to be the earliest variant.

Rods are generally identified as whetstones, with their form appearing to facilitate the sharpening of the full-channeled gouges. While this is a possibility for some, Robinson believes that some specimens appear to have been shaped, rather than used to shape something else, and the longer and more highly finished specimens may have been

produced as mortuary artifacts (1996:106). This diversity of stone rod forms also suggests the possibility of multiple functions.

Twenty-one ground stone rods were found in the collections and literature from the Maritimes, including 11 from Nova Scotia (four from the literature), and 10 from New Brunswick (one from the literature). Rods with provenience from Nova Scotia are from East Brook on Lake Rossignol, Cook's Falls on the LaHave River, Upper Nine Mile Lake, and with two rods each from Gaspereau Lake, Eel Lake, and Sherbrooke Lake (Figure 10). The distribution of rods in New Brunswick included one from Portobelo Lake, Jemseg River, Phil's Beach on the Bocabec River, Wabski on the Tobique River, and two from Maquapit Lake, Indian Point on Grand Lake, and Spednic Lake, respectively (see Figure 10).

The distribution of rods in New Brunswick is along the larger lakes and rivers, with six from around the Grand Lake area, two from Spednic Lake, and the two remaining from the Tobique and the Bocabec Rivers. The rod distribution in Nova Scotia follows that of New Brunswick, with all of the rods from lakes, except one, #4, from the LaHave River. This is similar to the distribution of the full-channeled gouges to which the rods are ultimately related.

Rods analyzed were mostly fragmentary, with only six apparently complete. The longest complete specimen was #4, measuring 275 mm. Rods examined had both round and oval cross-sections, and four exhibited end treatment. End treatment

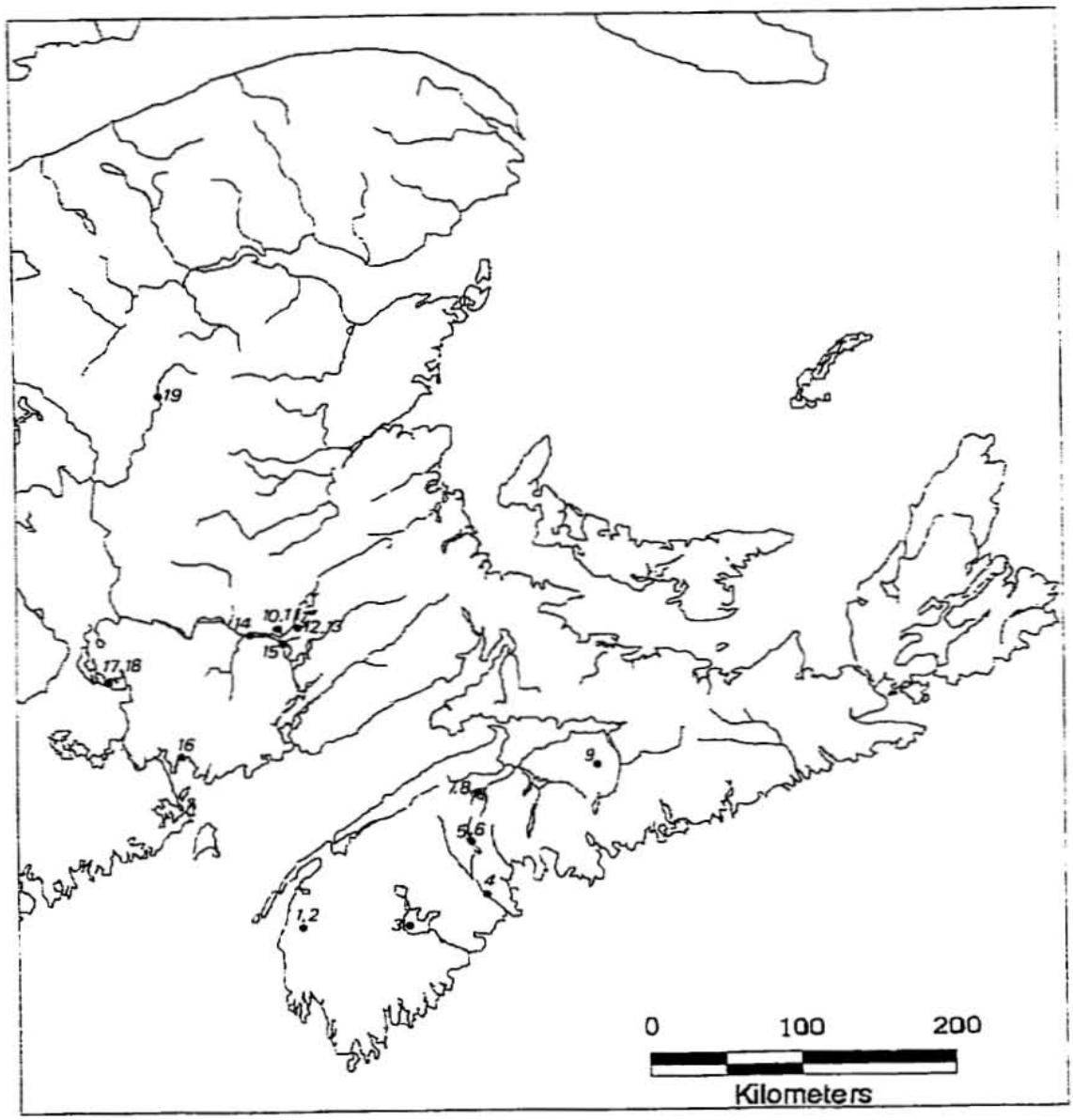

Figure 10. Distribution of ground stone rods in the Maritimes: 1-2) Eel Lake; 3) East Brook; 4) Cook's Falls; 5-6) Sherbrook Lake; 7-8) Gaspereau Lake; 9) Upper Nine Miles Lake; 10-11) Maquapit Lake; 12-13) Indian Point; 14) Portobelo; 15) Jemseg; 16) Phil's Beach; 17-18) Spednic Lake; 19) Wabski. See Appendix A for more information on individual artifacts.

included two with expanded heads from Nova Scotia (#4 and 5), and two with both ends tapering to points from New Brunswick (#17 and 18). As stated above, rods with expanding heads are considered the defining characteristic of the Table Land Burial complex, ca. 8500 B.P., and have been dated at the Weirs Beach site ca. 9000 B.P. (Bolian 1980; Maymon and Bolian 1992). The two rods from Nova Scotia are from Cook's Falls and Sherbrook Lake. The specimen from Cook's Falls appears to be complete and is the longest rod that has been recorded, while the Sherbrook specimen is only the end fragment. From New Brunswick the two rods with tapering ends are both from the same private collection, but from different sites on Spednic Lake. One of the rods, #8, from the Gaspereau Lake site is thought to be a rod preform.

Discussion

Evidence of an early Holocene occupation of the Maritime Provinces is indicated by the number and distribution of contracting stemmed projectile points, ground stone rods and full-channeled gouges. Provenience information on the artifacts used in this study suggest that sites, represented by these artifacts, were almost exclusively situated around the larger lake systems in New Brunswick and Nova Scotia. In New Brunswick, it is the Spednic Lake and Grand Lake areas around which all three classes of artifacts cluster. In Nova Scotia it is only the Gaspereau Lake area where all three classes occur, with Lake Rossignol having both rods and gouges, and Grand Lake having the most impressive number of full-channeled gouges.

