The Precontact Village at St. Croix (BfDa-1), Nova Scotia: Explorations of Site Size and Stratigraphic Integrity

BY

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Abstract

The St. Croix site in Hants County, Nova Scotia, offers archaeologists a glimpse into life among Native communities during the Woodland Period. Within the modern community of St. Croix, a small clearing in an undisturbed forested area was excavated in 1990 and 1993 and found to be rich in cultural material dating to the full breadth of the Woodland Period. Field work in 2012 expanded on earlier work by extending the excavation to the end of the undisturbed forested area and into the larger St. Croix community. Areas affected by modern activities such as plowing were tested to determine the quality of the archaeological record after decades of domestic cultivation.

Analyses of recovered ceramics, lithic artifacts and palaeoethnobotanical remains are comparable to previous work, revealing a site utilized throughout the Woodland Period. Currently known boundaries of the site within the undisturbed forest area are extended approximately 60m north and areas once thought irrevocably destroyed are now archaeologically viable with the discovery of a thin undisturbed occupation layer. St. Croix continues to represent a place of great archaeological wealth and represents one of the most important Woodland Period sites in the province.

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Chapter 1: Introduction

This thesis discusses the subsurface testing undertaken at the St. Croix village site, a Mi'kmaq village in St. Croix, Nova Scotia, during the summer field season of 2012. Subsurface testing was carried out in July 2012 as an addendum to previous work begun by Michael Deal of the Memorial University of Newfoundland. As part of his work with the Minas Basin Project, an archaeological survey and assessment of sites in and around Nova Scotia's Minas Basin, Deal conducted two field schools at St. Croix in 1990 and 1993. The excavations conducted in 2012 as a part of this research sought to address a number of concerns unanswered from this previous work, seeking to examine the width and breadth of the site as well as provide an assessment of the quality of the archaeological record in areas where sediments have been heavily impacted by historical and modern activities such as construction and domestic cultivation. Through the expansion of excavations from the central area of previous investigation north along the banks of the St. Croix River and east into the areas of modern disturbance, an in-depth look at the quality of the archaeological record and the dimensions of the St. Croix site is provided.

The site at St. Croix (BfDa-1) was selected for further investigations for a number of reasons. Investigations during 1990 and 1993 focused exclusively on a small clearing in an area undisturbed by modern activities (Figure 1.1) which generated a large volume of information but only for that specific area. This allowed archaeologists to answer many of the initial questions about the site concerning quality of the soil strata in that

Figure 1.1: An aerial view of the St. Croix community. The clearing where the 1990 and 1993 field schools took place is highlighted in yellow. (Source: Google Earth)

area, the age of the site and the cultural communities that contributed to the formation of the archaeological record. The field schools revealed the site to be rich in cultural heritage materials and very much intact within an undisturbed forested area of the community. Additionally, through a combination of radiocarbon dating and thermoluminescence dating (Godfrey-Smith, *et al.* 1997), St. Croix is one of the best dated sites in Nova Scotia. These dates and the use of pottery attribute analysis in conjunction with Petersen and Sanger's (1991) aboriginal ceramic sequence for Maine and the Maritime Provinces have revealed that this village was used extensively throughout the Woodland Period (ca. 2500-500 BP).

This research addresses a number of questions that the initial excavations, which were focused on a single location, were unable to answer. For example, test pitting conducted during previous excavations at the site suggested that St. Croix is a large site, extending over 560m (Deal 1989:1) from north to south and approximately 140m east to

west. However, no formal excavations have taken place outside of the area excavated during the 1990 and 1993 field schools. Excavations during the 2012 field season sought to address this gap by answering the question 'what are the physical boundaries of the St. Croix site?' In addition to this research direction, much of the broad, flat land east of the St. Croix riverbank is taken up by the modern community and has been disturbed through destructive actions such as construction and domestic cultivation. In designing this research project, excavations also sought to look at the archaeological integrity of the St. Croix site by asking 'What is the quality of the archaeological record in these yet unexplored areas of the St. Croix community?'.

Previous research also opened up two auxiliary points of inquiry. John Erskine initially discovered the St. Croix site during his investigation of the origins of Clarence Burton's collection of First Nations lithic artifacts. Within that collection are several Archaic Period pieces which have led to the supposition that there is a Late Archaic Period element to the St. Croix site. My research, conducted during the 2012 field season, sought to recover further evidence of this component through sub-surface testing.

After John Erskine's initial excavations at the St. Croix site, the site received no academic attention until the late 1980s. During the 1989 survey of the Minas Basin Archaeological Project, a project looking at subsistence strategies and resource exploitation in the Minas Basin area, the St. Croix site was rediscovered and a cellar depression inferred to be Acadian in origin was located on an adjacent property. Although not the primary focus of the 2012 excavations, further archaeological evidence of an Acadian element in the St.Croix community was of keen interest and became a secondary objective.

The following chapter takes a brief look at the geography of the site, the history of Nova Scotia's aboriginal communities and the archaeological sites which have informed that body of knowledge, establishing the cultural background within which the St. Croix site and its artifacts may be more fully understood. The history of St. Croix as an object of archaeological inquiry is covered in Chapter 3. Chapter 4 discusses the theoretical lens through which the findings of the 2012 excavations are interpreted. Chapter 5 includes a look at the methodologies which with research was undertaken. Chapter 6 gives a synopsis of the activities undertaken in the field at St. Croix in 2012 with a unit by unit breakdown of the newly excavated areas. Chapter 7 follows with an in-depth analysis of the artifacts recovered during the excavation, including lithics, ceramics and historical material. Ecofacts, pedological analysis and palaeoethnobotanical analysis follow in Chapter 8. The integration of these analyses is discussed in Chapter 9 with a unit by unit interpretation of the site and the broader research implications of the 2012 excavations are fully discussed.

Chapter 2: Geographic and Cultural Context

2.1 Geography

The St. Croix Village site is located in Hants County, Nova Scotia in the modern rural community of St. Croix along the St. Croix River. Research has been focused on the property of D. Wasowski and N. Geres at 25 Dawson Lane, although previous research and the 2012 field season included excavations on adjacent properties. The area of interest runs approximately 600m north to south from the modern highway bridge on Route 1 (Figure 2.1), located on the southeastern bank of the St. Croix River, and extends approximately 50 to 100m east to west running parallel with the river. A dirt road parallel with the river also runs through the site connecting six properties to Route 1 (Figure 2.1).

