AN ANALYSIS OF ARTIFACT MORPHOLOGY AND MATERIAL FREQUENCY IN EIGHT EARLY TO MIDDLE LABRADOR ARCHAIC LITHIC ASSEMBLAGES FROM NORTHERN LABRADOR

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An Analysis of Artifact Morphology and Material Frequency in Eight Early to Middle Labrador Archaic Lithic Assemblages from Northern Labrador

by

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Abstract

The lithic collections from eight early to middle Labrador Archaic sites (HeCi-11, HdCg-07, HdCh-37, HdCg-33, HdCg-19, HcCh-07, HiCj-05, and HdCh-09) were examined to determine if material and morphological trends might be recognized which relate to the cultural shift from the early to middle Labrador Archaic occupations of northern Labrador. This data was also used to explore the social and cultural variables which permeate these collections. Material frequencies within the collections were analyzed and factors including the distance from each site to the source areas of lithic types, as well as risk management within the lithic reduction process were determined to have had an impact on Labrador Archaic lithic strategies.

Much work has been done on this region and time period and some of these changes in lithic artifact assemblages have been remarked upon, but a mathematical metric and material description of these changes does not currently exist in the extant literature. This analysis was undertaken on collections excavated over the last 40 years in order to fill in that gap and create a firm quantitative basis from which future research can be launched. Towards this end traditional measurement techniques as well as modern digital approaches to artifact analysis were undertaken in order to better understand any such morphological shifts.

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Chapter 1: Introduction

1.1 Labrador Archaic VS Maritime Archaic

Eight thousand years ago northern Labrador was mostly tundra, with localized glacial fragments, weather, and vegetation patterns (Fitzhugh & Lamb 1985:363). It was in this wilderness that the Maritime Archaic people lived and thrived. They were the first inhabitants of Newfoundland and Labrador, with the earliest members of this group appearing between 7500 and 8000 years BP and staying in the region for close to 4000 years after that. They survived environmental change as well as encounters with new cultural groups (Fitzhugh 2006:51-64). Though the Maritime Archaic persisted throughout this period as a cultural entity, this is not to say that their culture did not change. Those Maritime Archaic who settled in northern Labrador are known archaeologically as the Northern Branch of the Maritime Archaic, or simply the Labrador Archaic (Rankin 2008a:5; Tuck pers. comm:2012). Contrasting this is the Southern Branch of the Maritime Archaic who occupied the Strait of Belle Isle, the island of Newfoundland, and regions further south.

Labrador Archaic culture is split into three major phases: early (7500-6000 BP), middle (6000-4200 BP), and late (4200-3500 BP) (Fitzhugh 2006:51-55). These phases have also been subdivided into further categories such as the Naksak and Sandy Cove complexes which have been documented by archaeologists working in the region (Hood 2008:175; Rankin 2006:33-34).

1.2 Focus of Research

My research is focused on lithic artifacts which were produced during the transition between the early and middle phases of the Labrador Archaic. While these terms are fairly broad, the more specific cultural complexes identified within the Labrador Archaic (Section 1.1) are either geographically or temporally inappropriate for my research scope. The lithic material from the early and middle phases of the Labrador Archaic is considered diagnostic of the shift between these two cultural periods. The changes in lithic tool forms include a switch from basic triangular or "nipple based" projectile points to more elongated specimens with pronounced shoulders and haftable stems (Tuck 1976:50-51), as well as an increase in the use of materials like Ramah chert and slate, and a diminishing use of local lithic materials (Fitzhugh 2006:53). I looked specifically at Labrador Archaic sites which date to between five and seven thousand years BP, with the aim of quantifying the lithic changes which occurred between the cultural phases and determining possible causes for them.

Despite the fact that this shift in stone technologies is the basis for the separation of early and middle Labrador Archaic cultures, none of the major publications reference an in-depth metric analysis of the lithic material using multiple collections from sites dating to this period (Fitzhugh 1976, 1997; Hood 2008; Tuck 1971, 1976). This is not to say that this change has not been observed, but simply that analysis of the lithic material from this time has remained largely descriptive. Albeit these descriptions are often illustrated with artifact photographs (Tuck 1976:50-51), they do remain qualitative statements (Hood 2008:175-176; Tuck 1976:51). A substantial collection of material was recently returned to the province of Newfoundland and Labrador by the Smithsonian Institution, and from these existing collections I was able to select a wide range of applicable material to conduct a more substantial quantitative lithic analysis. My aim was to determine and document any change through time in the size, shape, and distribution of tools and tool types from these collections.

I also examined possible correlations between changes in tool type/morphology and the changing frequencies of raw material use evident in the collections. The early-middle split within Labrador Archaic culture has been linked to the increased use of Ramah chert and a decline in the use of other materials like locally available cherts, quartzes, and rhyolites (Fitzhugh 2006:53; Tuck 1971:2). However, this change in lithic material use has not been demonstrated systematically and across multiple collections. The interplay between lithic materials and the forms of the tools made from them is an integral part of early to middle Labrador Archaic lithic traditions. Determining how material use changed over time is as important as determining how tool form changed to better understand how the Labrador Archaic organized their lithic technologies.

Finally I used digital image analysis software to complete some of my metric analysis. This was done in order to explore the potential utility of these programs for archaeologists. Though the programs I used (TPSutil and TPSdig) were originally developed for use in the field of biology they work well for studying archaeological collections. The programs were first tested against caliper measurements to ensure their accuracy, and then used to analyze projectile points; unfortunately, due to the small number of projectile points in the collected assemblages the more complex statistical applications offered by these programs were not used. Aside from this these programs proved to be useful in studying collections without handling the actual physical artifacts which can cut down on travel and courier costs involved in studying distant collections. Also the measurement tools built into these programs are extremely effective at retrieving and recording accurate metric data from artifact photos. Hopefully the promising (if somewhat limited) results from testing these programs within an archaeological context will entice other researchers to apply them to their own research.

It is my hope that an in depth analysis of lithic assemblages from Labrador Archaic sites can help illuminate how these people perceived their interactions with their world. In contemporary society we interact with out surroundings in a much less personal manner than in the past. We routinely use tools made from natural materials like metal and wood, but these tools come pre-fabricated and using them gains us no experiential concept of the connection between those tools and their component parts. The Labrador Archaic had to face their environment and their place within it much more directly. The tools they used were made from materials which were likely procured by them or at least by someone they knew. This tactile proximity to their world is reflected in how they structured their technological lifestyles, especially regarding tool form and raw material selection. By understanding how the different facets of early to middle Labrador Archaic lithic assemblages interacted with each other, it is possible to decipher some of the factors which influenced the creation of these lithic assemblages, and which reflect early to middle Labrador Archaic worldviews.

1.3 Why Research Extant Collections?

Though fieldwork was an option for this project I chose to work with extant museum collections for several reasons. First and foremost, the collections currently held at The Rooms Provincial Museum contain many Labrador Archaic lithic assemblages, even more so with the collections which were recently returned by the Smithsonian Institute. Museum collections are considered to possess *potential* for research, reference, or exhibition (Burcaw 1997:65). However much of the archaeological material that gets put into museums is not revisited for study or use and their potential remains untapped. Furthermore, collection space within museums is a limited commodity which requires financial upkeep; frequently this comes out of governmental or public/private funding. By studying museum materials rather than conducting excavations of my own, I chose to make use of some of these extant materials, and not add to the stress on museum storage facilities by excavating additional collections which would need to be housed. Using extant collections was not without problems, but it was well worth the effort.

Chapter 2: History of Research

2.1 The Maritime Archaic

Human occupation of the northeastern coast of North America has consisted of an ongoing succession of cultural traditions for several thousand years. In Newfoundland and Labrador the earliest people were the Maritime Archaic, identified by Dr. James Tuck (1971:343) following his excavation of the middle Maritime Archaic cemetery at Port Au Choix, Newfoundland. This identification was based on two major lines of evidence. First, Maritime Archaic sites are predominately located in coastal settings (Tuck 1971:350), although a few inland sites are known which produced Maritime Archaic materials, for example the Indian House Lake site (Samson 1978), as well as the Birchy Lake site in Newfoundland (Holly & Erwin 2009). Also, sites grouped under this designation show a maritime-adapted tool kit including flaked stone stemmed projectile points, toggling harpoon heads and ground slate "bayonnettes", normally associated with cultures which hunted large sea mammals (Tuck 1975a:143). Faunal assemblages from these sites include the remains of various species of sea birds, fish, and, in the case of the L'Anse Amour burial mound (7500 BP), large sea mammals such as walrus (Fitzhugh 1978:89, 79; Tuck 1975a:141; Tuck & McGhee 1975b:77-78).

Although Tuck defined Maritime Archaic culture based on collections from Newfoundland and Labrador, he did so with an eye towards a broader archaeological tradition. At its conception the Maritime Archaic formed the northern portion of a northeastern cultural continuum which stretched from northern New England to the northern reaches of Labrador, and which may have even influenced cultures as distant as New York State. These early southern cultural groups such as the Laurentian tradition espoused by Ritchie in the mid 20th century (1965), and more recently discussed by authors such as Sanger (1996) and Robinson (1996) bear some resemblance to Tuck's Maritime Archaic culture, especially in terms of artifact assemblages.

According to Ritchie (1965:79-80), the Laurentian culture mainly occupied southeastern Ontario and southern Quebec, northern New York, northern New England, and the Maritime Provinces. Artifact types associated with Laurentian occupations include adzes and ground slate points and semilunar knives, or ulus, all of which are present in Maritime Archaic assemblages. Laurentian artifacts seem to be oriented towards a hunting and fishing based economy (Ritchie 1969: 80). Tuck (1991:49-50) sees these similarities in assemblages as proof of contact between the two groups while Sanger (1996) views the Laurentian tradition as part of the Gulf of Maine tradition, a term which he uses to describe a range of archaeological sites and cultures rather than a single finite culture in itself.

2.2 The Maritime Archaic in Newfoundland and Labrador

The history of Maritime Archaic research in Newfoundland and Labrador begins in the late 19th century. In 1875 T.G.B. Lloyd produced the first published work on Labrador archaeology, writing about his visits to sites along the Strait of Belle Isle. Although Lloyd was conducting a geological survey of the area, he visited "two localities on the coast in which…Indian Graves and Stone Arrow-heads had been discovered"

(1875:39) in Forteau Bay. The first legitimate archaeological fieldwork was undertaken in 1910 by A.V. Kidder. Although he did not publish anything from this survey, Kidder did make collections of archaeological material from southern Labrador and Newfoundland (Fitzhugh 1972:1). A few decades later William Duncan Strong undertook fieldwork along the central coast of Labrador near Hopedale from which he developed the idea that an "Old Stone Culture" predated both the Innu and Inuit populations living in Labrador at the time (1930:127). Strong compared his finds to artifacts excavated throughout the Maritimes, parts of Ontario, New England and New York State. Though his Old Stone culture was eventually given up in favor of more precise terms such as Boreal Archaic (Byers 1959), and eventually Maritime Archaic (Tuck 1971), Strong (1930) proposed a depth of antiquity which had not previously been considered for the prehistoric inhabitants of Labrador.

In the 1950s and early 1960s Elmer Harp Jr. worked on sites in Newfoundland and along the Labrador side of the Strait of Belle Isle (Harp 1964). Although he associated his Labrador materials with Byers' Boreal Archaic phase (Byers 1959; Fitzhugh 1972:2), his findings are now associated with the Maritime Archaic and date to c. 5600 BP (Hood 1981:4). James Tuck's excavations in the late 1960s at the Port Au Choix cemetery, though not located in Labrador, had a huge impact on Maritime Archaic studies in Labrador. Tuck published an article on this excavation which contained, for the first time, the term Maritime Archaic (1971:343). More than that, Tuck drew connections between his excavated material and artifacts recovered from sites throughout northeastern North America, associating his nascent Maritime Archaic culture with other, better established archaeological groups such as the Moorehead Burial Tradition, the Boreal Archaic, and the Laurentian Tradition (1971:352-358).

The Moorehead Burial Tradition, also described as Red Paint Burials were discovered initially in Maine by Willoughby (1971 [1898]) and Moorehead (1913, 1922). These burials were distinctive in that they included large quantities of red ochre, and suggested a depth of occupation in the Northeast which had been formerly attributed almost exclusively to sites in the American south and southwest (Moorehead 1913:33). The artifacts associated with the burials include ground slate bayonets, ground celts, gouges, and chisels, net-sinkers or plummets, and flaked knife blades, among other artifact types (Willoughby 1971 [1898]:15-49).

The Boreal Archaic was described by Byers (1959:243) as a northward extension of the cultural influences of more southern cultures into northern New England and the Maritimes Provinces. Ritchie (1969:82) saw the Boreal Archaic as a cultural equivalent to the Laurentian Tradition which existed slightly to the west in northern New York State, southeastern Ontario, southern Quebec, and Northern New England. Byers also recognized similarities to other Archaic complexes (Ritchie 1969:83) and began thinking about these cultures as two large groups, the Maritime Boreal Archaic and the Laurentian Boreal Archaic (Byers 1959:255).

In 1971 Tuck determined that a cultural connection existed between Maritime Archaic sites from Newfoundland and Labrador and Archaic sites as far removed as New England and New York State (Tuck 1971). It was the similarity of multiple aspects present in all of these cultures which led him to suggest a Northeastern Maritime Continuum (1975a). The prominence of red ochre on Moorehead burial sites as well as those found at Port Au Choix (Tuck 1971:345), and the artifact similarities of Moorehead, Laurentian, and Boreal Archaic sites to material recovered from Maritime Archaic sites in Newfoundland and Labrador suggested possible links between sites from these areas.

During the 1970s further archaeological work was undertaken in Labrador. Fitzhugh (1970) completed his PhD on material from central Labrador; research which helped form the groundwork for decades of future research on the Labrador coast. From 1969 to 1971 James Tuck surveyed and excavated in Saglek Bay in northern Labrador, finding sites associated with the Maritime Archaic (c. 4600 BP) and the Dorset (c. 2300-2700 BP), as well as evidence of more recent groups like the Inuit (Tuck 1975b:ii; 12). Tuck documented approximately 30 sites during these years, two of which were deeply stratified and were excavated more intensively than the others (1975b:11). The Maritime Archaic sites excavated by Tuck in Saglek Bay were important for two reasons. First, they were the northern-most Maritime Archaic sites known at the time (Hood 1981: 6) and secondly, they presented evidence to suggest technological exchanges between the Maritime Archaic and the Pre-Dorset peoples, namely the adoption of the toggling harpoon by the Pre-Dorset, and the addition of the bow and arrow to Maritime Archaic assemblages (Hood 1981:6; Tuck 1975a:195-196).

In 1973 and 1974 Tuck and McGhee began work in the Strait of Belle Isle (Tuck & McGhee 1974, 1975a, 1975b) excavating sites which pushed the dates proposed by Harp as the earliest occupations for that area back to almost 9000 BP (Tuck & McGhee 1975b: 89). They also discovered the L'Anse Amour burial mound, which to this day represents the finest and earliest example of Early Maritime Archaic mortuary practice from Labrador. The L'Anse Amour Mound was reliably dated at 7530 BP using charcoal from a sealed hearth feature, and included the skeletal remains of a child associated with grave items and preserved organic artifacts (1975b:80). The organic artifacts are especially noteworthy because these materials are rarely preserved in Maritime Archaic contexts in Labrador. They also provided the first definite proof of a maritime adaptation among these people, in the form of a toggling harpoon head, as well as a tusk from a walrus (1975b: 79-80).

While Tuck and McGhee were working in the Strait of Belle Isle, William Fitzhugh was working in Hamilton Inlet and north along the Labrador Coast towards Nain. By the time Fitzhugh published his research in 1978, he had found sites between Hopedale and Davis Inlet, had determined that the earlier sites generally were situated on higher elevations above sea level than more recent ones, and that they were normally located near the mouths of bays, or on the surrounding islands. By this time there were 75 Maritime Archaic sites recorded in the Nain region alone, with 10 to 12 of them constituting major sites (Fitzhugh 1978: 65). It was also this fieldwork that led Fitzhugh to isolate the northern elements of the Maritime Archaic as a cultural entity separate from their southern counterparts. Fitzhugh defined the Northern Maritime Archaic as an amalgamation of several smaller cultural groups, namely the Naksak, Whale Island, Nukasusutok, and Gull Arm groups (1978:70-77). Fitzhugh united these groups on the grounds of artifact similarities as discussed below.

In the late 1970s the Smithsonian Institute conducted the Torngat Archaeological Project. This project aimed to survey the archaeological resources in arctic areas of northern Labrador as well as to study past and present environmental data. During two years of fieldwork the study located and surveyed over 350 archaeological sites and their environmental contexts (Fitzhugh 1980). This project established Ramah Bay as the likely northern limit of the Maritime Archaic habitation of Labrador (1980:595).

In 1981 Brian Hood submitted his Master's thesis on the Maritime Archaic site of Nukasusutok 5. In this he helped to clarify the chronology of Maritime Archaic occupations in Labrador by exploring Fitzhugh's earlier "Nukasusutok group" and placing the Nukasusutok Complex firmly among other archaeological complexes of the Labrador coast (1981:160-163).

The discovery of chert quarries at Ramah Bay (Gramly 1978) resulted in research concerning the importance of this northern resource among prehistoric groups. Lazenby's (1984) thesis on Ramah chert use during the Maritime Archaic period in Labrador helped to shed light on some possible motivations for the cultural adoption of Ramah chert as a major lithic resource. The eighties also saw archaeologists attempting to draw connections between environmental and cultural changes in Labrador. Fitzhugh & Lamb

(1985) determined that the spread of the Maritime Archaic into northern Labrador coincided with the expansion of the "shrub-tundra" zone about as far north as Saglek.

The 1990s saw a continuation of work done on Maritime Archaic sites, especially in regions further south. Archaeologists such as Bourque (1995), Sanger (1996), and Robinson (1996) continued to explore the Maritime Archaic occupation of northern New England, as well as parts of New Brunswick, and Tuck (1991) had also turned his eyes southwards, emphasizing the gap between New England and Maritime Canadian sites rather than delving deeper into the prehistory of Newfoundland and Labrador. This is not to say that Labrador Maritime Archaic archaeology came to a standstill during this time, but simply that it shifted focus from large scale survey expeditions to more concentrated studies, often comparing Maritime Archaic sites in Labrador with other regions or cultures (Hood 1992; Tuck 1991).

The development of mineral deposits at Voisey's Bay, Labrador, which started around the mid-nineties, was accompanied by archaeological survey work which covered a large area and documented over a hundred new archaeological sites. This number includes sites of all cultural affiliations known to occur in this part of Labrador, including six Maritime Archaic sites (Chism and Duguay 1996).

The new millennium brought a resurgence of interest in Maritime Archaic archaeology in Newfoundland and Labrador. Johan Jelsma's study of bioarchaeological data from Port au Choix (2000) employed physical anthropological techniques like skeletal analysis, stable isotope analysis, and DNA testing to determine how sex, age, diet, and familial connections influenced mortuary rituals and treatment of the dead among the people who had buried their dead at Port au Choix. Webb looked at a different physical anthropological data set and studied asymmetry in cranial forms among Maritime Archaic populations, as well as Basque Whalers and Colonial Europeans (2006). She was looking for potential causes for this asymmetry to gain information on not only the health of the individuals being studied, but also cultural behaviors of the society they belonged to.

Renouf and Bell (2006) compiled data relating to the location of Maritime Archaic sites on the island of Newfoundland and documented each site in its own spatial context, where possible in relation to where the shoreline would have been at the time of occupation. By doing this they were able to establish a predictive precedent for the location of coastal, interior, and even submerged Maritime Archaic sites on the island of Newfoundland.

Another study (Reid 2007) provided a typology for southern variant Maritime Archaic sites and their attendant artifacts by examining tools recovered from multiple excavated sites from northern Newfoundland and southern Labrador, dating to between 5500 BP and 3200 BP. Christopher Wolff's study of Labrador Maritime Archaic households examined the changes in the size and organization of households in order to interpret changes in Labrador Maritime Archaic culture over time (2008:10). Wolff suggested several possible cultural motivations behind the change in house structure among the Labrador Archaic, perhaps the most intriguing of which is the possibility that the longhouses served as physical manifestations of Labrador Archaic cultural norms, symbolizing an egalitarian society to differentiate them from the more stratified, southern Maritime Archaic groups (2008:227).

Hood's 2008 re-examination of the materials excavated from Nuakasusutok-5 as well as materials from Webb's Bay and Port Manvers Run was an effort to bolster the current literature regarding materials from Nain and surrounding regions. According to him, a large number of the publications from this region have been preliminary reports. This lead him to structure his 2008 publication in "both broader and narrower [focus]" (2008:1) in order to address the paucity of in-depth reports and abundance of preliminary reports currently defining this area.

Rankin's 2008 examination of caching behavior among the Amerindian inhabitants of prehistoric Labrador explores how the construction and placement of caches on the Labrador landscape operated as an expression of Labrador Archaic culture, and those of successive Amerindian groups. This behavior was used as a social strategy to effectively and visibly store surplus goods but also served as a means to maintain social relations and cultural identity over time (Rankin 2008b:142-144).

Most recently Renouf, Bell, and MacPherson's (2009) study of pond cores near Amerindian (Maritime Archaic), Paleoeskimo, and Recent Indian occupation sites in northern Newfoundland shows how the presence of different population groups effected the surrounding environment. By looking at the different inclusions of charcoal, fossil pollen, and fungal spores in cores taken from ponds adjacent to occupation sites, the authors were able to distinguish differences in the signatures left by each cultural group.

2.3 Paleoclimatic Factors in Post Glacial Labrador

Prior to the arrival of humans Labrador was completely covered by a glacier known now as the Laurentide ice sheet. This glacier covered much of northern North America including Labrador from the south coast north to the head of Baffin Bay between Baffin Island and southwestern Greenland. The Laurentide ice sheet stretched east to the coast of Labrador, where a range of moraines near Saglek marked the eastern edge of the glacier, and may in fact have remained ice free as *nunataks*, or outcrops of exposed rocks and sediment (Clark et al. 2003; Dyke et al. 2001). Over time this glacier slowly melted, and by c. 8500 BP the Nain coastal area was ice free (Clark and Fitzhugh 1990:302), and the central coast was deglaciated by around 8000 BP (Jordan 1975:108). The glacial retreat meant that during the summer the Labrador coast could have experienced extended periods of ice free water, allowing early Labrador Archaic groups to make seasonal forays into more northern parts of Labrador (Wolff 2008:27).

As the edge of the ice sheet was moving farther inland, a general warming trend occuring along the Labrador coast. Today the climate of coastal Labrador is generally typified by long cold winters and short cool summers, with heavy precipitation year-round (Jordan 1975:94). However around 6000 years ago Labrador was experiencing a climatic optimum characterized by warmer temperatures than are experienced today; in fact, July temperatures on the northern Labrador coast were about 0.5 °-1.0 ° C higher than today (Fitzhugh 1977b:493; Kerwin et al. 2004:1917; Wolff 2008:27). During this period the Labrador coastal climate would have been quite variable from region to region due to warmer sea surface temperatures and cool glacial land breezes. Precipitation levels were quite high beginning around 6000 BP (Diaz et al. 1989:53-56), but dropped over the next two thousand years as temperatures slowly declined on the coast of Labrador (Fitzhugh 1977b:493; Kerwin et al. 2004:1917)

As groups of humans began to work their way north along Labrador's newly exposed coastal regions, so too did other forms of life. Successive waves of plant life began colonizing their way northwards as the land opened up, and studies of fossil pollen from cores recovered from lake beds give us clues as to which plants began this migration, and in what order. Beginning around 9000 BP a heath/shrub tundra composed mostly of lichen and dwarf birches began to make its way north along the coast, followed by shrub alders between 6700 and 4000 BP and finally the fir/spruce forest which characterizes much of the Labrador coast today (Diaz et al. 1989:48; Fitzhugh and Lamb 1985:363; Jordan 1975:108). By about 4500 BP the Labrador boreal forest had reached its northernmost limit and began to retreat slowly southwards again (Diaz et al. 1989:48; Fitzhugh 1977b:493) During the c.6500-5000 BP period which the sites presented here date to stunted birch, alder, willow, grasses and sedges would have comprised much of the vegetation around the Nain region (Fitzhugh and Lamb 1985:363, 368; Short 1978:28,31). Charcoal taken from hearths on Labrador Archaic sites dating to this period in this area show that the firewood being used was composed of these types of wood, corroborating the fossil pollen data (Fitzhugh and Lamb 1985:363). The retreat of the glaciers from the coast, combined with slightly higher average summer temperatures and an influx of new plant species created an environment in northern coastal Labrador which was conducive to the advance of Maritime Archaic groups from the south. As they moved northwards the discovery of chert sources at Cape Mugford and Ramah Bay provided yet another resource which facilitated the long term occupation of Labrador's northern coast by the early Labrador Archaic people and subsequent populations.

2.4 Northern and Southern Branches of the Maritime Archaic

The terms Northern and Southern variants, or branches, to describe Maritime Archaic occupation in prehistoric Labrador were originally used by Tuck (1982) to distinguish between two distinct manifestations of the Maritime Archaic culture in Newfoundland and Labrador (Reid 2007:6). Fitzhugh (1978:70-71) also identified a northern variant of the Labrador Maritime Archaic but he described more of a coalition of northern archaeological groups and complexes than a single discrete northern manifestation of the Maritime Archaic. Although there is overlap between the north and south branches in terms of chronology, geography, and artifact assemblages, they are distinct enough to warrant separation in the archaeological literature of the region (Fitzhugh 1978; Hood 1981; Lazenby 1984; Reid 2007; Renouf & Bell 2006:5; Tuck 1982).

2.4.1 Southern Branch

The southern branch of the Maritime Archaic appeared around 6400 BP (Reid 2007:9) and their sites have been found from Hamilton Inlet in Labrador all the way to

Bonavista Bay on the Island of Newfoundland. Southern branch artifact assemblages are distinguished by projectile points with broad side notches, or expanding stems, several varieties of endscrapers, leaf shaped bifaces, as well as a blade-like flake technology which is absent from northern branch assemblages. Pièces ésquillées, on the other hand, which are diagnostic of northern branch Maritime Archaic sites, seem to be absent from the southern variant (Reid 2007:7-9).

2.4.2 Northern Branch

Those Maritime Archaic who settled in northern Labrador are known archaeologically as the Northern Branch of the Maritime Archaic, the Labrador Maritime Archaic (Fitzhugh 2006) or the Labrador Archaic (Rankin and Squires 2006:87; Tuck 2012, pers. comm.). Labrador Archaic culture history is split into three major groups based on radiocarbon dating, site elevation, settlement patterns, and artifact and raw material frequencies. These three phases are the early Labrador Archaic (7500-6000 BP), middle Labrador Archaic (6000-4200 BP), and late Labrador Archaic (4200-3500 BP) (Fitzhugh 2006:51-55; Lazenby 1984:19). Labrador Archaic history has also been subdivided into further categories such as the Naksak and Sandy Cove complexes which have been documented by archaeologists working in the Labrador region (Hood 1981:11-15, 2008:175; Rankin 2006:33-34). Sites associated with the northern branch of the Labrador Archaic have been found from the Saglek/Ramah Bay region as far south as the southern coast of Labrador (Penney 2006; Reid 2007:7).

Labrador Archaic artifact assemblages are generally composed of triangular, nipple based, or tapering stemmed projectile points, pieces esquillees, bifacial knives, and ground stone tools like adzes, celts, lances and ulus. Raw material preferences changed over time, but generally sites feature quartzite and quartzes of varying quality, Ramah chert, Mugford cherts, slate, schist, and sandstone (Fitzhugh 2006; Hood 1981, 2008; Reid 2007; Tuck 1971; Tuck and McGhee 1974). Changes specifically in northern branch lithic technologies can be observed during the transitions between these phases, including changes in tool form and raw material use. Use of locally available, low quality materials like quartz and quartzite gradually gave way to higher quality materials imported from distant source areas. Triangular and nipple based projectile points were replaced by ones with pronounced shoulders and long, tapering stems. A more refined expedient tool tradition also began to develop which made use of the increased presence of high quality lithic materials. The following research aims to quantitatively document these changes, and to discover something of the motives which may have led to these technological shifts between the early and middle phases of the Labrador Archaic.

Chapter 3: Methodology

3.1 Site Selection

The sites used for this research were chosen because they dated to the early and middle Labrador Archaic (between 6500-5000BP) and had substantial lithic collections. I first attempted to find sties that had been dated using radiocarbon to ensure the accuracy of the site date; however, many Labrador Archaic sites were not dated in this fashion. Using C^{14} to date sites in Labrador is often problematic, for example, organic material on these sites is often limited to sea mammal remains. Using sea mammal remains to date a site, or using material which has been impregnated with sea mammal fat can skew dates to make sites appear older than they actually are (Arundale 1981:244, 247-248). Also early sites in Labrador are often extremely shallow, with little to no distinction between different occupations (Fitzhugh, pers. comm., 2012).This makes is difficult to date individual occupation levels. Because these situations are common on early sites from northern Labrador, some relative dates based on tool morphology and site elevation had to be accepted in order to increase the site sample size.

Collection strategies and assemblage size from the available pool of sites was also taken into consideration. Fully excavated sites and sites with larger lithic collections were given preference over surveyed sites, surface collected sites, or sites with meager lithic collections. Though intensive regional site surveying is a valuable technique for understanding the patterning of archaeological sites and artifacts (Cherry and Parkinson 2003), larger collections from fully excavated sites tend to offer a more accurate representation of the culture to which that site pertains. Despite this, some smaller collections from thoroughly surveyed and tested sites were used because there were few substantial collections from sites dating to the desired period.

As well, site type was also used as a criterion for site selection. Habitation sites were given priority in order to make site comparisons among similar collections. That being said, it is important to note that not all of the sites used are of the same site type; Ballybrack 10, for instance, has a burial component as well as a habitation component (Fitzhugh 2006:53). In this case site type was supplanted in favor of the large collection size from that site. Variation in site type was accounted for when analyzing the collections and in some cases helped to explain anomalies in either artifact or material components of some sites (see Chapter 5).

The collections used for this analysis have been in some cases excavated for over 40 years, and some have been moved between museum facilities a number of times before arriving at their current location at The Rooms Museum, St. John's, Newfoundland. This has unfortunately resulted in a number of artifacts which were absent at the time that this research was being completed (see Appendix A for a complete list). Though a few of these artifacts are on loan to other museums, most were not able to be located and have presumably become lost or misplaced in one of the transfers these collections have undergone. The loss of these artifacts and the data they could provide is unfortunate, especially in cases like Imilikuluk 5 where a significant portion of the lithic collection is unaccounted for. While including the missing artifacts from each site would have allowed a more complete view of the assembled collections, much of the catalogue information relating to these artifacts was fragmentary or incomplete. Because of this they were all omitted from this study in order to avoid inadvertently incorporating inaccurate artifact data.

Some of the information for these sites was obtained from Site Record Forms (SRF's). These sources are not published records but are on file at the Provincial Archaeology Office, Ministry of Culture, Tourism and Sport, Government of Newfoundland and Labrador, St. John's, Newfoundland.

3.1.1 Ballybrack 10 – HeCi-11

Ballybrack 10 is an Early Labrador Archaic burial site located on the southeast coast of South Aulatsivik Island, in the Nain archipelago on the northern coast of Labrador (Figure 3.1) and was fully excavated during field seasons in 1977 and 1985 by Fitzhugh and Cox. There are five separate radio carbon dates from this site which span from as early as 7770 +/-350 BP, to as recently as 5020 +/-100 BP (Ballybrack 10 SRF). Fitzhugh (1977:10) places the occupation at approximately 7000 BP, though in his 1978 publication he is more hesitant to assign a definite date to the site and suggests c. 6500 BP (1978:90). This places the occupation within the Naksak complex which he describes as difficult to date due to typological variation between and within sites, as well as a relative lack of material to perform radiocarbon dating on (1978:72). As the lithic collection from this site does seems to suggest an early date for this site (Chapter 4;

Chapter 5, Section 5.1.4), Fitzhugh's date of 6000-6500 BP will be used for Ballybrack 10 (Fitzhugh 2001:12).

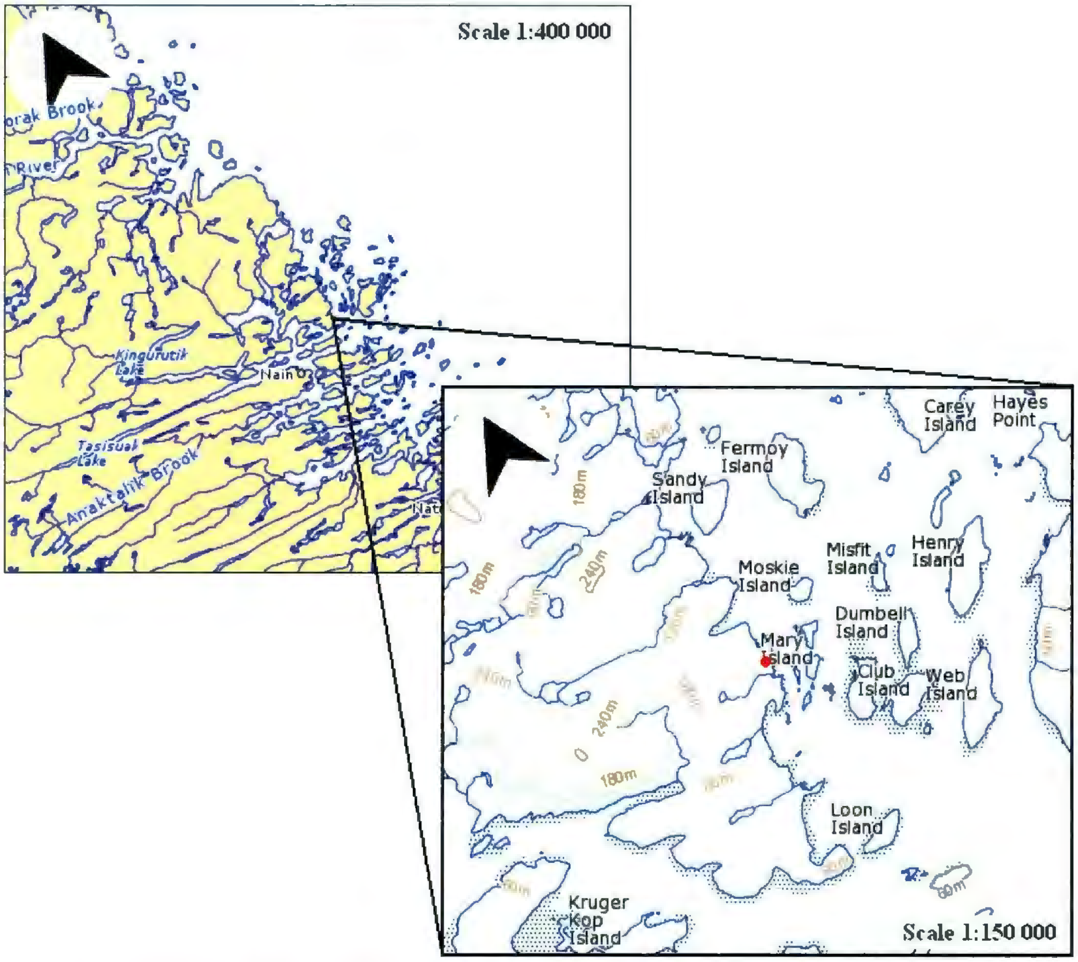

Figure 3.1 Ballybrack 10 (Modified from the Atlas of Canada 2007).

The collection from this site includes 2959 lithic items consisting of 336 formal tools and 2693 pieces of debitage. Two of these lithic artifacts were missing from the collections at the time of analysis and were therefore excluded from this study (missing artifacts are HeCi-11: 49;254).

3.1.2 Evilik Bay 5 – HdCg-07

The Labrador Archaic site of Evilik Bay 5 is located in a very isolated locale on the northern end of Dog Island, about 38 km outside of Nain (Figure 3.2). It is situated on a terrace approximately 46 meters above current sea level. This site was surface collected and test pitted by Fitzhugh during two years of investigation in 1974 and 1975 (Evilik Bay 5 SRF; Fitzhugh 1976); he associated it with the early Labrador Archaic period. Fitzhugh suggested that Evilik Bay 5 represents an uncontaminated example of early Labrador Archaic occupation in the Nain region and dated the site to approximately 6000 BP based on artifact typology and the fact that the site would have been most accessible during periods of high sea levels (Fitzhugh 1976:126; 1977:10; 1978:72).

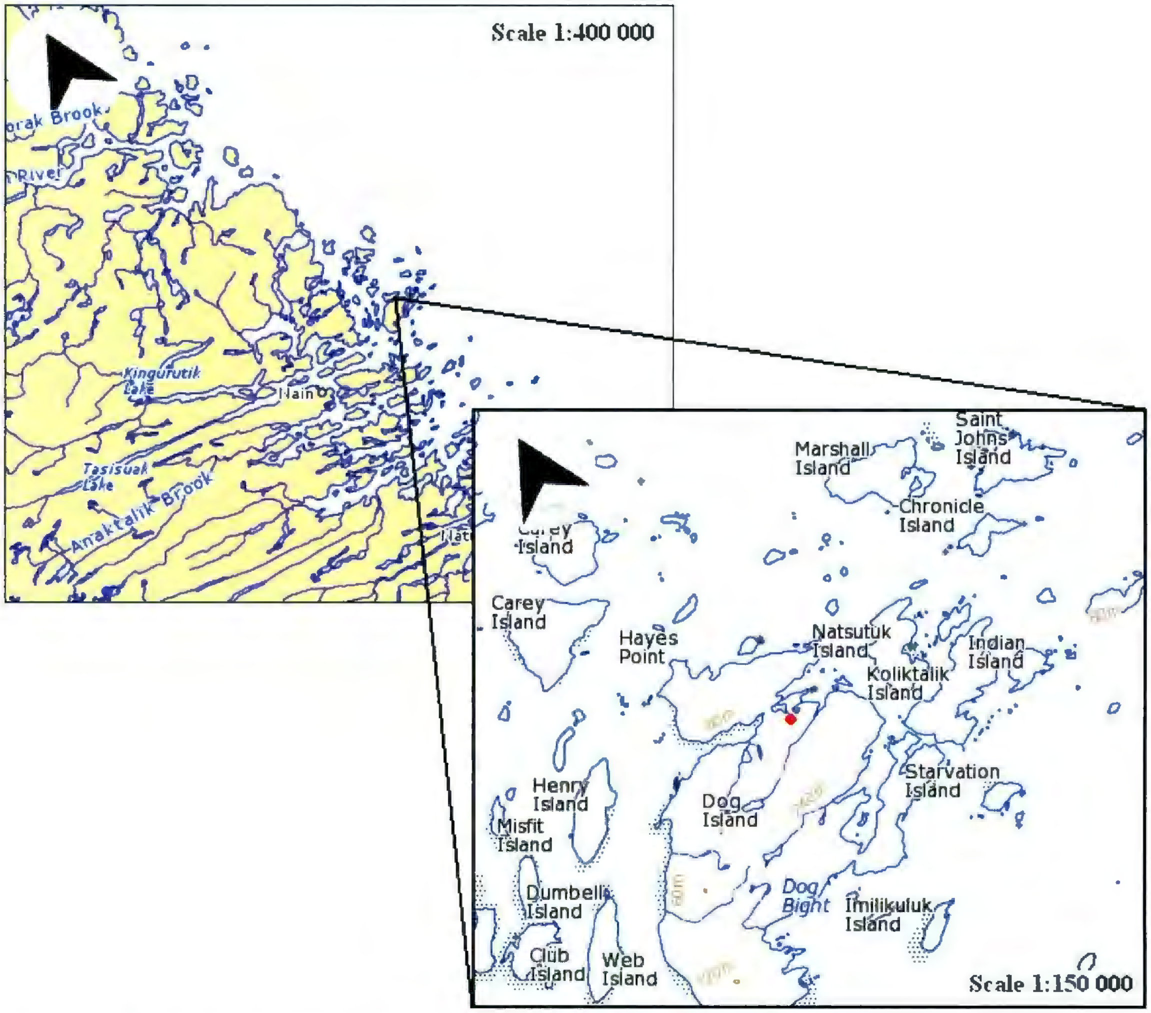

Figure 3.2 Evilik Bay 5 (Modified from the Atlas of Canada 2007).