With the possible exception of the Fairbanks collection, none of the provenience information for the specimens used in the present study indicates that any of the artifacts were found together, or with other artifacts, in what might constitute an assemblage. In a study such as the present undertaking, artifacts that are associated with assemblages can provide more information on site use and affiliation with archaeological cultures. Artifacts not associated with assemblages may, however, be considered stronger evidence for an early Holocene occupation of the Maritime Provinces, since it is theoretically possible that each artifact represents a different site.

Whether the Fairbanks collection represents the assemblage from a single site, is problematic. The Fairbanks collection was loaned to Harry Piers, prior to his 1895 paper, by Charles R. Fairbanks, who in turn had inherited the collection from his father Charles W. Fairbanks. On examining the collection, Piers commented that there were no labels on the artifacts indicating provenience but "there is no doubt that they are Nova Scotian and probably nearly all were found on Mr. King's farm" (Piers 1895:26). In a later survey of the area, Preston (1974) supports this, reporting that although there were no traces of prehistoric occupations in the area now, he believed that the King Farm is the source of some, if not all, of the Fairbanks Collection (1974:8).

The Fairbanks collection itself is quite substantial consisting of 38 celts or adzes, two plummets, two grooved axes, two large stemmed projectile points, and 17 gouges, all illustrated in Piers (1895). The fact that most of the sites reported from the Grand Lake area are Archaic in age, based on artifact forms, and that Charles W. Fairbanks had been

the engineer in charge of the completion of the Shubenacadie Canal during the 1850s make this claim, that all of these artifacts are from the same location, questionable. Both of these factors may have provided Mr. Fairbanks with ample opportunity to add to his collection. This enigmatic situation deserves more attention, and until then considering the Fairbanks collection as a single site assemblage is thought to be premature.

The distribution of the artifacts, whether representing individual sites or not, indicates possible settlement patterns. Sites aggregated around lakes, especially those situated at the inlet-outlets of lakes, are usually interpreted as optimal locations for exploiting anadromous fish. Anadromous species are thought to be an important resource and site location factor for the Early and Middle Archaic sites in New England (Petersen and Putnam 1992; Spiess et al. 1983), as well as Late Archaic site distribution (Turnbaugh 1975). This is thought to be the case in the Maritimes as well.

One of the reasons that the Great Hiatus Model has persisted in Maritime Provinces prehistory has been the traditional approach of using projectile points as cultural and temporal markers. This approach in the Maritimes, as in Northern New England, has proven to give a negative image of occupation. With the recent excavations of well stratified and dated sites in Maine, certain ground stone forms have been recognized as better indicators. Full-channeled gouges and rods have been in the collections of the Maritimes for a long time but have never been found in professionally excavated sites, let alone in well dated contexts.

In Northern New England full-channeled gouges have been erroneously attributed to the Vergennes phase of the Laurention tradition based on its definition in New York State and Vermont (Ritchie 1965, 1968). The Vergennes concept is still used in Northern New England by some (Cox 1991; Sanger et al. 1977) but thought to be problematic, at least in some areas (Petersen and Putnam 1992; Robinson 1987:37; Sanger 1996). Barring the large side notched Otter Creek points that are characteristic of the Vergennes phase, the rest of the assemblage, as well as settlement and subsistence patterns, is very similar to the Gulf of Maine Archaic tradition (Cox 1991; Petersen and Putnam 1992). Therefore, Otter Creek points being found in the same contexts as full-channeled gouges and ground stone rods may be the result of site preservation factors resulting in compressed stratigraphy, rather than representative of single components (Petersen and Putnam 1992). The range of variation through time for full-channeled gouges is poorly known, although they appear to be widely distributed in the Northeast (Robinson 1992:86). As it stands, their exclusive association with the Gulf of Maine Archaic tradition is still questionable, but neither are they exclusively associated with the Vergennes phase as previously believed.

This research suggests that the early Holocene occupants of the Maritimes were very similar to those of Northern New England. The distribution of artifact classes used in the present study follows that of contemporaneous sites in Northern New England, with evidence of occupation along the major lakes and rivers and a lack of sites along the

coast. There is no doubt that there were similar cultures throughout the Maritime Peninsula and Northern New England.

CHAPTER 6

PROPOSED MODEL

An early Holocene occupation of the Maritime Provinces is proposed. This model is based on the present research and thought to be compatible with the Gulf of Maine Archaic tradition. Hypotheses previously proposed to explain the Great Hiatus in Maritime Provinces prehistory are briefly discussed in light of this information. Data on site location and preservation factors from sites in Maine are reviewed and possible implications for the archaeological record of the Maritimes are discussed.

Proposed Model

The primary goal of the present research was to devise a working model of Early and Middle Archaic cultural manifestations in the Maritime Provinces. The three previous chapters have reviewed the existing literature on the paleoenvironment, re-interpreted the Gaspereau Lake site assemblage, and reported the results of a collections analysis of the available materials in New Brunswick and Nova Scotia. It is through the culmination of this research that a model of early Holocene occupation of the Maritimes will be based.

Paleoenvironmental evidence suggests strong affinities with Northern New England. An analogous environment with that of Northern New England, where there is well documented evidence of an Early and Middle Archaic presence, allows for the

possibility of an early Holocene occupation in the Maritimes. The existing literature for the Maritimes has, for the most part, suggested that a non-productive environment was responsible for the perceived population hiatus. The history of relative sea level change and how it has affected the geography of the Maritimes suggests that the shoreline ca. 10,000 to 5000 B.P. was vastly different than contemporary shorelines. This would have resulted in the inundation of any sites located along the coast and erased most of the archaeological evidence of such an occupation.

The analysis of the Gaspereau Lake site assemblage provides concrete proof of a Middle Archaic Period, ca. 7000 B.P., occupation in Nova Scotia. The Stark style projectile points recovered from the earliest portion of the site, stratigraphically below two other groups of well known Late Archaic forms, are undeniable evidence for this. The full-channeled gouge fragment and ground stone rods suggest the possibility of an Early Archaic Period utilization of the site. Similarities that are perceived between the Gaspereau Lake site assemblage and that of the Sharrow site in Maine strengthen this interpretation.

The results of a collections analysis, looking at three artifact forms considered characteristic of Early and Middle Archaic cultures in Northern New England, has further demonstrated solid evidence of an early Holocene occupation of the Maritimes. Provenience information suggests the importance of lakes and river systems with all three artifact classes having similar distribution patterns, although they were recovered separately. Similarities in site distributions and artifact forms demonstrate a strong

relationship with the Gulf of Maine Archaic tradition.

Based on this research it is proposed that the Maritime Provinces were occupied during the early Holocene. The distribution of Stark style projectile points suggests a Middle Archaic presence, while the full-channeled gouges and ground stone rods indicate an Early and Middle Archaic occupation. The distribution of the latter indicates that the southern portion of New Brunswick and most of Nova Scotia were populated during the early Holocene by people associated with the Gulf of Maine Archaic tradition. Based on artifact form alone, rods with expanding heads from Nova Scotia could possibly represent an occupation as early as 9000 B.P., as they have been dated in New Hampshire (e.g., Bolian 1980; Maymon and Bolian 1992). Both rods and gouges, although treated separately in the collections analysis, are believed to represent an occupation ca. 8000-6000 B.P. in the Maritimes, as they do in Maine (Petersen and Putnam 1992; Sanger 1996; Sanger et al. 1992).