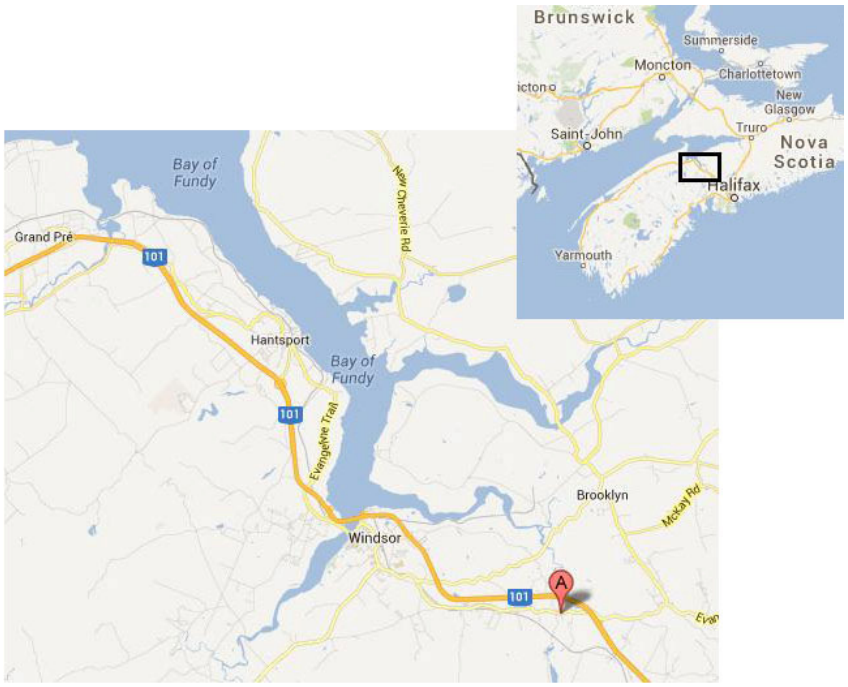

Figure 2.1: Map depicting the Minas Basin area of Nova Scotia. St. Croix is indicated by the letter "A" in the lower right corner. Source (Google Maps).

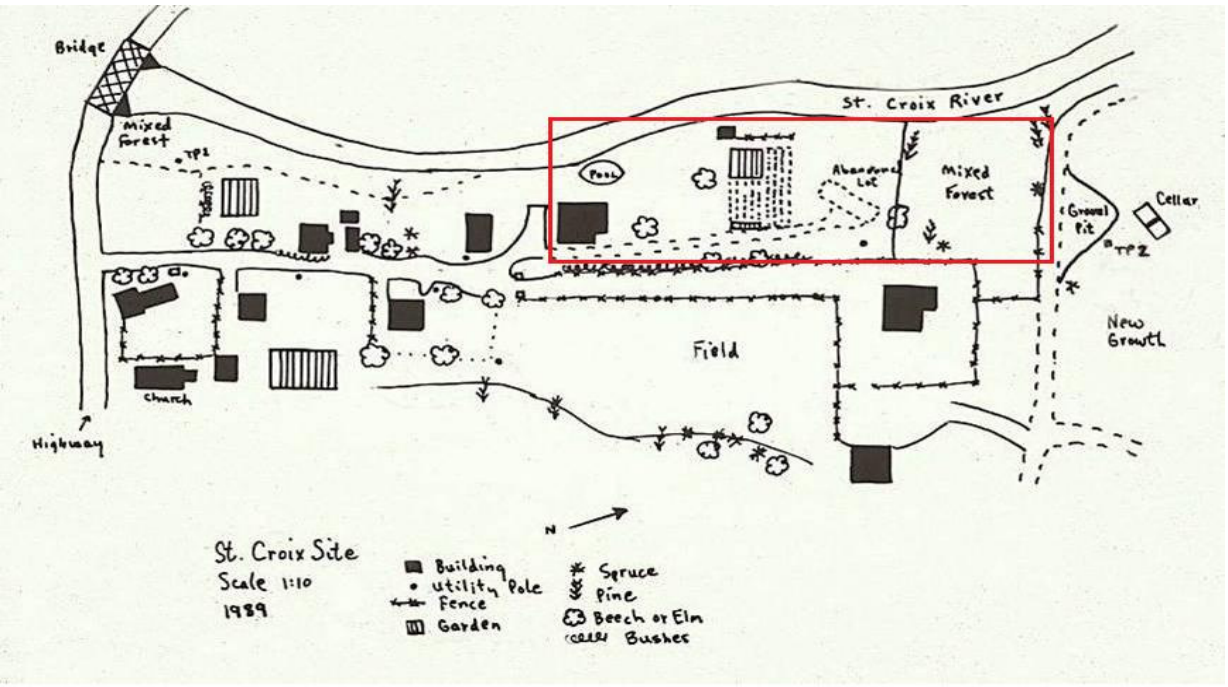

Figure 2.2: A hand-drawn depiction of the St. Croix community. The Wasowski/Geres property is highlighted in red. Dawson Lane runs through the center of the community. (Source: Image courtesy of Michael Deal)

The areas of the site unaffected by modern disturbance are found in a pocket of mixed forest stretching 80m from the northernmost edge of the Wasowski/Geres property. During precontact times, this area would have been at the head of the tide allowing for excellent fishing opportunities for salmon and gaspereau, both of which would have been common in the area. Since the construction of two dams in the 1930s, the water levels of the St. Croix River have declined and diverted fish runs to a small brook north of the site (Deal, 1991). The lower water levels give the site the appearance of being on a raised terrace whereas it may have at one time been just above the water level of the river. The dam's flooding has also increased water levels in the Panhook (or Panuke) Lakes, potentially flooding other sites (Deal, 1994). The St. Croix River is part of an across-province portage route from the Minas Basin through the Avon and St. Croix rivers into

the Panhook Lakes and through to the St. Margaret's Bay/Mahone Bay area on the South Shore. Linking the Minas Basin to the Atlantic Ocean, this portage route was very important to aboriginal groups and later European settlers (Dawson 1988:135). St. Croix's access to fish and its placement along this vital route would have made it a desirable place to camp.

2.2 Cultural Context

This chapter discusses the cultural context within which the evidence from the 2012 excavations will be viewed. Current theories about subsistence models and lifeways are paired with a comparative collection of sites and past research throughout the province of Nova Scotia in order to provide a fuller understanding of the world in which the native groups who occupied the St.Croix village site lived. The St. Croix site is primarily a Woodland Period site (ca. 2500-500 BP) and the emphasis of the following discussion and choice of comparative sites reflects this. There is, however, an Archaic Period element found in relation to the site, so a brief summation of the aboriginal occupation of Nova Scotia from the first footfalls of humans in the province to the beginning of the Woodland Period is provided for context.

2.2.1 Human Occupation in Nova Scotia Prior to the Woodland Period

Nova Scotia has a long and varied history of human occupation. The earliest known site in the province, at more than 10,000 years old, is found in Debert, Colchester County. Isolated finds from Cape Blomidon, Amherst Shore and the Gaspereau River further add to our knowledge of the breadth of Paleo-Indian occupation (Bonnichesen, *et*

al. 1993:6-7). The Paleo-Indian period in Nova Scotia, approximately 11,500 to 9,000 BP, came after the retreat of glaciers which once covered the province and saw the arrival of aboriginal groups who utilized fluted projectile points (Bonnichesen *et al*. 1993:5). Subsistence models are difficult to construct due to lack of preservation but circumstantial evidence suggests that caribou hunting played a part in the lifeways of Palaeo-Indians in Nova Scotia. The exploitation of avaian species, other terrestrial mammals and marine resources such as fish and seal is also suggested (Bonnichesen, et al. 1993:20-21). The end or further development of this culture in Nova Scotia beyond the Palaeo-Indian period is not well understood as a result of a lack of sites (Bonnichesen, *et al.* 1993:23; Tuck, 1993:29). It has been hypothesized that Palaeo-Indian groups may have been direct ancestors to those people living in the province during the Archaic period (Tuck, 1993:33).