Evilik Bay 5 is considered a habitation site, with features including a possible house structure relating to the Labrador Archaic occupation of the site, as well as scatters of lithic debitage. Surface collection and test pitting resulted in the recovery of 212 lithic artifacts including 185 formal tools and 27 pieces of unmodified debitage. One artifact (HdCg-7:103) was missing from the collection at the time of analysis and was excluded from this study.

3.1.3 Dog Island Southwest 1 – HdCh-37

Dog Island Southwest 1 is located on the southwest end of Dog Island in the Nain island archipelago on the northern Labrador coast (Figure 3.3). Dog Island Southwest 1 is a Labrador Archaic site with artifacts from Dorset and Intermediate Indian cultures, suggesting that other cultures occupied this site as well. This site was both surface collected and partially excavated in 1986 by Fitzhugh, with 55 artifacts in the catalogued collection. The typological dates given for this site range from 6000 BP to 3000 BP. Based on the artifact types present and the location of the site on an area of sandy dunes, the Labrador Archaic component likely belongs to the older end of this range, around 6000 BP (Dog Island Southwest 1 SRF). Of the 55 artifacts, only 36 were included in the analysis (35 artifacts and one piece of unmodified debitage), as the other 19 derived from cultures other than the Labrador Archaic; 4 artifacts (HdCh-37: 29, 30, 31, 32) are of Dorset origin, and 15 are Intermediate Indian artifacts (HdCh-37: 33, 34, 35, 36; 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55).

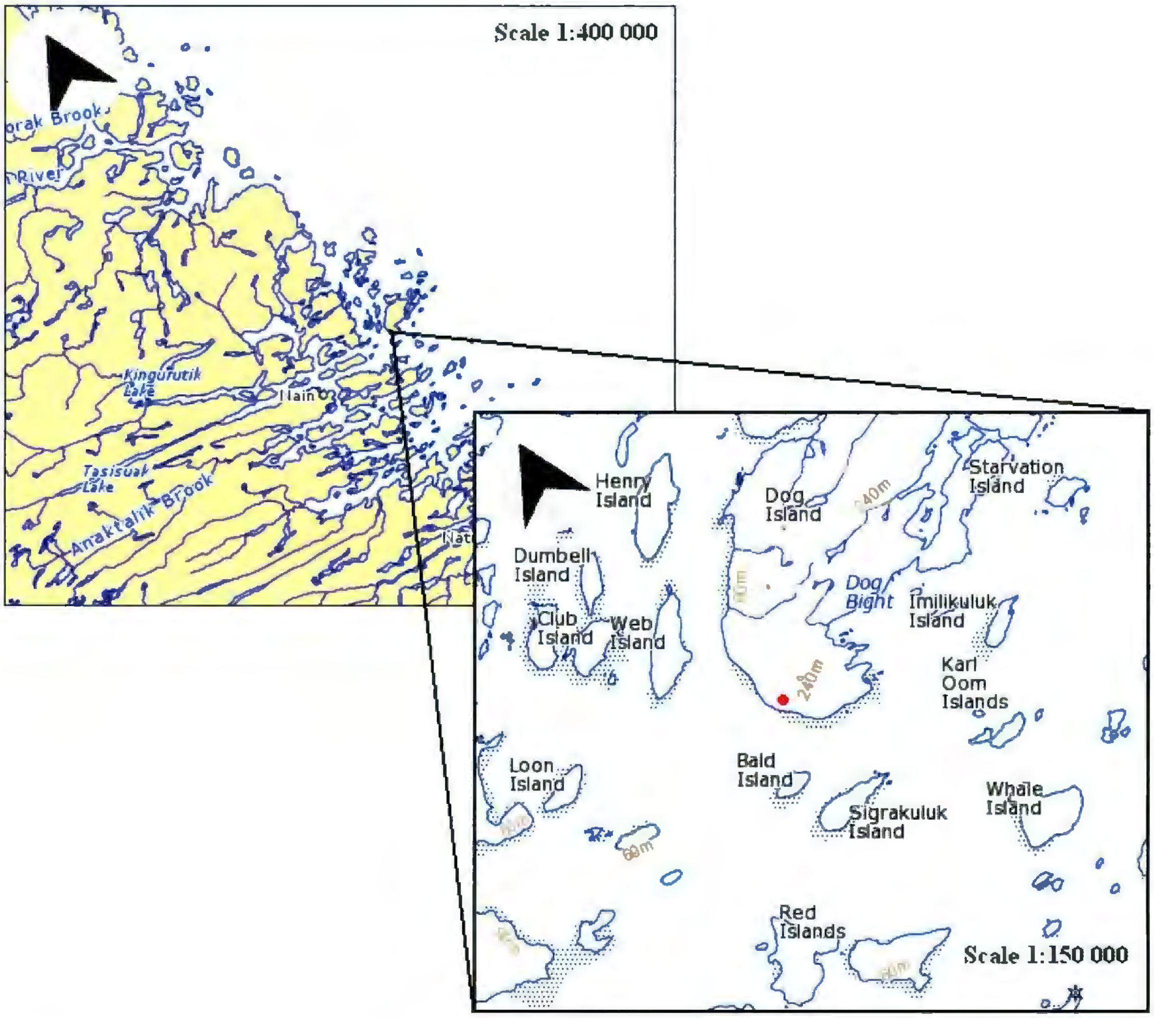

Figure 3.3 Dog Island Southwest 1 (Modified from the Atlas of Canada 2007).

3.1.4 Imilikuluk 5 – HdCg-33

Imilikuluk 5 is a Labrador Archaic site on Imilikuluk Island, a small island south of Dog Island, about 36 kilometers east of the town of Nain in the Nain island archipelago (Figure 3.4). Imilikuluk 5 is a habitation site which was tested and excavated by Fitzhugh in 1975, and returned to in 1984 and 1985 for additional site exploration and excavation. Imilikuluk 5 is a village site, with features including pit houses which are four to five meters wide, tent rings, and boulder structures (Imilikuluk 5 SRF). Relative dating techniques based on typological and context-derived evidence suggest an occupation date of 5000-6000 BP (Fitzhugh 1976:132). There is a single radiocarbon date of 3780 (+/-170) BP from this site, though this date is too recent to relate to the collection from Imilkuluk 5. The C^{14} date was taken from a sample of "charsoil" (Fitzhugh 1986:56), and its recent nature likely relates to contaminating factors within the soil like peat or forest fires (1986:57).

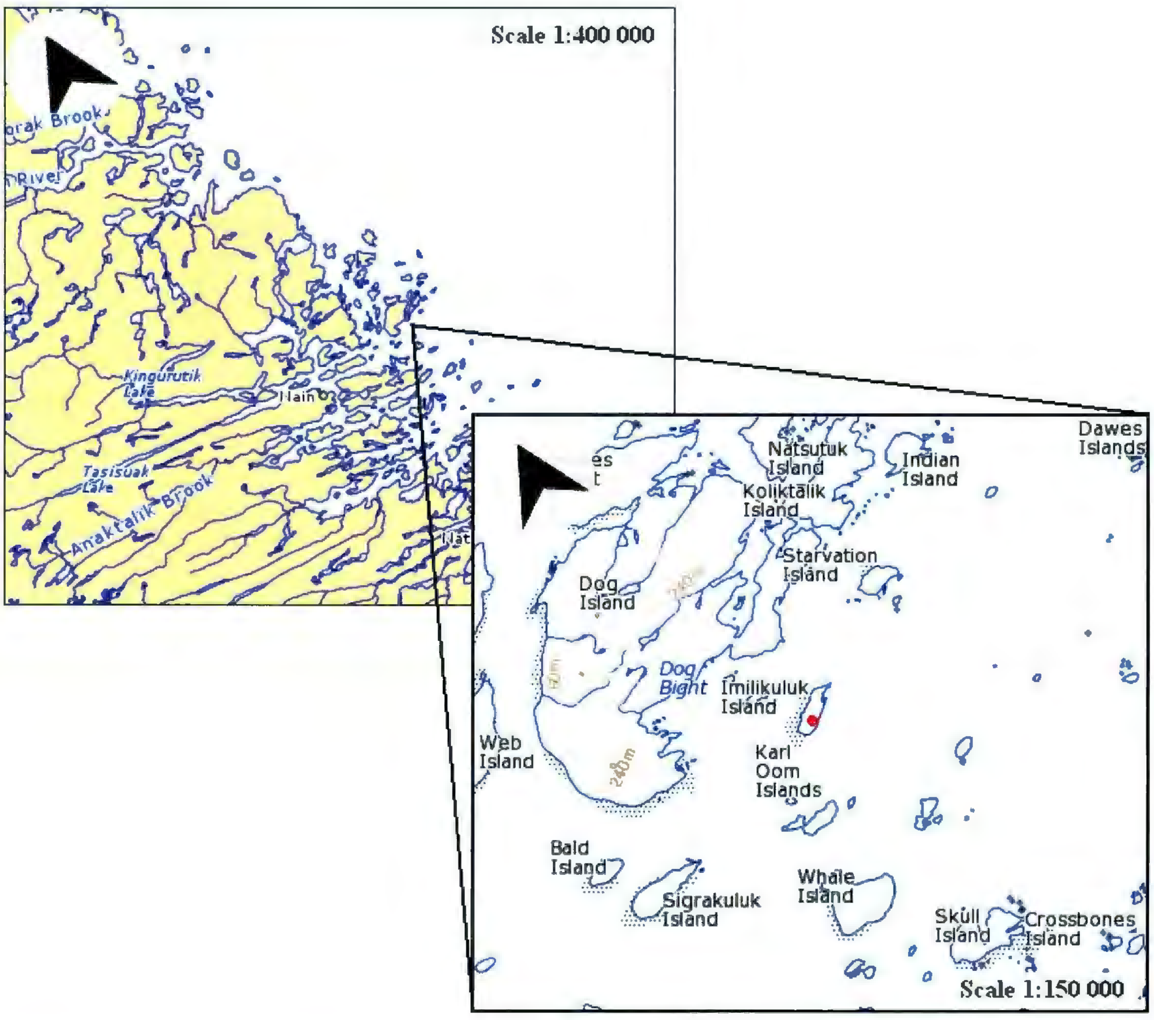

Figure 3.4 Imilikuluk 5 (Modified from the Atlas of Canada 2007).

The lithic collection from this site includes 1608 objects (213 artifacts and 1395 pieces of debitage). 43 catalogued artifacts (HdCg-33: 8; 10; 11; 12; 13; 28; 29; 30; 40; 46; 47; 54; 58; 59; 60; 64; 66; 68; 73; 74; 75; 76; 77; 78; 79; 80; 84; 85; 87; 88; 89; 90; 92; 94; 95; 97; 99; 102; 103; 105; 106; 107; 109; 113) were missing from the collection at the time of analysis and thus are not included in this study.

3.1.5 Gull Arm 1 – HdCg-19

Gull Arm 1 is a Labrador Archaic site with a Dorset component on the south side of Dog Island, on the northern Labrador coast (Figure 3.5). It is a habitation site located on an open terrace, complete with features like longhouses and hearths. Gull Arm 1 was surface collected and tested in 1976 by Arthur Speiss. In 1985 archaeologists revisited this site and conducted further testing and surface collecting (Tysell 1998:6). This site was radiocarbon dated twice. One sample returned a date of 3285 (+/-80) BP, and the other came back as 5605 (+/-160) BP (Tysell 1998:7). The 5605 +/-160 BP date is more probable given the nature of the collected artifacts (Hood 1981:152). The 3285 BP date is too recent to relate to any Labrador Archaic occupation, as the Labrador Archaic seems to have disappeared from northern Labrador by about 3500 BP (Tuck and Fitzhugh 1986:163). It is also too early to relate to the Dorset artifacts included in this assemblage, or an Early Dorset occupation of the area (Fitzhugh 1976:138; Hood 1986:52; McGhee 1978:69). This date may be the result of a sample from this period which was contaminated with sea mammal remains, or it might represent an intrusive deposit (William Fitzhugh, pers. comm., 2012).

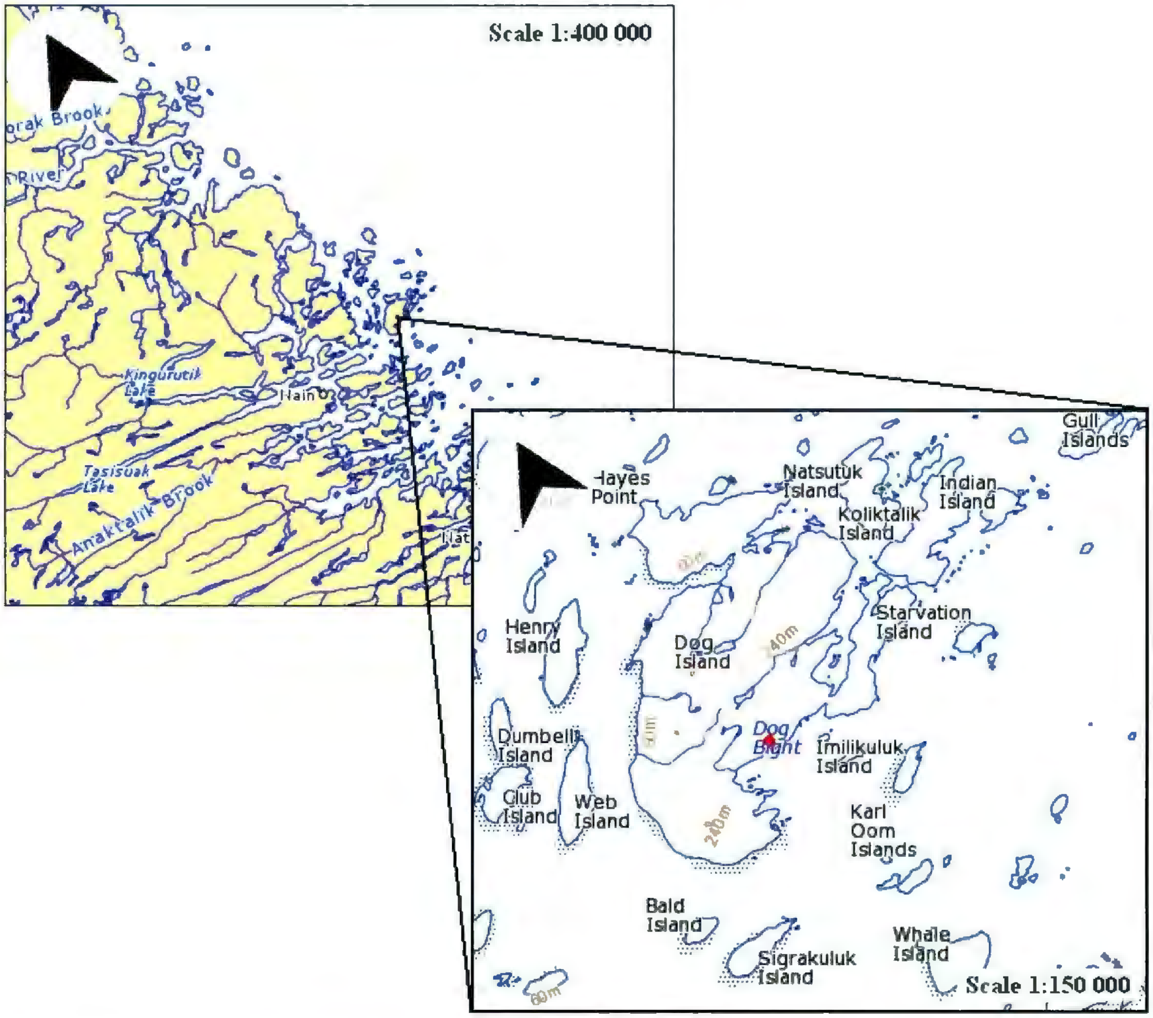

Figure 3. 5 Gull Arm 1 (Modified from the Atlas of Canada 2007).

There are 4551 lithic pieces in the collection from this site, 345 artifacts and 4206 pieces of unmodified stone debitage. Ten artifacts (HdCg-19: 33, 73, 97, 136, 146, 195, 196, 223, 232, 269) from this collection were absent at the time of analysis, and thus were excluded from this study. As well, two artifacts of Dorset origin are part of the assemblage from Gull Arm 1 (HdCg-19: 268; 288), and were therefore not included in the analysis.

3.1.6 Nukasusutok 5 – HcCh-7

Nukasusutok 5 located on Nukasusutok Island (Figure 3.6), approximately 32 kilometers southeast of Nain, is a Labrador Archaic habitation site dating to between 6100 +/-120 and 5305+/-175 years BP. This site was initially excavated by Fitzhugh in 1975, and Hood in 1979, 1980, 1992, and 1993 (Hood 1979:8, 9; 1980:8; 2008:65;). The site itself is located on raised beach terraces inside Wyatt Harbor, and is composed of three main areas (Hood 2008:61). Area 1 is located at the southeastern end of a raised beach ridge, and contains several hearth features. The excavation undertaken at this area did not recover many tools or flakes. Area 2 is about 20 meters north of Area 1, and is divided into three sub-areas, 2A, 2B, and 2C, and this is where the range of C^{14} dates comes from for this site. Area 2A dates between 5300-5700 BP, while Areas 2B and 2C date closer to 6000 BP. According to Hood this is indicative of two separate settlements, rather than a single continuous occupation (2008:65). Area 3 is located about 40 meters west of Area 2, and consists of two ochre deposits, and two rock features (2008:74). Area 3 does not have any dates associated with it. For the purposes of this study Nukasusutok 5 will be dated using the same C^{14} derived date of 5575+/-90 BP, as this is the one which has been used in previous studies (Fitzhugh 1978:66; Hood 1981:154), and because it appears to fit with the majority of the lithic material from this site.

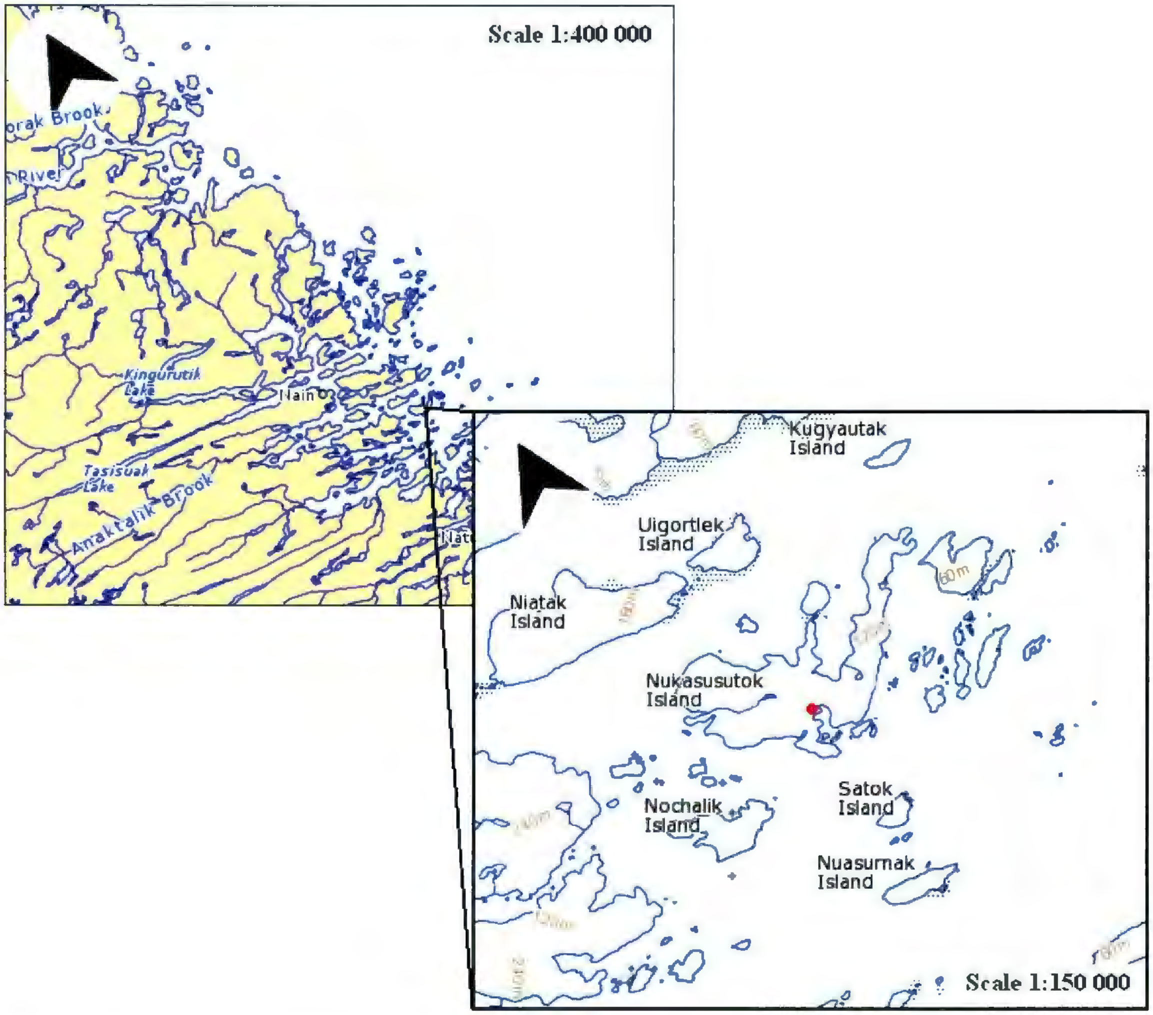

Figure 3.6 Nukasusutok 5 (Modified from the Atlas of Canada 2007).

The collection from Nukasusutok 5 is the largest collection in this study, with 845 lithic artifacts and 15441 pieces of debitage. Twenty-nine catalogued artifacts were missing from the collection, (HcCh-07: 19; 20; 21; 121; 134; 135; 187; 200; 244; 314; 325; 373; 415; 431; 442; 450; 459; 512; 520; 530; 540; 547; 548; 556; 557; 566; 569; 575; 1001) at the time of analysis and thus were excluded from the study. One modern geological sample (HcCh-07:533), seventeen pieces of bone, and eight charcoal samples were not examined either.

3.1.7 Cutthroat Island 2 – HiCj-5

Cutthroat Island 2 a single component Labrador Archaic site (Cox 1974), located on Cutthroat Island on the northern Labrador coast near Cape Mugford (Figure 3.7), about 100 kilometers north of Nain. The site is located on a beach terrace near a fresh water source, and is situated with an unobstructed view to the east and west. Cutthroat Island 2 was excavated by Cox over two seasons of work, uncovering a total of 32 m^2 which encompassed most of the occupation area at this site (1977: 108-109). This site produced a radiocarbon date of 5480 (+/-110) BP, though Cox rejected this date (1977:114) in favor of a date of 7000-6500 BP which was felt to be a better fit to the typology of the artifacts uncovered. IT is arguable that the C^{14} date should not be so easily dismissed as there is no indication that the sample used for the radiocarbon date was taken from an insecure context. The sample came from a hearth within the same strata as the other cultural material (Cox 1977:114-115). Also, while the material use at the site appears to differ from other sites contemporaneous with the c. 5400 BP date due to the dominance of this assemblage by Mugford cherts, this could be explained by the proximity of Cutthroat Island 2 to the Mugford Chert Source (Figure 3.7). Finally, the typological differences which were cited as justification for the 7000-6500 BP date (Cox 1977:115) do not appear so anomalous when placed within the continuum formed by the other sites under study, indicating a more recent origin for this site.

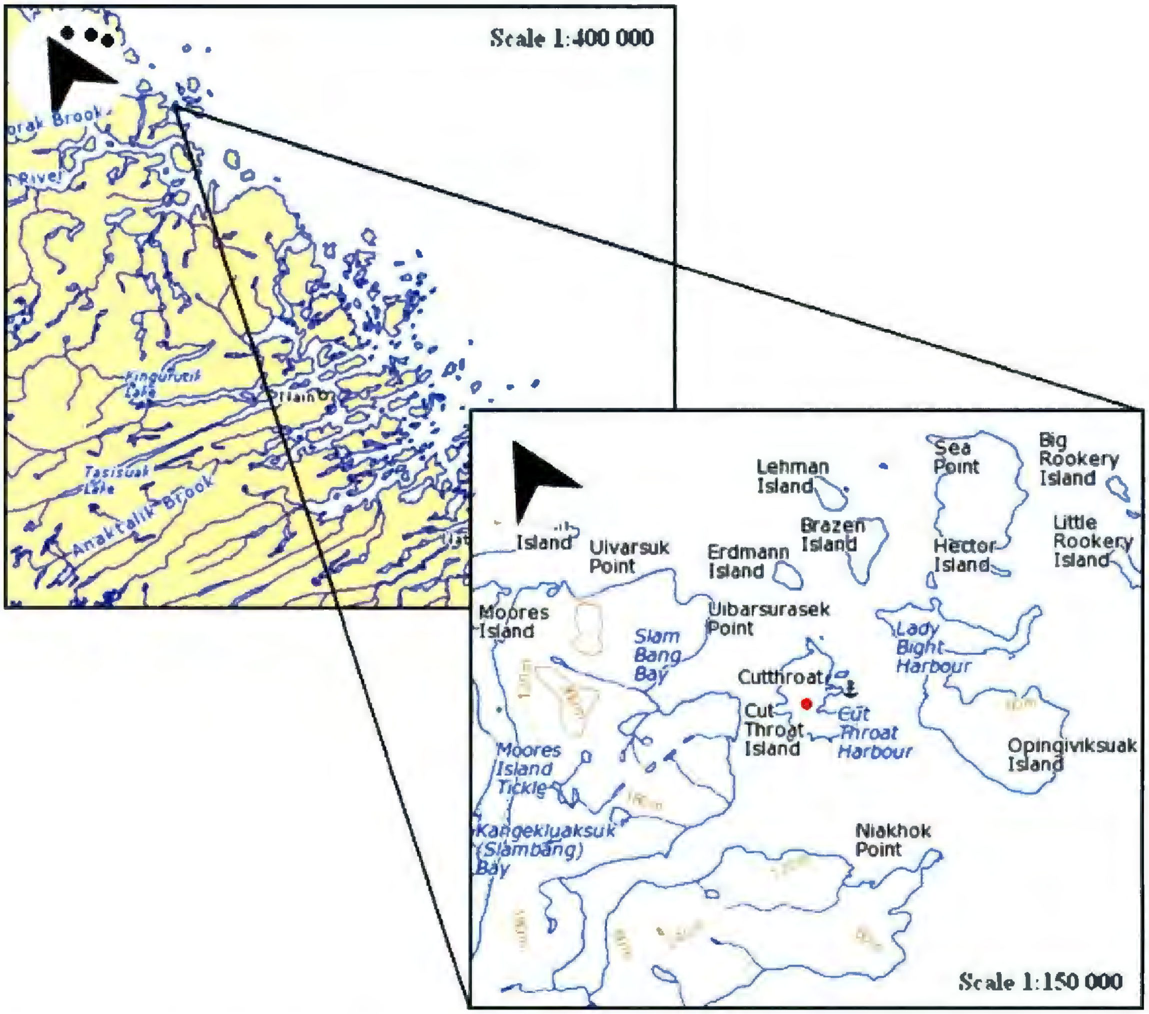

Figure 3.7 Cutthroat Island 2 (Modified from the Atlas of Canada 2007).

The three black dots on the smaller scale map show the approximate locations of the Mugford chert sources on Grimmington Island and Cod Island (Gramly 1978:44).

The lithic collection from this site includes 178 artifacts, and 6179 pieces of debitage, totaling 6355 individual pieces. Two of the catalogued artifacts were missing from the collections at the time the analysis was undertaken (HiCj-5:61; 154), and were therefore excluded from the analysis.

3.1.8 Dog Bight L9 – HdCh-9

Dog Bight L9 is a multi component site with Labrador Archaic and Paleo-Eskimo components located on the southern tip of Dog Island just over 30 kilometers outside of Nain, Labrador (Figure 3.8). The Labrador Archaic component of this site dates to c. 5000 years BP based on the typology of the artifacts recovered and the elevation of the site. This site was surface collected in 1974 by Fitzhugh (Dog Bight L9 SRF), without any more intensive investigation occurring.

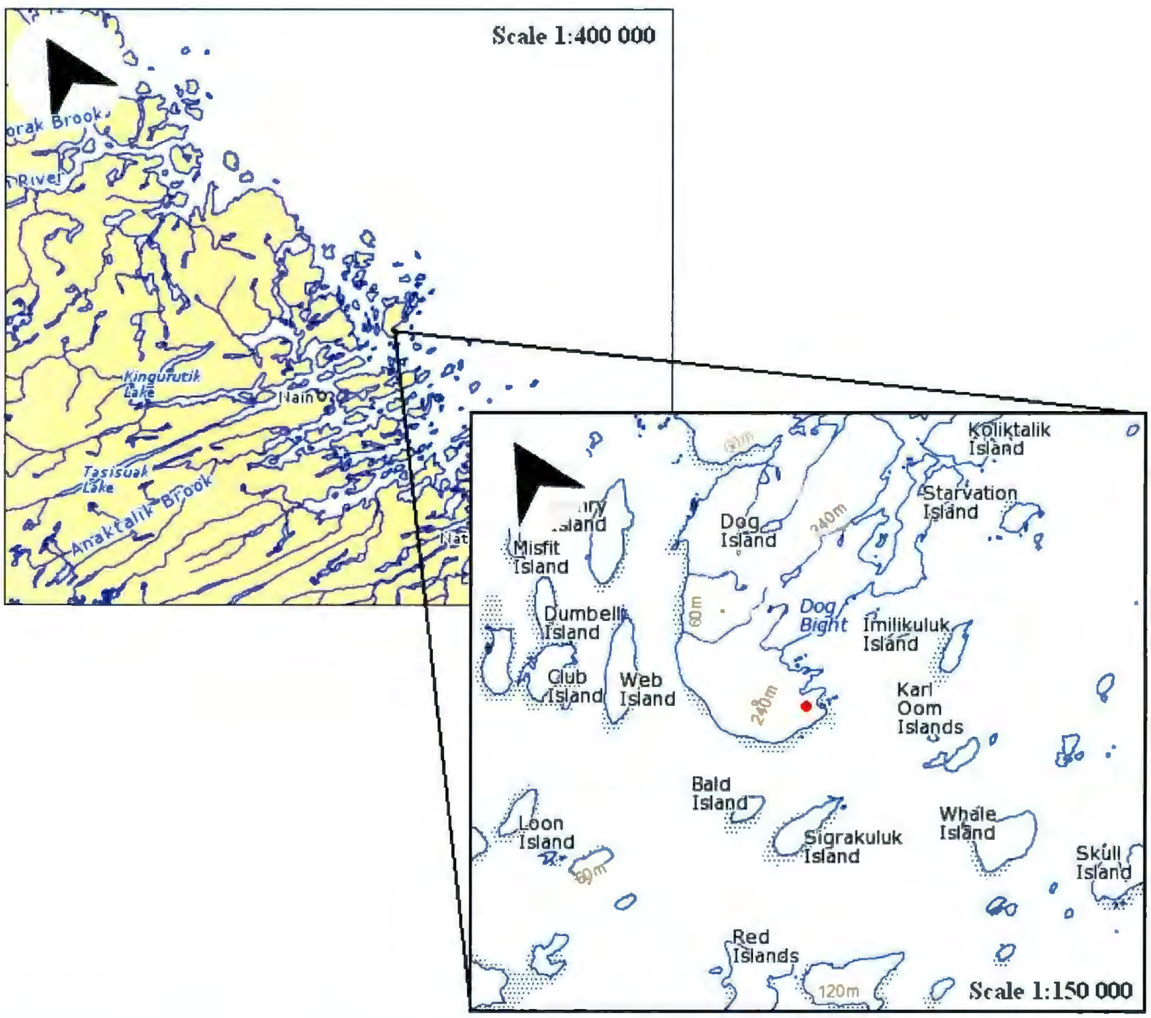

Figure 3.8 Dog Bight L9 (Modified from the Atlas of Canada 2007).

There are 84 artifacts in total in this collection, though only 77 of them were included in this study. Two of the catalogued artifacts were missing at the time of analysis (HdCh-9: 2; 68) and five of the catalogued artifacts derived from cultures other than the Labrador Archaic and were therefore left out of the analysis, including three Pre-Dorset artifacts (HdCh-9: 49, 53, 58) and two Groswater Dorset artifacts (HdCh-36, 40). Of the 77 artifacts which were studied, 69 of them are formal artifacts, and eight are pieces of unmodified debitage.

3.2 Artifact Categories

In order to properly analyze the selected collections, it was first necessary to develop a system of artifact classifications which fit the assemblages from all the collections being studied. Because many scholars before me have studied Maritime Archaic sites, and more particularly Labrador Archaic sites, I was able to derive many of the artifact class definitions I used from extant literature (Hood 1981, 2008; Nagle 1984; Reid 2007; Tuck 1976). These authors are by no means the only scholars to study Maritime Archaic lithic material from Labrador. Portions of the typologies they developed were used because they offered descriptive definitions of each artifact category in the context of the collections they were working with, rather than simply adopting the categories to label and discuss the artifacts. Because of this it was possible to gain a deeper understanding of how their terminology applied to the archaeological record, and therefore how it could be applied to my own research. Though most of the sources used here deal with northern collections, Reid's 2007 work was based on southern Labrador material. This source was chosen because the artifact typology she used was clear, thoroughly explained, and could easily be adapted to the study of northern Labrador Archaic lithics.

3.2.1 Artifact Categories: Production Artifacts

The objects listed here as *production artifacts* are tools which would have been used to fabricate other tools. This includes repositories of raw material such as cores, implements for percussion knapping like hammerstones, and grinding stones used in the production of ground stone tools.

Hammerstones

Hammerstones (Figure 3.9) are pieces of rock which are used to strike cores and remove flakes to be used in knapped tool production. Hammerstones are often made of very hard stones which are unlikely to fracture when struck against the core. Materials such as granite, quartz and quartzite are popular choices.

Figure 3.9 Hammerstones A. HcCh-7:950 B. HcCh-7:485.

<u>Cores and Core Tools</u>

A core (Figures 3.10 and 3.11) is any piece of lithic material which has been subject to flake removal (Reid 2007:18) for the purpose of creating flaked stone tools. Cores can either be simple sources of raw material, or they can be used as tools themselves. They are occasionally used for such basic functions as hammerstones as well as large scrapers (Kooyman 2000:14). Cores can either be raw, unaltered cobbles or they can be pieces extracted from quarry sites such as the Cirque at Ramah Bay (Lazenby 1984:40).

Figure 3.10 A Core/Hammerstone of High Quality Quartz (HcCh-7:238).
Its use as a hammerstone is evidenced by the battering marks.

Figure 3.11 A Core/Hammerstone of High Quality Quartz (HcCh-7:825).
Its use as a hammerstone is evidenced by the battering marks.

Pièces ésquillées, or bipolar cores, are small stone nodules which have been battered on both ends either as a result of being used as wedges or from bipolar reduction – a technique used to create large quantities of debitage from low quality materials like vein quartz and to work cores which have become too small to use direct percussion on (Andrefsky 1998:149; Hood 2008:157; Kooyman 2000:55-56; Reid 2007:18; Shott 1999; Tuck 1976:48). Although the exact function and origin of these artifacts has been and still is the subject of debate (see Hood 2008:157-158 for a more complete discussion of this debate), the term pièce ésquillée will be used to describe any core which exhibits bipolar battering either as a result of bipolar reduction or usewear from performing wedging tasks.

There is also some evidence that large bifaces were used by the Labrador Archaic as cores. The concept of the biface core is not new, and other scholars have remarked upon the use of these artifacts by highly mobile populations, when raw material is scarce, or when raw material sources are located far from the central habitation area (Andrefsky 1998:150, 157-158; Bever 2001:111; Kelley 1988; Odess and Rasic 2004:696,700). It is probable that biface cores were used in northern Labrador where the only sources of high quality lithic materials are distantly located at Cape Mugford and Ramah Bay.

Tablets

These artifacts (Figure 3.12) are worked, flat, roughly square or trapezoidal pieces of slate or schist which could have been used for making ground stone tools or grinding harder organic materials like bone, antler, ivory, or wood (Hood 2008:168-173). These tablets could also have served a sharpening or honing purpose similar to a whetstone, though their size suggests they were used for earlier stages of the reduction process, rather than for finer finishing work. Among the collections I have examined, these artifacts are only found at one site, Nukasusutok 5 (HcCh-7).

Figure 3.12 Schist Tablets. A. HdCh-7:236; B. HdCh-7:491.

3.2.2 Artifact Categories: Knapped Stone Tools

Knapped (flaked) stone artifacts are objects which have been intentionally worked through the use of direct percussion, indirect percussion, or pressure flaking. Knapped artifacts are the product of these reduction processes, whereas the byproducts are known as debitage. Direct percussion can be accomplished by striking the incipient artifact with either a hammerstone (known as hard hammer percussion) or a billet of hard organic material like antler, wood, ivory, or bone (soft hammer percussion). Indirect percussion involves using a punch and a hammer or billet to remove flakes. Pressure flaking is a finer reduction technique that removes smaller flakes, and can be used with more precision. Pressure flaking uses an instrument to apply concentrated pressure to a small point on the edge of a suitable piece of stone, which effectively pushes a small flake off of the main body of stone, allowing the knapper to modify tool shape and to re-sharpen dulled edges (Kooyman 2000:16-18).