The artifacts analyzed represent habitation sites almost exclusively. Mortuary artifacts associated with the Moorehead burial phase usually consist of finely made tools that appear too delicate for utilitarian purposes, covered in red ochre, often ritually broken, and found in assemblages. There was no residue of ochre on any of the artifacts analyzed, and most of the gouges and rods appear to have been well used, except specimen #16 (Plate 13), which may have been manufactured for mortuary purposes. With the exception of the Fairbanks collection as possibly representing one assemblage, about which the author has reservations, none of the artifacts were recovered in

associations similar to the assemblages that have defined the Morrill Point and Table Land burial complexes.

The distribution of full-channeled gouges and ground stone rods suggests a settlement pattern influenced by the exploitation of anadromous fish species, or at least a focus on waterways. Sites along lakes and rivers, especially in the confluence of the two, would be prime locations for such resources. Sites situated along waterways would also have facilitated travel by boat providing access to both the interior and coast. The seasonal nature of anadromous fishing and ease of travel by water serve to both explain and question the pattern that is interpreted from the artifact distribution.

It is believed that the distribution of the artifacts in the present study reveals only part of a multiple site or station settlement and subsistence pattern. The exploitation of anadromous fish species only represents part of a seasonal round which included the capitalisation of marine resources along the coast. It would be hard to imagine coastal resources not being important to people who inhabited the Maritimes, especially with the prominent role they have played in settlement strategies in later times, such as the during the Ceramic and Historic periods. The submerging of the coastline in the Maritimes at a rate of approximately 30 cm per century (Grant 1975; Scott and Greenburg 1983) would have long inundated any sites situated along the coast dating from the early Holocene. Evidence of a coastal settlement pattern is almost non-existent, with only one gouge (#15) being dragged up off the coast of Indian Island (Black 1997). If this artifact is representative of a site along the paleocoastline, and not an overboard loss, when plotted

on the sea level curve given for the Gulf of Maine and Bay of Fundy (a la Crock et al. 1993, Figure 5) it would indicate a site along the shore ca. 7500 B.P.

Sea mammal exploitation during the winter months may also have played a role in subsistence activities during the early Holocene. There is overwhelming evidence for the importance of seals to the prehistoric inhabitants of Newfoundland and Labrador (e.g., Erwin 1995; Fogt 1998; LeBlanc 1996; Murray 1992; Renouf 1993) and it continues to be an important resource today in Newfoundland and Labrador, as well as on Prince Edward Island and the Magdalene Islands. One of only three areas in the world where harp seals whelp, mate, and molt is on the pack ice in the Gulf of St. Lawrence (Sergeant 1991). Marine biologists believe that seal migration patterns have not changed drastically in the last 10,000 years (Sergeant 1991), and seals would therefore have been available to Early and Middle Archaic inhabitants of the Atlantic coast. This situation may be somewhat analogous to that in Labrador, where for thousands of years Maritime Archaic people flourished on the resources of the sea coast with their backs to a forest (Tuck 1991:41). The importance of marine resources to the Palaeoindian inhabitants of the Maritimes has also previously been proposed (Keenlyside 1985a, 1991; Tuck 1984). Unfortunately, evidence to support these claims has more than likely long been inundated by the sea.

Material culture of the early Holocene inhabitants of the Maritimes is thought to mirror that of the Gulf of Maine Archaic tradition. This has been demonstrated in the use of full-channeled gouges, ground stone rods, and stemmed projectile points found during the collections analysis, and in the perceived similarities between the Gaspereau Lake and

Sharrow site assemblages. It is hypothesized that the assemblages of well stratified early Holocene sites in the Maritimes, when they are discovered and excavated, will be similar to the sites excavated in Northern New England. It can be expected that sites will reveal assemblages including flaked stone tools characterized by a core and uniface technology, as well as ground stone forms. The flaked stone industry would include steep-edged quartz unifaces, irregular cores, flake tools, and flakes, with the selection of high quality quartz being a characteristic attribute, as it is in the early assemblages in Maine (Robinson 1992).

A wide ranging bone and antler tool industry is also expected. Preservation factors will dictate what will be recovered, but the nature of calcined bone has served to preserve over 60 individual fragments of bone tools ca. 6000-5800 B.P. from the Sharrow site in Maine. In the Maritimes faunal assemblages from interior sites are rare, and those that are recovered are almost exclusively calcined (Murphy and Black 1996:2). Poor preservation factors will also bias evidence of the proposed dugout boat technology.

Mortuary sites may also exist undisturbed in the Maritimes. These would again be analogous to those of the Table Lands and Morrill Point complexes of the Moorehead burial tradition. Morrill point complex cemeteries are said to occur on sand and gravel knolls and ridges, separate from occupation sites (Robinson 1992, 1996). They are characterized by red ochre deposits containing a variety of ground stone tool forms, including certain artifact forms thought to be indicative of age.

The model proposed for the Maritimes for the early Holocene is that people akin

to the Gulf of Maine Archaic tradition lived along some of the larger lakes and rivers, perhaps as early as 9000 B.P., and that the Maritimes were populated throughout the Great Hiatus and continuously from Palaeoindian times, as Tuck (1975) has previously suggested. Artifact distributions suggest that sites were located along the major lake systems but marine resources are also believed to have been an important attraction (see Figure 11 in Chapter 7 for a summary of the proposed model). In light of the current research the hypotheses proposed to account for a rapid attenuation of archaeological evidence for the early Holocene will be discussed.

Earlier hypotheses

The lack of apparent evidence for an Early and Middle Archaic presence in the Maritime Provinces has led to the formulation of many different hypotheses that attempt to explain this phenomena. These have, for the most part, relied on environmental factors such as paleoenvironmental reconstructions and relative sea levels, but have also included the lack of surveys and the non-recognition of diagnostic artifact forms. These are be reviewed in light of the present research. While none of the proposed hypotheses can be completely discounted, some are shown to be more likely than others.

The most popular of the explanations is known as the Ritchie-Fitting Hypothesis. This proposes that a major hiatus in the archaeological record was the result of the paleoenvironment not having the carrying capacity to support an archaeologically significant population. The available data on paleoenvironmental reconstructions for the

Maritimes does not, alone, either validate or reject this hypothesis. Instead, it is the similarities between the reconstructed paleoenvironment of the Maritimes and that of New England, where there is significant evidence for an early Holocene occupation, that suggest that this is not a factor. This is further strengthened by the number and distribution of the artifact forms from the collections analyzed in the present study. If the fishing of anadromous species was a key factor in early Holocene settlement and subsistence strategies, then changes in the regional fauna would not have effected their availability as it would have for terrestrial resources. As is the case in Maine (Petersen and Putnam 1992:19-20), the Ritchie Fitting hypothesis is no longer valid in the Maritimes.

Other hypotheses that suggest environmental factors contributed to an occupational hiatus include Sanger's hypothesis that the Gulf of Maine, or Bay of Fundy, was too shallow (Sanger 1975) and his River Gradient Hypothesis (Sanger 1979). Both suggest that environmental conditions led to the impoverishment of biotic resources. The literature concerning the history and development of the Bay of Fundy and its tidal systems is quite contradictory (Turnbull 1988:95), and does not address the resources that might have been available. Instead, the distribution of artifacts from the collection analysis will be used to address this hypothesis.