Very little is known about life during the Early and Middle Archaic, again due to the lack of documented sites. It has been suggested that the absence of sites may be attributed to a preference for marine exploitation and coastal occupation, and that rising sea levels have simply eroded the sites away (Tuck, 1993:32). The discovery of artifacts from this time period dredged up by fishermen from significant depths lends further credence to this theory (Tuck, 1993:34). Changes in the forest ecology of the area may have also made Nova Scotia simply unsuitable to the lifestyle of Palaeo-Indian groups, prompting a decrease in population or exodus (Tuck, 1993:35). Whatever the reason for the decrease in populations during the Early and Middle Archaic Periods, the Late Archaic saw an influx of aboriginal cultures and improved quality of site preservation.

The Maritime Archaic tradition, a coastally adapted aboriginal culture group associated with sites along the Atlantic and Gulf coasts of the Maritimes may have been the descendents of the proposed aboriginal groups whose sites were eroded by rising sea levels during the Late Archaic. Seal, walrus, sturgeon and swordfish were both economically and culturally important (Deal, et al 2006). Slate bayonets are a common grave good in the red ochre burials which help to define this tradition.

The Laurentian tradition is a cultural group found in Maine with comparable evidence in the Maritimes. The culture is thought to have originated around the Great Lakes, later colonizing the St. Lawrence area. With sites found exclusively within the interior, a subsistence strategy of interior hunting of terrestrial mammals and anadromous fish exploitation has been inferred (Deal, 2013; Tuck, 1993:50).

About 4000 years ago, the Maritime Archaic and Laurentian traditions disappear from the archaeological record and are replaced by a migration of people from south of New England referred to as the Susquehanna tradition (Tuck, 1993:52). Susquehanna sites are noted to feature broad-bladed projectile points and cremation burials. Subsistence was varied, with large terrestrial mammals and fish supplemented by shellfish, seals and birds exploited through residential mobility (Tuck, 1993:54).

2.2.2 Meadowood Cultural Traditions and the Early Woodland Period

After the end of the Archaic Period, the Maritime Provinces see the introduction of a distinct cultural tradition whose roots appear to stem from the Great Lakes area. This group is known as the Meadowood complex. The recovery of Meadowood material culture ties ten sites in the Maritimes to the Great Lakes area where the cultural tradition is believed to have originated. McEachen in his 1996 MA thesis on the Meadowood

culture in the Maritimes makes an elaborate argument for the migration not only of Meadowood traditions but also of people. Meadowood artifacts have no stylistic predecessors in the Maritimes but do in the Great Lakes region of Ontario, where their development is part of a natural stylistic progression and they are found in great concentrations. The Meadowood sites from Ontario and the Maritimes are all relatively contemporaneous and coincide with the extension of closed temperate hardwood-hemlock forest biomes east from central Canada to the Maritime Provinces which would allow for an easy transition of peoples and subsistence strategies (McEachen 1996:94-97). Seven habitation sites and three burial sites throughout the Maritimes feature Meadowood materials. The artifact assemblages from these sites often include fabric paddled, Vinette-style pottery, side notched, square based projectile points, and ground stone artifacts such as gorgets, birdstones and pecked and polished celts. Copper artifacts such as awls are not uncommon in both habitation and burial sites. Burials and cache blades from these sites are infused with deposits of red ochre, a ceremonial component of the Meadowood culture along with purposefully broken grave goods. Burials are found close to habitation sites, a practice which Karine Taché (2011) believes relates to socio-political factors where burials were used by elites to legitimize monopolization of particular resource centers for trade and surplus production purposes.

St. Croix features a Meadowood component, with Vinette style pottery and a side notched point similar to Meadowood points found around the province. The point is made of an exotic material, most likely Mistassini quartzite from Quebec, a type of material found at other Meadowood sites such as the Cox-Swanson site (McEachen, 1996:60). Similarly, a site along the Medway River drainage, BaDd-4, contained a large

assemblage of Meadowood artifacts, with several examples of what could be knapped stone tools of Onondaga chert from Ontario. The collection of prestige items like exotic tools and copper may be interconnected with Tache's (2011) purposed socio-political model for Meadowood society.

2.2.3. The Middlesex Cultural Tradition in the Woodland Period (c. 2800-2200 B.P.)

The Middlesex cultural tradition is marked by an infusion of elements from the mortuary rituals of the Ohio Valley Adena culture and the existing Meadowood culture in the Maritime Provinces. It is seen as a diffusion of ideas rather than a migration of peoples (Deal, 2013). Middlesex sites have been found along the St. Lawrence River drainage and in south central Nova Scotia and Eastern New Brunswick.

Differences between the material cultures in the Ohio Valley Adena cultures and the Middlesex cultures can be found in burial assemblages (Rutherford 1990). Whereas Adena projectile points are lobate in their base shape, Middlesex projectile points often have flat or square bases. Adzes found in Middlesex burials are chipped and ground, whereas Adena adzes are pecked and polished. Gorgets found in Adena burials are reel shaped but when the traditions reached the northeast, they became angular in shape. Moreover, the inclusion of pottery in Middlesex burials is at variance with Adena burial traditions. On the other hand, some inclusions in Middlesex burials are distinctly Adena, such as items exported from the Ohio Valley/Great Lakes area. These include copper beads from Ontario and blocked end tubular pipes and large bifaces from Ohio.

The most impressive evidence for the Middlesex cultural tradition in the Maritime Provinces comes from the Augustine mound site along the Miramichi River in New Brunswick. Aside from the diagnostic goods associated with Middlesex sites found in the

11 graves at the Augustine mound such as chipped and ground stone adze blades, square stemmed projectile points and closed end tubular pipes, copper salts leeched from copper beads allowed for extensive organic preservation. Basketry, cedar bark woven mats, woven thongs for beadwork and a broken spear shaft are among the many organic artifacts preserved (Deal, 2013).

Evidence for Middlesex burial practices in Nova Scotia is limited. There are two known burial sites just outside of the Halifax-Dartmouth area. The Esson Mound was a Middlesex burial mound destroyed by construction activities in the 19th century (Deal, 2013). The Skora site near White's Lake features a ceremonial burial mound radiocarbon dated to 2200^{14}C years BP (Davis 1993). One burial contained a cache of seven square stemmed blades and three chipped and ground stone adzes. A second burial from the mound contained flakes and calcined human bone. Artifacts recovered around the Minas Basin have stemmed from singular finds, mostly now in personal collections. Along Gaspereau Lake in 1965, George MacDonald found an Adena-style point. The Minas Basin Archaeology Project noted several chipped and ground stone adze blades in collections during their surveys in 1988 and 1989. No evidence for a Middlesex component was found at St. Croix.