Bifaces

Bifaces are pieces of lithic material which have had flakes intentionally removed from both dorsal and ventral surfaces (see Figure 3.13). However a number of more specific terms such as bi-pointed, lanceolate, and ovate are useful in defining the contents of the collections under examination. For this reason the broad term biface will only be used to describe objects with generic, ambivalent forms, or small bifacial fragments which lack any discernible attributes or are otherwise unidentifiable (Hood 2008:157).

Figure 3.13 Bifaces. A. HdCh-9:8; B. HiCj-5:11; C. HdCg-19:150; D. HiCj-5:102; E. HiCj-5:36; F. HiCj-5:10; G. HeCi-11:14; H. HeCi-11:7; I. HdCh-37:28.

Bifaces F and H are lanceolate, G and I are bi-pointed.

Bi-pointed bifaces are bifacially flaked lithic implements which have been worked to form a tapering point on both the proximal and distal ends of the artifact (Reid 2007:12). Orientation and use is often difficult to determine with these artifacts making further classification moot, despite the fact that many could have functioned usefully as anything from knives to projectile points.

Lanceolate bifaces are bifacial tools which are at least twice as long as they are wide (Reid 2007:12). However if an artifact which is lanceolate and bifacially flaked has characteristics which allow it to be classified more specifically, it will not be described as a lanceolate biface.

Stemmed bifaces are bifaces which possess defined shoulders and a narrower, projecting stem at the proximal end. This is similar to Reid's (2007:12) term *hafted biface* but differs in that *hafted biface* refers to any haftable biface, meaning that this category could overlap with other hafted bifacial artifacts like a projectile point. This category is used mostly in the context of bifaces where only the proximal portion remains, making further identification difficult. Other artifacts which are classified as a stemmed biface include bifaces which are unlikely to have been used as projectile points.

Projectile Points

Projectile points (Figure 3.14), as used here, is similar to Hood's *bifacial points* (2008:157). These are usually bifacially flaked and can be made either from flakes or from preforms. These tools are not grouped with bifaces because there are varieties of projectile points (for example flake points), which may or may not have been bifacially flaked. Labrador Archaic projectile points are triangular/nipple-based (early) or stem-based (middle-late) (Tuck 1976:50-51), and generally have elongated triangular blades.

Figure 3.14 A. HcCh-7:123; B. HcCh-7:470; C. HiCj-5:88; D. HdCh-9:38; E. HeCi-11:147; F. HdCg-7:71; G. HdCg-19:93; H. HcCh-7:22; I. HcCh-7:100; J. HdCg-33:15; K. HiCj-5:212; L. HdCg-7:105.

Endscrapers

Endscrapers (Figure 3.15) are small and either trapezoidal or triangular in plan, are steeply retouched on the wide working edge and exhibit varying degrees of retouch on the lateral edges (Hood 2008:157). Though they are often unifacial, the lateral edges are occasionally bifacially retouched. The distal scraping end can be a variety of shapes including straight, convex, concave, bi-concave, or undulating.

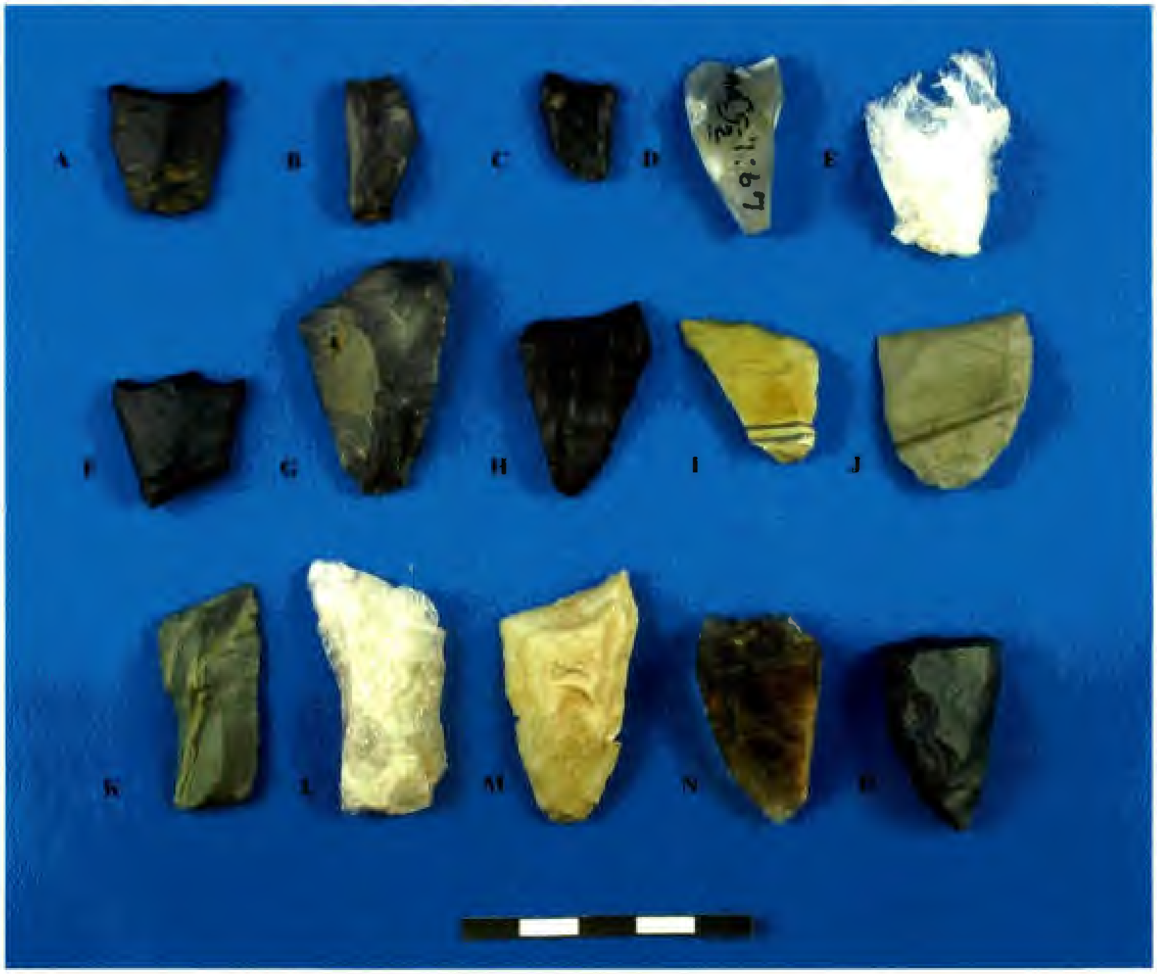

Figure 3.15 Endscrapers. A. HcCh-7:543; B. HeCi-11:53; C. HdCg-19:37; D. HdCg-7:67; E. HiCj-5:258; F. HcCh-7:542; G. HeCi-11:168; H. HcCh-7:201; I. HcCh-7:27; J. HiCj-5:197; K. HiCj-5:16; L. HiCj-5:259; M. HiCj-5:169; N. HdCg-7:124; O. HdCh-9:7.

Formal Flake Tools

Formal flake tools are tools made from flakes struck from a core, but are sometimes difficult to identify in cases where diagnostic flake characteristics were removed by the knapper (Reid 2007:13). These tools are most often unifacial, though bifacial retouch does occur. Formal flake tools include flake knives, flake scrapers, and projectile points made from flakes.

Flake knives are flakes which have been steeply retouched along a lateral edge, and are also known as a backed flake or a backed knife (Hood 2008:157). However, flake knives must have cutting usewear along the non-retouched edge to indicate that it was used for this purpose, or they are called flake scrapers.

Flake scrapers are very similar to flake knives, but lack cutting usewear along the non-retouched edge. It must be assumed that their primary function revolved around the steeply retouched lateral edge as a scraping edge, rather than the naturally sharp edge of the flake as a cutting implement.

Flake points are flakes of lithic material which have been retouched to form projectile points (Reid 2007:14). However, flake points are only retouched along the margins of the flake, and not across the entirety of either the dorsal or ventral surfaces. The retouch can be either bifacial, unifacial, or can be unifacial on alternating surfaces (Hood 2008:157). Flake points are often roughly symmetrical, though expedience does seem to have replaced symmetry in some cases.

Expedient Flake Tools

Retouched flakes are flakes which have had other flakes removed from them, usually to sharpen an edge or to create a quick expedient tool. The term retouched flake also applies to any fragment of a flake tool which has evidence of being retouched but is too small to be further identified.

Utilized flakes (Hood 2008:157) are flakes which exhibit shallow or indistinct usewear. For this work the term utilized flakes describes only those flakes which are completely unmodified but still bear traces of usewear, either in terms of edge attrition or surface polishing, while flakes which display both usewear and retouch are labeled as retouched/utilized flakes.

Debitage

Debitage describes the byproducts of the lithic reduction process and includes waste flakes and shatter (Nagle 1984:261). A waste flake is any flake which was not used (or at least does not have any usewear or retouch) after it was removed from the core. Waste flakes have flake characteristics like striking platforms, lines of compression, bulbs of percussion and bulbar scars, though one or more of these attributes may not be present depending on the condition and portion of the flake. Debitage which does not possess any of these characteristics is called shatter and is often angular and irregular (Kooyman 2000:12-15). However, because no focused analysis of the debitage was undertaken here both waste flakes and shatter are considered as debitage, and recorded only as total number of pieces and total weights of different material types.

3.2.3 Artifact Categories: Ground Stone

Ground stone tools are fashioned by using abrasive materials to grind away excess lithic material from a blank or a core to form a finished tool. Included in this manufacturing technique is intentional polishing like that done with fine sand or other abrasive materials (Kooyman 2000:10). Ground stone tools also have different material requirements than knapped stone. Ground stone tools do not need to be manufactured from silica-rich minerals because most lithic reduction via grinding does not include a heavy knapping component (though some tools are roughly knapped and then ground), and a small crystal or grain size is also less important for the same reasons. Materials such as slate are conducive to the manufacture of ground stone tools as they are not as hard and brittle as knappable minerals and can be sharpened to a keen edge. Ground stone tools like celts and adzes were likely used to work materials like wood (Brake 2006:9; Fiedel 1992:104; Stroulia 2003:2), bone, and ivory as they could be sharpened and re-sharpened easily, and could be hafted onto long handles and swung like an axe. Slate was frequently chosen as a material for these tools as it is a somewhat softer material with platy cleavage which makes it less brittle and thus less likely to shatter under a high velocity impact than materials like cherts. Also, polished surfaces result in more effective penetration into worked materials (like bone or wood), meaning smooth slate artifacts would be a more efficient tool for this task than a knapped chert implement (Kooyman 2000:11).

Celts

Celts (Figure 3.16) are a common ground stone artifact on Labrador Archaic sites, and they can vary in morphology. Celts are generally fairly large, robustly made, ungrooved, and are symmetrically sharpened (Reid 2007:16). Celts are roughly rectangular or triangular, with a sharpened edge on one end. Their function, as mentioned above, was probably related to rough woodworking as a chopping/splitting tool.

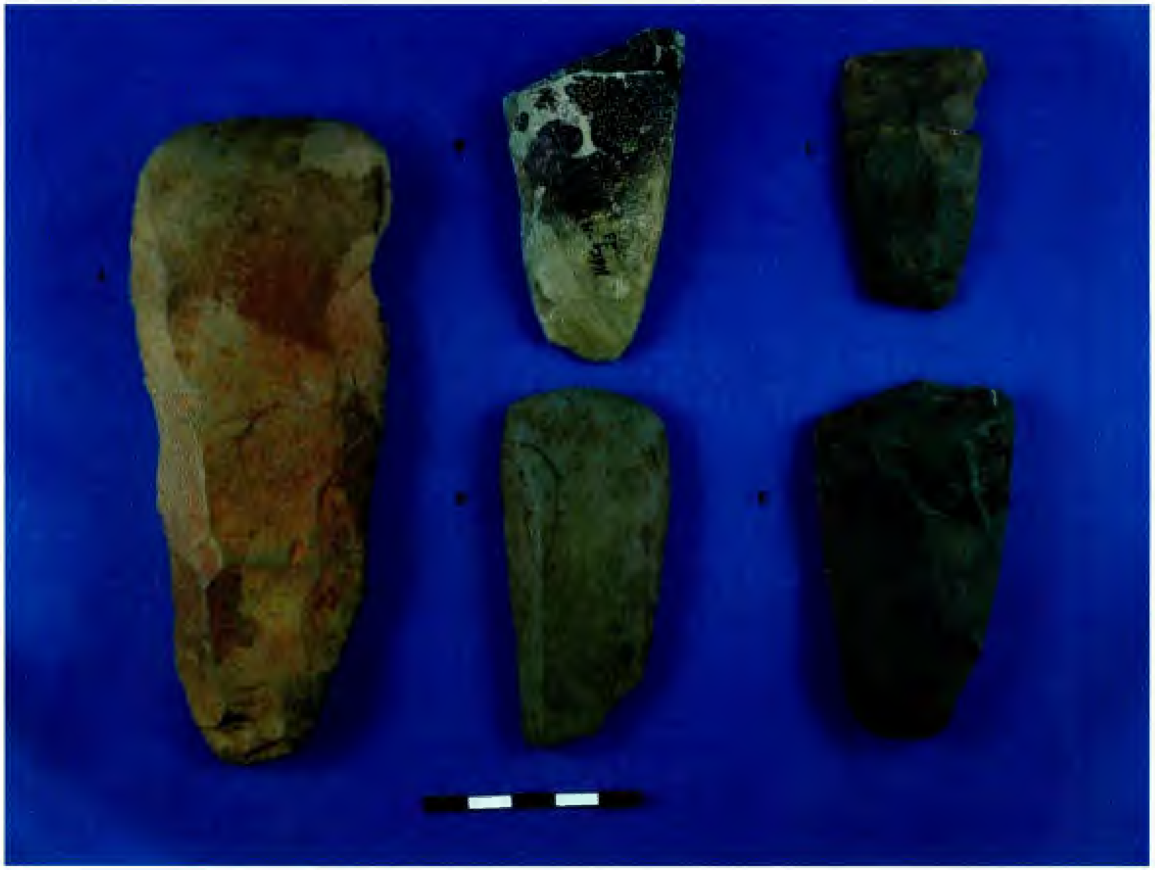

Figure 3.16 Celts. A. HcCh-7:913; B. HdCg-19:23; C. HcCh-7:196; D. HcCh-7:914; E. HcCh-7:916/73.

Adzes

Adzes (Figure 3.17) are similar to celts and the terms are sometimes used interchangeably but they are in fact different tool forms. Adzes are frequently grooved on one end, presumably to aid in hafting the tool, and are asymmetrical in profile, while celts are symmetrical. Also, adzes have at least one beveled edge (Reid 2007:17). Adzes are also thought to have been woodworking tools, though they were likely used for finer work than celts as adzes are generally smaller and more gracile than celts.

Figure 3.17 Adzes. A. HdCg-7:6; B. HeCi-11:18; C. HeCi-11:38.

Ground Slate Projectile Points

Another typical ground slate artifact type found on Labrador Archaic sites is the ground slate bayonet. These artifacts are typically at least twice as long as they are wide, have a variable morphology, and can be round or hexagonal in cross section (Hood 2008:159). The term ground slate projectile point will replace "bayonet" for two reasons; the term bayonet conveys images of semi-modern military accoutrements and a military function, and most of the ground slate projectile points from these collections are quite short, more so resembling spear or lance points than bayonets.

Slate Blanks

Slate blanks are pieces of slate which have been worked, but which do not possess any characteristics which would include them in a formal artifact class (Hood 2008:159). These artifacts are likely unfinished pieces, minimally reduced from a core to ease transportation and future reduction to a preform or finished tool.

Ground Slate Flakes vs. Ground Slate Fragments

A distinction must be made between two types of ground stone artifacts: ground slate flakes and ground slate fragments. The former possess traces of grinding but no distinguishable tool attributes, while ground slate fragments do have tool characteristics such as edges, bevels and shoulders (Hood 2008:159).

Semi Lunar Knives

Semi-lunar knives (Figures 3.18 and 3.19) are an artifact type from Labrador Archaic sites similar to those mentioned in Byers' Coastal Archaic toolkit (1959: 242; Fitzhugh 1972:129; Tuck and McGee 1975b:89), as well as the "...ovoid chipped and ground stone knife [knives]..." from Samson's Early Prehistoric culture from Indian House Lake (1978:190). These tools can either be knapped or ground, and occur in the collections made from a number of materials including slate and Ramah chert.

Figure 3.18 Semi Lunar Knives. A. HcCh-7:139; B. HdCg-19:147; C. HeCi-11:32; D. HdCg-19:94.

Figure 3.19 Knapped Semi Lunar Knives. A. HcCh-7:545; B. HeCi-11:32; C. HeCi-11:170.

Some of these artifact categories will be amalgamated into group categories for the purpose of tallying the results of the analysis, as discussed below (Chapter 4, Section 4.1.2). This is because some of the more specific artifact categories occur sporadically or in low frequencies across the sites, and grouping them into broader functional categories allows trends and patterns within the assembled lithic collections to become more apparent.

3.3 Material Analysis

The lithic collections analyzed were composed of a number of types of raw material, including sedimentary, metamorphic, and igneous lithics. The large majority of these collections were made up of silicate minerals which can be sedimentary or metamorphic and which include quartz, quartzite, chert, and some types of slate. There were a few igneous stone artifacts, namely granitic hammerstones. Visual identification was used for the material analysis, using basic magnifying hand lenses where necessary. The material types observed within the collections are listed and described below.

Quartz/Quartzite

Quartz is a mineral composed of silica (SiO_2) (Blatt et al. 2006:22). The presence of impurities within this mineral such as iron can create varieties like rose and smoky quartz. Quartz and quartzite are extremely common materials on Labrador Archaic sites, and are common minerals found throughout much of Labrador (Lazenby 1984:40) as vein quartz, quartz crystal, or quartzite. Quartz fractures conchoidally, and high quality pieces are often vitreous. In its crystal form quartz has a hexagonal crystal structure, and often has internal cleavage planes (Nagle 1984:112; Reid 2007:18). I have divided quartz into low quality vein quartz and higher quality, crystalline quartz. Low quality quartz includes specimens which are fractured along internal planes of cleavage, are opaque (though this can vary according to the thickness of the specimen), and which do not have a strong tendency to fracture conchoidally; in this sense it is similar to the way Nagle (1984:112) uses the term "quartz". High quality quartz denotes a higher quality material with stronger conchoidal fracturing, less tendency to cleave along internal planes, and a higher degree of transparency and light refraction. This includes macro-crystalline quartzite, quartz crystal, and high quality examples of vein quartz.

Quartzite is formed by silica rich sandstone which has been metamorphosed (Blatt et al. 2006:373; Reid 2007:18), but materials which are classed as quartzite include only microcrystalline examples of the mineral. This is because the macro-crystalline variety seems to possess similar knapping attributes to crystalline quartz, while microcrystalline quartzite tends to behave more like a chert in that it fractures in a more predictable, conchoidal manner.

Chert

Chert is common in Labrador Archaic lithic assemblages, and is a hard, dense mineral with conchoidal fracture (Simpson 1966: 212). Chert is composed mostly of microcrystalline and cryptocrystalline quartz and chalcedony crystals, but may have other impurities such as various elements/minerals or organic matter (Blatt et al. 2006:318; Eley & von Bitter 1989:1). These impurities often cause distinguishing features such as color variation or the inclusion of fossils within the matrix of the chert. There are two major types of chert within the studied collections, and these are derived from two different source areas on the Labrador coast: Cape Mugford and Ramah Bay.

Chert: the Mugford Group

The Mugford Group is a chert bearing geological formation on the northern coast of Labrador, just north of Okak (Figure 3.20). The Group is a mixed rock sequence of volcanic and sedimentary layers which produces chert, as well as slate, sandstone, and quartzite. This formation dates from the Aphebian age and is roughly the same age as the Ramah Group further north (about 1.2-1.5 billion years old). Because of their extreme age, Mugford cherts do not contain fossiliferous inclusions (Fitzhugh 1972:41; Gramly 1978:37; Nagle 1984:101). Mugford chert occurs in three varieties which are described in detail by both Gramly (1978) and Nagle (1984).

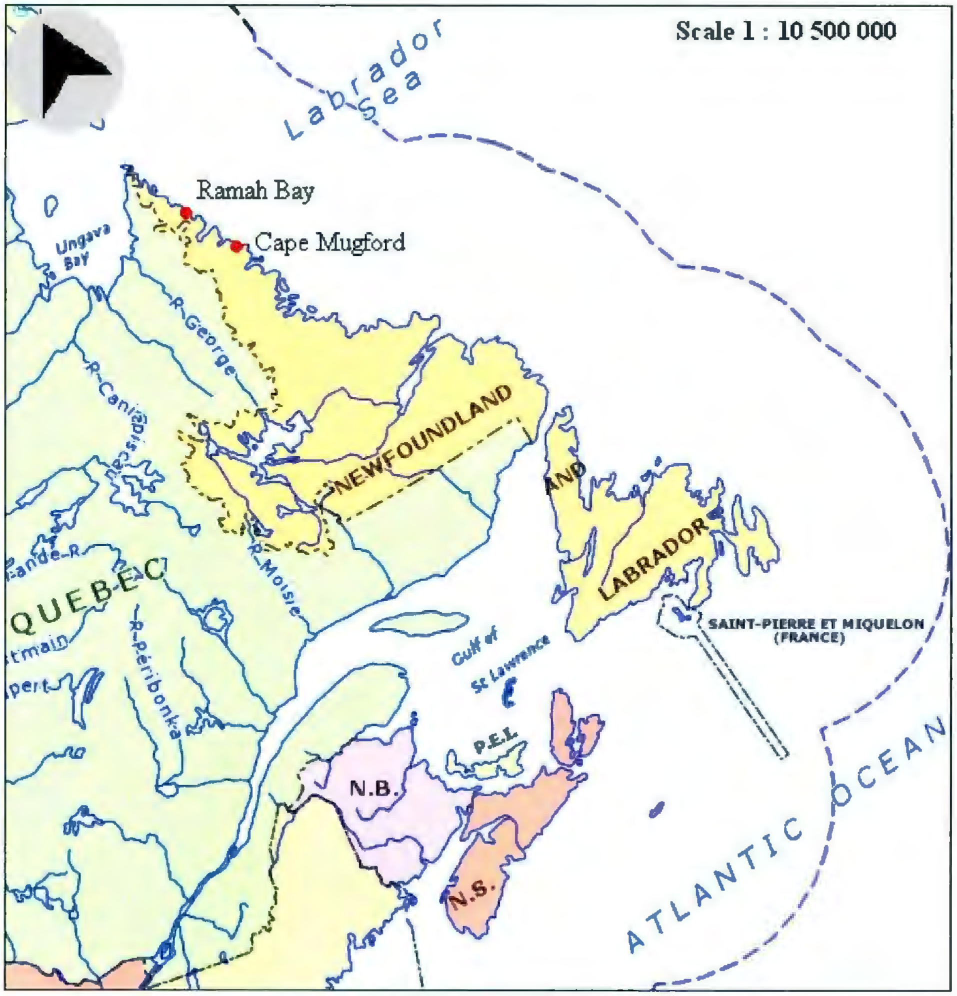

Figure 3.20 Map of Eastern Canada Showing the Approximate Locations of Ramah Bay and Cape Mugford (Modified from the Atlas of Canada 2007).

The first variety of Mugford chert is Cod Island chert, named after is source location on Cod and Grimmington Islands (Gramly 1978:44). This chert has a huge range of color variation and can be milky white, cream, light grey-green, brownish grey, rust, yellowish green, charcoal grey, or dark sea green. Despite this range, individual specimens are normally monochromatic. Cod Island chert has a texture like frosted glass with a dull luster, and is translucent in flakes. Though some examples (especially the grey variety) can be confused with Ramah chert, careful cleaning and inspection can separate them.

Kaumajet chert is the second variety of Mugford chert, and is almost as variable as the Cod Island type in terms of color. Kaumajet chert can be grey, tan, white, green, or it can grade between these colors. Also, specimens can be polychromatic and can have banding or speckles of black or white. Both Cod Island and Kaumajet cherts are badly jointed, and unblemished specimens more than 10 cm in length are rare.

The final type of Mugford chert is one that I have called Kaumajet Black. This is a dense, fine-grained black chert with a dull to waxy luster. Kaumajet Black is completely opaque, and can have fine joints which are filled with microcrystalline quartz. This chert is very similar to a variety of Ramah chert which will be discussed shortly, and they cannot be distinguished visually. According to Lazenby (1980:645) chemical methods may also be found lacking if used to separate these two cherts in archaeological collections. These two types of black chert were classified as their own material type, and are discussed below.

For the purpose of this research all cherts from the Mugford region (with the exception of Kaumajet Black), will be referred to as Mugford cherts. This is because the source areas for both varieties (Kaumajet Black has not been definitively linked to a specific source) occur very close to each other, and the flaking and extraction properties do not differ greatly between the two sources (Gramly1978:46; Lazenby 1984:43).

Chert: Ramah Chert

Ramah Chert comes from the Ramah Group in northern Labrador (Figure 3.20); this formation is found between Hebron and Nachvak Fjords, but the chert producing regions seems to range between Ramah Bay and Nachvak Fjord, a distance of about 30 km (Nagle 1984:96-99). Ramah chert is metamorphic, has been faulted and has undergone several major folding episodes, but despite this, unblemished pieces the size of footballs and bigger can be easily extracted from talus slopes. Some researchers have suggested it is this ease of extraction which made Ramah chert rise in popularity among prehistoric populations, as well as its excellent flaking properties (Lazenby 1984:44). Other researchers (Loring 2002:184) suggested it was perhaps due to its striking visual properties, particularly the occurrence of reddish ferrous inclusions within the translucent matrix of the stone which could have held special significance for the people using this material, perhaps representing life, blood, land, or all of the above. Whatever the reason, the use of Ramah chert increased in frequency throughout prehistory, and artifacts made of Ramah chert have been found as far south as New England, suggesting a very extensive trade network for this material (Gramly 1978:37).

Ramah chert is a high quality chert which is semi to completely translucent, and which has a color range from clear to completely black, but can also exhibit shades of red, yellow, and green. Ramah chert can also be banded, and can have inclusions in the form of clouds, streaks, or speckles of color (Reid 2007:22). Ramah chert has a very unique texture, described by Tuck (1976:52) as being like "sleet on a windshield".

Because of this it is described by researchers as alternately both fine and coarse grained (Nagle 1984:100; Reid 2007:22). Unlike the different types of Mugford cherts, Ramah chert is generally quite distinguishable in archaeological collections and can be identified using only visual identification techniques (Nagle 1984:100).

Black Chert

Despite the unique characteristics of most Ramah chert, there is a variety which causes some difficulties to researchers. Black Ramah, a lustrous, fine grained chert or silicified slate, is found in the Ramah Group and is extremely similar to Kaumajet Black (Fitzhugh 1972:39; Nagle 1984:100). Because of the difficulties in distinguishing between Black Ramah and Kaumajet Black, any opaque, black, fine grained chert in the collections will be labeled as black chert. This was done in order to avoid attributing lithic materials to the wrong source as well as to acknowledge the distinctiveness of this material when compared to any of the other lithic types in these collections.

Slate

Slate is a metamorphosed version of shale, siltstone, or mudstone, and is often present on Labrador Archaic sites in the form of ground stone tools. Slate is fine grained, has platy cleavage (Blatt et al. 2006:372; Kooyman 2000:36), and can be various shades of grey, green, or reddish brown. Slate is widely available on the Labrador coast, occurring alongside chert at most chert producing locations like the Mugford and Ramah Groups (Gramly 1978; Lazenby 1984:42; Reid 2007:19).

3.4 Metric analysis

The metric analysis undertaken here had two major components, the first of which consisted of a traditional analysis of every artifact in the assembled collections using calipers to measure the artifacts and a digital scale to record their weights. Secondly computer software was used to analyze the projectile points from these sites in order to first determine if these programs can be effectively used to study archaeological collections, and how they compare to more traditional measurement techniques. The data gathered from the projectile points using these programs was then used to trace the changes in projectile point morphology during the early and middle Labrador Archaic.

3.4.1 Traditional Metric Analysis

All of the artifacts from the assembled collections with the exception of unmodified pieces of debitage were measured using calipers to determine length, width, and thickness, and were then weighed on a digital scale in order to record weight (weights were recorded to one tenth of a gram). Debitage was weighed but dimensions were not measured. Expedient flake tools and endscrapers were well represented by large assemblages which included many complete artifacts. Because of this these two artifact categories were looked at in greater depth to determine how the shape of these artifacts changed during the early to middle Labrador Archaic occupation of northern Labrador.

3.4.2 Projectile Points and the "New" Morphometrics

The projectile points from the eight observed collections were first measured using calipers as described above, and were then subjected to a newer form of analysis using digital photography and geometric morphometric software to analyze their size, shape, and form. Though caliper measurements were sufficient to derive morphological data from these artifacts the newer digital technique was employed for two reasons: to determine how effectively these methods can be applied the study of Labrador Archaic lithics, and to evaluate their usefulness against a known means of analysis, namely calipers.

Applying geometric morphometric analyses to archaeological collections is not a new technique. Marcus and Corti's (1996:2) definition of traditional morphometrics is based on caliper measurements, areas, volumes, and angles and therefore reads like a description of traditional artifact analysis. However, in the last twenty five years scholars, mostly within the field of biology, have been exploring new ways to apply morphometric analysis to the problem of studying "shape variation within and among samples of organisms and of the analysis of shape change as a result of growth, experimental treatment, or evolution" (Rohlf & Marcus 1993:129).

This "new" or geometric morphometrics distinguishes itself from traditional methods by focusing on outlines, and landmark data in the form of point coordinates, to study shape (Marcus & Corti 1996:1). The term landmark or homologous landmark refers to attributes which are present on every specimen in the sample, such as the point where a salmon's fin connects with its body (Wilke & Kinnison 2006), or the extreme base or tip of a projectile point. Archaeologists were quick to realize that these methods could be used to study archaeological assemblages, and have used them to collect and analyze bioarchaeological and physical anthropological data (Ahlström 1996; Berge 1996; Wood & Lynch 1996). These methods have also been applied to lithic assemblages (Brande & Saragusti, 1996, 1999; Gowlett & Crompton 1993, 1994) in order to demonstrate changes in artifact form over time.

3.4.3 Quantifying Change

This geometric morphometric approach was used to develop a mathematical framework to help understand the morphological changes within Labrador Archaic projectile point assemblages. Being able to *quantitatively* delineate between a nipple based point and a stemmed one would be enormously helpful in a region like Labrador, where even multi-component sites often have little or no stratigraphy and blown-out sites are common. Having a mathematical continuum within which projectile points could be placed would also help to determine more accurate typological dates, which are frequently the only type available on northern Labrador sites due to the limited stratigraphy, infrequent preservation of organic materials, and presence of contaminants from things like sea mammal remains which can skew radiocarbon dates.

Two software programs, (TPSUtil and TPSDig) were used to measure the projectile points, and the digital measurements were then compared with measurements taken by calipers on the same group of artifacts to determine how accurately these programs could record artifact measurements. TPSUtil is a preliminary program used to compile artifact images into files accessed by TPSDig; TPSDig was then used to measure the artifacts and record those measurements, though this is the least of its capabilities.

TPSDig can also be used to record outline data on specimens, as well as record and compare homologous landmarks on specimens, measure angles, and can be used in concert with other programs to perform complex statistical analyses, though due to the limited number of complete and partially complete artifacts I was working with these functions were not used.

As with any study of stone tools, measurements of tool size and form were at the core of this analysis, to be used to track changes in projectile point morphology through the early-middle Labrador Archaic period in northern Labrador. This includes basic measurements like length and width, but also more focused measurements of structures on the artifacts, for example width of the stem or shoulders of a projectile point. Advances in the use of digital analysis techniques now make it possible to use computer programs to take and record these measurements, allowing for a level of accuracy that is equal to, if not superior to data derived from calipers. Also it allows researchers to analyze artifacts using photographs rather than the physical object, which can reduce wear on artifacts and facilitate research using distant collections. Furthermore, by using software which is easy to use and which records artifact measurements independently of the user, this method could help to lower the instances of all three types of observer-introduced error (random, systemic, and illegitimate error) during data collection (Gnaden and Holdaway 2000:740).

I used projectile points to test these programs because they are a discrete artifact category with a relatively fixed morphology, but there was also enough variation within that morphology to test the limitations of the software and to provide variables which were used in the analysis of this artifact type. The programs were used to measure total dimensions of the artifacts such as length and width, as well as the dimensions of structures found on the artifacts like the length of the blade, width of the stem and so forth (Figure 3.21 shows the four structures to be measured using the TPSDig program). The four measurements listed in Figure 3.21 were then reduced to ratios using shoulder width as the base factor. By selecting artifacts which had the shoulders and at least one other variable present, I was able to include more than twice the number of projectile points in the analysis presented in Chapter 5 (section 5.2.3) by incorporating data from broken artifacts as well as complete ones. It was also possible to accurately compare differences in artifact structures (for example blade length or stem width) between specimens of different sizes. Because the software produced results which are as accurate as caliper measurements (see next chapter), and which were quicker and easier to obtain, I can say that this method merits further exploration within archaeological analyses. As well, this method provides standardized results with less possibility for human error than caliper measurements.

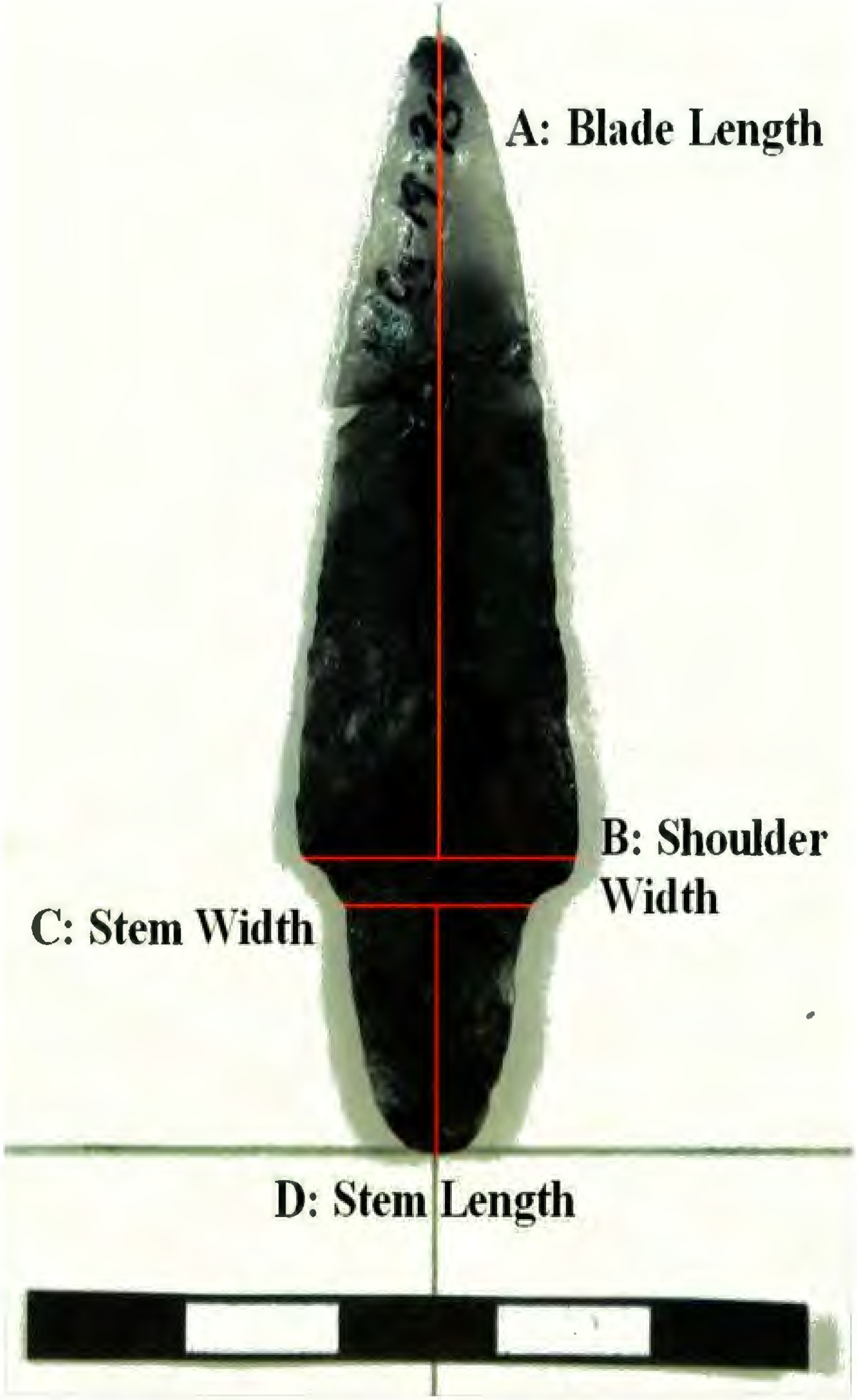

Figure 3.21 A Projectile Point (HdCg-19: 95) Showing the Four Structures Measured Using TPSDig: Blade Length, Shoulder Width, Stem Width, and Stem Length.

Chapter 4: Results

This chapter presents the results of the artifact and material analyses. These results are presented first as an amalgamation of the collections of all eight sites, followed by a site by site presentation. Results from each site are presented in chronological order starting with the oldest site and working toward the most recent. The results presented here describe the state of the collections as they were when my analysis was conducted. As outlined in Chapter 3, a number of artifacts were missing from the collections (a total list can be found in Appendix A); a few are on display at a number of different museums, and some have either been lost during the transfer to The Rooms Provincial Museum, or are otherwise unaccounted for. While including these artifacts would present a more complete picture of the collections, the absence of their physical presence during the analysis as well as the fragmentary nature of the catalogued information pertaining to them lower the reliability of any data included from these missing artifacts.

Artifact and material quantities are referred to as percentages of the portions of the collections which were actually observed (see above). Because the collections differ in size, reference to the artifacts and material types as raw counts would obscure relations between the sites. Using percentages to discuss the collections

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A note on tables: all the tables in this section feature values which represent percentages of the collections, either belonging to material types or artifact classes. In cases which the percent values do not total 100%, this is due to the rounding of these values to a single decimal point.

allows more accurate comparisons to be made between artifact and material frequencies within and between lithic collections of varying sizes.

To extract trends and patterns from the assembled collections, it was necessary to first rank them from oldest to most recent creating a continuum spanning from c. 6500 BP (Ballybrack 10) to c. 5000 BP (Dog Bight L9). By structuring this chronology using C^{14}-dated sites and filling it in with sites which have strong typological dates associated with them, an accurate picture of early to middle Labrador Archaic occupation of the northern coast of Labrador can be constructed (Table 4.1).