Three of the gouges from New Brunswick, and most of the gouges and rods found in Nova Scotia, are located on river systems that drain into the Atlantic (see Figure 9 and 10). It has been suggested that seasonal settlement on the Atlantic coast would provide

easy access to marine resources. This suggests that fluctuation in the biotic resources of the Bay of Fundy did not have any influence on a portion of the population. Evidence for people living along the lakes and rivers that drain into the Bay of Fundy also suggests that productivity was not debilitating.

The River Gradient Hypothesis has not been properly addressed in the present thesis. The development of the river systems since deglaciation has been affected by so many factors, such as isostatic rebound, lake formation and collapse, changes in relative sea levels, etc., that general statements, such as falls making rivers unusable to certain anadromous species, are problematic. Due to this complexity, these kinds of statements should be reserved for specific systems where evidence of these processes can be definitely demonstrated. Although this hypothesis may hold true for some river systems in the Maritimes, artifact distributions demonstrate that it does not hold true for the majority. Understanding the histories of individual river systems is, however, paramount to finding and understanding early Holocene sites in the Maritimes.

The Drowned Site Hypothesis is thought to be valid in light of the present research, albeit based on negative evidence and limited in explanation to coastal sites. Changes in the geography of the Maritime Provinces since early Holocene times is a result of the changes in the relative sea level. Sites along the shore between 10,000 and 5000 B.P. would be 18–16 meters and 58–8 meters below contemporary sea level according to sea level curves for the Maritimes (Grant 1975) and the Gulf of Maine (Sanger 1988), respectively. The full-channeled gouge found off the coast off Indian

Island is the only evidence for inundated coastal sites in the present study, but other evidence does exist. There have been numerous ulus, as well as other artifacts forms in smaller numbers, that have been dragged up off the coast of the Northeast and reported by archaeologists (e.g., Crock et al. 1993; Keenlyside 1984a; Turnbull and Black 1988). Ulus are the most suitable to such a recovery strategy since morphologically, they share the most attributes of any artifact forms with shellfish. Therefore, they are not believed to be very representative. Ulus are usually associated with the Late Archaic Vergennes phase of the Laurentian tradition (Cox 1995:151; Petersen 1995:218; Turnbaugh 1977), but some may well predate the Vergennes phase.

The Data Too Incomplete hypothesis (Sanger 1979) is also still valid in light of the current research. As suggested, pre 5000-year old artifacts are different than previously believed, and interior surveys of the Maritimes have been, for the most part, preliminary in nature, consisting of walking surveys and private collection analyses. Evidence for sites having been washed away was not presently addressed, but it is likely the case that they were at least mixed up if the same fluvial geomorphology and site preservation factors are in play in the Maritimes, as in Maine.

Site Preservation Factors

The premise of the present study is that the early Holocene occupants of the Maritimes are related to those of Northern New England. It is believed that people belonging to the same archaeological culture, using the same technologies, and living in

similar environments lived in the Maritimes and Northern New England. Continuing in this vein, the comparative wealth of information on site preservation and location in Maine will be reviewed in order to perhaps better understand the situation in the Maritimes.

In Maine, well stratified early Holocene sites have survived in deeply buried contexts. In fact, 17 of the 22 dated early Holocene sites in Maine are situated within relatively deep riverine alluvium (Petersen and Putnam 1992:27). In the case of the Sharrow and Brigham sites, the relative stability of the river channels and the natural constriction in the river at the down stream end of the large confluence pool, have ensured regular and deep alluviation from the late Pleistocene epoch onward (Petersen and Putnam 1992:33). This has resulted in separating cultural deposits with regular sediment aggradation, thus allowing over 55 cultural features, usually interpreted as short-term events, to be defined. As part of the Piscataquis Archaeological Project, the Brigham and Sharrow sites have been extensively studied. The results of this interdisciplinary research are thought to shed some light on the archaeological record of the Maritimes.

It is locations along rivers with aggrading alluvium and stable river channels that serve to bury deeply, and thereby preserve, early Holocene sites in Maine. Without sediment accumulation the remains of multiple occupations at a site become a mixture of poorly separated, often inseparable assemblages (Pertersen and Putnam 1992:23). River channels that are not stable tend to meander and may bury cultural remains well away from modern river channels or, alternatively, erode them altogether. The historic

damming of lakes in Maine has also affected site preservation, causing sites to be reworked into collections of artifacts (Petersen and Putnam 1992:24).

Across Eastern North America the most influential change in fluvial systems during the Holocene occurred before ca. 7000 B.P., although the record is variable from river system to river system. Recent research suggests that various drainages were likely unstable in northern Maine ca. 10,000-7000 B.P. (Petersen and Putnam 1992:24). These factors make discovery and testing of suitable archaeological contexts for early Holocene sites difficult in many riverine systems. Where evidence is preserved, contexts include deeply stratified sites, short-term deposits such as single occupation sites, and graves (Petersen and Putnam 1992:23). However, identification of these site types is generally difficult, demanding exceptionally deep excavation and close interval testing (Petersen and Putnam 1992:23). A sampling program would have to be designed to look at the specific places where stratified alluvium would be.

Assuming that circumstances are similar in Maine and the Maritimes, this information has many implications. With only two exceptions, the sites that artifacts represent in the collections are most likely from locations that have not been deeply buried by aggrading alluvium. Provenience information on full-channeled gouges and ground stone rods indicates that they were surface collected. The two exceptions are the gouges from the Montague River on Prince Edward Island and from the Clyde River in Nova Scotia. Both of these were reported to have been found buried in riverbank deposits at depths of five and 10 feet (1.5 and 3 m), respectively. This represents evidence that

early Holocene sites do exist in the Maritimes, deeply buried along rivers.

The Gaspereau Lake site assemblage, with its cultural sequence from Palaeoindian times onward, may best be explained as the result of both a low amount of sediment accumulation and historic damming. This is suggested by both the horizontal distribution of the artifacts and shallow depths in which they were found. If not for the encroaching forests, which caused the inhabitants of the site to move northward over time, there would probably be no separation of the components at all.

The poor stratification of sites is also thought to explain why full-channeled gouges have been recovered in what is believed to be in association with Brewerton side notched points. This has caused their erroneous placement within the Late Archaic Vergennes phase of the Laurentian tradition in the Northeast.

It is suggested that the majority of artifacts examined do not constitute actual assemblages because of certain geological processes. These processes are a low accumulation of sediments which is caused the erosion and reworking of lakeshore sites. Furthermore, this lack of sedimentation and subsequent shallow burial most likely facilitated the chance curation of these artifacts by passing collectors. Evidence for an absence of sedimentation is illustrated by the shallow and subsurface position of the Gaspereau Lake artifacts, and the surface collection of gouges at Lake Rossignol.

Therefore, it is deeply-buried sites, awaiting to be discovered in burial contexts possessing a long history of aggrading alluvium, that hold the key to a better understanding of the archaeological record of the Maritimes ca. 10,000-5,000 B.P.

Stemming from multidisciplinary research in Maine, favourable contexts for the preservation of early Holocene sites in the Maritimes may be located using combined methods from archaeology, geology, and remote sensing.

CHAPTER 7

CONCLUSIONS AND DISCUSSION

The goal of the present research was to devise a working model of Early and Middle Archaic cultural manifestations in the Maritime Provinces. This research included a review of the paleoenvironmental literature, a reanalysis of a semiprofessionally excavated site, and data obtained from a collections analysis, and resulted in a preliminary model of an Early and Middle Archaic occupation in the Maritimes. Furthermore, several questions related to this problematic period in the archaeological record were addressed.