2.2.4 Middle and Late Woodland Periods

The cultural distinctions between the Middle and Later Woodland periods (ca.2150-500 BP) are primarily constructed to allow archaeologists to better discuss stylistic developments and trends rather than to signify distinct cultural traditions. Indeed, it is generally agreed upon by Maritime archaeologists that the 1500 years before contact

with Europeans was a culturally cohesive sequence marked by minor changes in tool morphology and decoration (Deal, 2011a:14). The Mi'kmaq culture groups of this period are believed to have developed from the Archaic culture that inhabited the area or are the descendents of migratory populations from the Middlesex and Meadowood cultures (Deal 2011:14).

However unbroken the cultural sequence of the Middle and Late Woodland periods, they are culturally distinct from the Early Woodland (ca. 3050-2150 BP) for a number of reasons. Gone are the elaborate burial practices of the Middlesex and Meadowood cultural groups, replaced by simple burials without much in terms of grave goods (Deal 2013). In terms of material culture, there are new kinds of decorative artifacts including incised pebbles found at Holt's Point in New Brunswick (Deal 2013) and a number of examples of petroglyphs have been found across Nova Scotia, both featuring complex geometric designs. New decorative techniques are also found on Middle and Late Woodland period ceramics such as dentate stamping and cord wrapped stick and pseudoscallop shell impressions (Deal 2013).

Lithic morphology also begins to change in the Middle/Late Woodland periods from Early Woodland period artifacts. Early Middle Woodland period sites offer examples of a contracting stem style point, termed 'Tusket' points by John Erskine (1998:88). The style appears to originate on Prince Edward Island (Buchannan 2004). However, corner notched and side notched points become the dominant forms in the late Middle and Late Woodland Periods, decreasing in size as the use of bow and arrow became more common (Nassaney and Pyle, 1999: 244-245). Lithic resource exploitation is focused mainly on local sources, particularly quarries around North Mountain in Nova

Scotia's Southwest. Heavily utilized quarries are located at Scots Bay, White Rock, Ingonish Island, Munsungun Lake, and Washademoak Lake (Deal, 2013).

Changes in technology also alter tool prevalence in assemblages in other ways. A decrease in groundstone tools and an increase in unifacial scraping tools appears to indicate a switch from the use of dug-out canoes to birch bark canoes. The need for finer woodworking tools led to a marked decrease in celts and other groundstone woodworking implements during the Woodland periods (Deal, 2013).

An alternative breakdown of the Woodland Period focuses on changes in ceramic technology. Petersen and Sanger (1991) created a model for ceramic development in the Maritimes, subdividing the three periods of the Woodland Period into seven Ceramic Periods based on changes in ceramic decoration and manufacture. Ceramic Period 1 (ca. 3050-2150 BP) is noted for its grit tempered, undecorated, fabric paddled pottery similar in form to the Vinette pottery from the Great Lakes area. Ceramic Period 2 (ca 2150-1650 BP) is noted mostly for its undulating pseudoscallop shell patterns and thinner walled, grit tempered vessels. Ceramic Period 3 (ca. 1650-1350 BP) sees the walls of vessels thicken and the domination of dentate stamping decoration, which was evident during Ceramic Period 2 but came to prominence in Ceramic Period 3. It is during Ceramic Period 4 (ca. 1350-950 BP) and Ceramic Period 5 (ca 950-650 BP) that cord-wrapped stick decoration and punctates become the leading decorative style with dentate and fabric paddling making some appearances. Ceramic Period 6 (ca. 650-400 BP) features the slow decline of cord-wrapped stick and the return of fabric paddling to prominence. During Ceramic Periods 5 and 6, shell and organic material is used more commonly than grit to temper vessels but this disappears in Ceramic Period 7 (ca. 400-200 BP) when

fabric paddled, grit tempered vessels become the norm before ceramic manufacturing fades away completely. Refinements to this model have been made for its specific application to Nova Scotia and are discussed below.

2.2.5 Settlement and Subsistence during the Woodland Period

Subsistence strategies during the Early Woodland Period appear to be mostly interior-based, although it is worth mentioning again that there could be a possible submerged component due to rising sea-levels after the most recent glaciations. Sites are mostly riverine and lacustrine. Sites along the Mersey River in Nova Scotia, appropriately dubbed the Eel Weir sites, feature numerous V-shaped weirs which would have been used to collect anadromous fish and catadromous eels during the spring and fall (McEachen, 1996:81-82). Evidence for the hunting of terrestrial mammals have been found at many sites, including beaver remains in what have been interpreted as a dog burial at Mud Lake Stream (Deal, 1986). The exploitation of marine mammal resources is verified in at least one instance on Partridge Island, although the regular utilization of marine resources is contentious in terms of its role in the seasonal round of the Meadowood subsistence strategy (McEachen, 1996:84). As the nature of most Meadowood sites in the Maritimes seems to center around resource exploitation, which has many archaeologists pondering the placement and existence of base camps. This is a common concern across the American Northeast and Great Lakes for archaeologists working on the Early Woodland period. Adequate research on the subject has yet to be completed (McEachen 1996:83).

Housing during the Woodland periods varied from season to season. Summer homes would have been wigwams, tents made with poles covered in birch bark and skins

(Whitehead 1983:35). Archaeologically speaking, wigwams are difficult to detect as they simply sat upon the ground's surface and did not create easily identifiable markings in the archaeological record. Soil staining and hearth features are the most common ways of identifying summer house features during this time period. Winter houses were more substantial. Oval shaped semi-subterranean houses approximately 10-60cm below the ground's surface were used during the colder months. Although these too were most likely covered with birch bark, they were most likely insulated with mosses and furs (Deal, 2013). Evidence for winter dwellings has been found in Maine and the Passamaquoddy Bay area of New Brunswick. A possible semisubterranean house was found at Rafter Lake in Nova Scotia, although natural deterioration by water erosion makes it difficult to confirm (Davis 1986:119). Artifacts suggest the house is most likely Meadowood (Deal, 2013).

Diets during the Middle and Late Woodland period were as varied as the landscape of the province, with a seasonal focus on terrestrial, avian and aquatic animals and a broad variety of floral resources. Although there is evidence for agriculture in Maine during this time period, no such evidence has been found in Nova Scotia or the rest of the Maritime Provinces. However, the abundance of plum trees and charred plum pits at native sites in New Brunswick and plum seeds found in a leather pouch from a protohistorical burial in Northport, Nova Scotia point towards the possibility of native arboriculture (Deal, 2008).