Table 4.1 Site Chronology

Site	Borden Number	Age
Ballybrack 10	**HeCi-11**	**c. 6500-6000 BP**
Evilik Bay 5	HdCg-07	c. 6000 BP
Dog Island Southwest 1	HdCg-37	c. 6000 BP
Imilikuluk 5	HdCg-33	c. 6000-5000 BP
Gull Arm 1	**HdCg-19**	**5605 +/-160 BP**
Nukasusutok 5	**HcCh-07**	**5575 +/-90 BP**
Cutthroat Island 2	**HiCj-5**	**5480 +/-110 BP**
Dog Bight L9	HcCh-09	c. 5000 BP

Sites in bold script have been radiocarbon dated.

Differences in investigative strategies should also be considered when looking at these collections. Those sites which were less intensively investigated are bracketed on either side by sites which were more thoroughly excavated (Table 4.2). These thoroughly investigated sites act as anchors in much the same way as the sites which were dated using radiocarbon analysis in that they provide reliable points around which a framework of material and artifact frequencies can be built using the data from each site. Their placement within this framework allows any possible inaccuracies due to incomplete or smaller collections to be evaluated in the context of more secure data from larger, more inclusive lithic assemblages.

Table 4.2 Investigative Strategies

Site	Borden Number	Investigative Strategy
Ballybrack 10	HeCi-11	Excavation
Evilik Bay 5	HdCg-07	Surface collection and test pitting
Dog Island Southwest 1	HdCh-37	Survey, surface collection, partial excavation
Imilikuluk 5	HdCg-33	Test pitting, excavation
Gull Arm 1	HdCg-19	Surface collection, test pitting, excavation
Nukasusutok 5	HcCh-07	Surface collection and excavation
Cutthroat Island 2	HiCj-5	Excavation
Dog Bight L9	HdCh-09	Surface collection

4.1 Total Lithic Assemblage

This section presents the amalgamated lithic assemblages from all the sites.

4.1.1 Total Lithic Assemblage: Debitage

Lithic debitage is the largest single category of artifacts present in each collection (Table 4.3). Between unmodified flakes and pieces of shatter, there are 29,879 debitage pieces, weighing slightly less than 60 kilograms. In terms of total flake counts the debitage assemblage is dominated by Ramah chert (36.6%) and high quality quartz (30.8%), followed by Cape Mugford cherts (18.9%), and low quality quartz (8.5%). These four lithic types make up almost 95% of the total debitage assemblage, with slate and black chert (3.4% and 1.2% respectively) effectively completing the assemblage (99.3%). The remainder of the debitage assemblage is composed of 0.3% quartzite, 0.3% schist, less than 0.1% silicified slate, and small amounts of other lithic materials which are listed under the "other" category on Table 4.3. Though the smoky and rose quartz fall within the definition used for high quality quartz in Chapter 3, their striking visual properties set them apart into material categories of their own, though because they are so infrequent on these sites they are listed in the *other* category.

When weight is considered instead of total counts, the picture changes somewhat. While some lithic types do not move position much (slate, for instance, only increases by two tenths of a percentage to 3.5%), others increase significantly. High quality quartz now comprises the majority of the weight of the debitage collection with 35,542.5 g or 59.4% of the total debitage assemblage. Low quality quartz is next at 22.3% of the assemblage, and Ramah chert is next with 8.9%; Mugford cherts account for even less with only 3.6%. Quartzite is far more prevalent by weight than it is by quantity, making up 1.4% of the weight of the collection, while schist becomes only marginally more visible rising to 0.3%, black chert drops to 0.2%, and silicified slate maintains its position at <0.1%. The final 0.3% is made up of other lithic materials, making them more than three times more prominent by weight than by quantity. The differences between the weight and quantity of the debitage from different materials in these collections could relate to the type of reduction being practiced with each material at each site. Materials represented by high flake counts and low debitage weights were likely only subject to secondary reduction on site (producing a larger quantity of small flakes), whereas small flake counts but higher total weight could indicate earlier stages of reduction being used with this material creating fewer, larger flakes. Local materials were more likely to be used in this way, as lithic types from distant sources would probably have been brought on site in partially reduced forms, as blanks or preforms if not finished artifacts.

Table 4.3 Total Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Mug-ford	Quartz-ite	Ramah	Silicified Slate	Schist	Slate	Other	Total	%
Quantity												
Ballybrack 10	2	1830	59	198	46	406	2	0	74	6	2623	8.8
Evilik Bay 5	0	6	2	1	0	3	0	0	14	1	27	0.1
Dog Island Southwest 1	0	0	0	1	0	0	0	0	0	0	1	0.0
Imilikuluk 5	2	1028	92	0	19	244	0	0	6	4	1395	4.7
Gull Arm 1	30	2300	153	45	13	1546	0	4	105	10	4206	14.1
Nukasusutok 5	312	3801	2225	58	0	8271	3	77	693	0	15440	51.7
Cutthroat Island 2	5	248	5	5338	0	451	3	0	118	11	6179	20.7
Dog Bight L9	0	1	0	2	0	5	0	0	0	0	8	0.0
Total	351	9214	2536	5643	78	10926	8	81	1010	32	29879	100.0
%	1.2	30.8	8.5	18.9	0.3	36.6	0.0	0.3	3.4	0.1	100.0	
Weight (g)												
Ballybrack 10	0.9	12329.5	791.2	142.5	281.6	225.4	6.1	0.0	212.1	20.4	14009.7	23.4
Evilik Bay 5	0.0	54.8	18.0	1.6	0.0	2.3	0.0	0.0	155.1	3.4	235.2	0.4
Dog Island Southwest 1	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Imilikuluk 5	0.1	5933.3	762.9	0.0	386.3	59.1	0.0	0.0	81.6	103.8	7327.1	12.2
Gull Arm 1	21.5	6631.7	543.7	32.6	170	1077.4	0.0	59.2	411.6	25.7	8973.4	15.0
Nukasusutok 5	82.2	9130.7	11199.2	20.0	0.0	3803.1	0.7	143.7	828.2	0.0	25207.8	42.1
Cutthroat Island 2	3.3	1454.5	24.8	1970.5	0.0	161.0	10.8	0.0	424.0	55.1	4104.0	6.9
Dog Bight L9	0.0	8.0	0.0	1.8	0.0	8.4	0.0	0.0	0.0	0.0	18.2	0.0
Total	108.0	35542.5	13339.8	2169.8	837.9	5336.7	17.6	202.9	2112.6	208.4	59876.2	100.0
%	0.2	59.4	22.3	3.6	1.4	8.9	0.0	0.3	3.5	0.3	100.0	

Other Materials: basalt (1), jasper (1), feldspar (1), hornblende (1), smokey quartz (1), soapstone (1), rhyolite (3), sandstone (18), tuff (1), limestone (2), unidentified red aggregate (2.

4.1.2 Total Lithic Assemblage: Artifacts

The total artifact assemblage from all eight Labrador Archaic sites included in this study is presented in Table 4.4. Several of the artifact classes included in this table require some elaboration, as they were created by amalgamating several of the artifact categories outlined in the previous chapter. The *Biface* category is comprised of all types of bifaces including lanceolate, bi-pointed, ovate, and biface fragments. *Core Tools* include cores which had additional functions other than simply serving as repositories of raw material. These include cores which had seen use as hammerstones, as well as cutting and scraping tools. *Expedient Flake Tools* includes utilized flakes, retouched flakes, and flakes which exhibit traces of both usewear and retouch. In contrast, the *Formal Flake Tool* category is made up of tools which required a higher degree of manufacture such as flake projectile points, flake scrapers, and flake knives. *Other Artifacts* is composed of artifact types which had a low number of specimens, and/or which were an aberration of another artifact type; this category includes unidentified tools, pebbles, awls, cobbles, whetstones, micro-points, chisels, and mica fragments. This was necessary in order to make the data more readable. Similar tool types represented by small numbers of artifacts were also grouped together in order to keep trends within larger groups of artifacts from being obscured by a cloud of minor data points representing these infrequently occurring tools.

Table 4.4 Total Assemblage of Lithic Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	6	0	0	6	0.3
Bifaces	9	25	1	7	22	138	6	2	0	1	211	9.9
Blanks/ Preforms	0	1	0	0	1	3	0	4	0	0	9	0.4
Celts	0	2	0	0	0	0	2	17	0	1	22	1.0
Cores	0	106	13	67	6	8	0	1	0	1	202	9.5
Core Tools	0	7	0	3	1	0	0	0	0	0	11	0.5
End-scrapers	8	12	1	0	20	5	0	0	0	0	47	2.2
Expedi-ent Flake Tools	18	253	21	16	119	507	5	26	0	1	966	45.7
Formal Flake Tools	0	17	0	1	5	28	1	0	0	1	53	2.5
Ground Flakes	0	0	0	0	1	0	1	59	0	1	62	2.9
Ground Frag-ments	0	0	0	0	1	0	4	81	0	1	87	4.1
Hamm-erstones	0	7	0	0	0	0	0	0	0	3	10	0.5
Micro-Blades	0	1	0	0	11	1	0	0	0	0	13	0.6
Pièces Ésquill-ées	1	151	15	17	11	45	0	0	0	1	241	11.3
Pig-ments	0	0	0	0	0	0	0	0	32	0	32	1.5
Pro-jectile points	1	3	0	0	1	67	1	5	0	0	78	3.7
Scrapers	6	4	1	0	12	2	0	0	0	2	27	1.3
Semi-Lunar Knives	0	0	0	0	0	2	1	8	0	2	13	0.6
Tablets	0	0	0	0	0	0	0	3	0	7	10	0.5
Other	0	1	0	0	0	3	0	8	0	8	20	0.9
Total	43	596	40	123	208	815	21	220	32	30	2120	99.9
%	2.0	28.0	1.9	5.8	9.8	38.3	1.0	10.3	1.5	1.4	100.0	

Other: Gneiss biface, sandstone celt, schist core, jasper retouched flake, smokey quartz scrapers (2), white chert graver/scraper, schist ground flake, granite hammerstones (3), rose quartz pièce ésquillée, schist semi-lunar knife, schist tablets (7), unidentified gneiss ground stone tool, unidentified slate ground stone tool, mica fragments (4), granite pebbles (3), limestone pebble, ramah chert awl, slate awl, ramah chert micropoints (2), high quality quartz micropoint, slate whetstones (4).

The largest artifact category within the assembled collections is *Expedient Flake Tools*, composing 45.7% of the collections. *Pièce Ésquillées* are a distant second with 11.3%, followed by *Bifaces* (9.9%), *Cores* (9.5%), *Ground Fragments* (4.1%), and *Projectile Points* (3.7%). *Ground Flakes* represent 2.9% of the total artifact collection, tailed by *Formal Flake Tools* (2.5%) and *Endscrapers* (2.2%). *Pigment Minerals* represent a further 1.5% of the assembled artifacts, *Scrapers* another 1.3%, and *Celts* account for 1.0%. The remaining artifacts all represent less than 1.0% each (*Microblades* and *Semi-Lunar Knives*: 0.6%; *Core Tools*: 0.5%; *Hammerstones* and *Tablets*: 0.5% each; *Blanks/Preforms*: 0.4%; *Adzes*: 0.3%), for 3.4% of the total collection. The final 0.9% of the total artifact assemblage is made up of an assortment of *Other* artifacts.

4.1.3 Total Lithic Artifact Assemblage: Materials

There are a total of ten different material categories, one of which represents more than one specific lithic type; the *other* category includes minerals found in very small quantities like jasper, mica, limestone, gneiss, granite, rose quartz, smoky quartz, and schist. These materials were amalgamated because individually they each represented only a small percentage of the collections. Grouping these materials together makes patterns within the total collection easier to see as it removes some of the low value "noise" from the table, while still preserving the presence of these other material types to be used in the analysis. Also the *Quartzite* category includes grey, pink, purple, and red varieties of that mineral.

The most commonly used material within the artifact collections was Ramah chert, making up 38.3% of the artifacts. High quality quartz was the second most common material with 28.0%, with slate and Mugford cherts vying for third with 10.3% and 9.8% respectively, and low quality quartz in fifth place with 5.8%. These five materials make up the large majority of the collection (92.2%) with black chert (2.0%), quartzite (1.9%), pigment minerals like hematite and limonite (1.5%), silicified slate (1.0%), and the various lithic types grouped under *Other* (1.4%) filling out the remaining 7.3% of the assemblage.

4.2 Individual Site Assemblages

This section presents the individual lithic assemblages from each site.

4.2.1 Ballybrack 10 (HeCi-11)

Debitage

Table 4.5 presents the lithic debitage assemblage from Ballybrack 10.

Table 4.5 Ballybrack 10 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	2	1830	59	46	198	406	2	0	74	6	2623
% Quantity	0.1	69.8	2.3	1.8	7.6	15.5	0.1	0.0	2.8	0.2	100.2
Weight (g)	0.9	12329.5	791.2	281.6	142.5	225.4	6.1	0.0	212.1	20.4	14009.7
% Weight	<0.1	88.1	5.7	2.0	1.0	1.6	0.1	0.0	1.5	0.1	100.1

Other: basalt (1), feldspar (1), hornblende (1), jasper (1), soapstone (1), smokey quartz (1).

Both in terms of quantity (69.8%) and weight (88.1%), high quality quartz dominates the debitage assemblage from Ballybrack 10. With regards to quantity, Ramah chert is a distant second at 15.5%, followed by Mugford cherts (7.6%), slate (2.8%), low quality quartz (2.3%), and quartzite (1.8%). These six material types make up over 99% of the 2622 pieces in the debitage assemblage, with the remaining 0.4% composed of black chert, silicified slate, and *other* lithic types (0.2%). With regard to weight, low quality quartz takes second place (5.7%) to high quality quartz (88.1%). Quartzite sits at 2.0%, and though Ramah chert is the second most frequent lithic material, it weighs in with far less importance at a mere 1.6%; slate drops in prominence to 1.5% of the total weight, as does Mugford chert which weighs in at 1.0% of the debitage assemblage.

Artifacts

The formal artifact assemblage from Ballybrack 10 is presented below in Table 4.6. The most frequent artifact class is *Expedient Flake Tools*, with 43.4% of the collection. *Bifaces* are the next most common artifact type within this collection at 13.5% (38 standard or fragmented bifaces, one asymmetrical biface, five lanceolate bifaces, one stemmed biface), followed by *Cores* (10.8%), and *Pièces Ésquillées* (7.5%). *Formal Flake Tools* come next, representing 4.2% of the artifacts from Ballybrack 10, trailed closely by *Projectile Points* (3.6%), *Ground Fragments* (2.7%), and *Endscrapers* (2.7%). Completing the assemblage are *Ground Flakes* (2.4%) *Scrapers* (1.8%), *Celts*, *Hammerstones*, and *Pigment Minerals* (1.2% each), *Core Tools* and *Semi-Lunar Knives* (0.3% each). The remaining 2.4% of the collection is comprised of a small assortment of *Other* artifact types.

Table 4.6 Ballybrack 10 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	3	0	0	3	0.9
Bifaces	3	5	0	3	10	19	3	1	0	1	45	13.5
Blanks/ Pre-forms	0	0	0	0	0	0	0	0	0	0	0	0.0
Celts	0	2	0	0	0	0	0	2	0	0	4	1.2
Cores	0	30	1	1	0	1	0	0	0	0	36	10.8
Core Tools	0	1	0	0	0	0	0	0	0	0	1	0.3
End-scrapers	0	4	0	0	4	1	0	0	0	0	9	2.7
Expedi-ent Flake Tools	0	55	2	3	43	37	0	4	0	1	145	43.4
Formal Flake Tools	0	10	0	0	4	0	0	0	0	0	14	4.2
Ground Flakes	0	0	0	0	0	0	0	8	0	0	8	2.4
Ground Frag-ments	0	0	0	0	0	0	1	8	0	0	9	2.7
Hamm-erstones	0	4	0	0	0	0	0	0	0	0	4	1.2
Micro-Blades	0	0	0	0	0	0	0	0	0	0	0	0.0
Pièces Ésquillées	0	20	0	0	3	2	0	0	0	0	25	7.5
Pigments	0	0	0	0	0	0	0	0	4	0	4	1.2
Projectile points	0	1	0	0	0	11	0	0	0	0	12	3.6
Scrapers	0	2	0	0	2	0	0	0	0	2	6	1.8
Semi-Lunar Knives	0	0	0	0	0	0	1	0	0	0	1	0.3
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	3	0	5	8	2.4
Total	3	135	6	7	66	71	5	29	4	9	334	100.0
%	0.9	40.1	1.8	2.1	19.8	21.3	1.5	8.7	1.2	2.7	100.0	

Other artifacts/materials: slate chisels (2), slate unidentified knapped and ground stone tool (1), granite pebble (1), mica fragments (4), gneiss biface (1), jasper retouched flake (1), smokey quartz scraper (1).

Artifact Materials

The primary material used to produce the artifacts from this site was high quality quartz; 40.1% of the artifact collection is made from this material. Ramah chert is the second most prevalent material from Ballybrack 10, representing 21.3% of the artifacts. 19.8% of the assemblage are artifacts made from Mugford chert, and 8.7% from slate. Quartzite accounts for 2.1%, low quality quartz for 1.8%, and silicified slate for 1.5%. The remainder of this collection comprises 1.2% hematite/limonite, 0.9% black chert, and 2.7% assorted other lithic types.

4.2.2 Evilik Bay 5 (HdCg-7)

Debitage

The debitage assemblage from Evilik Bay 5, presented in Table 4.7 is composed of six different lithic types. The most common material of these six is slate, with 51.6% of the debitage count. This is followed by high quality quartz (22.2%), and Ramah chert (11.1%). Low quality quartz is next with 7.4%, and the collection is rounded out by Mugford chert and sandstone with 3.7% each. When weight is accounted for the order is almost the same, with slate leading the pack at 65.9%, followed by high quality quartz (23.3%) and low quality quartz (7.65%). Sandstone is next, representing 1.44% of the total weight of the debitage collection, then Ramah chert (0.98%), and finally Mugford chert (0.68%).

Table 4.7 Evilik Bay 5 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	0	6	2	0	1	3	0	0	14	1	27
% Quantity	0.0	22.2	7.4	0.0	3.7	11.1	0.0	0.0	51.9	3.7	100.0
Weight (g)	0.0	54.8	18.0	0.0	1.6	2.3	0.0	0.0	155.1	3.4	235.2
% Weight	0.0	23.3	7.7	0.0	0.7	1.0	0.0	0.0	65.9	1.5	100.0

Sandstone is the only other lithic type in this collection.

Artifacts

The artifact assemblage from Evilik Bay 5 is presented in Table 4.8. *Expedient Flake Tools* are the most common artifact from Evilik Bay 5, composing 52.2% of the total artifact collection (Table 4.8). *Pièces Ésquillées* are next with 17.4%, followed by *Bifaces* with 6.0% (ten standard/fragmented bifaces, one ovate biface), *Formal Flake Tools* (5.4%), *Ground Stone Fragments* (3.8%), and *Projectile Points* (2.7%). *Celts*, *Endscrapers*, and *Semi-Lunar Knives* all account for 2.2% of the assemblage, with *Scrapers* just behind them at 1.6%. *Adzes*, *Cores*, and *Ground Flakes* account for 1.1% of the collection each, and *Blanks/Preforms* and *Pigment Minerals* split the final 1.1% evenly between the two of them (0.5% each).

Table 4.8 Evilik Bay 5 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	2	0	0	2	1.1
Bifaces	0	1	1	0	0	87	1	0	0	0	11	6.0
Blanks/ Pre-forms	0	0	0	0	0	0	0	1	0	0	1	0.5
Celts	0	0	0	0	0	0	0	4	0	0	4	2.2
Cores	0	1	0	0	0	1	0	0	0	0	2	1.1
Core Tools	0	0	0	0	0	0	0	0	0	0	0	0.0
End-Scrapers	0	2	1	0	0	1	0	0	0	0	4	2.2
Expedi-ent Flake Tools	0	49	1	2	1	33	0	10	0	0	96	52.2
Formal Flake Tools	0	5	0	1	0	5	0	0	0	1	10	5.4
Ground Flakes	0	0	0	0	0	0	0	2	0	0	2	1.1
Ground Frag-ments	0	0	0	0	0	0	0	7	0	0	7	3.8
Hamm-erstones	0	0	0	0	0	0	0	0	0	0	0	0.0
Micro-Blades	0	0	0	0	0	0	0	0	0	0	0	0.0
Pièces Ésquill-ées	0	21	8	0	0	2	0	0	0	1	32	17.4
Pig-ments	0	0	0	0	0	0	0	0	1	0	1	0.5
Pro-jectile points	0	0	0	0	0	5	0	0	0	0	5	2.7
Scrapers	0	2	0	0	1	0	0	0	0	0	3	1.6
Semi-Lunar Knives	0	0	0	0	0	1	0	3	0	0	4	2.2
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	0	80	11	3	2	55	1	29	1	2	184	100.0
%	0.0	43.5	6.0	1.6	1.1	29.9	0.5	15.8	0.5	1.1	100.0	

Other artifacts/materials: white banded chert burin-like tool (1), rose quartz pièce ésquillées (1).

Artifact Materials

High quality quartz is the most common lithic material from the Evilik Bay 5 artifact collection (43.5% of the collection). Ramah chert is close behind with 29.9%, followed by slate (15.8%). Low quality quartz accounts for 6.0% of the artifacts from this site, quartzite for 1.6%, and Mugford chert for 1.1%. Hematite/limonite and silicified slate, 0.5% each, with rose quartz and a fine grained white banded chert finishing the last 1.1% of the collection.

4.2.3 Dog Island Southwest 1 (HdCh-37)

Debitage

The debitage from Dog Island Southwest 1 consists of a single flake of Mugford chert, weighing 0.8g.

Artifacts

Within the artifact collection from Dog Island Southwest 1 (Table 4.9), *Expedient Flake Tools* are the most frequent artifact type with just over a third of the collections. *Pièces Ésquillées* represent another 25.7%, and *Bifaces* have 20.0%. *Ground Fragments* comprise 8.6% of the assemblage, followed by *Cores* (5.7%), and *Formal Flake Tools* and *Projectile Points* with 2.9% each.

Table 4.9 Dog Island Southwest 1 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	0	0	0	0	0.0
Bifaces	0	1	0	0	0	5	0	1	0	0	7	20.0
Blanks/ Preforms	0	0	0	0	0	0	0	0	0	0	0	0.0
Celts	0	0	0	0	0	0	0	0	0	0	0	0.0
Cores	0	2	0	0	0	0	0	0	0	0	2	5.7
Core Tools	0	0	0	0	0	0	0	0	0	0	0	0.0
End-scrapers	0	0	0	0	0	0	0	0	0	0	0	0.0
Expedi-ent Flake Tools	0	3	0	0	0	9	0	0	0	0	12	34.3
Formal Flake Tools	0	0	0	0	0	1	0	0	0	0	1	2.9
Ground Flakes	0	0	0	0	0	0	0	0	0	0	0	0.0
Ground Fragments	0	0	0	0	0	0	0	3	0	0	3	8.6
Hamm-erstones	0	0	0	0	0	0	0	0	0	0	0	0.0
Micro-Blades	0	0	0	0	0	0	0	0	0	0	0	0.0
Pièces Ésquillées	0	9	0	0	0	0	0	0	0	0	9	25.7
Pigments	0	0	0	0	0	0	0	0	0	0	0	0.0
Projectile points	0	0	0	0	0	1	0	0	0	0	1	2.9
Scrapers	0	0	0	0	0	0	0	0	0	0	0	0.0
Semi-Lunar Knives	0	0	0	0	0	0	0	0	0	0	0	0.0
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	0	15	0	0	0	16	0	4	0	0	35	100.0
%	0.0	42.9	0.0	0.0	0.0	45.7	0.0	11.4	0.0	0.0	100.0	

Artifact Materials

The artifact assemblage from Dog Island Southwest 1 comprises three different materials. Ramah chert is the most frequent of the three, with 42.9%, followed by high quality quartz (45.7%), and last and least, slate (11.4%).

4.2.4 Imilikuluk 5 (HdCg-33)

Debitage

Table 4.10 contains the data gathered from the debitage collection from Imilikuluk 5. High quality quartz forms the majority of the collection's bulk and weight, with 73.7% of the flake count and 81.0% of the total weight. It is followed by Ramah chert which makes up another 17.5% of the flake count, low quality quartz (6.6%) and quartzite (1.4%). The remainder of the total number of flakes in the debitage assemblage is made up of small percentages of slate (0.4%), black chert (0.1%), and a small quantity of other materials (0.3%). However, the weight represented by each of these material types is a different story with low quality quartz (10.4%) succeeding high quality quartz, followed by quartzite (5.3%), slate (1.1%), Ramah chert (0.8%), with the final 1.4% made up of other lithic types.

Table 4.10 Imilikuluk 5 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	2	1028	92	19	0	224	0	0	6	4	1395
% Quantity	0.1	73.7	6.6	1.4	0.0	17.5	0.0	0.0	0.4	0.3	100.0
Weight (g)	0.1	5933.3	762.9	386.3	0.0	59.1	0.0	0.0	81.6	103.8	7327.1
% Weight	<0.1	81.0	10.4	5.3	0.0	0.8	0.0	0.0	1.1	1.4	102.7

Other: limestone (2) and unidentified red aggregate (2).

Artifacts

Table 4.11 contains the artifact assemblage from the site at Imilikuluk 5. Dominating the assemblage is *Expedient Stone Tools*, with 69.4% of the total number of artifacts. *Cores* are the second most frequent type of artifact from Imilikuluk 5 (8.2%), followed by *Bifaces* and *Pieces Ésquillées* which each compose 7.6% of the collection. *Projectile Points* represent 3.5% of the assemblage, and *Hammerstones* are next with 1.2%. *Core Tools* (0.6%), *Endscrapers* (0.6%), *Formal Flake Tools* (0.6%), and 0.6% *Other* artifacts comprise the remainder of the collection.

Table 4.11 Imilikuluk 5 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	0	0	0	0	0.0
Bifaces	0	1	0	0	0	12	0	0	0	0	13	7.6
Blanks/ Preforms	0	0	0	0	0	0	0	0	0	0	0	0.0
Celts	0	0	0	0	0	0	0	0	0	0	0	0.0
Cores	0	8	6	0	0	0	0	0	0	0	14	8.2
Core Tools	0	1	0	0	0	0	0	0	0	0	1	0.6
End-scrapers	0	0	0	0	0	1	0	0	0	0	1	0.6
Expedient Flake Tools	2	34	3	6	5	68	0	0	0	0	118	69.4
Formal Flake Tools	0	1	0	0	0	0	0	0	0	0	1	0.6
Ground Flakes	0	0	0	0	0	0	0	0	0	0	0	0.0
Ground Fragments	0	0	0	0	0	0	0	0	0	0	0	0.0
Hamm-erstones	0	1	0	0	0	0	0	0	0	1	2	1.2
Micro-Blades	0	0	0	0	0	0	0	0	0	0	0	0.0
Pièces Ésquillées	0	10	3	0	0	0	0	0	0	0	13	7.6
Pigments	0	0	0	0	0	0	0	0	0	0	0	0.0
Projectile points	0	0	0	0	0	6	0	0	0	0	6	3.5
Scrapers	0	0	0	0	0	0	0	0	0	0	0	0.0
Semi-Lunar Knives	0	0	0	0	0	0	0	0	0	0	0	0.0
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	1	0	0	0	0	0	0	0	0	1	0.6
Total	2	56	12	6	5	87	0	0	0	2	170	99.9
%	1.2	32.9	7.1	3.5	2.9	51.2	0.0	0.0	0.0	1.2	100.0	

Other Artifacts/materials: limestone pebble (1), granite hammerstone (1)

Artifact Materials

The artifact assemblage from Imilikuluk 5 is mainly made up of Ramah chert (51.2%) and high quality quartz (32.9%). Low quality quartz is the next most frequent material type at 7.1% of the artifact assemblage, followed by quartzite (3.5%) and Mugford cherts (2.9%). Black chert and other lithic types (granite and limestone) complete the collection with 1.2% each.

4.2.5 Gull Arm 1 (HdCg-19)

Debitage

The debitage from Gull Arm 1 (Table 4.12) is divided between nine different material types. The majority of the collection is made up of two lithic types, high quality quartz and Ramah chert, which represent 91.5% between them, 54.7% and 36.7% respectively. The next most common material is low quality quartz (3.6%), followed by slate (2.5%), and Mugford cherts (1.1%). The remainder of the collection is composed of black chert (0.7%), quartzite (0.3%), and sandstone (0.2%).

Table 4.12 Gull Arm 1 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	30	2300	153	13	45	1546	0	4	105	10	4206
% Quantity	0.7	54.7	3.6	0.3	1.1	36.7	0.0	0.1	2.5	0.2	100.0
Weight (g)	21.5	6631.7	543.7	170.0	32.6	1077.4	0.0	59.2	411.6	25.7	8973.4
% Weight	0.2	73.9	6.1	1.9	0.4	12.0	0.0	0.7	4.6	0.3	100.1

Sandstone represents all 10 examples of Other lithic types from this site.

Artifacts

Table 4.13 shows the quantities and frequencies of lithic artifacts and material types from the Gull Arm 1 Labrador Archaic site. *Expedient Flake Tools* represent 50.2% of the collection, followed by *Bifaces* at 14.1% (45 standard/fragmented bifaces, one asymmetrical biface, and one lanceolate biface) and *Pièces Ésquillées* (11.1%). *Projectile Points* account for 6.9% of the artifact assemblage from this site, cores for 3.9%, and *Formal Flake Tools* and *Ground Flakes* 3.0% each. *Celts* account for 1.5% of the collection, with *Ground Fragments* and *Semi-Lunar Knives* making up 1.2% each, and *Scrapers* and *Endscrapers* each representing 0.9% of the artifacts from this site. *Blanks* and *Preforms* form 0.6% of the collection, followed by *Hammerstones* at 0.3%, and finally *Other* artifacts fill in the final 1.2% of the artifact assemblage.

Table 4.13 Gull Arm 1 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	0	0	0	0	0.0
Bifaces	2	4	0	1	1	39	0	0	0	0	47	14.1
Blanks/ Preforms	0	0	0	0	0	0	0	2	0	0	2	0.6
Celts	0	0	0	0	0	0	1	3	0	1	5	1.5
Cores	0	9	1	0	1	1	0	1	0	0	13	3.9
Core Tools	0	0	0	0	0	0	0	0	0	0	0	0.0
End-scrapers	1	1	0	0	1	0	0	0	0	0	3	0.9
Expedient Flake Tools	4	40	3	4	1	112	1	2	0	0	167	50.2
Formal Flake Tools	0	1	0	0	1	7	1	0	0	0	10	3.0
Ground Flakes	0	0	0	0	0	0	0	10	0	0	10	3.0
Ground Fragments	0	0	0	0	0	0	1	3	0	0	4	1.2
Hamm-erstones	0	1	0	0	0	0	0	0	0	0	1	0.3
Micro-Blades	0	0	0	0	0	0	0	0	0	0	0	0.0
Pièces Ésquillées	0	19	4	0	0	14	0	0	0	0	37	11.1
Pigments	0	0	0	0	0	0	0	0	0	0	0	0.0
Projectile points	0	0	0	0	0	22	1	0	0	0	23	6.9
Scrapers	1	0	1	0	1	0	0	0	0	0	3	0.9
Semi-Lunar Knives	0	0	0	0	0	0	0	3	0	1	4	1.2
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	1	0	1	0	2	4	1.2
Total	8	75	9	5	6	196	5	25	0	4	333	100.0
%	2.4	22.5	2.7	1.5	1.8	58.9	1.5	7.5	0.0	1.2	100.0	

Other artifacts/materials: granite pebbles (2), Ramah chert micropoint (1), sandstone celt (1), schist semilunar knife (1), slate whetstone (1).

Artifact Materials

The lithic assemblage from this site, though made of eleven different materials, is largely composed of a single type. Ramah chert is the most frequent lithic type from Gull Arm 1, with 58.9% of the collection. High quality quartz accounts for 22.5%, and slate makes up another 7.5%. Low quality quartz comprises 2.7% of the artifact assemblage, followed by black chert at 2.4%, Mugford cherts at 1.8%, and quartzite at 1.5%. 1.5% of the collection is made up of silicified slate, with the final 1.2% consisting of various other lithic materials.

4.2.6 Nukasusutok 5 (HcCh-7)

Debitage

The debitage data from Nukasusutok 5 is presented in Table 4.14. Ramah chert is the most frequent lithic type from this site, making up 53.6% of the debitage assemblage. High quality quartz is the next most common at 24.6%, with low quality quartz following at 14.4%. Slate is next (4.5%), followed by black chert (2.0%), and finally schist (0.5%), Mugford chert (0.4%), and silicified slate (<0.1%).

Table 4.14 Nukasusutok 5 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	312	3801	2225	0	59	8271	3	77	693	0	15441
% Quantity	2.0	24.6	14.4	0.0	0.4	53.6	0.0	0.5	4.5	0.0	100.0
Weight (g)	82.2	9130.7	11199.2	0.0	21.3	3803.1	0.7	143.7	828.2	0.0	25209.1
% Weight	0.3	36.2	44.4	0.0	0.1	15.1	0.0	0.6	3.3	0.0	100.0

Artifacts

Of the 816 formal lithic artifacts in the collection from Nukasusutok 5 (presented below in Table 4.15), the most frequent are *Expedient Stone Tools* which represent 36.6% of the collection. *Cores* are the next most prevalent at 15.6%, followed by *Pieces Ésquillées* (13.5%), and *Bifaces* with 7.4% of the collection (52 standard/fragmented bifaces, one asymmetrical biface, one bipointed biface, one biface with two notches at the distal end, three lanceolate bifaces, and two ovate bifaces). *Ground Tool Fragments* and *Ground Flakes* are next, with 6.9% and 3.9% respectively, and are followed by *Pigments* (3.1%), *Projectile Points* (2.6%), and *Endscrapers* (2.1%). *Formal Flake Tools* form 1.8% of the artifact assemblage, and *Scrapers* and *Tablets* are next with 1.2% each. The final 4.0% is made up of small quantities of *Celts* and *Core Tools* (1.0% each), *Blanks/Preforms* (0.6%), *Semi-Lunar Knives* (0.4%), *Hammerstones* and *Microblades* (0.2% each, and *Other* artifact types (0.7%). One final artifact worth mentioning is one of the scrapers in this assemblage (HcCh-07:210). It is made in a form which is unique not only to this collection but to all the collections in this study, with two horns or spurs (Hood 2008:169) protruding laterally from this piece. This piece will be discussed further in Chapter 5.

Table 4.15 Nukasusutok 5 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	0	0	0	0	0.0
Bifaces	4	11	3	1	41	0	0	0	0	0	60	7.4
Blanks/ Preforms	0	1	0	0	0	3	0	1	0	0	5	0.6
Celts	0	0	0	0	0	0	1	7	0	0	8	1.0
Cores	0	53	66	2	0	5	0	0	0	1	127	15.6
Core Tools	0	5	3	0	0	0	0	0	0	0	8	1.0
End-scrapers	7	2	0	0	6	2	0	0	0	0	17	2.1
Expedient Flake Tools	12	51	12	0	2	219	0	3	0	0	299	36.6
Formal Flake Tools	0	2	0	0	0	13	0	0	0	0	15	1.8
Ground Flakes	0	0	0	0	0	0	1	30	0	1	32	3.9
Ground Fragments	0	0	0	0	1	0	0	55	0	0	56	6.9
Hamm-erstones	0	0	0	0	0	0	0	0	0	2	2	0.2
Micro-Blades	0	1	0	0	0	1	0	0	0	0	2	0.2
Pièces Ésquillées	1	69	17	0	1	22	0	0	0	0	110	13.5
Pigments	0	0	0	0	0	0	0	0	25	0	25	3.1
Projectile points	1	2	0	0	0	14	0	4	0	0	21	2.6
Scrapers	5*	0	0	0	3	2	0	0	0	0	10	1.2
Semi-Lunar Knives	0	0	0	0	0	1	0	1	0	1	3	0.4
Tablets	0	0	0	0	0	0	0	3	0	7	10	1.2
Other	0	1	0	0	0	2	0	1	0	2	6	0.7
Total	30	198	101	2	14	325	2	105	25	14	816	100.0
%	3.7	24.3	12.4	0.2	1.7	39.8	0.2	12.9	3.1	1.7	100.0	

Other Artifacts: Ramah chert awl (1), schist cobble (1), ground schist flake (1), ground gneiss fragment (1), granite hammerstones (2), Ramah chert micropoint (1), high quality quartz micropoint (1), schist semi-lunar knife (1), schist tablets (7), slate whetstones(2). Excluded from this collection: one rock sample (slate/schist).

Artifact Materials

The materials which make up the artifact assemblage are also presented in Table 4.13. Ramah chert is the most common lithic material from this site, accounting for 39.8% of the artifact assemblage. High quality quartz represents just over half as much at 24.3%, with slate in turn representing just over half as much as high quality quartz at 12.9%. Low quality quartz is close behind at 12.4%, followed by black chert (3.7%), pigment minerals (hematite and limonite) with 3.1%, and Mugford chert with 1.7% of the assemblage. Silicified slate and quartzite are last with 0.2% each. The final 1.7% of the artifact assemblage is represented by other lithic types, which are listed at the bottom of Table 4.13.

4.2.7 Cutthroat Island 2 (HiCj-5)

Debitage

The lithic debitage, (unmodified flakes and shatter) from Cutthroat Island 2 is presented below in Table 4.16.

Table 4.16 Cutthroat Island 2 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	5	248	5	0	5338	451	3	0	118	11	6179
% Quantity	0.1	4.0	0.1	0.0	86.4	7.3	0.1	0.0	1.9	0.1	100.1
Weight (g)	3.3	1454.5	24.8	0.0	1970.5	161.0	10.8	0.0	424.0	55.1	4104.0
% Weight	0.1	35.4	0.6	0.0	48.0	3.9	0.3	0.0	10.3	1.3	99.9

Other includes rhyolite (3), sandstone (7), and tuff (1).

An overwhelming proportion of the debitage from Cutthroat Island 2 is composed of Mugford chert. This single lithic type accounts for just over 86% of the pieces of debitage from this collection, and almost 50% of the total weight. Ramah chert, high quality quartz, and slate are the only other lithic types which represent over 1% of the debitage collection with regards to quantity (7.3%, 4%, and 1.9% respectively). Even though there are more examples of Ramah chert than high quality quartz or slate within this collection, when weight is considered high quality quartz is actually almost ten times more prevalent than Ramah, and the amount of slate debitage is almost three times heavier than the Ramah component. The *other* category accounts for the final 1.3% of the total weight of debitage from Cutthroat Island 2.