According to the model presented here, there was no occupational hiatus in the Maritimes Provinces during the early Holocene. At present, the model consists of information on material culture, settlement patterns, and subsistence strategies (see Chapter 6 and summary in Figure 11). Early and Middle Archaic material culture from archaeological sites and surface collections suggests a close affinity to the Gulf of Maine Archaic tradition. It should be noted that this model is preliminary in nature, and is intended as a tentative framework for structuring future research into the Early and Middle Archaic period in the Maritimes.

Material Culture:	•Ground stone tools, including grounds stone rods, full-channeled gouges, among other forms.
	•Paucity of bifaces, although some stemmed forms may occur after ca. 6500 B.P.
	•Quartz core and uniface flake technology.
	•Bone and antler technology.
	•Specialized mortuary artifacts.
Settlement Pattern:	•Interior lacustrine, along the lakes and major rivers.
	•Coastal, based on negative evidence.
Subsistence:	•Terrestrial mammals.
	•Anadromous and catadromous fish species.
	•Sea mammals, as well as other marine resources.

Figure 11. Characteristics of the proposed model.

Other than suggesting strong affinities with the Gulf of Maine Archaic tradition, the model does not address regional relationships. Since the study area is located between the Gulf of Maine Archaic tradition peoples in Northern New England, and the Maritime Archaic peoples living along the Strait of Belle Isle by 8000 B.P. and the Island of Newfoundland by 5000 B.P., it may some day reveal possible relationships between the two culture areas. Indeed, researchers from both regions have suggested this, especially between the Late Archaic Maritime Archaic and Moorehead traditions, as well as the earliest burial complexes of the recently redefined Moorehead burial tradition

(Robinson 1992, 1996). However, such comparisons may have to be put aside until early Holocene sites have been excavated in the Maritimes.

Ample evidence for in situ early Holocene cultural deposits in the Maritimes does exist. From the present analysis, the two gouges that were reportedly found deeply buried in riverbanks in Nova Scotia and Prince Edward Island indicate a great potential for more sites. Perhaps the best evidence may be the Kitchen site (CaDu-1), located high up on the bank of the St. John River in New Brunswick. This site was initially tested by Sanger in 1967, and recently reinterpreted as having produced artifacts reminiscent of early Holocene sites in Maine (Sanger 1996:23). This area is still accessible today, and could easily be retested. Although a radiocarbon assay had returned a modern date, the artifacts reported were buried beneath fluvial deposits, below the modern plowzone, indicating their considerable age (Sanger 1996:23). As well, the possibility of locating early Holocene sites that have long been inundated by the rising sea levels may also someday play a significant role, following contemporary research in locating and excavating sites along the North American Continental Shelf (e.g., Stright 1990). It will only be the discovery and excavation of stratified, well dated sites in the Maritimes that will serve to finally fill in the Great Hiatus. The information from the present study, coupled with research from Northern New England, will be paramount for accomplishing this.

Future Research

The wealth of research into the early Holocene in Northern New England, especially that resulting from the Piscataquis Archaeology Project, is the basis for the suggested future research strategies. Methods to find sites of this age in the Maritimes may include starting out with a broad regional analysis of late Quaternary geomorphology. This would include an aerial photograph analysis of the terrain detailing drainage patterns, late glacial landforms, and surficial deposits (Putnam 1994:474-475). In Maine, aerial photographs of the area surrounding the Sebec and Piscataquis River confluence, the location of the Brigham and Sharrow sites, were analyzed using standard methodologies (Way 1973). Drainage patterns were found to be generally coarse textured and angular dendritic, indicating that the river channel has been controlled by joint fractures, or bedding planes, in the underlying metasedimentary bedrock (Petersen et al. 1986). This resulted in the channel control that is responsible for maintaining the Sebec and Piscataquis rivers in their present position throughout the span of the Holocene epoch. Coupled with regular sediment alluviation, this has served to preserve well stratified sites, such as Brigham and Sharrow. Similar situations may also exist in the Maritimes, such as is known for the younger Ceramic Period Oxbow site (Allen 1981).

Thus a remote sensing methodology can be used to find high potential areas for early Holocene sites in the Maritimes. Locations that display potential could then be tested by high resolution column sampling. Sampling would indicate if the location had aggrading sediments, possibly how long, and may even provide cultural evidence indicating site potential.

Although surveys of lakes and river systems in the Maritimes are likely to uncover many more artifact forms that are characteristic of the Early and Middle Archaic, it will only be the excavation of dated, well stratified sites that will refine the proposed model. When these sites are found, it is expected that the assemblage of the earliest levels, ca. 9000-8000 B.P., will be dominated by thick quartz cores and scrapers, tabular choppers or knives, and ground stone rods similar to the earliest levels in the occupation sites in Northern New England (Bolian 1980; Maymon and Bolian 1992; Petersen and Putnam 1992). This may be followed by the addition of fuli-channeled gouges, celts, ground slate points, and plummets to the assemblages ca. 8000-6000 B.P., similar to the Brigham and Sharrow sites (Petersen 1991; Petersen and Putnam 1992). Although the paucity of bifaces of any kind are one of the characteristics of the above levels, after ca. 6500 B.P. some stemmed point forms may occur that are similar to Middle Archaic forms defined at the Neville site (Dincauze 1976).

Excavating such sites in the Maritimes would not only add to the local archaeological record, but to our present knowledge of the Archaic period in the Northeast in general. The location of the Maritimes place it in a very important position when looking at both interregional and intraregional culture relationships during the Archaic Period. Excavated sites may also contribute to ongoing research into the early Holocene occupations of Maine by providing insights into questions relating to subsistence strategies (Spiess 1992) and the nature and timing of plant domestication (Petersen and Asch Sidell 1996; Petersen and Putnam 1992).

Evidence presented in this thesis strongly suggests an early Holocene presence in the Maritimes. The present research may well provide the structure for future projects that are focused on finding and excavating Early and Middle Archaic sites. Given that similar settlement patterns persisted throughout the Archaic period, it is likely that any such sites excavated in the future will be multicomponent sites. Therefore, future research will likely contribute to the knowledge of the entire Archaic period and not just the Early and Middle Archaic portions thereof.

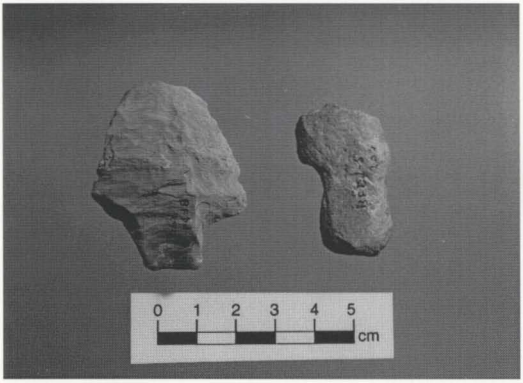

Plate 1. Artifacts that Erskine attributed to his Blue-whin phase but have been reclassified as Late Archaic. From left to right # 294, and 202.

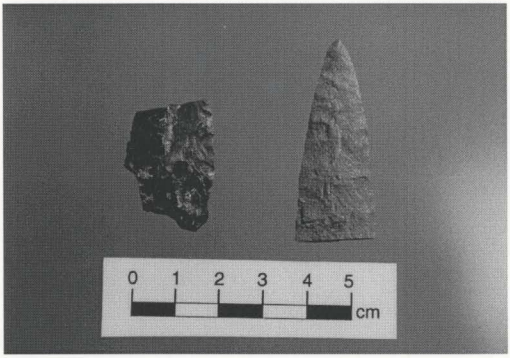

Plate 2. Palaeoindian projectile points. From left to right #158, and 193.