It should be noted that limited research has been done on floral resource exploitation and that macrobotanical analysis really only began in the Maritimes during the 1980s. There is still much to learn about aboriginal botanical resource use. Of the

research that has been done, cherry and plum pits and seeds of an indeterminate *Rubus* species, most likely blackberry or raspberry, are the most common marcobotanical remains. Charred seeds from other edible forest fruits such as strawberries, blueberries, and elderberries have been found on sites around the Maritime Provinces, as well as remains of edible plants such as violet, sarsaparilla and bulrush (Deal, 2008). Evidence for the consumption of nuts has been found at Middle and Late Woodland period sites, particularly butternut, hazelnut, beechnut, and acorns. Butter nut is also known to grow naturally in New Brunswick, making the discovery of charred butternuts at the Port Joli site in Nova Scotia evidence for regional trade and distribution of botanical resources (Deal, et al 2011).

Faunal resources were very important to native groups during this time as they provided not only food but also hides, furs, sinews and bones with which many of their everyday items were made. Faunal remains recovered from New Brunswick during this time come from a variety of fur bearing and non-furbearing mammals including moose, beaver, caribou, white-tailed deer, black bear, porcupine, river otter, muskrat, hare, marten, dog, fisher and the now extinct sea mink (Deal, 2013). Marine mammals include a variety of seal species, including the grey seal, hooded seal and harbour seal, harbour porpoises, sperm whales, and the Atlantic walrus in certain areas in northeastern New Brunswick and Prince Edward Island.

Native groups also exploited marine resources at this time. Fish species whose remains have been found at archaeological sites from this time include Atlantic cod, Atlantic sturgeon, herring, haddock, longhorn sculpin, monkfish, harbor pollock, flounder and hake. The presence of camp sites and weir sites along rivers also suggest that

anadromous species such as salmon and gaspereau and catadromous species such as eels were an important food resource.

Shellfish also became increasingly important as a food source during the Middle and Late Woodland periods. Although they were originally thought to be a starvation food, Atlantic oyster, urchins, mussels and several species of clams were an easily exploitable resource harvestable by all members of a band. In the Bay of Fundy area, soft shell clams were the most commonly utilized. This is evidenced by the large quantities of their shells which make up many coastal midden deposits in the Bay of Fundy area. These middens are very important archaeologically because the shells change the chemical composition of the soil allowing for greater preservation of organic material, creating more complete archaeological assemblages.

Avian resources were also exploited. Waterfowl, both coastal and from the interior were hunted around the Maritime Provinces. Migratory birds were also part of the Mi'kmaq diet, including loons, wading birds, ducks, gannets, Canada geese, double-crested cormorants, both great and razorbill auks and the thick-billed murre (Erskine 1966:114). The bones of migratory birds found on sites also help archaeologists determine patterns of seasonality.

Settlement and subsistence models for the Maritimes are broad and varied so I will focus on Nova Scotia. For southwestern Nova Scotian Ronald Nash put forth a 'central place' model based on work he was conducting at Melanson [(1991) (See 2.3.2 Woodland Sites – Melanson)]. Nash considered Melanson a central place, with a favorable environment connected to ten microenvironments, both marine and terrestrial. From these microenvironments, food and material resources could be readily accessed as

the seasons permitted. Travel further afield could also be accomplished through a number of connecting rivers and lakes which run out from the Gaspereau River system.

Davis put forth a contiguous subsistence model for aboriginal groups in the Maritime Provinces during the Middle and Late Woodland periods based on seasonal resource exploitation (1986:195). From April through to September, aboriginal groups would have had access to a wide variety of food sources from multiple species of anadromous fish and migratory birds. These resources may not necessarily be found in the same places, so the division of labour into task groups would allow for multiple resources to be exploited simultaneously. One group would stay at a base camp area around the coast while others would make temporary camps inland along rivers and lakes to better take advantage of the fish runs. A long-term coastal camp site would then act as a base camp while sites in other biomes would act as specialized resource camps for the purposes of exploiting a particular resource during a particular time (Davis 1986: 206). As the majority of sites thought to be long-term are found on the coast, the decision to make camp at a particular place would then be determined by the distance to avenues of exploitation, mainly rivers and lakes which could be navigated by canoe to four exploitable habitats labeled by Davis: forest, inshore marine, intertidal zone and riverine/lakes (Davis 1991:99-100).

Many subsistence and settlement models suffer from a focus on a small, particular study area. Broader subsistence and settlement models take into account divisions in the maritime region based on resource availability, traditional tribal divisions and coastal areas, especially the Atlantic coast, the Bay of Fundy and the Gulf of St. Lawrence. Many resources are readily available across the region, but certain areas favour particular

resources or lack some resources and have an abundance of others. Items like butternuts only grow naturally in New Brunswick, and usable lithic sources like those at Scot's Bay may have been traded throughout the Maritime Provinces through exchange routes. Connecting river systems and portage routes would have made such a trade network possible. In any case, seasonal exploitation of resources and trade networks were used extensively by aboriginal groups during the Woodland period in the Maritimes.

2.2.6 St. Croix in the Historic Period

With the founding of the first permanent European settlement in Nova Scotia in 1605, the lives of the Mi'kmaq living in the province would be forever intertwined with the new settlers. Just as the Mi'kmaq had determined before them, the area around St.Croix was deemed a desirable area for Acadian settlers. Large, flat plateaus of arable land along the St. Croix River allowed Acadian settlers to grow crops inland and still be able to access their larger communities at Grand Pre and further afield at Port Royal through connections with the Avon River and the larger Minas Basin (e.g., Fowler 2013). Although the history of the area immediately surrounding the St. Croix site is not known, an Acadian cellar of indeterminate age is present on an adjacent property suggesting a French presence on the site.

In *Ste. Croix Village and Ste. Croix Churches* (1997), Maribelle Smiley talks about a number of Acadian cottages at the head of the St. Croix dyke lands. The village is purported to have had a small chapel and its own grist mill. Common local lore says that during the expulsion of the Acadians, many Acadians took shelter with the Mi'kmaq along the St. Croix. Some families sheltered with the Mi'kmaq in this area while others

made their way through the Ponhook portage routes down to Nova Scotia's south shore (Smiley 1997:3).

A large Acadian farm village known as 'Les Cinq Maisons' or the Five Houses was also located on the St. Croix and was most likely founded by the Hébert family (Hicks 2012:21). The Hébert family had a long-standing presence on the river with census data linking the family to the river as early as 1701 (Hicks 2012:25). When British rule overcame Acadia, the Five Houses were transferred to British military interests. Colonel Joseph Scott, bequeathed the land by his elder George Scott, rented the village and surrounding lands to British planters (Hicks 2012:26). The area was renamed Georgefield and British planter families, Dills and Smiths, took up the land with the Dills eventually purchasing much of the area around 1811. The Dill family still resides in the St. Croix area (Hicks 2012:28-31).

Historically, European habitation of the St. Croix area is referenced in an account of a skirmish between the British and Mi'kmaq. In A.D. 1750, while marching from Fort Sackville to begin the construction of Fort Edward near modern day Windsor, Captain John Gorham and his men were attacked by Mi'kmaq and possibly some Acadians just south of the St. Croix site near Battle Hill. Gorham and his men were overwhelmed and took refuge in a sawmill and two houses, sending for reinforcements from Fort Sackville who turned the tide in favour of the British (Grenier 2008:154-55; Hicks 2012:15-16; Smiley 1997:3).