Artifacts

A tally of all the formal artifacts from the Cutthroat Island 2 collection is presented in Table 4.17. The most frequent artifact type within this collection is *Expedient Flake Tools* by a wide margin. At 55.1% of the collection, *Expedient Flake Tools* is ahead of the next most frequent artifact type (*Bifaces*) by more than 45.0%. *Bifaces* do make up the second most common artifact type with 9.7% of the assemblage (comprising fifteen standard/fragmented bifaces, and two lanceolate bifaces), followed by *Pièces Ésquillées* at 8.0%. *Microblades*, an artifact type not common on the other sites being studied, are the third most frequent artifact with 6.3%, followed by *Endscrapers* (4.6%), *Scrapers*, *Cores* and *Projectile Points* (2.8% each). *Ground Fragments* make up 1.7% of the collection, and *Ground Flakes* form another 1.1%. Finally *Pigment Minerals* and *Other* artifacts each represent 1.1% of the collection. Together these artifact types compose 97.2% of the artifact assemblage from Cutthroat Island 2, with the remaining 2.9% being *Blanks and Preforms*, *Core Tools*, *Formal Flake Tools*, *Hammerstones*, and *Semi-Lunar Knives*, each of which represents less than 1% of this assemblage.

Table 4.17 Cutthroat Island 2 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	0	0	0	0	0.0
Bifaces	0	1	0	0	10	6	0	0	0	0	17	9.7
Blanks/ Preforms	0	0	0	0	1	0	0	0	0	0	1	0.6
Celts	0	0	0	0	0	0	0	0	0	0	0	0.0
Cores	0	0	0	0	5	0	0	0	0	0	5	2.8
Core Tools	0	0	0	0	1	0	0	0	0	0	1	0.6
End-scrapers	0	3	0	0	5	0	0	0	0	0	8	4.6
Expedient Flake Tools	0	14	0	0	63	13	3	4	0	0	97	55.1
Formal Flake Tools	0	0	0	0	0	1	0	0	0	0	1	0.6
Ground Flakes	0	0	0	0	0	0	0	2	0	0	2	1.1
Ground Fragments	0	0	0	0	1	0	0	2	0	0	3	1.7
Hamm-erstones	0	1	0	0	0	0	0	0	0	0	1	0.6
Micro-Blades	0	0	0	0	11	0	0	0	0	0	11	6.3
Pièces Ésquillées	0	5	0	0	7	2	0	0	0	0	14	8.0
Pigments	0	0	0	0	0	0	0	0	2	0	2	1.1
Projectile points	0	0	0	0	1	3	1	0	0	0	5	2.8
Scrapers	0	0	0	0	5	0	0	0	0	0	5	2.8
Semi-Lunar Knives	0	0	0	0	0	0	0	1	0	0	1	0.6
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	2	0	0	2	1.1
Total	0	24	0	0	110	25	4	11	2	0	176	100.0
%	0.0	13.6	0.0	0.0	62.5	14.2	2.3	6.3	1.1	0.0	100.0	

Other artifacts: *one slate whetstone, and one slate awl.*

Artifact Materials

The materials which these artifacts were made from are primarily Mugford cherts (62.5%). Ramah chert is a distant second with 14.2%, followed by high quality quartz (13.6%). Slate accounts for 6.3%, with silicified slate and the pigment minerals hematite and limonite filling up the remainder of the collection at 2.3% and 1.1% respectively.

4.2.8 Dog Bight L9 (HdCh-9)

Debitage

The debitage collection from Dog Bight L9 (presented in table 4.18) is relatively small compared to the rest of the sites in this study. Ramah chert is the most frequent type of debitage from this site, with 62.5% of the collection. Mugford chert is second with 25.0%, and high quality quartz is last with 12.5%. Ramah chert also pulls the most weight within this debitage assemblage, with 46.2%. High quality quartz, though last in frequency, is the second heaviest with 44.0% of the collective weight, and Mugford weighs the least, representing only 9.9%.

Table 4.18 Dog Bight L9 Debitage

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silicified Slate	Schist	Slate	Other	Total
Flakes	0	1	0	0	2	5	0	0	0	0	8
% Quantity	0.0	12.5	0.0	0.0	25.0	62.5	0.0	0.0	0.0	0.0	100.0
Weight (g)	0.0	8.0	0.0	0.0	1.8	8.4	0.0	0.0	0.0	0.0	18.2
% Weight	0.0	44.0	0.0	0.0	9.9	42.6	0.0	0.0	0.0	0.0	100.1

Artifacts

Of the 69 artifacts from the Dog Bight L9 collection (Table 4.19), *Expedient Flake Tools* are the most common, representing 43.5% of the group. *Bifaces* are the second most common at 14.5% (9 standard or fragmented bifaces, and one lanceolate biface), followed by *Ground Flakes* and *Ground Fragments* (8.7% each), *Projectile Points* (7.3%), and *Endscrapers* and *Pieces Ésquillées* (5.8% each). *Formal Flake Tools* compose 2.9% of the assemblage, and the final 2.9% is split evenly between *Adzes* and *Celts* (1.5% each).

Table 4.19 Dog Bight L9 Artifacts

	Black Chert	High Quality Quartz	Low Quality Quartz	Quartzite	Mug-ford	Ramah	Silic-ified Slate	Slate	Hematite/ limonite	Other Lithic Types	Total	%
Adzes	0	0	0	0	0	0	0	1	0	0	1	1.5
Bifaces	0	1	0	0	0	7	2	0	0	0	10	14.5
Blanks/ Preforms	0	0	0	0	0	0	0	0	0	0	0	0.0
Celts	0	0	0	0	0	0	0	1	0	0	1	1.5
Cores	0	0	0	0	0	0	0	0	0	0	0	0.0
Core Tools	0	0	0	0	0	0	0	0	0	0	0	0.0
End-scrapers	0	0	0	0	4	0	0	0	0	0	4	5.8
Expedient Flake Tools	0	7	0	1	1	17	1	3	0	0	30	43.5
Formal Flake Tools	0	0	0	0	0	2	0	0	0	0	2	2.9
Ground Flakes	0	0	0	0	0	0	0	6	0	0	6	8.7
Ground Fragments	0	0	0	0	0	0	2	4	0	0	6	8.7
Hamm-erstones	0	0	0	0	0	0	0	0	0	0	0	0.0
Micro-Blades	0	0	0	0	0	0	0	0	0	0	0	0.0
Pièces Ésquillées	0	1	0	0	0	3	0	0	0	0	4	5.8
Pigments	0	0	0	0	0	0	0	0	0	0	0	0.0
Projectile points	0	0	0	0	0	4	0	1	0	0	5	7.3
Scrapers	0	0	0	0	0	0	0	0	0	0	0	0.0
Semi-Lunar Knives	0	0	0	0	0	0	0	0	0	0	0	0.0
Tablets	0	0	0	0	0	0	0	0	0	0	0	0.0
Other	0	0	0	0	0	0	0	0	0	0	0	0.0
Total	0	9	0	1	5	33	5	16	0	0	69	100.0
%	0.0	13.0	0.0	1.5	7.3	47.8	7.3	23.2	0.0	0.0	100.0	

Artifact Materials

The artifact assemblage from Dog Bight L9 is composed mainly of Ramah chert, which makes up 47.8% of this collection. This is followed by slate (23.2%), and high quality quartz (13.0%). Mugford cherts and silicified slate are neck and neck at 7.3% each, with quartzite comprising the final 1.5% of the collection.

4.3 Assemblage Metrics

Aside from the material analysis, a metric analysis of certain artifact types within the assembled lithic collections was undertaken to assess the changes in artifact size and shape between sites, and thus across the time spanned by the sites. Though all the artifacts in the collection were subject to analysis, only three artifact types will be examined in detail (see Appendix B for the data from the total metric analysis). These three artifact types were chosen because they form the largest artifact groups within the assemblage. Expedient flake tools (including retouched, utilized, and retouched and utilized flakes) are the most common artifact types from all the sites, and will therefore be discussed. Also, the metric data from the projectile point assemblage will be examined, as they are arguably the most recognized artifact type from Labrador Archaic sites. Finally, endscrapers will also be discussed. Endscrapers were chosen for a number of reasons: a large percentage of the endscrapers within the collection are either complete (50.8%) or are distal portions (30.4%) and thus retain the working portion of the tool allowing analysis of even these incomplete specimens. Also endscraper morphology is quite defined, with discrete variation limited mainly to the shape and orientation of the working edge. Finally the endscraper assemblage shows interesting trends with regards to material frequencies which are similar to those remarked upon by Hood (2008: 172, 183) within the Nukasusutok collection, and an attempt to reconcile the metric and material data from this facet of the collection will be made in the next chapter. The other artifact types were excluded from this in-depth analysis for a number of reasons. Some classes of artifacts were represented by too few individuals to support a focused metric analysis, while others were only present within the assemblages of one or two sites, and thus could not produce information relating to the entire period of time represented by these sites.

The metric attributes of the lithic artifacts from the collections under study were measured in two ways. First, caliper measurements were taken on all the artifacts to record artifact length, width, and thickness, and digital scales were used to record the weight of each artifact. On top of these methods, digital photography and software designed for geometric morphometric analysis were used to measure projectile points in an effort to determine the applicability of these programs (TPSdig, TPSutil, TPSrelw) to archaeological investigation. As well, these programs were used to measure different structures on each projectile point (see Chapter 3, Figure 3.21) in order to track changes in projectile point morphology over time.

4.3.1 Expedient Flake Tools

The expedient flake tool assemblage (Table 4.20) is composed of three distinct tool types: utilized flakes, retouched flakes, and retouched/utilized flakes. Of the 966 expedient flake tools in the collections, 497 of them (51.4%) are strictly utilized, 287

(29.7%) are strictly retouched, and 182 (18.8%) have traces of usewear as well as retouch. The measurements presented in this section are caliper measurements, and the average dimensions for artifacts were calculated using complete specimens only.

Table 4.20 Total Expedient Flake Tools

Site	Number of Artifacts	Complete		Distal		Medial		Proximal		Edge Fragments		Average Weight (g)	Average Length (mm)	Average Width (mm)	Average Thickness (mm)
		#	%	#	%	#	%	#	%	#	%				
Total	966	265	27.4	171	17.7	182	18.8	241	24.9	107	11.1	11.2	34.9	25.2	8.7
Ballybrack 10	145	43	29.7	25	17.2	20	13.8	22	15.2	35	24.1	15.4	36.4	26.0	10.1
Evilik Bay 5	96	25	26.0	28	29.2	24	25.0	15	15.6	4	4.2	18.8	40.0	28.6	11.7
Dog Island Southwest 1	12	3	25.0	2	16.7	2	16.7	3	25.0	2	16.7	41.1	58.3	44.9	14.6
Imilikuluk 5	118	28	23.7	20	16.9	33	28.0	29	24.6	8	6.8	12.5	33.5	25.2	10.6
Gull Arm 1	165	50	30.3	30	18.2	35	21.2	40	24.2	10	6.1	6.5	31.4	21.7	6.7
Nukasusutok 5	300	82	27.3	54	18.0	53	17.7	87	29.0	24	8.0	9.2	34.6	26.1	7.4
Cutthroat Island 2	98	28	28.6	9	9.2	14	14.3	33	33.7	14	14.3	9.0	33.9	23.6	8.9
Dog Bight L9	32	6	18.8	3	9.4	5	15.6	12	37.5	6	18.8	6.7	38.6	22.4	7.3

Averages calculated using complete artifacts.

Utilized flakes

The utilized flakes from the assembled collections (Table 4.21) are made up of 28.8% complete specimens, 27.6% proximal pieces, 19.3% medial pieces, 19.7% distal pieces, and 4.6% edge fragments. The average length of a utilized flake is 34.0 mm, the average width is 24.6 mm, and the average thickness is 8.1 mm. They weigh on average 9.8 grams.

Table 4.21 Utilized Flakes

Site	Number of Artifacts	Complete		Distal		Medial		Proximal		Edge Fragments		Average Weight (g)	Average Length (mm)	Average Width (mm)	Average Thickness (mm)
		#	%	#	%	#	%	#	%	#	%				
Total	497	143	28.8	98	19.7	96	19.3	137	27.6	23	4.6	9.8	34	24.6	8.1
Ballybrack 10	52	15	28.8	15	28.8	7	13.5	11	21.2	4	7.7	6.5	31.4	21.9	8.5
Evilik Bay 5	70	18	25.7	20	28.6	16	22.9	13	18.6	3	4.3	18.4	39.8	27.0	10.6
Dog Island Southwest 1	1	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	N/A	N/A	N/A	N/A
Imilikuluk 5	79	17	21.5	17	21.5	24	30.4	19	24.1	2	2.5	9.1	31.0	23.4	10.5
Gull Arm 1	96	27	28.1	19	19.8	18	18.8	27	28.1	5	5.2	7.5	32.8	22.6	6.8
Nukasusutok 5	170	57	33.5	25	14.7	26	15.3	56	33.0	6	3.5	9.3	33.5	25.2	7.1
Cutthroat Island 2	24	7	29.2	1	4.2	4	16.7	9	37.5	3	12.5	8.7	36.1	22.2	6.7
Dog Bight L9	5	2	40.0	1	20.0	1	20.0	1	20.0	0	0.0	9.3	48.0	26.5	10.3

Averages calculated using complete artifacts.

Retouched flakes

The retouched flake assemblage (Table 4.22) is composed of 24.7% complete artifacts, 24.4% proximal artifacts, 18.1% medial artifacts, 15.0% distal artifacts, and 17.8% edge fragments. The average complete retouched flake in these collections is 33.1 mm long, 24.6 mm wide, 8.6 mm thick and weighs on average 9.6 grams.

Table 4.22 Retouched Flakes

Site	Number of Artifacts	Complete		Distal		Medial		Proximal		Edge Fragments		Average Weight (g)	Average Length (mm)	Average Width (mm)	Average Thickness (mm)
		#	%	#	%	#	%	#	%	#	%				
Total	287	71	24.7	43	15.0	52	18.1	70	24.4	51	17.8	9.6	33.1	24.6	8.6
Bally-brack 10	47	15	31.9	5	10.6	5	10.6	5	10.6	17	36.2	16.2	33.2	24.8	9.6
Evilik Bay 5	12	3	25.0	2	16.7	3	25.0	1	8.3	3	25.0	15.2	33.6	30.8	11.2
Dog Island South-west 1	9	2	22.2	2	22.2	2	22.2	1	11.1	2	22.2	15.9	46.7	33.0	13.3
Imili-kuluk 5	17	1	5.9	2	11.8	4	23.5	6	35.3	4	23.5	3.5	36.7	27.0	2.9
Gull Arm I	35	14	40.0	3	8.6	7	20.0	9	25.7	2	5.7	3.3	27.2	18.3	6.3
Nuka-susutok 5	86	19	22.1	20	23.3	18	20.9	19	22.1	10	11.6	8.6	36.2	28.7	8.2
Cut-throat Island 2	61	14	23.0	7	11.5	10	16.4	22	36.1	8	13.1	8.9	31.3	23.4	10.1
Dog Bight L9	20	3	15.0	2	10.0	3	15.0	7	35.0	5	25.0	6.9	39.1	21.8	6.7

Averages calculated using complete artifacts.

Retouched/Utilized flakes

Of the 182 retouched and utilized flakes in the total collection (Table 4.23), 28.0% are complete, 18.7% are proximal, 18.7% are medial, 16.5% are distal, and 18.1% are edge fragments. The average length of a complete retouched and utilized flake is 40.3 mm, the average width is 29.0 mm, the average thickness is 10.5 mm, and the average weight is 17.7 grams.

Table 4.23 Retouched/Utilized Flakes

Site	Number of Artifacts	Complete		Distal		Medial		Proximal		Edge Fragments		Average Weight (g)	Average Length (mm)	Average Width (mm)	Average Thickness (mm)
		#	%	#	%	#	%	#	%	#	%				
Total	182	51	28.0	30	16.5	34	18.7	34	18.7	33	18.1	17.7	40.3	29.0	10.5
Ballybrack 10	46	13	28.3	5	10.9	8	17.4	6	13.0	14	30.4	24.7	46.0	33.6	12.5
Evilik Bay 5	14	4	28.6	6	42.9	3	21.4	1	7.1	0	0.0	23.3	45.6	34.3	16.9
Dog Island Southwest 1	2	1	50.0	0	0.0	0	0.0	1	50.0	0	0.0	91.7	81.5	68.7	17.3
Imilikuluk 5	22	10	45.5	1	4.5	4	18.2	4	18.2	3	13.6	19.1	37.5	27.9	11.5
Gull Arm 1	34	9	26.5	8	23.5	10	29.4	4	11.8	3	8.8	8.6	33.8	24.0	6.6
Nukasusutok 5	44	6	13.6	9	20.5	9	20.5	12	27.3	8	18.2	9.6	40.5	27.3	8.8
Cutthroat Island 2	13	7	53.8	1	7.7	0	0.0	2	15.4	3	23.1	9.6	36.9	25.2	8.5
Dog Bight L9	7	1	14.3	0	0.0	1	14.3	4	57.1	1	14.3	1.1	18.6	15.8	3.0

Averages calculated using complete artifacts.

4.3.2 Endscrapers

The endscraper assemblage (Table 4.24) from the combined collections in this study is comprised of 47 individual pieces. 59.6% of these pieces are complete, 2.1% are proximal, 29.8% are distal, 8.5% are edge fragments, and there are no medial portions of endscrapers present.

The average length of a complete endscraper within these collections is 34.0 mm; average width is 21.9 mm (at the distal end), average thickness is 7.8 mm, and average weight is 9.1 grams.

Table 4.24 Endscrapers

Site	Number of Artifacts	Complete		Distal		Medial		Proximal		Edge Fragments		Average Weight (g)	Average Length (mm)	Average Width (mm)	Average Thickness (mm)
		#	%	#	%	#	%	#	%	#	%				
Total	47	28	59.6	14	29.8	0.0	0.0	1	2.1	4	8.5	9.1	34.0	21.9	7.8
Ballybrack 10	9	7	77.8	2	22.2	0.0	0.0	0	0.0	0	0.0	9.9	33.7	21.7	8.4
Evilik Bay 5	5	3	60.0	1	20.0	0.0	0.0	1	20.0	0	0.0	8.2	33.7	26.0	7.9
Dog Island Southwest 1	0	0	0.0	0	0.0	0.0	0.0	0	0.0	0	0.0	N/A	N/A	N/A	N/A
Imilikuluk 5	1	1	100.0	0	0.0	0.0	0.0	0	0.0	0	0.0	8.1	35.0	24.0	9.2
Gull Arm 1	3	2	66.7	1	33.3	0.0	0.0	0	0.0	0	0.0	1.2	18.6	13.0	3.4
Nuka-Susutok 5	17	7	41.2	6	35.3	0.0	0.0	0	0.0	4	23.5	10.9	34.7	22.4	7.1
Cut-throat Island 2	8	7	87.5	1	12.5	0.0	0.0	0	0.0	0	0.0	9.2	38.2	22.4	8.5
Dog Bight L9	4	1	25.0	3	75.0	0.0	0.0	0	0.0	0	0.0	8.7	33.4	20.8	10.0

Averages calculated using complete artifacts.

4.3.3 Projectile Points

There were 78 projectile points present in the analyzed collections (Table 4.25); 10.3% of these are complete specimens, 39.7% are proximal, 19.2% are medial, 30.8% are distal and no edge fragments were identified. There were no edge fragments from projectile points in these collections, likely because any edge fragment from a projectile point would be small and ambiguously bifacial, and would thus be classified as a biface fragment. This is corroborated by the fact that edge fragments represent the largest portion of the biface assemblage with over a quarter (25.1% or 53 individual pieces) of that artifact category. The average length for a complete projectile point within these collections is 62.4 mm, the average width is 26.1 mm, and they are on average 7.8 mm thick. The average weight is 13.3 grams.

Table 4.25 Projectile Points

Site	Number of Artifacts	Complete		Distal		Medial		Proximal		Average Weight (g)	Average Length (mm)	Average Width (mm)	Average Thickness (mm)
		#	%	#	%	#	%	#	%				
Total	78	8	10.3	24	30.8	15	19.2	31	39.7	13.3	62.4	26.1	7.8
Ballybrack 10	12	2	16.7	2	16.7	2	16.7	6	50.0	10.6	47.4	22.6	8.7
Evilik Bay 5	5	1	20.0	1	20.0	0	0.0	3	60.0	9.4	51.0	24.7	8.3
Dog Island Southwest 1	1	0	0.0	0	0.0	1	100.0	0	0.0	N/A	N/A	N/A	N/A
Imilikuluk 5	6	1	16.7	2	33.3	0	0.0	3	50.0	15.3	73.4	27.2	7.2
Gull Arm 1	23	1	4.3	3	13.0	7	30.4	12	52.2	5.2	61.0	18.2	5.0
Nukasusutok 5	21	2	9.5	13	61.9	1	4.8	5	23.8	19.2	73.3	32.9	8.6
Cutthroat Island 2	5	1	20.0	2	40.0	1	20.0	1	20.0	17	72.4	27.8	7.4
Dog Bight L9	5	0	0.0	1	20.0	3	60.0	1	20.0	N/A	N/A	N/A	N/A

Averages calculated using complete artifacts

4.4 Geometric Morphometrics

A geometric morphometric analysis of the projectile points from the collections assembled was undertaken with the goals of assessing the practical applicability of this approach to archaeological assemblages, as well as gleaning more detailed metric data from the artifacts than could be easily achieved using caliper measurements. Projectile points were chosen for this analysis because they are a well defined artifact type with a fairly consistent morphology while still exhibiting distinct variation within that morphology. For this same reason expedient flake tools, like utilized and retouched flakes, were excluded from this analysis; their widely varied morphology and relatively simple dimensions (length, width, thickness, and weight) means that they could be more easily assessed with calipers than with geometric morphometric software.

4.4.1 Geometric Morphometrics: Accuracy

The first part of the geometric morphometric analysis was to determine how accurate the measurements taken using the program TPSDig really are. To do this, 26 projectile points from the collections were measured using calipers to determine length; these same artifacts were then photographed and measured using the software program TPSDig to determine length. The two sets of measurements were then graphed against each other (Fig. 4.1), demonstrating that the data sets differ by less than 1.0%. This means that the digital measurements taken using TPSDig are effectively as accurate as more traditional caliper measurements. See Appendix C for the full data set relating to this comparison.

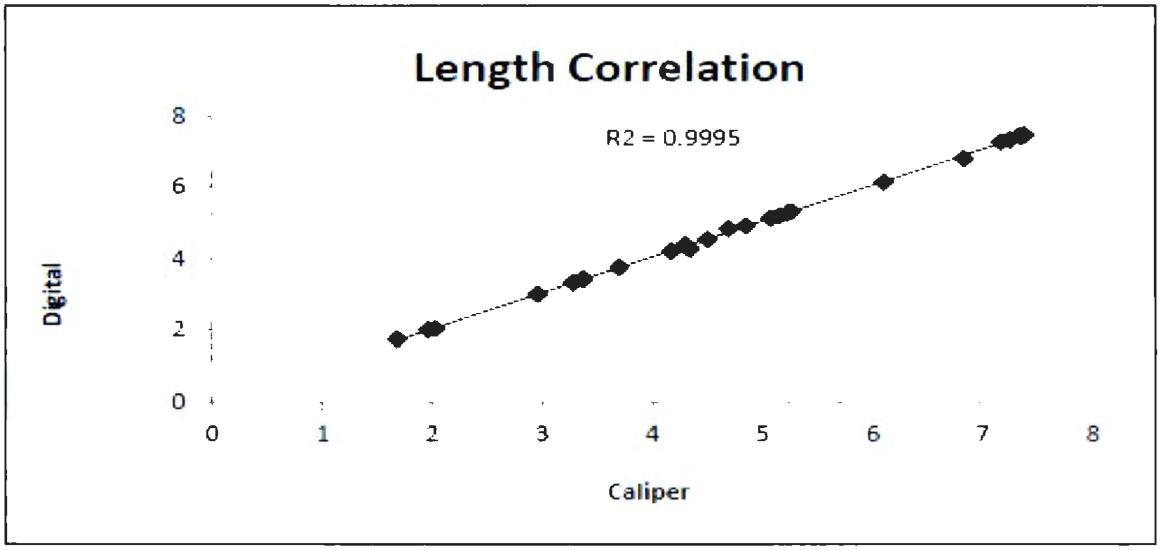

Figure 4.1 A Comparison of Length Measurements Taken Using Calipers and Digital Methods (TPSDig).

4.4.2 Geometric Morphometrics: Projectile Points

Once it was determined to be at least as accurate as calipers, the geometric morphometric software was used to analyze the projectile points from the assembled collections and the data from that analysis is presented in Table 4.26. This analysis included 30 projectile points from the assembled collections (listed in Appendix D). Of these 30 artifacts, six were flake points, and two were micropoints. These were included because despite their smaller scale they possess all the structures being targeted by this analysis. In fact, many of these are only distinguishable from projectile points due to their lack of complete bifacial flaking and thin profile. The analysis focused on the dimensions of four structures within the artifacts: blade length, shoulder width, stem width, and stem length. These measurements were then converted to proportions to account for differences in the overall size of each artifact, allowing artifacts like micropoints to be analyzed alongside full sized projectile points. As many of the artifacts being used are incomplete, shoulder width was chosen as the base factor for all the proportions as it is the one variable present on each of the artifacts. Average proportions were then determined for each structure first as a total collection and then by site.

Table 4.26 Dimensions and Proportions of Projectile Points

Borden Numberr	Number of Specimens	# Complete (%)	# Proximal (%)	# Medial (%)	# Distal (%)	Average Dimensions (cm)				Number of Specimens Averages Are Based On			
						Shoulder Width	Blade Length	Stem Width	Stem Length	Shoulder Width	Blade Length	Stem Width	Stem Length
HeCi-11	7	2 (28.6)	5 (71.4)	0 (0.0)	0 (0.0)	2.3	4.1	1.4	0.4	7	2	7	7
HdCg-7	3	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	2.7	4.5	1.2	0.3	3	1	3	3
HdCg-33	5	1 (20.0)	3 (60.0)	0 (0.0)	1 (20.0)	2.5	5.5	1.9	1.4	5	2	5	4
HdCg-19	1	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	1.8	4.5	1.2	1.4	1	1	1	1
HcCh-7	12	7 (58.3)	2 (16.7)	0 (0.0)	3 (25.0)	2.4	3.7	1.9	1.1	12	11	11	8
HiCj-5	1	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	2.7	6.3	1.4	0.8	1	1	1	1
HdCh-9	1	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	3.6	N/A	2.2	N/A	1	1	1	1
						Ratios – X : Shoulder Width							
Total	30	13 (43.3)	12 (40.0)	4 (13.3)	1 (3.3)	1.0:1.0	2.0: 1.0	0.6:1.0	0.4:1.0	30	18	29	24
HeCi-11	7	2 (28.6)	5 (71.4)	0 (0.0)	0 (0.0)	1.0:1.0	1.8: 1.0	0.6: 1.0	0.2: 1.0	7	2	7	7
HdCg-7	3	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	1.0:1.0	1.7: 1.0	0.5: 1.0	0.1: 1.0	3	1	3	3
HdCg-33	5	1 (20.0)	3 (60.0)	0 (0.0)	1 (20.0)	1.0:1.0	2.3: 1.0	0.8: 1.0	0.5: 1.0	5	2	5	4
HdCg-19	1	0 (0.0)	0 (0.0)	0 (0.0)	1 (100.0)	1.0:1.0	2.5: 1.0	0.7: 1.0	0.8: 1.0	1	1	1	1
HcCh-7	12	7 (58.3)	2 (16.7)	0 (0.0)	3 (25.0)	1.0:1.0	1.6: 1.0	0.8: 1.0	0.5: 1.0	12	11	11	8
HiCj-5	1	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	1.0:1.0	2.3: 1.0	0.5: 1.0	0.3: 1.0	1	1	1	1
HdCh-9	1	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	1.0:1.0	N/A	0.6: 1.0	N/A	1	N/A	1	N/A

Based on the data collected from the geometric morphometric analysis.

Of the 30 projectile points chosen for this geometric morphometric analysis, thirteen of them (43.3%) were complete specimens, twelve (40.0%) were proximal, four (13.3%) were medial segment and one (3.3%) was a distal portion. The average proportion of blade length to shoulder width is 2.0:1.0, the average proportion of stem width to shoulder width is 0.6:1.0, and the average proportion of stem length to shoulder width is 0.4:1.0. All of the data presented here in Chapter 4 is discussed in detail in the following chapter.

Chapter 5 – Discussion

5.1 Materials

The Labrador Archaic lithic assemblages that were analyzed were composed of a number of different materials, and certain materials stand out as being staples within these lithic traditions, namely quartzes and quartzites of varying qualities, Ramah chert, Mugford cherts, and slate. A number of other lithic types occur consistently, but in much smaller quantities on Labrador Archaic sites; minerals such as silicified slate, schist, gneiss, granite, jasper, mica, rose and smokey quartz, soapstone, sandstone, and rhyolite. As well feldspar, hornblende, limestone, and different aggregate minerals and tuffs are included in the collections of these eight sites, but not with distinct cultural modifications; if they are cultural they could have been collected as curiosities or for unknown social or cultural purposes. The final material from these sites is a variety of fine grained, opaque black chert referred to in Chapter 2 as Black Ramah or Kaumajet Black. Artifacts of this material are scarce (2.0% of the total collections from all eight sites), and debitage is even more elusive (0.2% of the weight of debitage from the assembled collections), indicating that black chert was likely worked off site and transported on site as finished artifacts.

The raw materials from which the lithic collections are formed tell part of the story about who made and used these tools, and how they conceived of their actions. The major sources for consistently high quality raw materials in northern Labrador are confined to a small number of known locations, while low quality materials are abundant and widely distributed throughout the region. The sources of the two highest quality lithic materials used by the early Labrador Archaic for the manufacture of stone tools are located at Cape Mugford and in Ramah Bay, which are more than 150 kilometers apart in a straight line. Even the most northern site represented here (Cutthroat Island 2) is approximately 30 kilometers south of the Mugford chert source, and over 180 kilometers south of Ramah Bay. The actual travel route would have been much longer than this through the challenging north Labrador Sea and over harsh, rugged terrain. Also, this was not a climate in which year round procurement of every lithic material was likely possible; winter in northern Labrador would make travel challenging, and for much of the year the ground would have been covered by a thick blanket of snow and ice (Hood 1992:330; Lazenby 1984:14). The period from which the sites under consideration date to is a scarce 2500-3000 years after deglaciation occurred in the area surrounding the Nain Archipelago, which was likely covered in a shrub tundra of stunted trees, grasses and sedges (Fitzhugh and Lamb 1985:363, 368; Short 1978:28,31). As well, starting around 6000 BP Labrador began to cool even further due to a marine shift which brought the cold waters of the Labrador Current closer to shore (Fitzhugh and Lamb 1985:365). While frozen lakes and rivers can make winter travel easier by providing clear routes of travel either by foot or by sledge, it would only be advantageous if the lithic source outcrops were exposed, and not covered by ice, snow, or frozen earth. As well, summer often entails wet boggy conditions on many parts of the Labrador coast (Jordan 1975:97), making overland routes difficult and impractical. Perhaps because of these climatic factors the early Labrador Archaic groups made specific and prescribed use of each material at their disposal, and their lithic traditions were practiced within a doctrine which influenced every aspect of their toolkit.

5.1.1 Space-Time Distribution: Debitage

Of the eight sites studied, only five of the debitage assemblages from these sites will be analyzed: Cutthroat Island 2 (6179 pieces), Ballybrack 10 (2622 pieces), Imilikuluk 5 (1395 pieces), Nukasusutok 5 (15451 pieces), and Gull Arm 1 (4208 pieces). Granted, there is size variation within these sites, but each has a large debitage collection which is representative of the age to which they date. In contrast to this Evilik Bay 5 has only has 27 pieces of debitage in its collection, Dog Bight L9 has eight pieces, and a single flake of Mugford chert makes up the debitage component of the collection from Dog Island Southwest 1. These three sites were not excluded from the debitage analysis simply because of the small debitage assemblages associated with them but also because of the types of investigation carried out at each site. The five sites with large debitage collections were all subject to rigorous excavation, whereas Dog Bight L9 and Dog Island Southwest 1 were only surveyed and surface collected, and Evilik Bay 5 was test pitted (Dog Bight L9 SRF; Dog Island Southwest 1 SRF; Evilik Bay 5 SRF). A fully excavated site with a small debitage collection may simply mean that little or no knapping occurred on this site. However, because these sites were only surveyed and tested the quantity and composition of debitage in each assemblage may not accurately reflect the nature of the site. This is especially true in the context of the early to middle Maritime Archaic where so much of the debitage is often low quality local quartzes and quartzites. In an attempt to present as accurate an analysis as possible, Evilik Bay 5, Dog Island L9, and Dog Island Southwest 1 were excluded from the debitage analysis.

Interesting trends in the distribution of materials can be seen in the five large debitage collections (Figure 5.1). Looking at the quantity of debitage materials in each collection, it is apparent that on-site use of high quality quartz was subject to a gradual decline over time as Ramah chert use gradually gains prominence on Labrador Archaic sites. This pattern changes near the end of the sequence as neither Ramah chert nor high quality quartz debitage is present in any meaningful quantities from Cutthroat Island 2. Instead Mugford cherts dominate this debitage assemblage, evidently replacing Ramah chert as the lithic material of choice (Fig 5.1). This pattern appears both in regards to material weight and flake quantity, suggesting that on this site Mugford cherts were used as a surrogate material to replace Ramah chert, likely because of Mugford cherts' high quality and this site's close proximity to the source locale for this material.

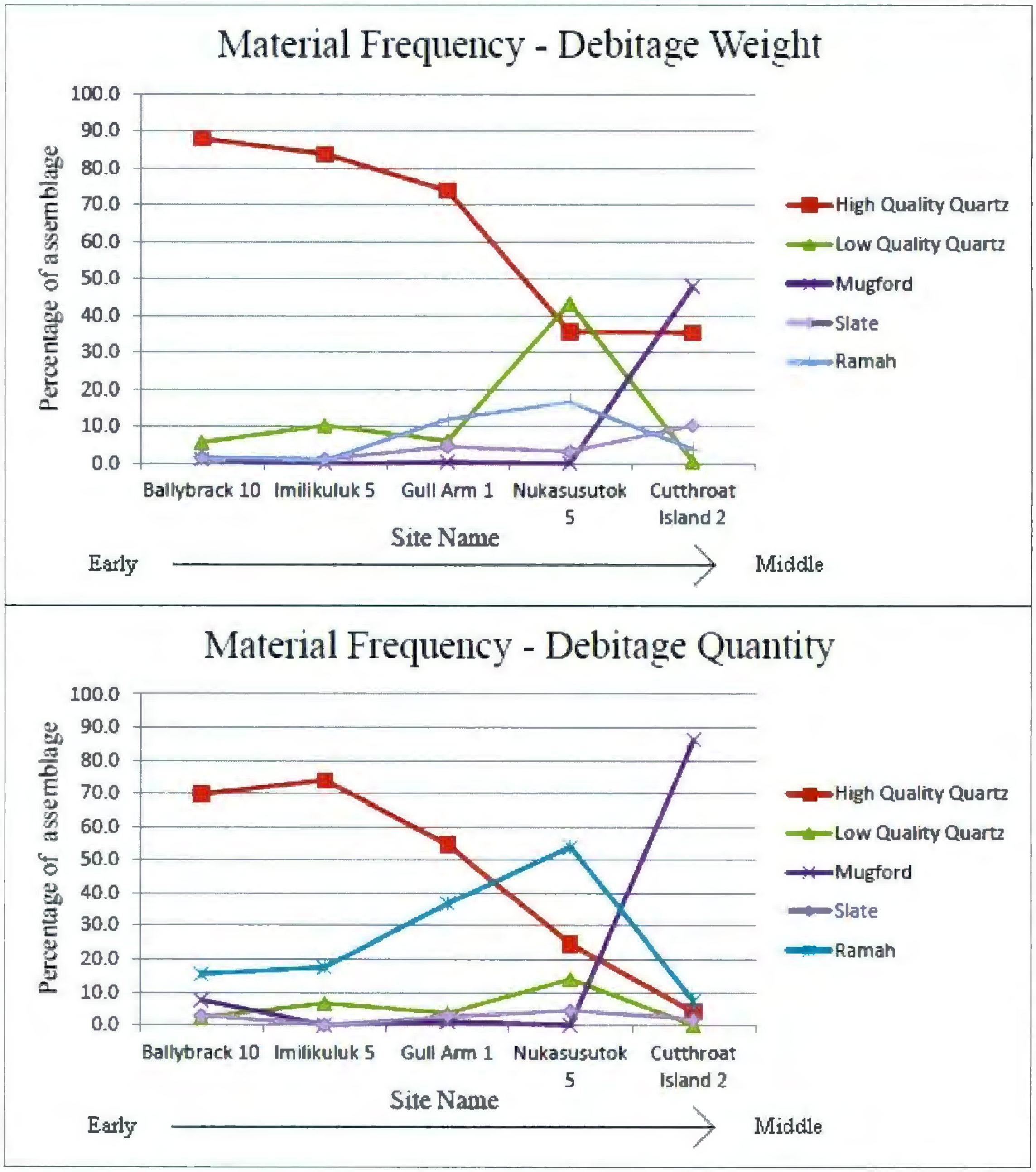

Figure 5.1 Material Frequencies Within Debitage Collections.

Black chert, quartzite, schist, silicified slate and slate are excluded from this graph due to their consistently low frequencies.

Over time quartz declines in prominence and Ramah starts a gradual climb, rising more quickly by weight than flake counts. Again, Mugford cherts assume a position of prominence in the Cutthroat Island 2 debitage collection, a position which based on the trends stemming from the other sites one would assume to be occupied by Ramah chert.

Quartzes of various qualities occur frequently up and down the Labrador coast as cobbles as well as veins in the bedrock (Fitzhugh 1972:39; 1978:72; 1980:589; Hood 1992:343; Lazenby 1984:12, 25, 41; Nagle 1984:111-112) so the preponderance of quartz debitage on these sites is not surprising. Quartz was a material which could have been worked in camp as more often than not quartz occurs naturally near areas where Labrador Archaic groups would have camped, either as inclusions and veins in the bedrock, as in Figure 5.2, or as cobbles collected from the shore. More importantly quartz could have made it onto sites in a less refined state than minerals which would have had to be transported such as Ramah and Mugford cherts. In four out of the five cases presented here, Ramah debitage is more prevalent than quartz debitage but the quartz is heavier, indicating that Ramah chert probably travelled from its distant source area at Ramah Bay as prepared cores, blanks, or finished tools. It could then be worked into finished tool forms and usable flakes, and finished tools could have been retouched and repaired. In contrast to this, quartz could have been reduced on site from locally available cores to finished products (either usable flakes or formal tools).

Figure 5.2 A Vein of Quartz, Approximately 15 cm Across. In the Bedrock on Black Island in the Nain Archipelago.