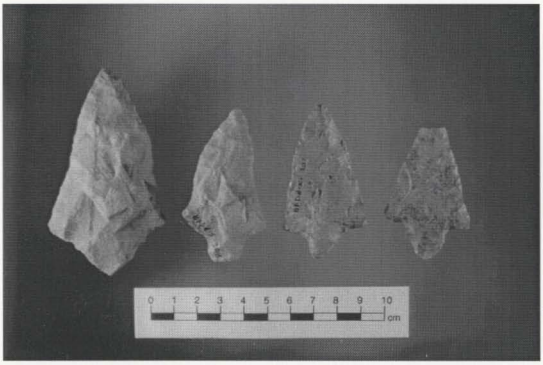

Plate 3. Erskine's Group 2 projectile points. From left to right #314, 308, 201, and 230. Specimens 314 and 308 have been reclassified as belonging to Group 5, while #201 and 230 are similar to Stark style forms

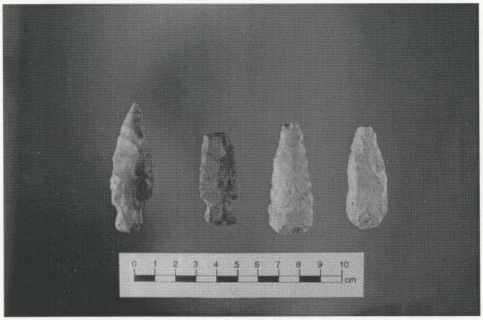

Plate 4. Erskine's Group 3 projectile points. From left to right #167, 310, 218, and 203. Specimens 167 and 310 are similar to Merrimack style points, while # 218 and 203 are thought to be too amorphous to classify precisely.

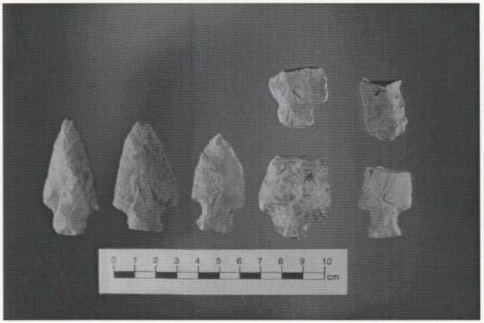

Plate 5. Erskine's Group 4 projectile points. Bottom row from left to right #315, 182, 165, 264 and 228. Top row #295, and 190. These points are associated with the Susquehanna or Broadspear tradition.

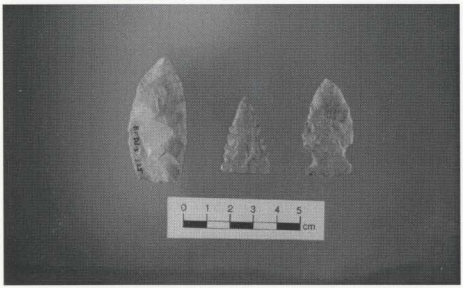

Plate 6. Projectile points from various groups. From left to right #325 (Erskine's Group 5), 169 (Erskine's Group 7), and 240 (Erskine's Group 8).

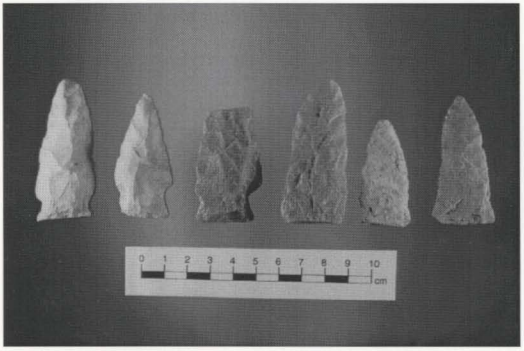

Plate 7. Erskine's Group 6 projectile points. From left to right #166, 220, 217, 181, 322, and 168. These points are associated with the Laurentian tradition.

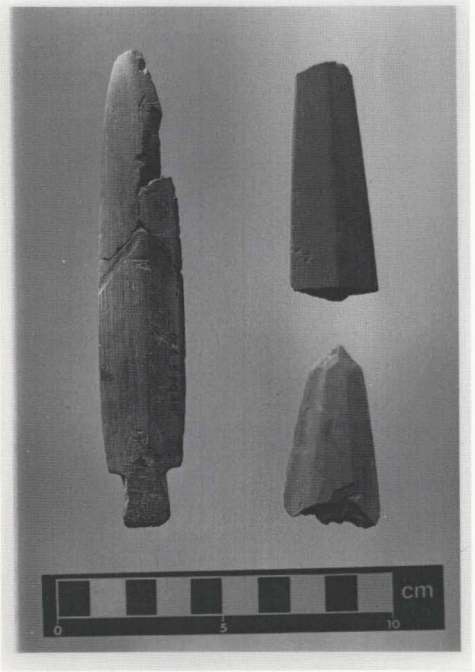

Plate 8. Ground slate knives from the Gaspereau Lake site assemblage. Clockwise from left #320, 210, and 309.

Plate 9. Pre-plummets and a plummet from the Gaspereau Lake site assemblage. From left to right #21, 354, 2, and 231.

Plate 10. Miscellaneous ground stone artifacts from the Gaspereau Lake site assemblage. Top row from right to left #14 (adze blank), 44 (adze), 317 (adze), 9 (adze blank). Bottom row from right to left # 26 (adze blank), and 266 (bit fragment of a full-channeled gouge).

Plate 11. Grooved axes from the Gaspereau Lake site assemblage. Left to right #27, and 6.

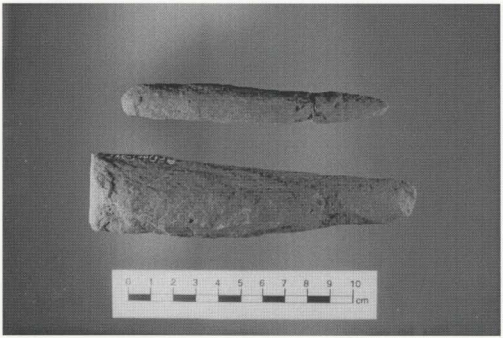

Plate 12. Ground stone rod and rod preform from the Gaspereau Lake site. Catalogue number for both artifacts is #28.

Plate 13. Full-channeled gouge, #16 in appendix, found along the St. John River above Fredericton.

APPENDIX A

ARTIFACTS MENTIONED IN THE TEXT

provenience; artifact's location or source if not located (accession # and any other information that is written on the artifacts): other sources; attributes and miscellaneous information.

Contracting Stemmed 'Neville' and 'Stark' Style Points (n= 7)

1. Gaspereau Lake (BfDd-5); Gaspereau Lake site assemblage (BfDd-5:230); Erskine 1967, also see Keenlyside 1984b: slide 7.

2 Gaspereau Lake (BfDd-5); Gaspereau Lake site assemblage (BfDd-5:201); Erskine 1967, also see Keenlyside 1984b: slide 7.

3. Spednic Lake (BkDw-3); Archaeological Services New Brunswick collection (JBG:11/516/BkDw-3); also see Tuck 1991:39, figure 2.2.