St. Croix continues to be occupied today. A small community of homes sits on the flat, raised terrace of St. Croix, an area valued as it was in historic and precontact times for its easy access to the Southern Shore and the business districts of the Halifax

Regional Municipality, and to the beauty and bounty of the Annapolis Valley and Minas Basin. The history of the site makes itself known in the domestic gardens of the residents, where artifacts from its long occupation surface through regular plowing and erosion. These artifacts have brought archaeology to the site and a wealth of research on what has become one of Nova Scotia's largest precontact occupation sites. This research is presented in the following chapter.

2.3 Woodland Period Sites in Nova Scotia

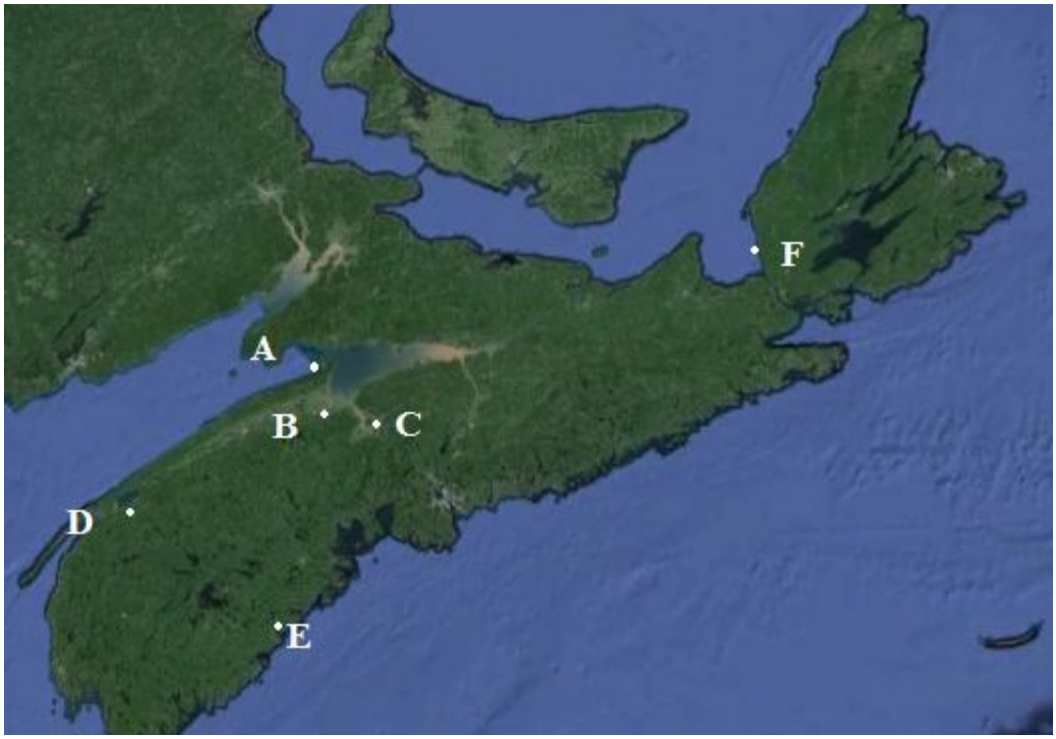

Figure 2.3: Location of Woodland period sites mentioned in text. Clam Cove (A), Melanson (B), St. Croix (C), Bear River (D), Port Joli (E), and Delorey Island (F). (Source: Source image courtesy of Google

2.3.1 Bear River (BdDk-4)

BdDk-4 is one of a number of sites found near the outlet of Bear River which drains into the Annapolis Basin. The site was discovered in 1975 during a survey as part of a field school at neighboring site BdDk-1 and was excavated due to the threat of erosion. Twenty-five square metres of the postulated 75 metres square site were excavated (Davis 1986:105). The site featured a five square metre midden with blue mussel and soft shell clam. High soil acidity did not allow for good organic preservation despite the presence of the shell and surviving faunal material was highly fragmentary. As such, much of it could not be identified (Davis 1986:109). Two hearth features were discovered, consisting of circles of stone with burned calcined bone and ceramic sherds. A layer of charcoal stained gravel runs across the whole site and artifact distributions point to two major areas of activity, although evidence for particular houses was not readily apparent. The heavy exploitation of blue mussels, an easily harvested resource which takes a long time to re-establish itself, and the lack of evidence for more long standing structures point to BdDk-4 being a short term occupation site (Davis 1986:110).

Archaeological attention was drawn to the Bear River site as a result of the work conducted by John Erskine, an avocational archaeologist who dug around the area from 1957 to 1959 and again in 1966 (Connolly 1977:38). Unfortunately, the site was frequented by looters and amateurs who caused damage to the site, including a burial (Davis 1986:105). Connolly undertook an analysis of the artifacts found by Erskine in 1977. The nature of Erskine's recording techniques means that the provenience data for all of the artifacts is lost and as a result, the analysis is an attempt at a broad examination of the site. Stemmed biface morphology suggests both Late Archaic and Woodland Period dates, as does the large assemblage of pottery. Lithic artifacts ranged from

complete bifaces and unifaces to preforms, cores and ground stone artifacts. Two burials were found on the site, one of an older child and one of a woman and child. Contrary to Davis's (1986) mention of his work on the site in 1975 (Davis 1986:105-110), a large amount of faunal material was found by Erskine, including modified beaver teeth, canines and carved bone 'altestakun', or gaming pieces. Connolly believes the site was a seasonal encampment, but one that was used by multiple cultural traditions (1977:42-45).

2.3.2 Clam Cove (BhDc-5)

Another site excavated by Erskine during the 1960s, the Clam Cove site is a native occupation site located in Scot's Bay. Erskine was drawn to the site for its shell middens where locals recounted collecting 'arrowheads' (Halwas 2006:21). Investigations by Erskine uncovered faunal material such as shellfish and sturgeon, cervid bone tools and ceramics and lithics. He suggested that the site was a workshop, used to reduce cores from Scots Bay sources. In 1988, Deal and the Minas Basin Archaeological Project continued excavations there, uncovering a depression with ceramics, charcoal and bone. He returned in 2004 and 2005 with graduate student Sara Halwas and they uncovered a wide variety of artifacts including native copper, ground stone plummets and a single projectile point, as well as historic materials, including remnants of a 1920s saw mill located on the site (Halwas 2006:22-26).

The results of the digs included 175 lithic artifacts made of cherts, jaspers and chalcedonies mostly likely sourced from a quarry at nearby Davidson's Cove. Corner notched stemmed bifaces point to Late Woodland origins. Bifaces and a variety of unifacial forms were also found. Seven possible vessels were uncovered with decorative embellishments ranging from cord-wrapped stick to dentate and dragged designs, adding

a Middle Woodland date to the site (Halwas 2006:28-32). Extensive palaeoethnobotanical research, the focus of Halwas' 2006 MA thesis, is discussed below in Chapter 3. The Clam Cove site appears to be a temporary site utilized during the Middle and Late Woodland periods for the exploitation of both faunal and lithic resources.