Slate debitage becomes slightly more frequent on later sites, but the real change is to the weight of slate debitage over time. What debitage is present is heavier on later sites than it is on earlier sites indicating that larger pieces were being worked on these later sites. This does not necessarily indicate that more slate was being worked however as the frequency of slate debitage only increases marginally on later sites. This increase over time could relate to the increased presence of Ramah and Mugford cherts on sites, as the source areas for both these minerals also produce slate (Gramly 1978:37; Nagle 1984:101).

The minerals which are not represented in Figure 5.1 are ones which occur in consistently low frequencies over all of the sites. These materials (black chert, pigment minerals hematite and limonite, quartzite, silicified slate, and the *other* category which includes minerals like gneiss, granite, schist, etc.) represent in every case less than 5% of their parent assemblage, with the exception being the weight of quartzite debitage from Imilikuluk 5 (5.2% of the assemblage). These minerals, excluded from Figure 5.1 in order to make trends in more abundant materials more visible, are graphed in Appendix E. There are no important trends visible within these materials, though there does seem to be a gradual decline in the frequency of quartzite and *other* debitage on sites and black chert debitage seems to occur slightly more frequently over time.

5.1.2 Material Frequency – Artifacts

Material frequencies within the artifact assemblages from these sites show similar trends to those seen in the debitage assemblages (Figure 5.3). The occurrence of high quality quartz artifacts on sites declines steadily over time as Ramah chert artifacts become more common. Slate artifacts also see a slight increase over time, though this growth is sporadic and slight when compared to the steady increase of Ramah chert artifacts, or the decrease of high quality quartz. Once again, the expected frequencies of Ramah and Mugford chert at Cutthroat Island 2 are reversed, with Mugford chert being far more common than Ramah as a material for artifact manufacture.

The minerals which are not represented in Figure 5.3 are again ones which occur in consistently low frequencies over all of the sites. These materials (black chert, pigment minerals hematite and limonite, quartzite, silicified slate, and the *other* category which includes minerals like gneiss, granite, etc.) represent in every case less than 5% of the assemblage to which they belong, with the exception of silicified slate artifacts from Dog Bight L9 (7.3% of the assemblage), though this is likely a result of the limited investigation at this site and the resulting small size of the total collection. These minerals, excluded from Figure 5.3 in order to make trends in the use of other materials more visible, are graphed in Appendix E. Within these infrequent materials, the use of black chert and silicified slate seem to rise slightly over time, while quartzite and other materials generally decline in frequency. The frequency of pigment materials does not experience any sustained or regular change over time.

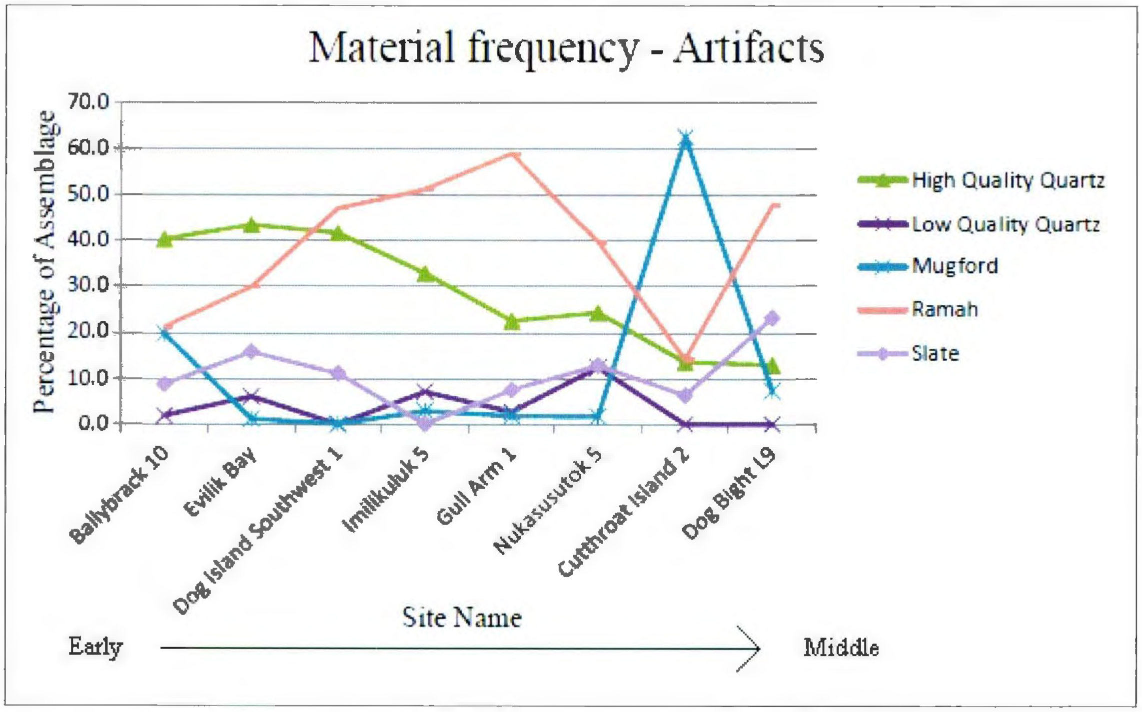

Figure 5.3 Material Frequencies Within the Artifact Assemblages of Each Site.

Lower frequency materials such as black chert, quartzite, schist, silicified slate and slate are excluded from this graph.

5.1.3 Mugford Cherts and the Potential for Material Surrogacy

Material surrogacy, or the willingness of a group to substitute one culturally prevalent lithic type (In this case Ramah chert) for another, less commonly used stone, seems to have been an active process on these Labrador Archaic sites. The dominance of Mugford cherts on Cutthroat Island 2 (Figure 5.1) may be an example of this material surrogacy where Mugford cherts were intentionally chosen for use as an acceptable substitute for Ramah chert; a trend which is visible in the material frequencies of both the debitage and artifact assemblages from this site (Figure 5.3). This substitution was likely due to the proximity of the Mugford chert sources (around thirty kilometers) to Cutthroat Island 2, compared to almost 200 kilometers to access Ramah chert in Ramah Bay. Despite the fact that Mugford cherts are not as easily extractable as Ramah chert and the extracted pieces are often smaller, the ease of access to the source locale likely made it an attractive option to the Labrador Archaic. Mugford cherts may not be as visually appealing as Ramah chert but they are high quality, fine grained materials which can, with the appropriate amount of skill, be knapped into as fine a tool as one created from Ramah chert (Lazenby 1984:43-44). The Mugford chert quarries offered a high quality alternative to both quartz and Ramah chert, and the occupants at Cutthroat Island 2 made the choice to increase their use of Mugford chert in lieu of these materials.

This willingness to use alternate materials can be seen elsewhere as well, most notably quartz was used on Labrador Archaic sites despite its obvious inferiority to higher quality but more distant materials, likely because it could be easily procured. The substitution of Ramah chert for more available local materials like quartz is visible in the artifact assemblage from Nukasusutok 5. There Ramah chert accounts for the largest portion of the artifacts, but tools made of this material are less abundant than can be observed at the previous three sites. Meanwhile the occurrence of artifacts made from high quality quartz, low quality quartz, and slate all increase in comparison to earlier sites, suggesting that the demand for Ramah chert was lessened due to the ready presence of these local materials. While this material surrogacy is less pronounced at Nukasusutok 5 than within the Cutthroat Island 2 assemblage, its occurrence indicates that this sort of substitution is not a phenomenon isolated to one site, and suggests a level of pragmatism underlying how the Labrador Archaic groups treated lithic resources.

5.1.4 Material Allocation

Labrador Archaic groups treated each lithic resource at their disposal differently. For example, the Ballybrack 10 lithic assemblage contains high numbers of artifacts made from Ramah and Mugford cherts despite its early date. However the debitage from these materials occurs less frequently (Tables 4.5, 4.6), suggesting these artifacts were brought in rather than produced on site. This aligns with the ceremonial attributes of the site (Fitzhugh 1978:65, 79, 85, 86; 2006:53), showing how these people placed different values on each lithic type.

The distribution of materials within each artifact type is presented in Figure 5.4. This graph represents all of the sites under analysis and spans approximately 1500 years of Labrador Archaic occupation of northern Labrador. It illustrates two other important aspects of Labrador Archaic lithic material use. First, a wide variety of materials were used to make tools, many of which are low quality local materials. Secondly, there were clear preferences for materials within different artifact classes, preferences which seem to have been at least partially structured according to the technical attributes of each type of stone, and with artifact attrition and breakage in mind.

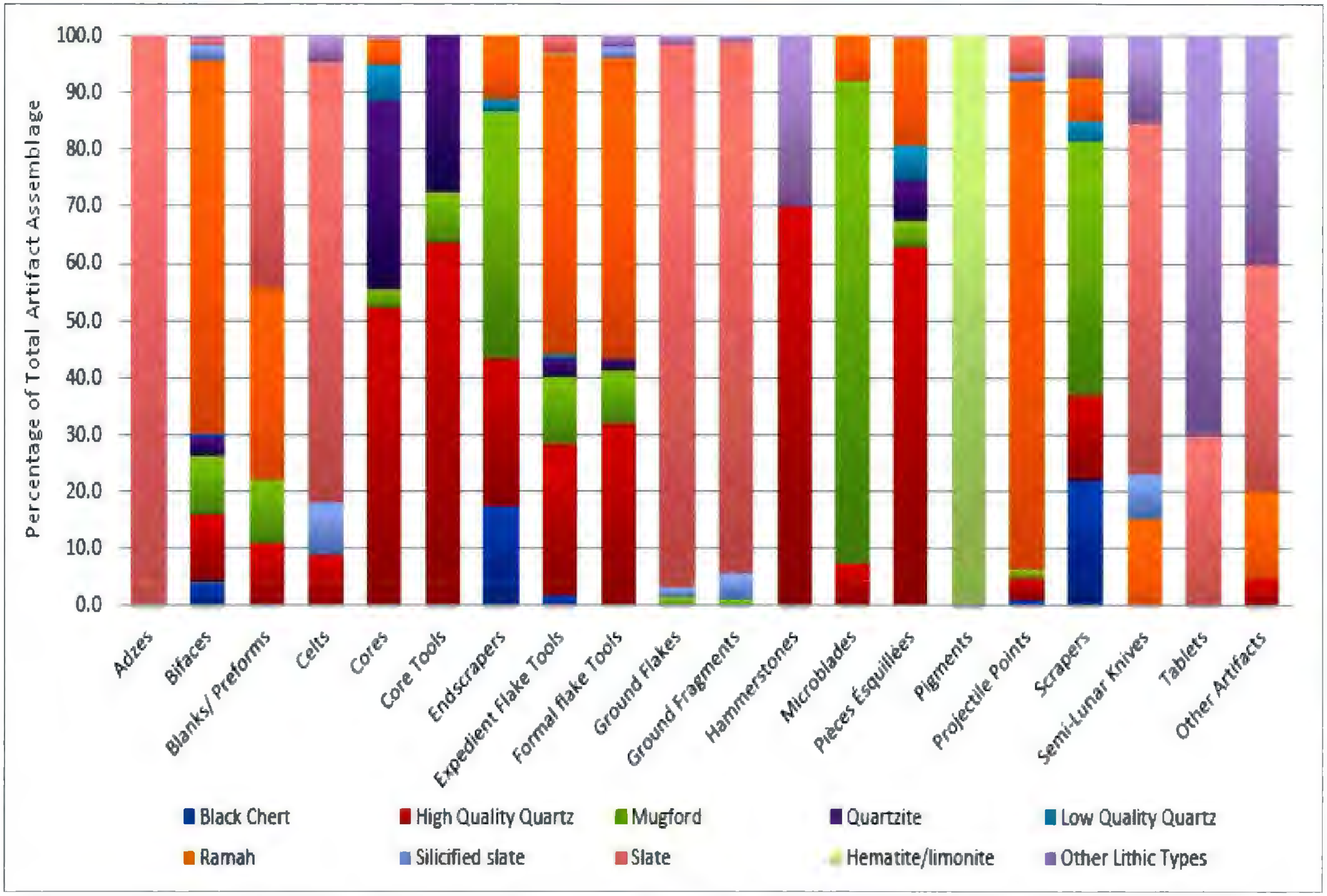

Figure 5.4 Total Material Distribution by Artifact Type.

The most obvious trend is the use of slate for high impact artifacts like celts and adzes, as well as for other ground stone implements like semi-lunar knives and endblades/projectile points. Slate is a material well suited to these tool forms as it can be readily shaped both by flaking and grinding, and ground edges can be easily sharpened and repaired with the same techniques. Also, due to its platy cleavage slate is less likely to completely shatter under a high velocity impact than harder, more brittle materials like quartz or chert.

Other material preferences which are readily apparent concern high quality quartz and Ramah chert. High quality quartz is the primary material used in the production of pièces ésquillées, hammerstones, core tools, and cores and also shows up in noticeable quantities as bifaces, blanks/preforms, endscrapers, expedient and formal flake tools, and scrapers. Ramah chert use is limited to the production of knapped stone implements. That being said it is the main material for bifaces, both expedient and formal flake tools, and blanks. Furthermore it comprises almost all of the projectile points from these sites. Ramah chert was also used for more than 10% of the pièces ésquillées, semi-lunar knives, and other artifacts. Interestingly, Ramah chert cores are not frequently present on these sites (8.0% of the total cores) despite its frequent use as a material for flake tools. This suggests that either the cores were reduced completely over the course of their use-life, or Ramah chert cores have a different structure than simple blocks of raw material.

Mugford cherts seem to have been used primarily for the production of endscrapers, scrapers, and expedient flake tools, and they account for most of the microblade category. These cherts also appear in small quantities as bifaces, blanks, core tools, and formal flake tools. The "other" material in the hammerstone category is mainly granite, and schist makes up the "other" materials within the tablet category. Finally, quartzite does not appear very frequently in the artifact collection, though when it does it is mainly used in reductive artifacts like cores and core tools, and small quantities of pièces ésquillées.

These material-artifact preferences reveal a great deal of forethought and planning by the Labrador Archaic regarding their lithic technologies, specifically for materials like high quality quartz and Ramah chert. The materials seem to have been used strategically to get as much use and or usable material out of a piece of stone as possible. It should be mentioned that non-lithic materials (i.e. organics like antler, textiles, and bone) were likely also used with a similar degree of strategy and forethought. However due to the generally poor preservation of organic materials on Labrador Archaic sites from this time period, this cannot be fruitfully discussed at this time. Since it can be considered a local material on all of the sites under study, quartz likely entered the lithic assemblages on each site as cores, and each time they were reduced the products and by-products of that reduction were passed into the next stage of the use process (Figure 5.5). A use pattern like this would produce a distinctive trace in the archaeological record with the later stages of the process (pièces ésquillées, flake tools, debitage) generally being better represented in the lithic assemblages than the initial stages of reduction, and this pattern is present in the collections (Figure 5.6). Though cores are not the smallest category of quartz artifact on every site, this is the case on seven of the eight sites. Nukasusutok 5 is the exception but this is not overly surprising as this site had an enormous amount of quartz debitage (6026 pieces weighing just over 20 kilograms) which would have had to have come from a large number of cores. Also there are two identified quartz sources on Nukasusutok Island close to Nukasusutok 5 (Hood 2008:179), so complete reduction of this material may not have been as necessary and cores could have been abandoned if they became irregular or otherwise difficult to work.

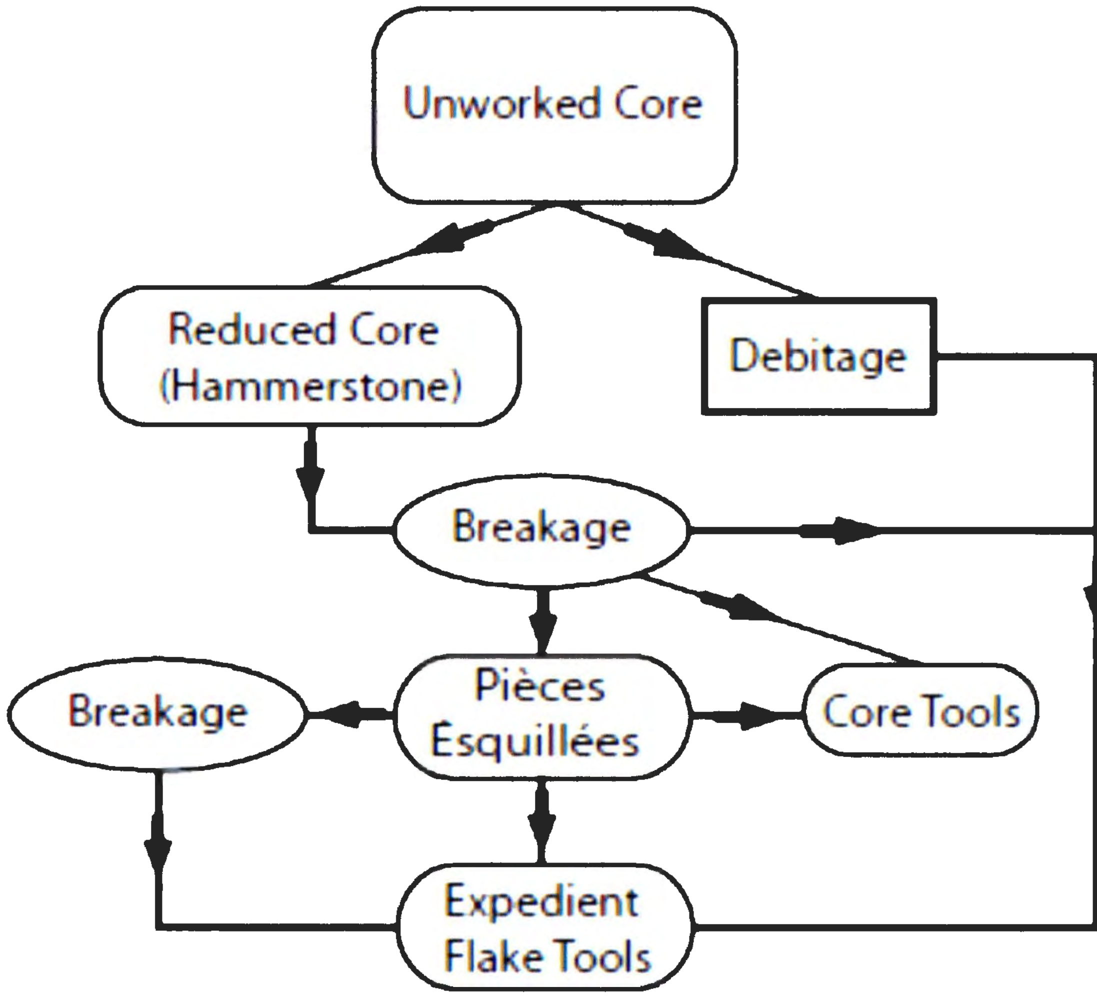

Figure 5.5 A Model for Quartz Use on Early Labrador Archaic Sites.

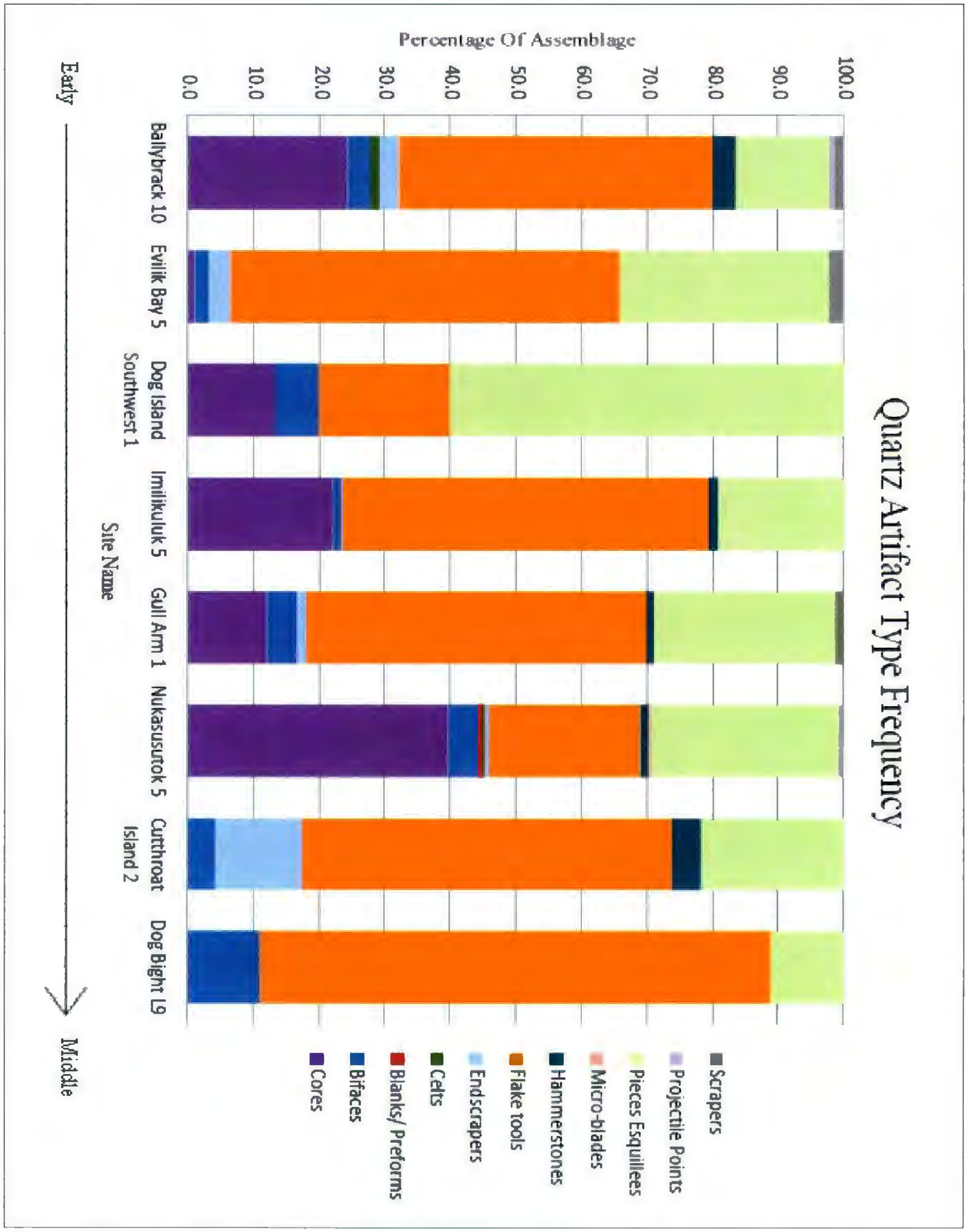

Figure 5.6 Frequency of Each Artifact Type Made from Quartz (High or Low Quality).

In this graph core tools have been absorbed into other artifact categories (e.g. a core/celt is counted as a celt, a core/hammerstone is counted as a hammerstone), because any large piece of quartz within this model can function as a core simultaneously with its function as any other artifact type.

Ramah chert could have been used in a similar manner to quartz, which would have maximized its usefulness over time (Figure 5.7). The low yet steady frequency of Ramah chert pièces ésquillées suggest that bipolar and thus more complete reduction of cores was practiced, but this does not wholly account for the paucity of Ramah chert cores. Recently, flintknapper Timothy Rast demonstrated how a large biface of obsidian could function as a core for usable flakes as well as a discrete tool in its own right (2010). Rast was able to remove large, useable flakes from the biface while maintaining its shape and integrity. When the biface had been sufficiently reduced, some simple modifications to the base transformed the now smaller biface into a well formed projectile point. A similar process could have been used by the Labrador Archaic in their treatment of Ramah chert, and in fact would fit well with the use patterns already demonstrated within the quartz assemblage.

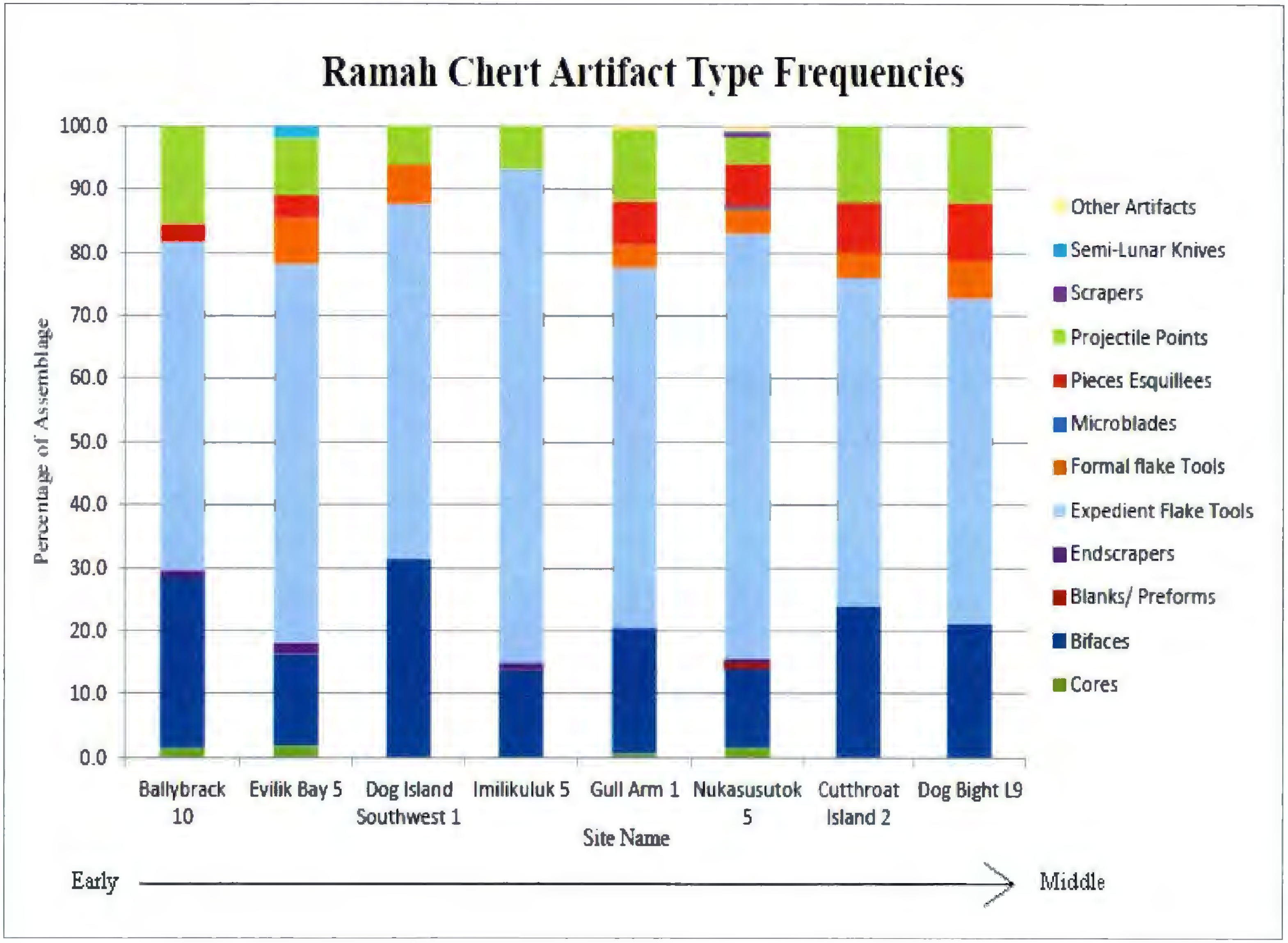

Figure 5.7 Frequency of Each Artifact Type Made From Ramah Chert.

Because of the remote location and difficult access to Ramah chert quarries, it is unlikely that material would have been brought back simply as blocks or prepared cores. Large bifaces would have been a more likely option for the transport of Ramah chert by early and middle Labrador Archaic populations. The use of large bifaces as cores has a number of advantages over the transportation of cobbles or blocks of material (Andrefsky 1998:150-152). Primarily, the use of large biface-cores maximizes the amount of tool edge being transported while minimizing the amount of waste debitage being carried with a group or individual. Biface cores also provide a constant source of "fresh" flakes to be either used in their own right or made into other tool types, while ensuring that the edge of the biface itself remains sharp and useable (Andrefsky 1998:157; Kelly 1988:718-719). Also, bifaces are more reliable sources of useable stone than a cobble or roughed out blank as any faults (joints, cracks, fissures, etc.) in the stone would likely be revealed during production of the biface-core. Finally, the tool maker has an opportunity to become familiar with the piece of stone as the biface is made and used, lowering the likelihood of failure or breakage during later phases of the reduction process (Andrefsky 1998:151).

These bifaces would have been useful cutting tools, and the flakes detached to sharpen or shape the bifaces could then be used as either expedient flake tools, or for manufacture into more formal tool types. A reduced biface required only a few modifications to the proximal end to produce a bifacial projectile point. This projectile point could then be used until lost or broken, at which point it could have been recycled into any number of tools, from scrapers to pièces ésquillées, or even into another projectile point (Figure 5.8). A look at the Ramah chert artifact assemblages from these sites (Figure 5.7) show a pattern very similar to what is described above. Cores are rare and, owing to their nature as reductive artifacts, are present mostly as exhausted specimens while bifaces in general represent between fifteen and thirty percent of the Ramah chert collection. Meanwhile expedient flake tools account for the majority of the Ramah chert artifacts on every site along with projectile points and pièces ésquillées. The lack of Ramah chert cores and high frequency of expedient flake tools of this material coincide with the associations proposed by Kelley (1998:721) for the production and use of bifaces as cores.

One might expect that pièces ésquillées and projectile points would have a more robust representation in the Ramah chert assemblage as the last stand of Ramah chert use (barring the repair and reuse of broken artifacts as shown in Figure 5.8). After all, almost any broken Ramah chert artifact could have been turned into a pièce ésquillée, and projectile points seem to have been an end-point artifact, manufactured as biface cores became sufficiently reduced. The relative paucity of these artifacts, however, fits within how they would have functioned. Pièces ésquillées are reductive artifacts, and would likely have been completely depleted by the end of their use life in order to generate useable flakes decreasing their visibility in the archaeological record. Pièces ésquillées made of quartz are the exception to this, possibly due to the abundant nature of this material on the Labrador coast, lessening the need to scrimp and save every bit of useable quartz.

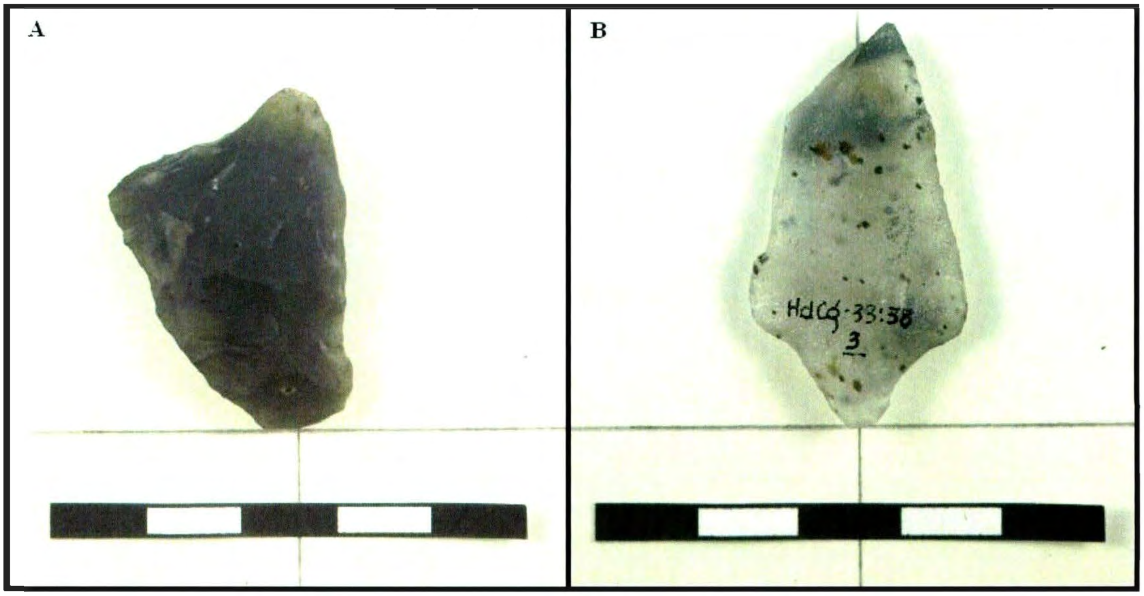

Figure 5.8 Two Examples of the Re-use of Broken Artifacts.

Artifact A (HdCg-33:38) is an endscraper made from Ramah chert. This artifact is likely made from the stem of a broken projectile point or biface as almost all endscrapers are unifacfial and this one is entirely bifacial. Also, only 5% of the assembled endscrapers are made from Ramah chert. Artifact B (HdCg-33:38) is a broken projectile point which has been reused, as can be seen by the dulling on the distal point, and usewear along the broken distal edge.

The scarcity of projectile points within the Ramah chert assemblage is slightly more puzzling. We know from looking at projectile points from early/middle Labrador Archaic sites that Ramah chert was the preferred material for these artifacts and that other materials were rarely substituted for their manufacture (Figure 5.4), yet projectile points only account for on average 9.7% of the Ramah chert artifacts from these sites. This could be due to the fact that a bifacial projectile point of the type made by the Labrador Archaic is a costly artifact to produce in terms of material use. They may only have been produced to replace lost or damaged projectile points, or as the biface-cores reached the point in their use-life where they had to be transformed into a projectile point. Task specific artifacts like projectile points, endscrapers, celts, etc. all occur in relatively low quantities on these sites (see artifact frequency tables for each site, Chapter 4), suggesting that these specialized artifacts were produced less often and curated more carefully than more expedient tools. This reflects the higher level of effort and volume of material required to produce such formalized tool types. Finally projectile points are more likely to be broken or lost in action due to their function as a hunting tool, especially in a marine oriented society like the Labrador Archaic where much of the hunting would occur on or near a very cold ocean, lessening the chance of retrieval of lost or damaged projectile points.

Mugford chert was also used in a manner that maximized its potential use, but not through reuse of material. Mugford chert occurs on Labrador Archaic sites most often as endscrapers and other scraping tools. The manufacture of these is uniquely suited to Mugford chert, as this material occurs mostly as small, thin beds of chert rather than the large blocks which characterize the Ramah chert source (Nagle 1984:101). Because endscrapers are small and thin (see section 5.2.2), and often unifacially flaked, they are an artifact which is well suited to be made from this material. By making endscrapers almost exclusively from Mugford cherts, early and middle Labrador Archaic populations lessened the strain on their supplies of other, more costly or exotic materials such as Ramah chert which is better suited to the production of larger, more complex bifacial tools like projectile points and bifaces. They also reduced the strain on themselves by not trying to make finely tooled artifacts like endscrapers from coarse, difficult-to-work materials like quartz and quartzite.

5.2 Metric Analysis

The metric analysis undertaken here had two main goals. The first was to determine the exact metric attributes for select artifact types, and to use those attributes to trace how these artifact types changed over time. The second goal was to use artifact size and shape to relate different categories of artifacts to one another in an attempt to understand how the lithic systems of the early to middle Labrador Archaic functioned.

5.2.1 Expedient Tools: Utilized Flakes, Retouched Flakes, and Retouched/Utilized Flakes

Expedient flake tools are by far the most common artifacts on early and middle Labrador Archaic sites. On average they represent 50% of the lithic assemblages recovered from these sites. These tools are simple, effective, disposable, and prevalent; perhaps the archaic equivalent of modern-day plastic cutlery. The category of expedient flake tools is divided into three sub classes: utilized flakes, retouched flakes, and utilized/retouched flakes.

In general, expedient flake tools decrease in size over time (Figure 5.9). This decrease is most noticeable when weight is considered and least noticeable when thickness is considered. This general decrease is also present in the assemblages of retouched flakes (Figure 5.10) and retouched/utilized flakes (Figure 5.11), but purely utilized flakes actually increase in size over time (Figure 5.12); most notably, they get longer.

If these three sub-classes of expedient flake tools can be considered as different points in a single artifact type's use-life, rather than as different variants of the same type of artifact then these patterns make sense. Flakes removed from a core would have been put into use immediately and utilized flakes would therefore represent the maximum size found within the expedient flake tool category. As they were used they would dull and either be discarded, lost, or re-sharpened as required via the removal of small pressure flakes, becoming retouched flakes. These retouched flakes would then continue to be used until they were worn and retouched beyond any hope of rejuvenation, eventually becoming lost or discarded.

Over time utilized flakes are generally made longer but not thicker or heavier (Figure 5.12), while expedient flake tools in general diminish in size. This reflects the increased use over time of higher quality materials like Ramah and Mugford cherts (Figures 5.3 and 5.13). Use of superior materials allows flakes to be detached which have a greater surface area while maintaining a thin flake profile (Andrefsky 1994:29; 1998:23). This in turn increases the amount of usable flakes available from each core or biface. Also, high quality materials are easier to retouch and can be retouched with greater accuracy, extending the use-life of a given flake and resulting in an "exhausted flake" which is smaller than one which has been retouched less extensively or which was broken during sharpening. Finally, a thin, long flake that has been retouched will weigh less when discarded than a shorter and thicker flake which has little to no retouch, and this accounts for the marked decline in expedient flake tool weight seen in the general assemblage (Figure 5.9).

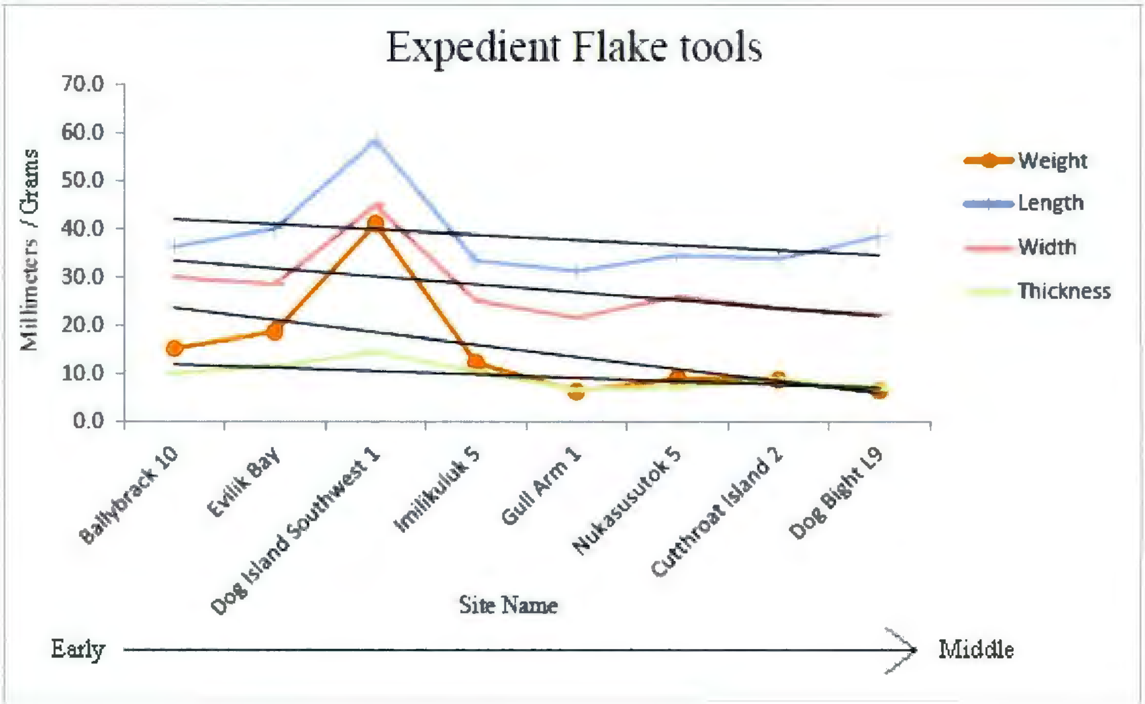

Figure 5.9 Dimensions of Expedient Flake Tools from Each Site.