4. Spednic Lake (BkDu-29); Archaeological Services New Brunswick collection (JBG:130/413); in a box labeled BjDv-29.

5. Spednic Lake (BjDv-10/11); In Armstrong 1982:15 (JBG 385); Unable to locate this artifact.

6. Star Island, Palfrey Lake (BkDu-3); In Tuck 1991: Figure 2.2; From Lounder collection.

7. Grand Lake; Archaeological Services New Brunswick collection (5332HG/5332); collected by John Gunter near the mouth of Jemseg.

Full-Channeled Gouges (n= 94)

1. Palfrey Point (BjDu-16); In Allen 1983:7, figure 16a; expanding parallel.

2. Diggity Stream (BjDu-4); In Allen 1983:11, figure 16h; flared.

3. Spednic Lake (BkDw-7); In Deal 1983 (JBG 908); parallel.

4. Spednic Lake (BgDu-7); In Deal 1983 (JBG 63); parallel.

5. Spednic Lake (BjDv-8); In Armstrong 1982 (JBG 332).

6. Spednic Lake (BjDu-7); Archaeological Services New Brunswick collection (JBG 62/328/ BjDu-7); also in Armstrong 1982:3, and Deal 1983; flared, incomplete.

7. Spednic Lake (BjDu-13); Archaeological Services New Brunswick collection (RML 75); also in Deal 1983; wide parallel, incomplete, evidence of hammering on butt end, constricted for hafting.

8. Spednic Lake (BjDu-13); Archaeological Services New Brunswick collection (RML 80); also in Deal 1983; flared, constricted for hafting.

9. Spednic Lake (BjDu-13); Archaeological Services New Brunswick collection (RML 82); also in Deal 1983; flared.

10. Spednic Lake (BjDu-29); Archaeological Services New Brunswick collection (JBG 927); also in Deal 1983; flared.

11. St. Croix ; Archaeological Services New Brunswick collection (JBG 880/St. Croix); also in Deal 1983, wide parallel, incomplete, evidence of hammering.

12. Phil's Beach, Bocabec River (BgDr-25); Archaeological Services New Brunswick collection (BgDr-25:123/979.74.74); flared, incomplete.

13. Lake Utopia; New Brunswick Museum collection (stone gouge, Lake Utopia, L Y MacLearen Esq. Feb. 1900); also in Wintemberg 1913; wide parallel, evidence of hammering on the butt end.

14. Rouen Island site, Marble Island (BfDr-8); Archaeological Services New Brunswick collection (BfDr-8:3); wide parallel, two grooves on the dorsal surface.

15. Off the coast of Indian Island; In Black 1997; parallel, found at a depth of 38m.

16. Fredericton; New Brunswick Museum collection (5211 HHH); also in Wintemberg 1913; flared, found on St. John River above Fredericton.

17. Grand Lake; New Brunswick Museum collection (10L.G.); also in Wintemberg 1913; parallel.

18. Grand Lake; New Brunswick Museum collection (5332 JG/198); also in Wintemberg 1913; wide parallel.

19. Grand Lake; New Brunswick Museum collection (WM 14/201); also in Wintemberg 1913; flared.

20. Grand Lake; In Wintemberg 1913 (5332 J.G.); parallel.

21. Indian Point; New Brunswick Museum (D.B. 15/202/Indian Point, D. Balmaiq, Aug. 1901); also in Wintemberg 1913; flared.

22. Indian Point; In Wintemberg 1913 (5340 D.B.); wide parallel.

23. French Lake; In Wintemberg 1913 (524 0/F.T.B.); parallel.

24. Jemseg; New Brunswick Museum collection (5407 WM); flared, incomplete.

25. Mouth of Jemseg; Archaeological Services New Brunswick collection (RPG 644); also in Wintemberg 1913; parallel.

26. Upper Jemseg; New Brunswick Museum collection (20.955/ Upper Jemseg, W.M.); flared, incomplete.

27. Big Lake Musquash; New Brunswick Museum collection (Big Lake Musquash/X8002-80FHS); flared, evidence of hammering on the butt end.

28. Westfield Beach; New Brunswick Museum collection (Westfield Beach, Mr. Samuel Lyons, Aug. 15 1896); also in Wintemberg 1913; parallel.

29. Richibucto River; New Brunswick Museum collection (32/285); also in Wintemberg 1913; parallel, has deep incised lines.

30. Wirrell, King's County; New Brunswick Museum collection (29615 Charles Perkins, Wirrell); wide parallel.

31. Nipisiquit River; In Wintemberg 1913; Accession 78 Cat. No. VII-D-I; parallel; 1 ½ miles above Bathurst.

32. River Philip; In Deal and Rutherford 1991; parallel.

33. Wentworth site (BkCv-3); In Deal 1996; Sunrise Trail Museum.

34. Scottsville, Margaree River; Nova Scotia Museum (26.94.4/5925/Gouge, Scottsville, Inn. Co. N.S.); also see Deal and Rutherford 1991; expanding parallel.

35. Enfield (BfCv-10); Nova Scotia Museum collection (4014/ 1/2 mile south of Enfield/1318); also see Preston 1974:24, and Deal and Rutherford 1991; wide parallel.

36. Grand Lake, King Farm (BfCv-17); Nova Scotia Museum collection (1/4.70); also in Piers 1895:Figure 70, and Deal and Rutherford 1991; wide parallel, from the Charles Fairbanks collection.

37. Grand Lake, King Farm (BfCv-17); Nova Scotia Museum collection (07.4.68); also in Piers 1895:Figure 68, and Deal and Rutherford 1991; parallel, incomplete, from the Charles Fairbanks collection.

38. Grand Lake, King Farm (BfCv-17); Nova Scotia Museum collection (07.4.69); also in Piers 1895:Figure 69, and Deal and Rutherford 1991, parallel, from the Charles Fairbanks collection.

39. Wellington, Grand Lake (BfCv-17); Nova Scotia Museum collection (884/02.116/Wellington, Grand lake, N.S.); parallel.

40. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 56; also in Deal and Rutherford 1991; expanding parallel, incomplete, from the Charles Fairbanks collection.

41. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 57; also in Deal and Rutherford 1991; wide parallel, from the Charles Fairbanks collection.

42. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 58; also in Deal and Rutherford 1991; wide parallel, from the Charles Fairbanks collection.

43. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 60; also in Deal and Rutherford 1991; parallel, from the Charles Fairbanks collection.

44. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 66; Deal and Rutherford 1991; parallel, from the Charles Fairbanks collection.

45. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 67; also in Deal and Rutherford 1991; parallel, from the Charles Fairbanks collection.

46. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 71; also in Deal and Rutherford 1991; wide parallel, from the Charles Fairbanks collection.

47. Grand Lake, King Farm (BfCv-17); In Piers 1895:Figure 72; also in Deal and Rutherford 1991; wide parallel, incomplete, from the Charles Fairbanks collection.

48. Lake Thomas (BeCv-5); Nova Scotia Museum collection; (32.79/74080); parallel, collected by Neil McQuarrie c. 1880, Lake Thomas, Halifax County.