2.3.3 Melanson (BgDb-7)

The Melanson area includes several sites along the Gaspereau River and is one of the largest concentrations of Woodland Period sites in Nova Scotia. As a result of attention from looters, archaeological testing was conducted by John Erskine in 1957, and again by George MacDonald in 1965. Macdonald dug several trenches in the hopes of recovering Palaeoindian remains like those found at the recently discovered site in Debert, but found exclusively Woodland Period artifacts. Ronald Nash and Frances Stewart conducted field work in the area in 1985 and in 1986 conducted a St. Francis Xavier University field school at a site in the modern village of Melanson (BgDb-7).

Cultural heritage materials analyzed in *Melanson: A Large Mi'kmaq Village in Kings County, Nova Scotia* (1990) by Nash and Stewart include artifacts from two collections and the artifacts recovered during the Macdonald excavation, but focuses on those found at BgDb-7. Forty-seven projectile points were uncovered in total with 26 of them hailing from BgDb-7. Of the 26 from BgDb-7, nine are corner-removed/stemmed points, two are side-notched, two are without notching and several are corner-notched styles (1990:74). Eighteen end scrapers were found, along with waste flakes of the same material indicating on-site manufacture. Twenty-nine marginal retouch tools, utilized flakes for cutting and scraping, were recovered. Bifaces, both medium and large,

accounted for forty-two of the artifacts found at BgDb-7. Core and flake counts point to Melanson being an area of secondary manufacture; small tools were constructed mainly of Scots Bay cherts and chalcedony, but flakes and cores were primarily quartzite, no doubt obtained from nearby White Rock (1990:93). Large tools found at BgDb-7 consist of flat stones, a grooved maul, two 'spatula' shaped tools, while celts, chisels, net sinkers and small groove axes were recovered from other areas of the Melanson site (1990:94).

A total of 1018 sherds made up the ceramic assemblage at BgDb-7, which were grouped into 53 inferred vessels (Nash and Stewart 1990:111). The vessels were a mix of temper types, including grit, organic, shell and grit with organic, although each area excavated showed a particular preference. Decorative techniques were equally varied, including rocked and simple stamping, dentate stamping, punctuates and castellations on the rims. Patterns of decoration show include cord-wrapped stick, dentate and pseudo scallop shell, in various areas and levels. It is hypothesized that this is due to the expansion of the site gradually upriver, as some areas sport exclusively cord wrapped stick, a later decoration, while others have all three (Nash and Stewart 1990:115). Thermoluminescence dating places the older areas, those with the thin walled pots with pseudo scallop shell designs, at a Middle Woodland period date of 1760 ± 60 BP(Nash and Stewart 1990:116-7). As the occupation of the site moved westward, the archaeological record shows the thin walled pots being replaced by thicker dentate stamped pots and later cord wrapped stick pots of a similar consistency. Radiocarbon and thermoluminescence dating places the westernmost sites in a date range of 790 ± 60 BP to 500 years ± 20%, indicating occupation until European contact (Nash and Stewart 1990:116-7).

In terms of organic artifacts, 374 faunal elements were recovered with 204 identifiable mammal bones and a single fish element. The fish element was determined to be from the cod family, most likely Atlantic cod (*Gadus morhua*). Beaver (*Castor canadensis*), river otter (*Lutra canadensis*) and woodchuck (*Marmota monax*) were among the mammals represented (Nash and Stewart 1990:168). Macroplant remains were analyzed by Michael Deal in 1990. Nine sediment samples were subjected to water flotation and their macroplant remains removed and identified. Of the 892 macrobotanical specimens found, 617 were charred. Charred specimens included edible *Rubus* species, most likely blackberry or raspberry, pin cherry (*Prunus pensylvanica*), sedge seed (*Carex sp*.), lamb's quarters (*Chenopodium album*), staghorn sumac (*Rhus typhina*) and elderberries (*Sambucus canadensis*) (Deal 1990: 179-180). Specimens from non-edible plants include needles from the balsam fir (*Abies balsamea*) and hemlock (*Tsuga canadensis*), most likely represented bedding or fuel wood (Deal 1990: 179-180).

Melanson site BgDb-7 is a Woodland Period site with a long history of occupation. The site was a seasonal resource exploitation site used during the summer and fall, as evidenced by the recovery of berry seeds of species available only during those seasons. Despite the lack of faunal evidence, fishing was most certainly the principal reason for occupation, with gaspereau runs known not only today but also in historic times. Food resources would have been supplemented with hunting and fishing in the Minas Basin. Known small camp sites in the area most likely acted as satellite camps to the larger and semi-permanent Melanson site (Nash and Stewart 1990:194-195).

2.3.4 Delorey Island (BjCj-9)

Delorey Island is the largest island in Tracadie Harbour in Antigonish County, Nova Scotia. Historic accounts place a Mi'kmaq village, Tlagatig ('the Settlement' in the Mi'kmaq language) within the Tracadie Harbour area. Site surveys by Steve Davis in 1973 revealed several sites and artifacts from the Woodland Period and possibly the Archaic Period. In 1980, St. Francis Xavier University ran a field school on the island, part of a larger look at aboriginal settlement and subsistence in Nova Scotia's northeast and the first excavation of its kind in the area (Nash 1986: 18).

Dates from the 1980 excavation are divergent, with uncorrected radiocarbon dates ranging from 1595 ± 80 BP to 810 ± 70 BP. Thermoluminescence dating of one sherd from the lowest level produced a date of 490 ± 20% BP, indicating a possible Protohistoric presence at the site as well. Nash (1986:25) concludes that the site is a Woodland period site that has seen intermittent use from the earliest radiocarbon date to the historic period. The lithic artifact assemblage features both corner-notched projectile points, a later form, and small stem projectile points, which are much earlier, with comparable points found at the Oxbow site dated between 1745 ± 70 and 1675 ± 50 years BP (Nash 1986:28). Nash also noted a lack of contracting stemmed projectile points (1986: 26, 28).

Lithic artifacts were not limited to projectile points. Scraper tools, unifaces, bifaces and ground stone tools were also found on site. Despite acidic soils, close to a hundred modified bone specimens were also found, including harpoons and other tools related to fishing and hunting (Nash 1986: 99-102). Ceramic artifacts found on site consisted of 354 sherds, 339 of which were body sherds while 15 were decorated sherds from the pot rims. Cord-wrapped stick was the most common decoration on both rim and

decorated body sherds, some with variations including cord-wrapped stick with punctuates and cord-wrapped stick with incisions. Tempers used include grit, organic and shell (Nash 1986:93-95). The presence of shell temper and the abundance of cord wrapped stick decoration are indicative of a later occupation.

Frances Stewart (1986) analyzed the faunal remains recovered during the 1980 field school at Delorey Island. Of the 236 fish bones collected, the only fish to be represented more than once was the striped bass, a coastal fish found close to shore during migrations in spring and fall, although never very far from shore in the winter. Scutes from a sturgeon were also found (Stewart 1986:111). Bones from a heron, bald eagle and several species of large sea birds such as loons, cormorants and gulls, and Canada geese made up the avian bones found at Delorey Island. Most bones may come from a single specimen of each species (Stewart 1986: 112-115).