Measurements were taken from complete artifacts only.

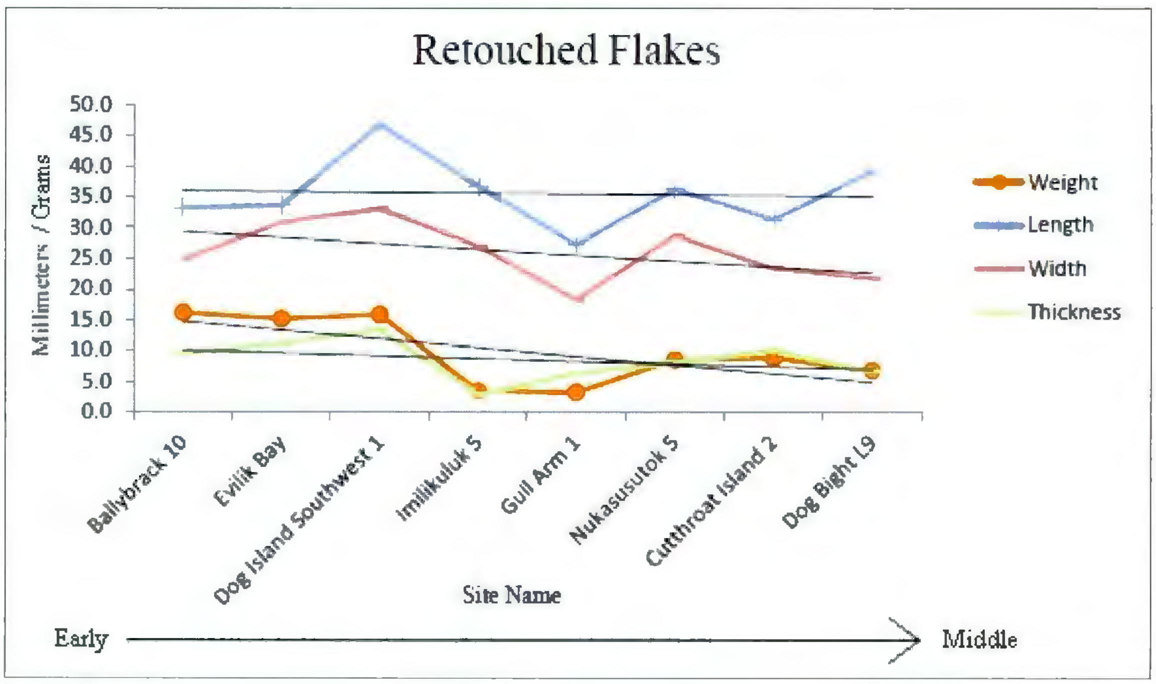

Figure 5.10 Dimensions of Retouched Flake Tools from Each Site.

Measurements were taken from complete artifacts only.

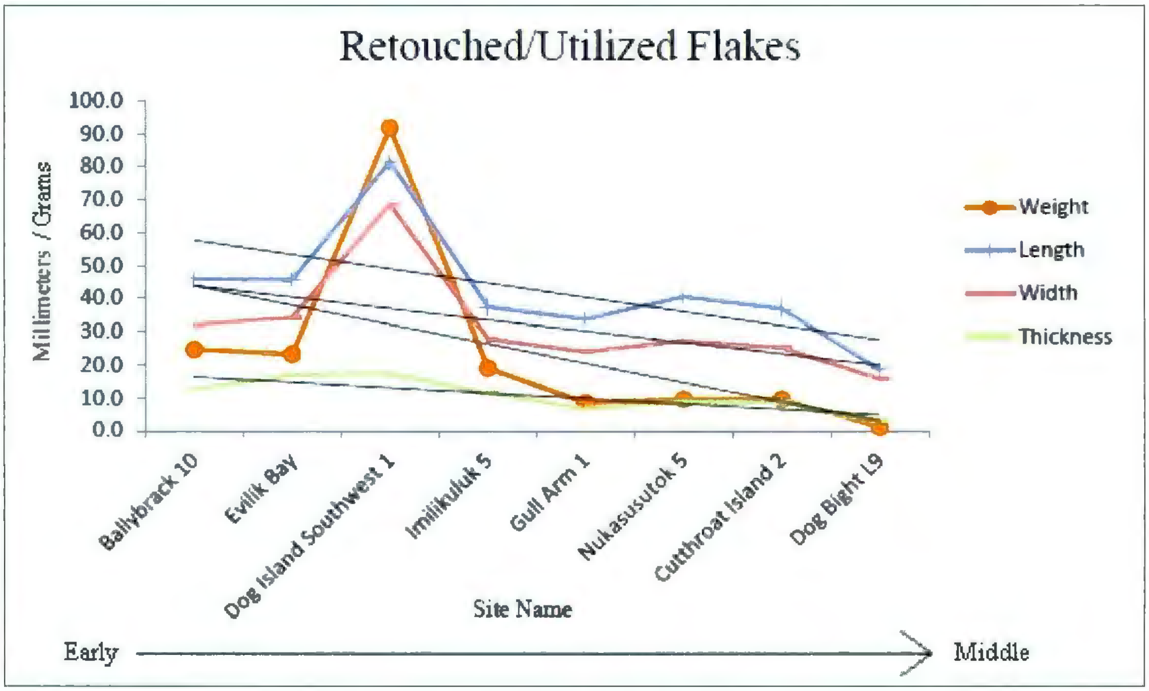

Figure 5.11 Dimensions of Retouched/Utilized Flakes from Each Site.

Measurements were taken from complete artifacts only.

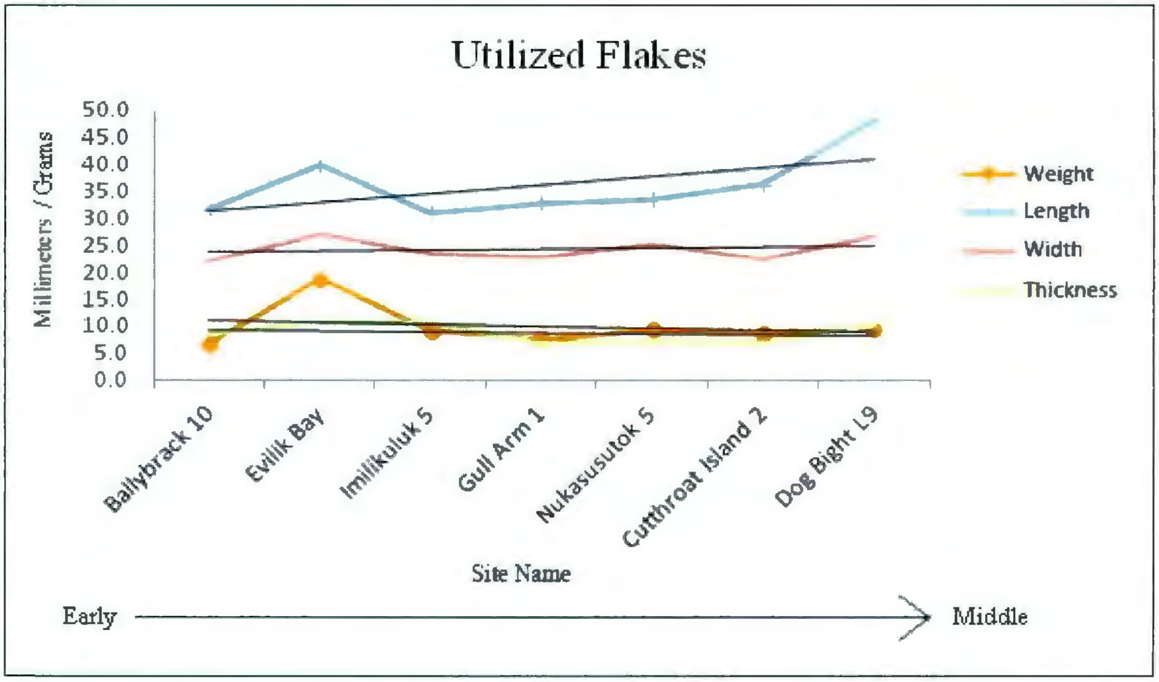

Figure 5.12 Dimensions of Utilized Flakes from Each Site.

Measurements were taken from complete artifacts only.

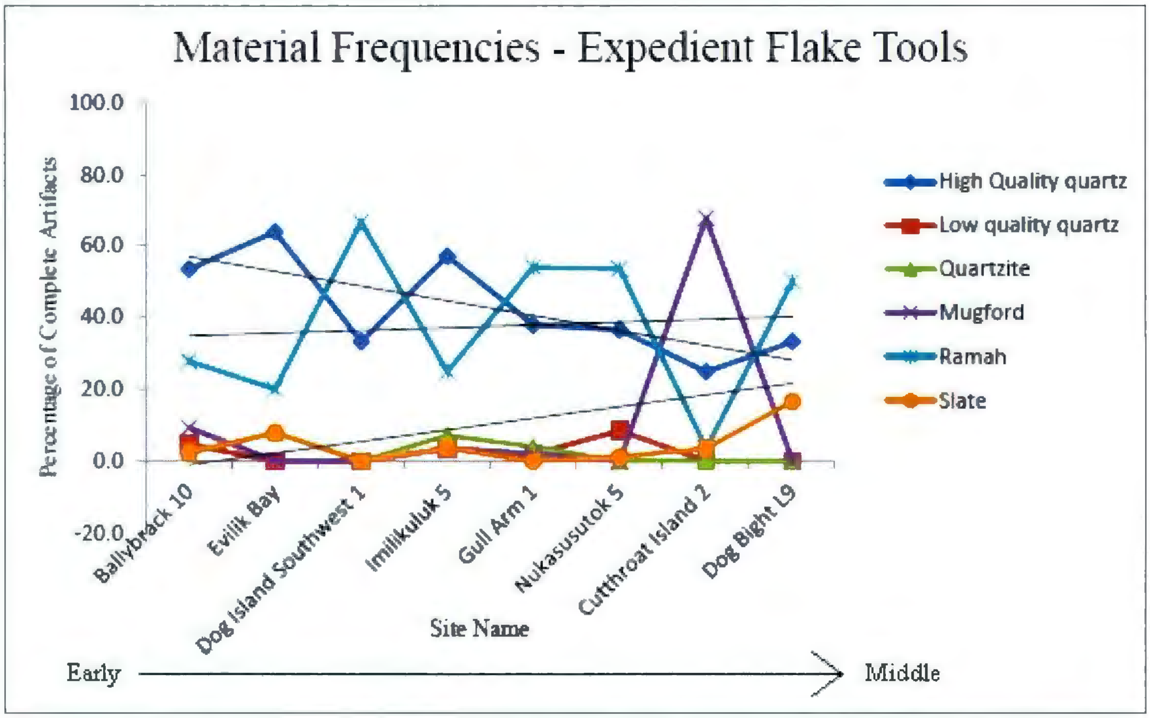

Figure 5.13 Material Frequencies Within the Expedient Flake Tool Assemblages from All Sites.

This figure contains data from complete artifacts only.

5.2.2 – Endscrapers

Endscrapers form just over 2.2% of the total collections (Table 4.2). Of the 47 endscrapers within all of the collections, 28 (59.6%) of them are complete. They are present in the collections from seven of the eight sites being studied. No endscrapers were recovered from the site of Dog Island Southwest 1, though this may be a result of limited collection techniques at the site rather than a reflection of the true nature of the lithic assemblage which would have been used at this site.

Endscraper dimensions (Figure 5.14) do not seem to change much over the c. 1500 years covered by the sites under analysis. As can be seen from Figure 5.14, despite some slight variation between sites these artifacts remain quite stable throughout the early and middle Labrador Archaic periods in northern Labrador. The unifaces from Cutthroat Island 2 which were one of the reasons that an earlier date was assigned to this site (Cox 1977:115), were analyzed as endscrapers. This is because they do not, on average, differ very much from the dimensions of endscrapers from other sites, or even from catalogued endscrapers within the Cutthroat Island 2 assemblage. Structurally these unifaces resemble endscrapers as well, being "roughly triangular…[and] laterally retouched…" with "unifacially flaked distal edges…" (Cox 1977:113).

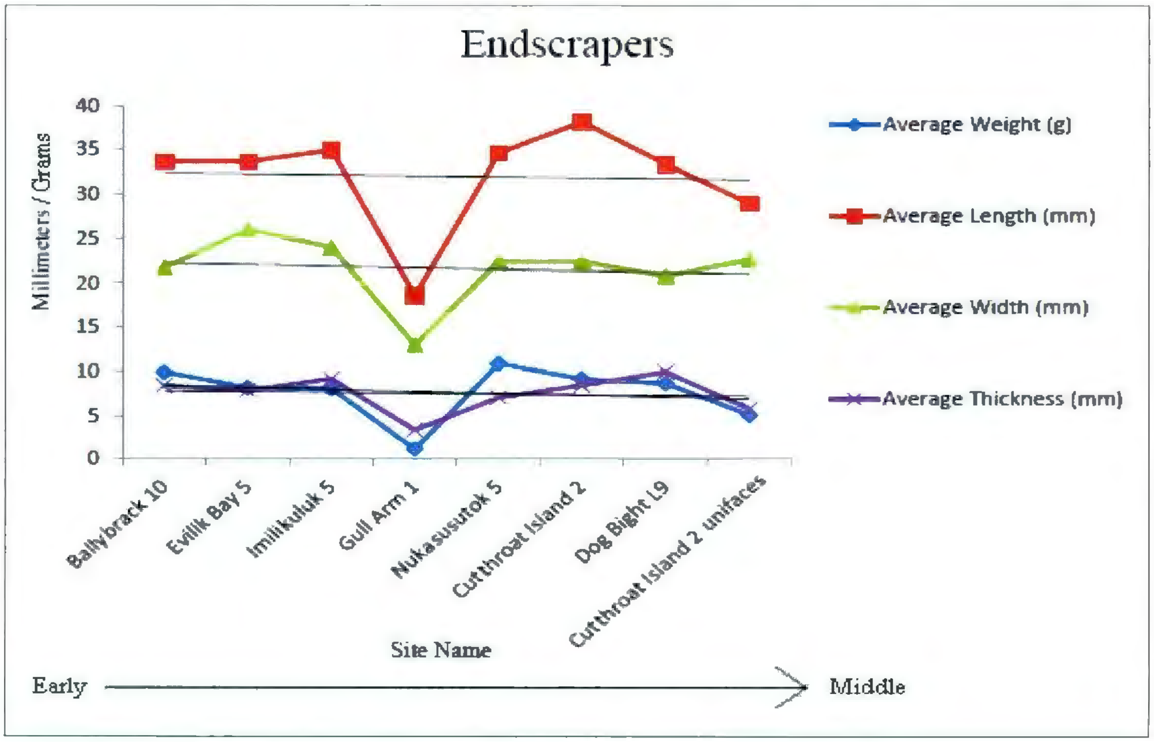

Figure 5.14 Dimensions of Endscrapers From Early Labrador Archaic Sites.

Measurements were taken from complete specimens only.

Endscrapers from these Labrador Archaic sites occur in three basic shapes: triangular, square, and leaning rectangular (Figure 5.15). The majority of endscrapers from the eight sites are triangular, with sides which contract from a wide distal scraping edge to a narrow proximal end (Figure 5.16). Leaning rectangular endscrapers, which have a rectangular proximal portion and a distal portion which "leans" at a slight angle relative to the proximal end, occur at two sites, Nukasusutok 5 and Cutthroat Island 2. These sites are close chronologically, but geographically they are located approximately 124 km apart. The occurrence of this distinct style of endscraper on both of these sites is another reason why Cutthroat Island 2 has been interpreted here in relation to the C^{14} date of 5480 +/-110 rather than the earlier typological date given to it by Cox (1977).

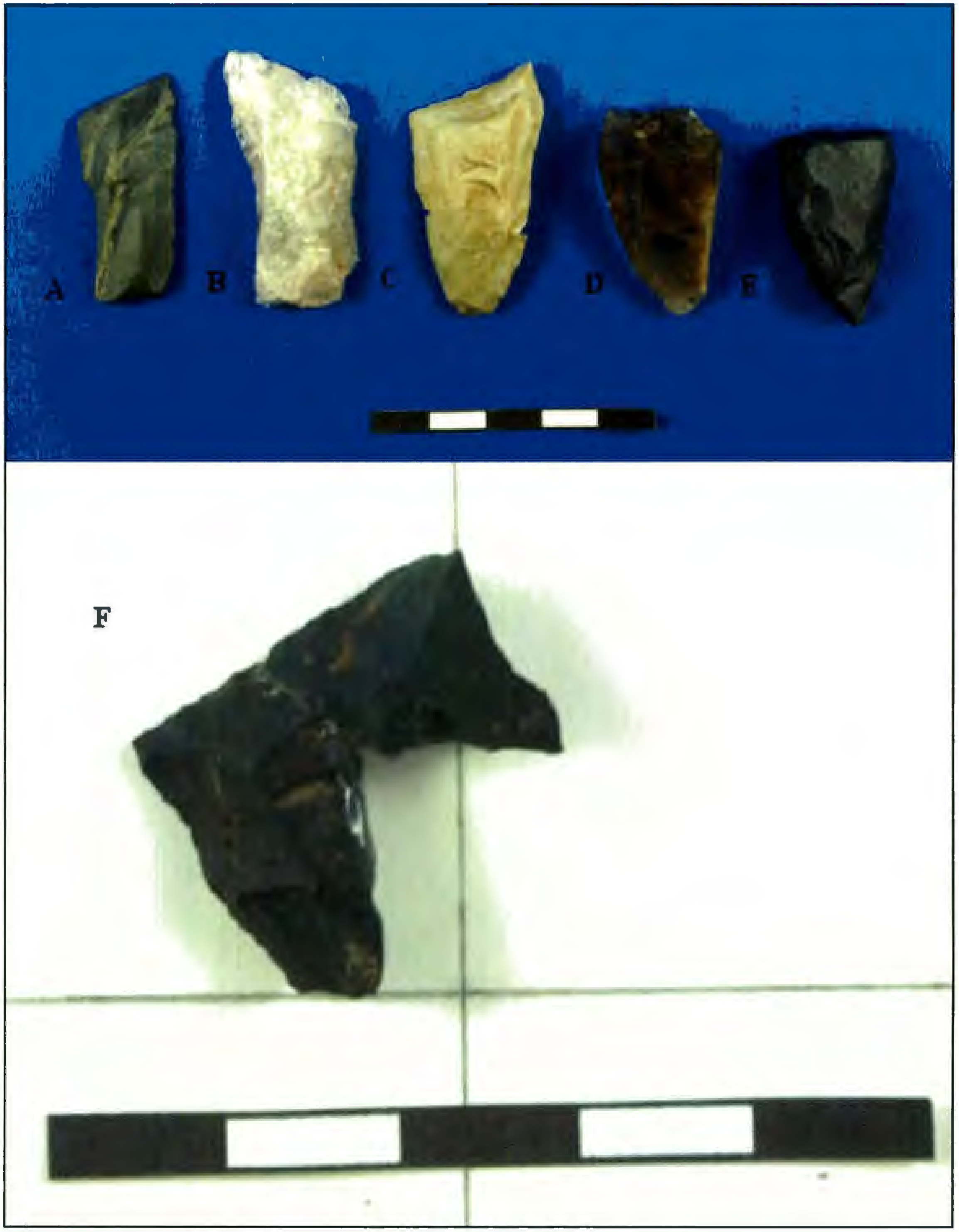

Figure 5.15 Variations in Endscraper Shape.

A (HcCh-7:543) and B (HeCi-11:53) are leaning rectangular endscrapers, C (HdCg-19:37) D (HdCg-7:67) and E (HiCj-5:258) are triangular, and F (HcCh-7:205) is square sided.

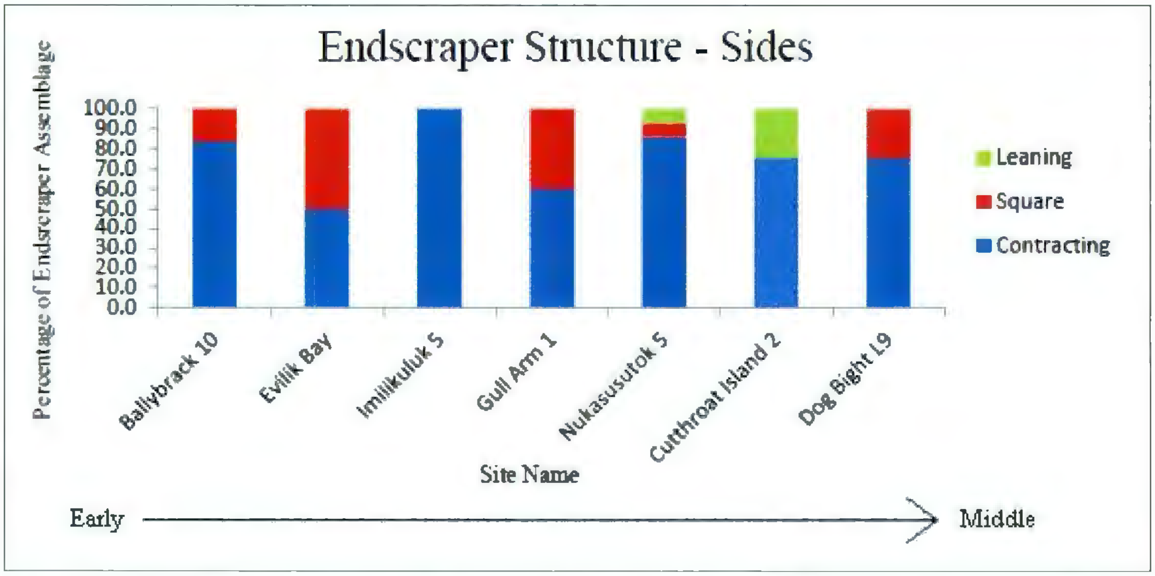

Figure 5.16 Percentages of Different Endscraper Shapes From Each Site.

The endscrapers in these collections have one more distinctive trait, and that is the shape of their distal ends. There are five different variations of this trait: endscraper distal ends are either straight, convex, concave, biconcave, or undulating (Figure 5.17). These variations do not appear to be patterned chronologically, though concave distal ends are more prevalent over all, followed by convex and straight distal ends. Due to the apparent lack of chronological significance, I attribute this variation to differences in the function of the endscraper. Though it is possible, and indeed likely, that endscraper form relates in part to artifact rejuvenation and resharpening (Dibble 1984;1987;1995; Dumont 1983:139; Jelinek 1976), a difference in function seems a more complete explanation for the differences in endscraper morphology in this instance.

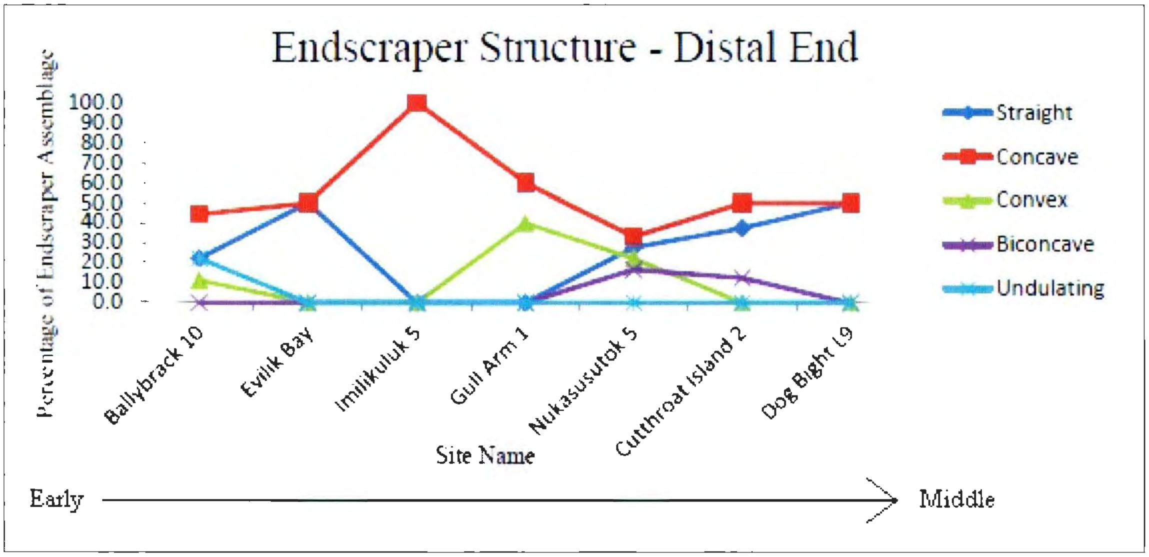

Figure 5.17 Inter-Site Variation in the Structure of the Distal End of Endscrapers.

It has been shown that function can account for differences in the shape of endscrapers on hunter-gatherer sites (Dumont 1983; Meltzer 1981), and this seems to be the case among the endscrapers from these seven Labrador Archaic sites. The straight, concave and biconcave endscraper types represented in these collections must be differentiated based on function from those with convex scraping edges simply because the different forms could not effectively work the same materials. Most notably the straight, concave, and biconcave endscrapers are unlikely to have been used to scrape hides as the sharp projecting corners would catch and tear the hide being worked, while convex scraping edges would be well suited to this task. Dumont (1983:132-139) demonstrates this with a sophisticated method of usewear and statistical analyses but a brief experiment using a spoon and then a fork to "scrape" a piece of paper (hide) will also show this to be true. Conversely, a convex distal end on an endscraper, while well suited to scraping hides, would make working harder materials like bone or antler more difficult as the point of contact between the endscraper and the scraped material would be very small (1983:139). The most likely scenario is that convex-ended endscrapers were used for hide working, and the straight- and concave-ended types were used to work other materials. The biconcave and undulating aberrations within the collections are more puzzling, though these could relate to further differences in function or they could be the result of personal expression or experimentation within the tool making process.

The final "endscraper" to be discussed is one which was found at Nukasusutok 5. This artifact is made of an opaque black chert which is found in small quantities on many Labrador Archaic sites in northern Labrador (Chapter 3.3). The reason this artifact (Figure 5.18) is being discussed individually is because its form is completely unique within the assembled collections. Hood listed this piece as a graver, though he mentioned that the distal edge has usewear consistent with scraping and that both "spurs" have usewear on them as well. Hood also posits that it is possible that this artifact was an effigy of some type (2008:168).

The form and multiple instances of usewear on this artifact suggest that it could have been a sort of archaic multi-tool, capable of functioning as an awl, a graver, and a scraper all at once. This artifact is unifacial, and the distal edge is concave which puts it into the same structural realm as many endscrapers from early Labrador Archaic sites. However presence of the pointed right hand spur and the flat ended left hand spur suggest that there was more intended in its creation than simply to be used as a scraper, and the fact that both spurs exhibit usewear supports this. Unfortunately this artifact is only a distal fragment, so any information about how or if it was hafted is missing, which makes its ultimate intention harder to determine.

Hood's other explanation (2008:168) that it could have been an effigy is equally interesting. Due to the fact that it is broken it is impossible to say if it was ever part of a larger, more elaborate piece or simply attached to a stem for hafting. However the piece which remains is evocative of a number of arctic and subarctic animals, including profile views of a small rack of caribou antlers, a wolf or fox looking upwards or howling, or even a stylized representation of a whale's fluke. That it is made from the opaque black chert which occurs in such small but consistent quantities on these sites (Chapter 4, section 4.2), also supports the idea that it had more significance than as a simple utilitarian artifact.

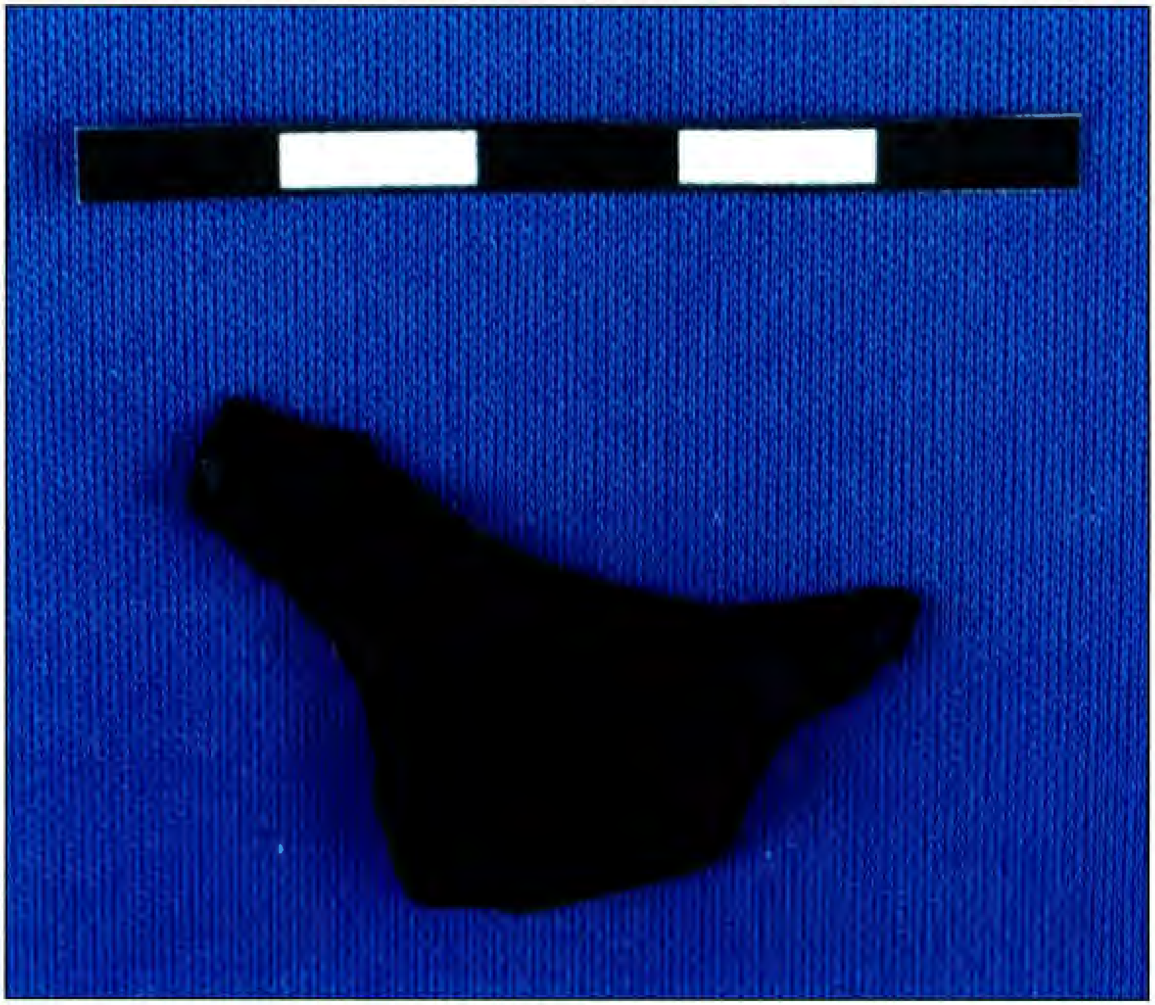

Figure 5.18 A "Scraper" from Nukasustok 5 (HcCh-07:210).

This artifact has a unique form and usewear which suggests it was designed to be used as a scraper as well as for other tasks.

This significance could be due to its multi-functionality; early and middle Labrador Archaic lithic strategies put emphasis on efficiency (Figures 5.5, 5.6, 5.7) and expediency (Chapter 5.2.1). Perhaps this artifact was indeed an effigy, but not in the traditional sense of directly depicting a physical item or entity. Maybe this was not simply a representation of an animal but rather an embodiment of the Labrador Archaic lithic ontology. Using a rare material to create a tool which can perform a number of different tasks would perfectly encapsulate and pay homage to the emphasis within Labrador Archaic lithic assemblages on conservation of material and the linking of artifact types through the expected and inevitable by-processes of use such as breakage and tool rejuvenation.

5.2.3 Projectile Points

The Labrador Archaic projectile point is easily the most recognizable artifact of the earliest occupation of northern Labrador, despite the relative scarcity of these artifacts within the archaeological collections from early to middle Labrador Archaic sites. Projectile points comprise only 3.7% of the total collections observed, and on average they represent 4.1% of each collection (3.6% from Ballybrack 10, 2.7% from Evilik Bay 5, 2.9% from Dog Island Southwest 1, 3.5% from Imilikuluk 5, 6.9% from Gull Arm 1, 2.6% from Nukasusutok 5, 2.8% from Cutthroat Island 2, and 7.9% from Dog Bight L9).

Changes within projectile point structure have been used to identify and trace cultural shifts between early, middle and late Labrador Archaic occupations. These have been relatively vague, concluding that early Labrador Archaic occupations were characterized by nipple based or triangular projectile points, and that over time the middle and late Labrador Archaic adopted a projectile point style with a more elongated stem and more pronounced shoulders (Hood 2008:175-176; Tuck 1976:51). My aim was to clarify this statement by providing a detailed metric analysis of projectile point shape, size, and structure.

When the basic dimensions (weight, length, width, thickness) of the projectile points in these collections were analyzed, the data was quite thin. This is because despite the fact that there are almost 80 projectile points from the eight sites assembled, only thirteen of them (including flake- and micro-points) were complete specimens. Because of the significant differences in size (but not necessarily in function) between bifacial projectile points and flake points (Figures 5.19 and 5.20) any comparison using measurements from both of these artifact types would be flawed, and additionally thirteen specimens is too small a data set to conduct a proper analysis. In order to create a larger data set and to obtain more accurate data about these projectile points, I elected to compare how the proportions of specific structures on a projectile point (e.g. length of the blade or the width of the shoulders) relate to each other. By selecting specimens which had at least the shoulders and one other structure present I was able to expand the number of useable specimens from thirteen to thirty.

Using the image analysis software TPSutil and TPSdig I measured the four structures discussed in Chapter 3 and by using the width at the shoulders as a base factor the measurements for each structure were reduced to ratios describing the proportions of the projectile point. These ratios are: blade length to shoulder width; stem width to shoulder width; and stem length to shoulder width. Once these ratios were established an average ratio for each structure on each site was determined, and these averages were placed on line graph which shows the variation in projectile point proportions over the roughly 1500 years of Labrador Archaic occupation covered by these sites (Figure 5.21).

Projectile point blades become longer in relation to the width of the point at the shoulders, and projectile point stems also get longer and narrower when compared to shoulder width, though at a slower rate of change than the blades. At the same time the shoulder width of projectile points gradually increases (Figure 5.22), resulting in more elongated projectile points with the prominent, defined shoulders and tapering stems which are characteristic of the middle and late Labrador Archaic (e.g. the projectile points in Figure 5.23 which come from the Rattler's Bight site near Groswater Bay in southern/central Labrador [Fitzhugh 1972:96]).

Figure 5.19 Flake Points and Micropoints. Top Row, From Left to Right: HcCh-7:24, 237; HdCg-19:35. Bottom Row, Left to Right: HcCh-7:126, 125, 23; HdCg-19:180.

Figure 5.20 Projectile points. From Left to Right: HdCg-19:95; HcCh-7:22, 100; HdCg-33:15; HiCj-5:212, HdCg-7:105.

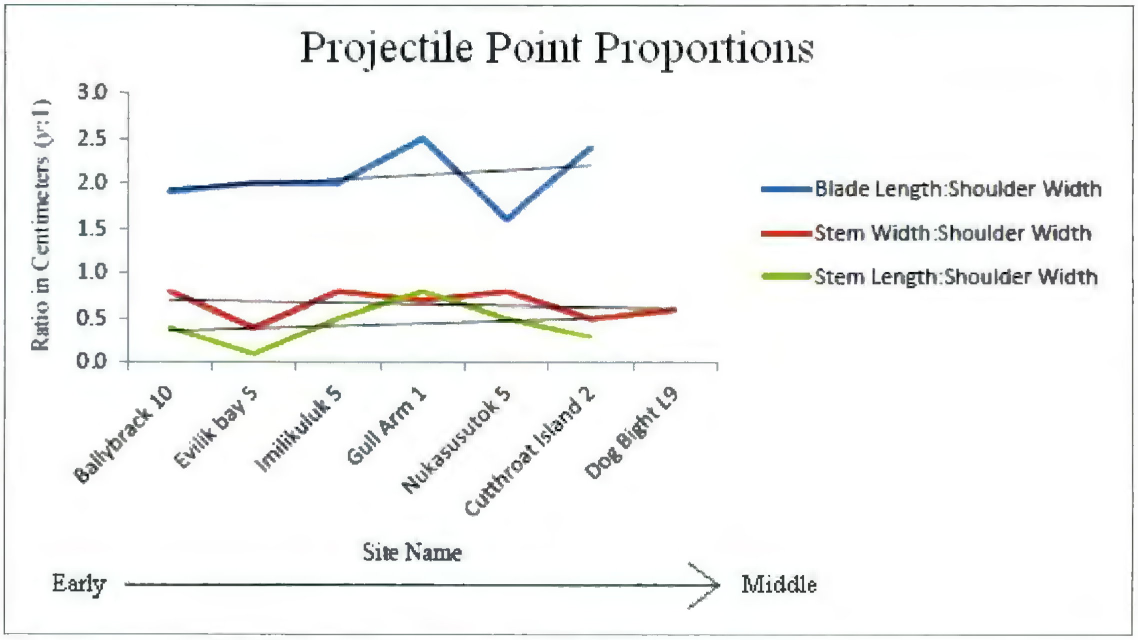

Figure 5.21 Projectile Point Proportions.