49. Melanson; Nova Scotia Museum collection (73.180.430); parallel, incomplete.

50. Gaspereau Lake (BfDd-5); Gaspereau Lake site assemblage (BfDd-5:266); in Erskine 1967; parallel, incomplete.

51. Gaspereau Lake (BaDf-4); Jim Legge collection (BaDf-4); expanding, incomplete.

52. Gaspereau Lake (BaDf-4); Jim Legge collection (BaDf-4); parallel.

53. Gaspereau Lake (BaDf-4); Jim Legge collection (BdDf-4); flared, incomplete.

54. Gaspereau Lake (BaDf-4); In Deal and Rutherford 1991; also in Deal 1991, unable to locate in the Jim Legge collection.

55. Salmontail Lake; In Deal and Rutherford 1991; also in Deal 1991; from the Jim Legge collection.

56. Salmontail Lake; In Deal and Rutherford 1991; also in Deal 1991; from the Derek Redden collection.

57. McGowen Lake (BeDg-2); St. Mary's University collection (BeDg-2:366); flared.

58. McGowen Lake (BeDg-2); St. Mary's University collection (BeDg-2: 278); parallel, incomplete.

59. Indian Gardens; Queen's County Museum collection (THR 27); wide parallel, incomplete.

60. Indian Gardens; Queen's County Museum collection (THR 25); parallel.

61. Indian Gardens (BaDg-2); Queen's County Museum collection (BaDg-2); wide parallel.

62. Indian Gardens (BaDg-2); In Kemp 1987:20 (THR 24).

63. Indian Gardens (BaDg-2); In Deal and Rutherford 1991.

64. Indian Gardens, Low Terrace site (BaDg-2); In Kemp 1987 (BaDg-2:114); also see Deal and Rutherford 1991; flared.

65. Lake Rosignol, Mersey River (BaDf-5); Nova Scotia Museum collection (BaDf-5:12); also in Myers 1973; parallel.

66. Lake Rosignol, Mersey River (BaDf-5); Nova Scotia Museum collection (BaDf-5:11); also in Myers 1973; expanding parallel, evidence of hammering on the butt end.

67. Lake Rosignol (BaDh-2); Nova Scotia Museum collection (BaDh-2:8); also in Rosignol Survey 1985; parallel, incomplete.

68. Lake Rosignol (BaDh-1); Nova Scotia Museum collection (BaDh-1:19); also in Rosignol Survey 1985; wide parallel, incomplete.

69. Lake Rosignol (BaDh-1); Nova Scotia Museum collection (BaDh-1:5); also in Rosignol Survey 1985; wide parallel.

70. Lake Rosignol (BaDh-2); Nova Scotia Museum collection (BaDh-2:4); also in Rosignol Survey 1985; parallel, incomplete.

71. Lake Rosignol (BaDh-15); Nova Scotia Museum collection (BbDg-15:7); also in Rosignol Survey 1985; flared, incomplete.

72. Lake Rosignol (BaDg-2); In Rosignol Survey 1985 (BaDg-2:121); also see Deal and Rutherford 1991.

73. Shelburne River; Queen's County Museum collection (86:42:12); expanding parallel, incomplete, Shelburne River is possible location Inness 1997.

74. Shelburne River; Queen's County Museum collection (86:42:12); expanding parallel, incomplete, Shelburne River is possible location Inness 1997.

75. Barren Lake (AlDk-2/5); Yarmouth County Museum collection (WTS 370); parallel, provenience Powell 1997.

76. Eel Lake (BbDm-5); Nova Scotia Museum collection (BbDm-5:24); also in Davis 1991; flared; incomplete.

77. Clyde River, Shelburne County; In Piers 1911:206; also in Deal and Rutherford 1991; found at a depth of 10 feet.

78. Montague PEI; Cunningham 1998: parallel.

79. No provenience; Queen's County Museum collection; expanding parallel.

80. No provenience; Nova Scotia Museum collection; parallel.

81. No provenience; Nova Scotia Museum collection; parallel.

82. No provenience; Nova Scotia Museum collection; flared.

83. No provenience; Nova Scotia Museum collection (01186); flared, incomplete.

84. No provenience; Nova Scotia Museum collection (0.191 A); wide parallel.

85. No provenience; Nova Scotia Museum collection (3574/10.6); expanding parallel.

86. No provenience; Nova Scotia Museum collection; parallel, evidence of hammering on the butt end.

87. No provenience; Queen's County Museum collection (83-043.7); parallel, incomplete, evidence of hammering on the butt end.

88. No provenience; Queen's County Museum collection (86.23); wide parallel, incomplete.

89. No provenience; Yarmouth County Museum collection; wide parallel.

90. No provenience; Yarmouth County Museum collection; wide parallel.

91. No provenience; Yarmouth County Museum collection; expanding parallel.

92. No provenience; New Brunswick Museum collection; (X8002.2); expanding parallel.

93. No provenience; Archaeological Services New Brunswick collection; expanding parallel.

94. No provenience; In Wintemberg 1913 (33/2262 Gesner); wide parallel.

Ground Stone Rods (n= 21)

1. Eel Lake (BbDm-5); Nova Scotia Museum collection (BbDm-5:32); also in Davis 1991:74; incomplete.

2. Eel Lake (BbDm-5); Davis 1991:74; unable to locate artifact.

3. East Brook, Lake Rosignol (BbDg-12); In Rosignol Survey 1985 (BbDg-12:11); also in Deal and Rutherford 1991.

4. Cook's Falls, LaHave River; Nova Scotia Museum collection (00.10.9/Cook's Falls, LaHave River. Bridgewater); expanding head, complete, 275 mm long.

5. Sherbrook Lake (BeDd-1); Nova Scotia Museum collection (BeDd-1:7); expanding head; incomplete.

6. Sherbrook Lake; Jim Legge collection; found near the head of the LaHave River.

7. Gaspereau Lake (BfDd-5); Gaspereau Lake site assemblage (BfDd-5:28); also in Erskine 1967.

8. Gaspereau Lake (BfDd-5); Gaspereau Lake site assemblage (BfDd-5:28); also in Erskine 1967; preform?.

9. Upper Nine Mile Lake, Hants County; In Deal and Rutherford 1991; also in Preston 1991.

10. Maquapit Lake; New Brunswick Museum collection (slickstone/73/Maquapit Lake); incomplete.

11. Maquapit Lake; Archaeological Services New Brunswick collection (5184 DB); incomplete.

12. Indian Point, Grand Lake; New Brunswick Museum collection (DB 979.62.28); incomplete, collector lived near Indian Point Laroque 1997.

13. Indian Point, Grand Lake; New Brunswick Museum collection (979.62.27 DB); incomplete, collector lived near Indian Point Laroque 1997.

14. Portobelo; New Brunswick Museum collection (5335); incomplete.

15. Jemseg (BkDm-14); Archaeological Services New Brunswick collection (BkDm-14:783); incomplete, found in test pit 1 Jeandron 1997.

16. Phil's Beach, Bocabec River (BgDr-25); Archaeological Services New Brunswick collection (BgDr-25:3/74/battered slickstone); incomplete.

17. Spednic Lake (BjDu-7); Archaeological Services New Brunswick collection (JBG: 375); also see Armstrong 82:7, and Deal 1983; complete, both ends taper to points.

18. Spednic Lake (BjDu-10); In Armstrong 1982:7 (JBG 427); also in Deal 1983; both ends taper to points, unable to locate this artifact.

19. Wabski; New Brunswick Museum collection (44.41 ETA); incomplete, from site W-1.

20. No provenience; Yarmouth County Museum (WTS 635); incomplete.

21. No provenience; Davis 1997 (WTS 688); rod in the Wilbur Sollows collection.

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