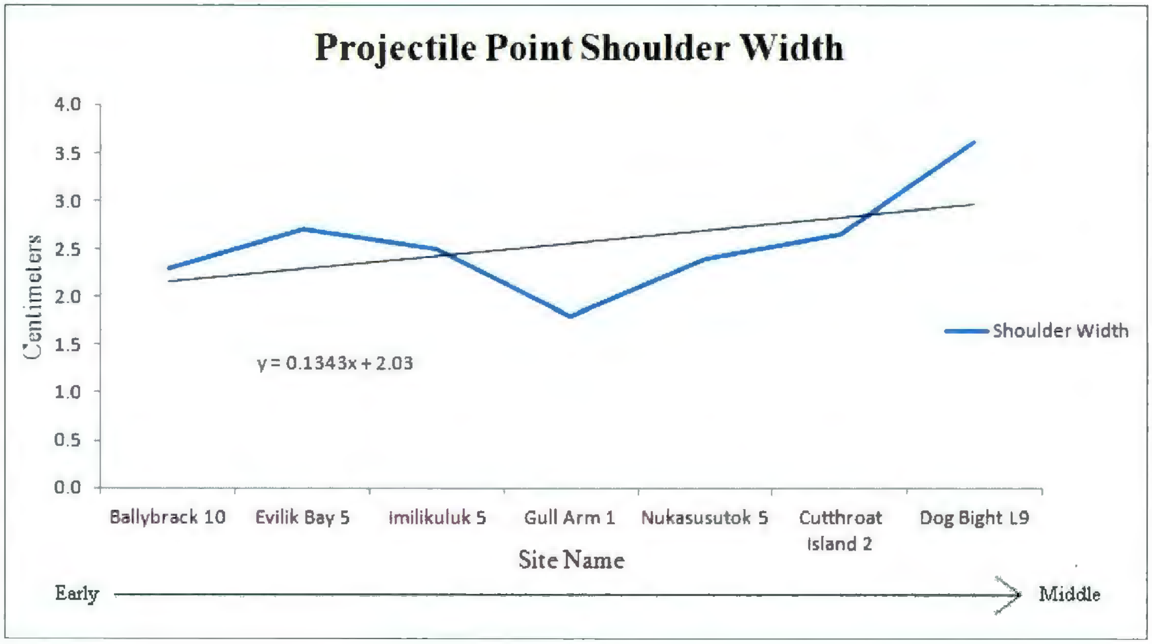

Figure 5.22 Distribution of projectile point shoulder width from Early Labrador Archaic sites.

Each data point represents the average projectile point shoulder width from that site. Gull Arm 1, Cutthroat Island 2, and Dog Bight L9 are exceptions to this as each of these sites was only represented by a single artifact.

Figure 5.23 Late Labrador Archaic Projectile Points from the Rattler's Bight Site (GcBi-7). Left to Right: GcBi7:4281&4232; 4038; 4129.

These changes occur in a roughly linear fashion, though none of the structure changes can be described as exactly linear. This is due in part to the small sample size and the fact that some sites contained a number of projectile points, while others contained only a single specimen. Compounding this there is the question of personal variation within the manufacturing process. According to Eerkens (2000:663,667) the range of "perfection" for the manual reproduction of an object from a mental template accounts for approximately 5% variation within assemblages which were produced by numerous individuals, and about 2-3% variation for assemblages produced by only a few skilled individuals. However the main reason for the variation within this continuum of change is that in all likelihood this change was not linear. There is a clear indication within the data that a gradual shift towards long bladed, broad shouldered, tapered stem projectile points was underway during the sixth millennium BP, but there is no conceivable way that this change occurred along a nice orderly course. Individual knappers with either conservative or progressive mind-sets would have heavily influenced the assemblage left at the site they had occupied. Furthermore, northern Labrador is a barren place today, and would have been even more so 5000-6000 years ago; a projectile point lost or left on the surface could have been found a year later or 500 years later, and once recycled back into the toolkit of the finder that point would have a significant impact on how archaeologists might interpret the site where it was abandoned. A good example of this occurs at Cutthroat Island 2. Much of the assemblage from this site aligns with the C^{14} date of c. 5400 BP (material frequencies and endscraper morphology for example), yet the projectile point from Cutthroat Island 2 has characteristics which suggest an earlier origin (Figure 5.20). The stem length to shoulder width and stem width to shoulder width ratios from this artifact are reminiscent of earlier projectile points, though the blade length to shoulder width ratio and shoulder width itself are consistent with the date of c. 5400 BP.

The data presented above confirms earlier qualitative statements regarding change within Labrador Archaic projectile point morphology. However it also shows that the changes in stem size/shape wewre secondary to the change in blade length and shoulder width. These two factors seem to have driven this change, resulting in a longer bladed projectile point which required a longer stem in order to be effectively hafted and used.

The information presented in Figures 5.21 and 5.22 is obviously imperfect due to the small number of projectile points available from the collections. However examining projectile points using proportional ratios rather than concrete length/width/thickness measurements allows broken and incomplete points to be examined alongside complete artifacts to increase the total number of specimens available to the researcher. It also arranges these artifacts chronologically according to a set of mathematical variables which can be obtained from all complete Labrador Archaic projectile points and from many incomplete points as well. Extending the range to include earlier and later sites in the Labrador Archaic continuum, or adding data into the current time span and thus ameliorating the quality of the current data will increase our understanding of how Labrador Archaic projectile points changed during the earliest colonization of Labrador.

Chapter 6 – Conclusions

6.1 Expediency

Expediency and conservation are themes which overlay much of early and middle Labrador Archaic lithic technologies. From how they chose their materials to how they chose to allocate those materials, Labrador Archaic knappers seemed to always keep half a mind towards making their tools as efficient as possible, and thus maintaining lithic supplies as long as possible. This includes everything from using local, low grade materials to produce many of their tools to using biface-cores which could function as tools as effectively as the flakes removed from them, and which could evolve into other tool types as they began to deplete. Of course these strategies stand to reason in a landscape where the sources of high quality lithic materials are rare and difficult to access.

6.1.1 Shape Similarities Within and Between Artifact Classes

One small method by which the early Labrador Archaic were able to streamline their lithic technologies was to use similar shapes while manufacturing different tool types. Learning to knap stone is a process which requires time, practice, and a lot of material. By repeating artifact shapes between artifact types the process of learning how to knap these tools would have been greatly shortened. In a situation where material was hard to come by and well-made stone tools were necessary for day to day life, any strategy that would shorten and steepen the stone knapping learning curve would be a great advantage to the population who employed it.

As Figure 6.1 shows, the degree of similarity which exists between certain artifact types within early Labrador Archaic assemblages is quite striking, even between sites.

Figure 6.1 Different Artifact Types Which Showcase Similarities in Shape or Manufacture Technique. From Left to Right: an Endscraper (HcCh-7:768), a Pièce Ésquillée (HcCh-7:542), and a Projectile Point Base (HdCg-7:71)

Granted, there are significant differences between these artifacts, like unifacial versus bifacial knapping, as well as their function, but in plan-view they are quite similar. This likeness would be very useful in learning how to produce these artifacts, as similar knapping techniques would have been employed to create each artifact. For example, the distal end of the endscraper and the proximal end of the projectile point are both biconcave in shape, with distinct shoulders and a protruding central point. Despite the fact that the projectile point is bifacial and the endscraper is unifacial, techniques like how to hold these pieces while pressure flaking them to get the final shape, or how to create the proper shoulder-to-lateral-edge angle would have been translatable between the two.

6.1.2 Biface Cores, Pièces Ésquillées, and Informal Flake Tools

Biface-cores are often used by mobile hunter gatherer populations, especially in areas like northern Labrador where raw material sources are scarce, widely separated, or inaccessible during certain parts of the year. Using this form of core decreases the amount of excess material carried from a quarry locale as the material is in a usable form before being transported from the source. This also allows for the discovery of any flaws in the stone like cracks, faults, or crystal deposits which can then be removed or the core can be discarded in favor of a superior piece of stone. It should be noted that at Ramah Bay there are an estimated twenty to forty million large pieces of discarded worked stone carpeting the quarry site (Gramly 1978:40), indicative that this sort of core exploration and material high-grading occurred on a large scale over millennia. Using bifaces as cores also increases the use-value of that piece of material. A biface-core is a functional cutting implement as well as a source of useable flakes (also functional cutting/scraping implements), and can ultimately be reduced and turned into any number of bifacial tool forms.

Pièces ésquillées are another invaluable addition to the toolkit of the Labrador Archaic. These small, battered nodules of stone allowed Labrador Archaic knappers to extract every possible useable flake out of a core of a piece of stone (Shott 1999:220). They were frequently made from quartz, indicating that they played an important role in the reduction of that material. This is not surprising as the vein and cobble quartz which the early Labrador Archaic used was not, for the most part, a high quality knappable stone. Prolonging the supply of lithic materials by increasing their usability by volume would have been very useful in a region like northern Labrador (Andrefsky 1998:152-153).

Closely tied to the use of pièces ésquillées is the use of informal flake tools on early Labrador Archaic sites. Utilized flakes, retouched flakes, and utilized/retouched flakes are the most common artifacts recovered from these sites. A lithic strategy dependent on expedient tools like these would have required a large supply of available flakes to operate smoothly. The early Labrador Archaic used pièces ésquillées as well as locally abundant materials to supplement their supply of imported lithic materials like Ramah and Mugford cherts and produce enough flakes to meet this demand. Because expedient tools like these were used so frequently there was less use-related attrition to other, more material-costly artifacts like projectile points and various types of bifaces. This allowed these types of artifacts to be manufactured less frequently, thus conserving stockpiles of lithic material.

6.1.3 Material Choices

Materials were assessed according to their mechanical properties, and then used for the task or artifact which was most appropriate for what that material could do. Ramah chert was transported a great distance and used mostly for the more material-intensive artifacts like projectile points and large bifaces due to its occurrence in large unflawed pieces and the ease with which Ramah chert can be knapped. Mugford cherts were used to manufacture endscrapers, the thin, unifacial artifacts well suited to be made from a material which occurs unflawed only in thin cobbles seldom larger than 10 cm across (Lazenby 1980:634). And quartz was used for everything. From quickly utilized flakes to endscrapers, projectile points, bifaces, and even hammerstones, the early and middle Labrador Archaic took full advantage of the abundance and widespread distribution of this material.

The generalized and generous use of quartz by the early and middle Labrador Archaic was at least partially a result of the lower quality of that material. Internal planes of cleavage, inconsistent crystal size, as well as quartz's generally truculent nature were all elements which the Labrador Archaic had to contend with, and they did this in part by using a large volume of quartz to manufacture their tools; this can be seen in the preponderance of quartz debitage on every site in this study. By making a lot of debitage and completely reducing cores through techniques like bipolar percussion, they could pick and use the good flakes and discard the rest without needing to worry about wasting material, as quartz occurs so readily along Labrador's northern coast.

In contrast to this Ramah chert and Mugford cherts had much more prescribed usages. Possibly due to the distance between the sites in this study and the source areas for these materials, Ramah and Mugford cherts were mostly used to produce specific artifact classes. Mugford chert accounts for the majority of endscrapers and scrapers from these sites, and was also used to manufacture bifaces, though less frequently. In keeping with tradition, useable flakes were recycled either to be used expediently as flake tools, or to be modified into more formal flake tool categories.

Ramah chert was used mostly for bifacial, labor/material costly artifacts or for expedient tools like utilized flakes. Ramah chert accounts for almost 70% of the bifaces from these sites, but less than 5% of the cores. As it also accounts for about half of both the expedient and formal flake tool categories, it seems likely that the bifaces were being used as cores, and flakes struck off them put into use as flake tools. Ramah chert was also used in the manufacture of projectile points, almost to the exclusion of all other materials. That Ramah was used both for difficult bifacial tools as well as for quick flake tools reflects both its material properties as well as the distance to its source area. Ramah chert flakes exceptionally well, and naturally occurs in large cobbles and boulders suitable for producing bifaces. Because it knaps so well, long thin flakes could be removed from the bifaces and used as tools in their own right. This use pattern maximized the amount of useable tool edge available from each piece of stone, conserving it until more could be supplied or procured.

The obvious preference for Ramah chert projectile points is somewhat more mysterious. It could be because the form of a projectile point can be so easily derived from a depleted or depleting biface, or because Ramah chert works so well for bifacial reduction and could be found in whatever size piece was desired. It could also be for cultural or ritual reasons. Maybe, as Loring (2002:184), suggested it had to do with the presence of ferrous inclusions in the rock, mimicking the blood spilled during the act of hunting or signifying the life sustained by that same act. Perhaps it was due to the unique sugary appearance of Ramah chert, which Tuck so aptly described as resembling a windshield covered in sleet (1976:52), since these projectile points were likely used at least in part to harvest sea mammals from the equally icy Labrador Sea. These motivations are often lost by the time archaeologists are examining the material for clues about the people who left it behind, yet perhaps in this case they were written in stone.

6.1.4 Risk Assessment and Risk Reduction

I believe that all the attention the early and middle Labrador Archaic put towards streamlining their lithic technologies and reducing the waste of materials might be explained in terms of risk management. Lithic technologies constituted the base of Labrador Archaic technological livelihood; certainly organic materials like wood, ivory, bone and antler were used by these people (Tuck & McGee 1976:80); however, these materials would have been hard to work and even harder to acquire without the stone tools to do so. Because the sources of both of the high quality lithic types represented in these collections (Ramah and Mugford Cherts) are so distant from the sites themselves exhausting the supply of one or the other could have made life very difficult for the populations inhabiting these sites. Travelling the northern coast of Labrador can be difficult in any season (Chapter 2, Section 2.3; Chapter 5), so stocks would have had to last until the next chance to resupply. Renouf (1999:411) argued that managing risk is integral to the hunter-gatherer lifestyle using the example of food resource management among the Maritime Archaic in Newfoundland. The methods they used to prolong their food supplies work equally well in the context of Labrador Archaic lithic strategies, specifically targeting surpluses and preserving stocks of material.

Figure 6.2 helps to illustrate how the pairing of artifact types with appropriate materials can mitigate the risks taken not only by the knapper but by the entire community. Using Ramah chert to produce projectile points from cores on site would have been a high risk activity and the consequences should the production fail could be quite severe as the source for Ramah chert is so distant. However, by using Ramah chert to produce biface cores at the source area the inherent risk is lowered as there is less chance of inferior material being transported back to camp as unexplored blocks of stone. This being said, the consequences would still have been severe if the material supply were depleted before a resupply trip could be organized, or an additional stock of material secured either by trading for more of the same material or by locating and retrieving a substitute material. By using these biface cores to produce usable flakes rather than simply reducing them with the end product of a projectile point in mind the severity of the consequences are lowered should failure occur as the broken biface can continue to be used to produce usable flakes until it has been reduced completely, likely via bipolar percussion and the production and reduction of a pièce ésquillée.

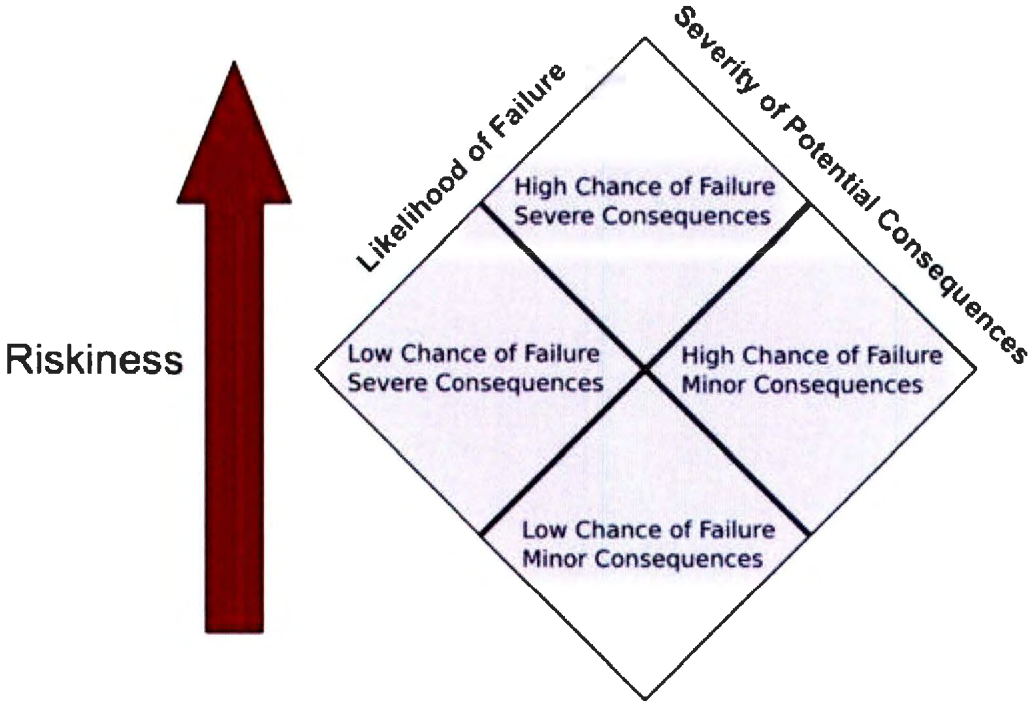

Figure 6.2 Diagram Showing Different Levels of Risk vs Consequence During the Knapping Process (Waber & MacLean 2011).

Similarly the choice to use Mugford cherts to produce mainly scraping tools rather than large bifacial tools like projectile points or biface cores is a risk reduction strategy. Choosing a small, thin artifact type to produce from this material increases the chance of successfully producing the desired tool. The willingness to use the resulting flakes as expedient tools reduces the consequences should the knapper not be able to make a suitable scraper or endscraper as useable tools were still produced from the original core, and the failed artifact could be recycled into a pièce ésquillée to produce more usable debitage.

Using quartz to manufacture stone tools always carries a high risk of failure due simply to the nature of the stone. However the abundance of this material on the northern coast of Labrador ensures that the consequences of that failure remain relatively slim. And by knapping large quantities of this material the chance of failure is reduced as well, making quartz tool production a low risk, small consequence activity.

Risk reduction is something that we as humans do every day of our lives either as conscious decisions or as unconscious acts. From ensuring there is enough gas in the car to arrive at one's destination to ensuring one's paycheck lasts until the next one arrives we reduce the risks inherent in our current lifestyle and minimize the consequences posed by those risks. Constant effort to diminish the amount and severity of the risks we take is ingrained into how we think and behave, and this is no different today than it was fifty-five hundred years ago on the northern coast of Labrador. Depleting stocks of lithic material ahead of schedule would have been a risk which carried severe consequences for the Labrador Archaic. Using a system like the one described above to mitigate the risks involved in stone tool production allowed Labrador Archaic groups to prolong lithic supplies gathered from distant sources, and to thrive and prosper in their environment and in their world.

6.2 Contending With Climate, 6500-5000 BP

Perhaps one reason that efficiency and risk management were such big parts of early and middle Labrador Archaic lithic technology was the climate of northern Labrador at the time. Summer temperatures were slightly higher than they are today, and at the beginning of this period precipitation levels were slightly higher as well. These factors, combined with considerable regional climatic variability, would have meant that long the type of long distance travel needed to access the chert sources at Cape Mugford and Ramah Bay would have been season specific (Chapter 2, Section 2.3). Warm wet summers would have made overland routes boggy and would have caused unpredictable coastal weather. Long cold winters would have created travel routes for those able to travel by foot or by sledge along frozen waterways and over sea ice, but could also have made chert sources difficult to access either due to icy and dangerous approaches or deep snow/frozen ground covering the source locals. Though early and middle Labrador Archaic groups were doubtless able to travel the Labrador coast with a high degree of skill, their survival would have still depended on using that skill to chose the best times to make trips along the coast or into the interior. By structuring their lithic technologies around efficiency and risk mitigation, they avoided unnecessary travel to procure material, and the risks associated with that travel.

6.2 The Last Word

Intense archaeological studies of early and middle Labrador Archaic populations in northern Labrador have been ongoing since at least the early 20th century. During this time outstanding research has been completed allowing archaeologists to peer backwards in time and see how these first inhabitants lived and interacted with their environment, their own culture, and with other newly arrived populations. The lithic assemblages left behind by these people have been instrumental in aiding these studies, especially since organic materials are so rarely preserved in such early archaeological contexts in

Labrador. Hopefully this quantitative look at multiple lithic collections has helped to solidify current knowledge about how the early and middle Labrador Archaic made and used their tools, and their strategies for doing so during the period of c. 6500-5000 BP.

Drawing together well dated assemblages from sites which were intensively excavated and investigated shows how material use changed during this period (Figures 5.1 and 5.3). Through exploring the apparent cultural values placed on each material and the material preferences for different artifact forms, possible reasons for these preferences emerged. These were then weighed against the available data relating to changing material frequencies, the available lithic materials, the mechanical properties of each lithic type and the environment through which early and middle Labrador Archaic groups had to travel to acquire each material.

To complete the picture metric data from the artifacts within these assemblages was examined to see how the forms of different artifact types changed between 6500 and 5000 BP. Using both traditional methods as well as new digital approaches the artifacts were analyzed and the information from this analysis was combined with the material data to help paint a picture of the strategies, goals and values which made up the lithic technology of the early to middle Labrador Archaic. What emerged was an image of a people who invested both thought and significance into their tool technology, and their methods of reducing the risks involved in stone tool manufacture, allowing them to survive in a demanding landscape like northern Labrador.

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Appendix A

The artifacts in the following tables were absent from the collections at the time that the analysis was performed. The information that is here was obtained from the artifact catalogues at The Rooms Provincial Museum, St. John's, Newfoundland.

Cutthroat Island 2 (HiCj-5)

Borden Number	Catalogue Number	Artifact Type	Material
HiCj-5	61	Unknown	Unknown
HiCj-5	154	Preform	Chert

Ballybrack 10 (HeCi-11)

Borden Number	Catalogue Number	Artifact type	Material
HeCi-11	49	Utilized flake	Chert
HeCi-11	254	Flake Scraper/Knife	Quartz

Imilikuluk 5 (HdCg-33)

Borden Number	Catalogue Number	Artifact Type	Material
HdCg-33	8	Pièce Ésquillée	Quartz
HdCg-33	10	Unknown	Quartz
HdCg-33	11	Utilized Flake	Quartz

HdCg-33	12	Unknown	Quartz
HdCg-33	13	Unknown	Quartz
HdCg-33	28	Flake Scraper/Knife	Quartz
HdCg-33	29	Utilized Flake	Quartz
HdCg-33	30	Utilized Flake	Quartz
HdCg-33	40	Biface (Preform)	Quartz
HdCg-33	46	Utilized Flake	Red Quartzite
HdCg-33	47	Utilized Flake	Quartz
HdCg-33	54	Utilized Flake	Quartz
HdCg-33	58	Flake Scraper/Knife	Quartz
HdCg-33	59	Utilized Flake	Quartzite
HdCg-33	60	Utilized Flake	Quartz
HdCg-33	64	Utilized Flake	Quartz
HdCg-33	66	Flake Scraper/Knife	Quartz
HdCg-33	68	Utilized Flake	Quartz
HdCg-33	73	Utilized Flake	Quartz
HdCg-33	74	Utilized Flake	Quartz
HdCg-33	75	Utilized Flake	Quartz
HdCg-33	76	Utilized Flake	Quartz
HdCg-33	77	Utilized Flake	Quartz
HdCg-33	78	Utilized Flake	Quartz

HdCg-33	79	Utilized Flake	Quartz
HdCg-33	80	Utilized Flake	Quartz
HdCg-33	84	Utilized Flake	Quartz
HdCg-33	85	Utilized Flake	Quartz
HdCg-33	87	Utilized Flake	Quartz
HdCg-33	88	Utilized Flake	Quartz
HdCg-33	89	Utilized Flake	Quartz
HdCg-33	90	Utilized Flake	Quartz
HdCg-33	92	Biface	Quartz
HdCg-33	94	Utilized Flake	Quartz
HdCg-33	95	Core	Quartz
HdCg-33	97	Utilized Flake	Quartz
HdCg-33	99	Utilized Flake	Quartz
HdCg-33	102	Utilized Flake	Quartz
HdCg-33	103	Utilized Flake	Quartz
HdCg-33	105	Utilized Flake	Quartz
HdCg-33	106	Core	Quartz
HdCg-33	107	Flake Scraper/Knife	Quartz
HdCg-33	109	Core	Quartz
HdCg-33	113	Flake Scraper/Knife	Quartz

Nukasusutok 5 (HcCh-7)

Borden Number	Catalogue Number	Artifact Type	Material
HcCh-7	19	Stemmed Projectile Point	Ramah Chert
HcCh-7	20	Stemmed Projectile Point	Ramah Chert
HcCh-7	21	Stemmed Projectile Point	Ramah Chert
HcCh-7	121	Adze	Slate
HcCh-7	134	Celt	Slate
HcCh-7	135	Biface	Quartz
HcCh-7	187	Ground Flake	Slate
HcCh-7	200	Preform	Unknown
HcCh-7	244	Flake	Chert
HcCh-7	314	Flake	Ramah Chert
HcCh-7	325	Ground Flake	Slate
HcCh-7	373	Biface	Ramah Chert
HcCh-7	415	Pièce Ésquillée	Quartz
HcCh-7	431	Unknown	Unknown
HcCh-7	442	Unknown	Unknown
HcCh-7	450	Unknown	Unknown

HcCh-7	459	Ground Flake	Slate
HcCh-7	512	Hematite Fragments	Hematite
HcCh-7	520	Slate Fragment	Slate
HcCh-7	530	Flake	Ramah Chert
HcCh-7	540	Unidentified	Sandstone?
HcCh-7	547	Sandstone Sample	Sandstone
HcCh-7	548	Sandstone Sample	Sandstone
HcCh-7	556	Pièce Ésquillée	Quartz
HcCh-7	557	Unknown	Unknown
HcCh-7	566	Projectile Point?	Ramah Chert
HcCh-7	569	Unknown	Unknown
HcCh-7	575	Pièce Ésquillée	Quartz
HcCh-7	1001	Ground Flake	Slate

Dog Bight L9 (HdCh-9)

Borden Number	Catalogue Number	Artifact Type	Material
HdCh-9	2	Utilized Flake	Slate
HdCh-9	68	"Other"	"Other"

Evilik Bay 5 (HdCg-7)

Borden Number	Catalogue Number	Artifact Type	Material
HdCg-7	103	Celt	Slate

Gull Arm 1 (HdCg-19)

Borden Number	Catalogue Number	Artifact Type	Material
HdCg-19	33	Unknown	Unknown
HdCg-19	73	Utilized Flake	Ramah Chert
HdCg-19	97	Core	Quartz
HdCg-19	136	Utilized Flake	Quartz
HdCg-19	146	Lanceolate Biface	Ramah Chert
HdCg-19	195	Ground Flake	Slate
HdCg-19	196	Utilized Flake	Ramah Chert
HdCg-19	223	Utilized Flake	Quartzite
HdCg-19	232	Pièce Ésquillée	Quartz
HdCg-19	269	Scraper	Quartz

Appendix B

The metric data presented here are the average dimensions of each type of artifact within the assembled collections. These averages were made using the dimensions from complete artifacts. They are not measurements for each individual artifact.

*Cores are considered to be all complete or incomplete as they are reductive artifacts

** Edge fragments within the Ground Fragments category are any which are not obviously proximal, medial, or distal. Because this artifact class is entirely artifact fragments, complete pieces do not occur within this category.

***Based on a 75% sample of the complete pieces

	# of Artifacts	% Complete	% Proximal	% Medial	% Distal	% Edge Fragment	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)
Adzes	6	83.33	0	0	16.66	0	70.48	33.45	12.29	34.76
Bifaces	211	11.85	21.33	22.75	18.01	25.12	59.36	30.05	10.79	22.62
Blanks Preforms	9	66.66	0	22.22	11.11	0	89.48	48.68	12.1	72.45
Celts	22	45.45	4.55	18.18	22.73	9.09	61.98	34.25	11	58.81
Cores	201	100*	0	0	0	0	NA	NA	NA	119.32
Core Tools	11	90.91	0	0	0	9.09	NA	NA	NA	NA
End-scrapers	46	58.7	2.17	0	30.43	8.7	34.29	21.87	7.83	9.25
Expedi-ent Flake Tools	972	NA	NA	NA	NA	NA	NA	NA	NA	NA
Re-touched flakes	288	24.66	24.31	19.1	14.93	17.01	31.83	23.54	8.28	9.66
Utilized Flakes	500	30.2	27.2	18.8	19.8	4	32.73	24.64	7.54	12.19
Re-touched utilized flakes	182	28.57	18.68	18.68	17.03	17.03	31.81	24.12	8.35	17.43
Formal flake Tools	54	NA	NA	NA	NA	NA	NA	NA	NA	NA
Flake Knives	8	75	12.5	0	12.5	0	44.73	25.42	7.08	9.58
Flake points	21	38.1	19.05	4.76	33.33	4.76	35.05	20.18	3.79	24.1
Flake Scrapers	12	25	33.33	0	0	41.67	48.3	38.75	19.92	33.73
Flake scrapers knives	6	0	33.33	33.33	16.67	16.67	NA	NA	NA	NA
Flaked pebble	1	100	0	0	0	0	NA	NA	NA	4
Stemmed flakes	4	50	25	25	0	0	24.45	18.45	3.98	1.8
Notched flakes	2	0	50	50	0	0	NA	NA	NA	NA

Ground Flakes	62	58.06	8.06	9.68	6.45	17.74	NA	NA	NA	1.36
Ground Frag-ments **	86	0	4.65	11.63	5.82	81.4	NA	NA	NA	NA
Hammer-stones	10	30	0	0	0	70	NA	NA	NA	176.47
Micro-blades	13	38.46	46.15	0	15.38	0	32.03	8.44	2.07	0.88%
Pieces Esq-uillees	241	63.49	9.13	13.69	6.64	7.05	32.8***	25.54***	12.4***	18.24
Pigments	32	NA	NA	NA	NA	NA	NA	NA	NA	7.69
Projectile Points	78	8.97	41.03	19.23	30.77	0	64	26.29	7.73	13.86
Scrapers	27	25.93	0	22.22	25.93	25.93	31.19	25.96	9.98	10.63
Semi-Lunar Knives	13	30.77	7.69	7.69	30.77	23.08	54.09	32.16	7.84	22.13
Tablets	10	60	0	0	0	40	91.13	46.33	11.89	201.25
Other Artifacts	22	NA	NA	NA	NA	NA	NA	NA	NA	NA
Whet-stones	4	25	25	25	25	0	84.5	38	22.95	119.5
Awls	2	0	0	0	100	0	NA	NA	NA	NA
Chisels	2	0	50	0	50	0	NA	NA	NA	NA
Un-identified knapped and ground tool	1	100	0	0	0	0	52.5	29	5.3	10.1
Pebbles	4	100	0	0	0	0	NA	NA	NA	44.3
Mica frag-ments	4	0	0	0	0	100	NA	NA	NA	0.9
Micro-points	3	33.33	0	0	66.67	0	20.7	13.95	2.4	0.6

Appendix C

Borden Number	Catalogue Number	Digital Measurement (cm)	Caliper Measurement (cm)
HcCh-07	136	3.33	3.28
HcCh-07	125	5.27	5.22
HcCh-07	152	3.01	2.96
HcCh-07	24	2.06	2.03
HcCh-07	198	4.21	4.17
HcCh-07	982	4.92	4.85
HcCh-07	546	4.84	4.69
HcCh-07	23	4.27	4.34
HcCh-07	22	7.32	7.25
HcCh-07	100	7.44	7.36
HcCh-07	126	4.35	4.3
HdCg-07	105	5.13	5.07
HdCg-19	95	6.14	6.1
HdCg-33	108	5.32	5.26
HdCg-33	15	7.44	7.34
HdCh-09	75	4.54	4.5
HeCi-11	198	4.39	4.3
HeCi-11	167	3.43	3.37
HeCi-11	147	3.76	3.7
HeCi-11	126	1.76	1.68
HeCi-11	no cat	3.43	3.37
HeCi-11	104	2.03	1.96
HeCi-11	166	5.2	5.15
HiCj-05	212	7.26	7.17
HdCg-07	123	7.45	7.38
HdCg-07	470	6.79	6.83

Appendix D

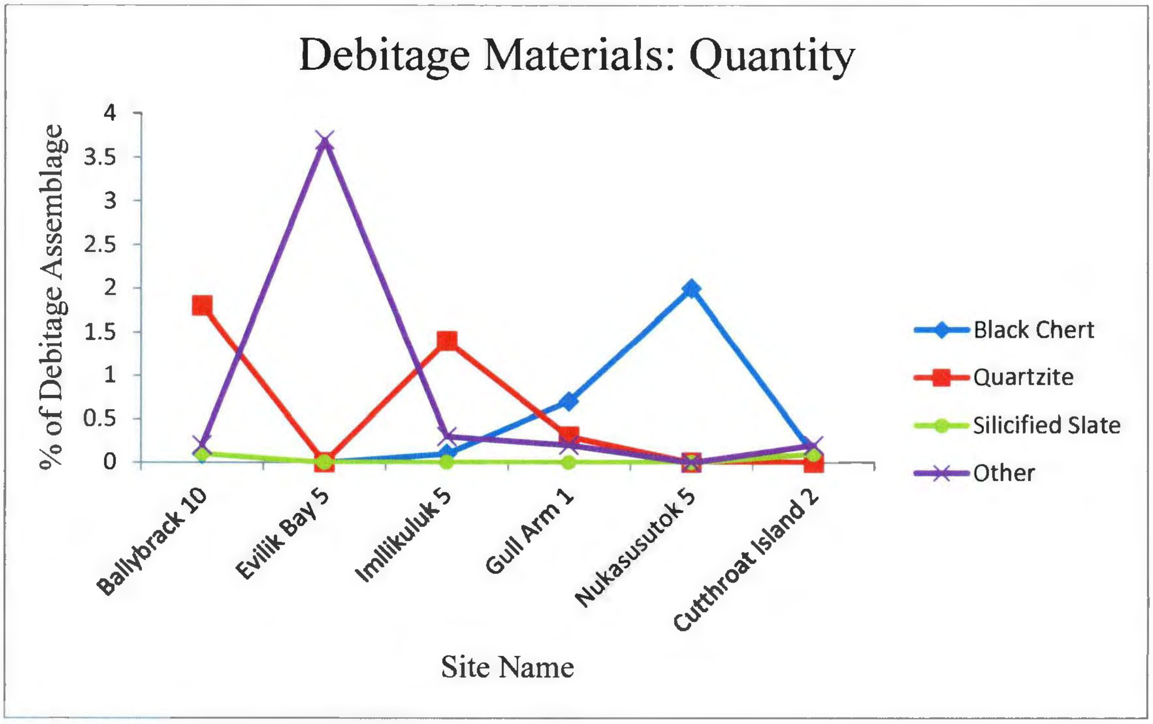
Borden Number	Site Name	Catalogue Number
HcCh-7	Nukasusutok 5	22
HcCh-7	Nukasusutok 5	23
HcCh-7	Nukasusutok 5	24
HcCh-7	Nukasusutok 5	100
HcCh-7	Nukasusutok 5	123
HcCh-7	Nukasusutok 5	125
HcCh-7	Nukasusutok 5	126
HcCh-7	Nukasusutok 5	136
HcCh-7	Nukasusutok 5	152
HcCh-7	Nukasusutok 5	198
HcCh-7	Nukasusutok 5	470
HcCh-7	Nukasusutok 5	546
HcCh-7	Nukasusutok 5	982
HdCg-19	Gull Arm 1	95
HdCg-33	Imilikuluk 5	14
HdCg-33	Imilikuluk 5	15
HdCg-33	Imilikuluk 5	38
HdCg-33	Imilikuluk 5	168
HdCg-7	Evilik Bay 5	105
HdCh-9	Dog Bight L9	38
HdCh-9	Dog Bight L9	75
HeCi-11	Ballybrack 10	104
HeCi-11	Ballybrack 10	126
HeCi-11	Ballybrack 10	147
HeCi-11	Ballybrack 10	149
HeCi-11	Ballybrack 10	167
HeCi-11	Ballybrack 10	198
HeCi-11	Ballybrack 10	No catalogue number
HiCj-5	Cutthroat Island 2	89

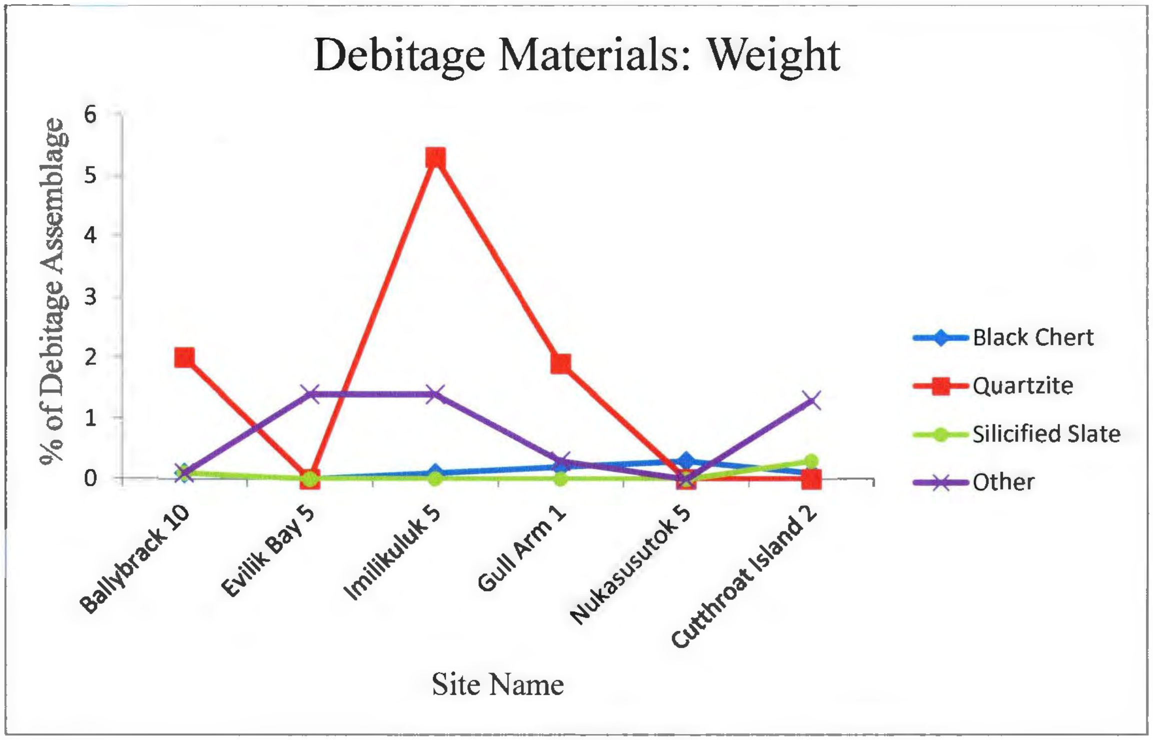
HiCj-5	Cutthroat Island 2	168

Appendix E

The following graphs show the frequencies of those materials which were excluded from Figures 5.1 and 5.3 in Chapter.

The debitage assemblage from Dog Island Southwest 1 is not included as it only contains a single piece of Mugford chert. The debitage assemblage from Dog Bight L9 does not contain any of the materials listed here and thus is not included either. None of the debitage assemblages contain pigment minerals, so hematite and limonite are not present on these graphs.





The artifact assemblage from Dog Island Southwest 1 is absent from the following graph as it does not include any of the materials listed.