Both terrestrial and marine species make up the assemblage of 1027 mammalian bones. Moose appears to have been the prey of choice at Delorey Island, represented by 56 confirmed elements and a number of plausible identifications amounting to at least two adults and an immature specimen (Stewart 1986:116). Caribou, black bear, beaver, porcupine, fox and muskrat are also represented. Dog bones were also found, but there is limited evidence for their regular consumption (Stewart 1986:121-122). Bones from several species of seal make up the marine mammal specimens, including most importantly harbour seals but also gray, harp, and hooded seals (Stewart 1986:122-124). Two sheep elements and a human maxilla were also found.

Faunal evidence suggests that the Delorey Island site was used at multiple times of the year for different resources. A relative lack of fish remains indicates that fishing

was not a primary activity on the site (Stewart 1986:144). Seal species are only available during the warmer months when they migrate into the harbour to mate. Although beavers are more easily hunted in the warmer months, growth rings indicate that the beavers at Delorey Island were taken during the winter months. Moose are known also from ethnographic accounts to be hunted during the winter, so a winter occupation is also plausible (Stewart 1986:144-146). Combined with evidence from artifacts, Delorey Island appears to be a site occupied both during the summer and winter seasons at various times during the Woodland period and into the Protohistoric period.

2.3.5 Port Joli (AlDf-24)

Matthew Betts has been researching Native life in the Late Holocene on Nova Scotia's South Shore through excavations and survey at Port Joli since 2008. The area boasts a number of sites, mostly large shell middens. AlDf-24 is one of the largest midden sites in Nova Scotia, nearly 900 square metres, and has produced large lithic, ceramic and faunal assemblages (Betts 2009:7; Betts 2010:11). The midden is approximately 110cm deep in some sections and sports a number of subsurface hearths and living floors. The midden is deeply stratified and visible preferences for particular shellfish, such as blue mussels, green sea urchins and razor clams, make the strata easily discernible. Lithic materials recovered from AlDf-24 include end scrapers and corner-notched and short stemmed projectile points (Betts 2009:7; Betts 2010:12).

Feature 4 of Area C at AlDf-24 appears to be the remnants of a wigwam structure containing high amounts of charcoal and lithic debitage. A significant lack of shells also points to the feature being an activity floor. The feature contains a hearth and several

rings of stones. Artifacts recovered from the house include end scrapers, corner-notched projectile points and shell tempered cord wrapped stick ceramics (Betts 2010: 12-13). Ceramic artifacts recovered in Area A of AlDf-24 were mainly grit tempered with dentate stamp decoration. Area C ceramics were mostly shell tempered with cord wrapped stick decoration (Betts 2010: 15).

AlDf-30 is another deep midden deposit (30cm) with abundant pottery, lithic debitage and a cultural arrangement of stones (Betts 2009:7). Thanks to the neutralizing effect of the soft shell clam shells in the acidic soil, faunal preservation is decidedly better than most areas and Atlantic cod, caribou, moose, goose, duck, and small seal bones have been recovered (Betts 2009:7). Ceramics uncovered include grit and shell tempered sherds with punctuates and pseudoscallop shell decorations, as well as small castellations. Radiocarbon dates place active use of the midden between ca. 1650 BP to 1450 BP (Betts 2010: 9).

2.4 Summary

Past archaeological research has allowed researchers to move past the ethnographic reports of the Mi'kmaq at the time of European settlement. Many ethnographic reports suffer from the age in which they were written, in that contact with Europeans had already changed the shape of aboriginal culture in Nova Scotia well before anyone took the time to record it. Archaeology allows researchers in the province to build a more accurate depiction of life among the aboriginal peoples of Nova Scotia during the Woodland Period. St. Croix has been the subject of a wealth of past research,

which will influence the interpretation of data recovered during the 2012 excavations. A summary of past research is provided in the following chapter.

Chapter 3: Previous Research at St. Croix

This chapter outlines previous research on both the St. Croix site and aspects of its artifact and ecofact assemblages. The work of John Erskine in the 1960s, the Minas Basin Archaeological Project in the late 1980s and early 1990s and subsequent research projects are discussed. These sections provide the background upon which the 2012 excavations and subsequent analysis were established and the knowledge base to which its findings will be added.

3.1 Pre-1980s Research

In terms of archaeological research, the history of the St. Croix Village site begins with the work of John Erskine, a prominent avocational archaeologist doing work for the Nova Scotia Museum in the 1950s and 1960s. In 1962, Erskine came into contact with Clarence Burton of Wolfville, who had in his possession a large collection of First Nations lithic material including artifacts from the Late Archaic and Woodland Periods (Figure 3.1). The collection is now owned by his son David Burton (Deal, 1991). When asked about the origin of his collection, Burton directed Erskine to a property in St. Croix, which had been owned for several generations by the Smith family, but which is now owned by Wasowski/Geres. Interviews with the Smith family indicate that 'buckets of arrowheads' (Erskine, 1985:103) were found on site and debitage flakes continued to show up during ploughing.

Erskine dug a series of 'test holes' on the edges of the area now referred to as Sullivan's Garden. These tests revealed the area to be heavily impacted by domestic cultivation and other activities, leaving the archaeological record irrevocably disturbed (Deal 1994). Erskine noted that the site had been cultivated for nearly 200 years prior to

Figure 3.1: The Burton collection. (Source: Image courtesy of Michael Deal)

his arrival and that the presence of Archaic material on the surface of the site meant that no significant stratification remains (Erskine, 1985:103).

3.2 The Minas Basin Archaeological Project

The site remained without further investigation until 1989 when it came to the attention of the Minas Basin Archaeological Project. The Project is a collaborative undertaking between archaeologists, geologists and other specialists to develop a 'reconstruction of prehistoric and historic coastal resource exploitation and settlement patterning in the Minas Basin area' (Deal, 1988:6). To accomplish this, surveys took place in the western Minas Basin to document floral and faunal resources, lithic resources, and to create an inventory of archaeological sites and archaeological collections. The project sought out collectors and avocational archaeologists and brought together their information to develop a more comprehensive view of the archaeology of the Minas Basin (Deal, 1988).

With this intention in mind, the Minas Basin Archaeological Project survey crew relocated the Burton collection and in turn rediscovered the site at St. Croix. The survey crew took a week surveying the community, including the Smith property (then owned by the Sullivan family) and other adjacent properties. Vegetable gardens from four properties produced Woodland Period artifacts. Two excavation units were dug, which contained lithics and ceramics from the Woodland Period. It was determined that areas of the site warranted further excavation, especially a forested section on the north of the Sullivan's property. The site was given the Borden number BfDa-1 (Deal, 1990). In

addition to the aboriginal elements found on site, a possible Acadian cellar was found on a property adjacent to the Sullivans (see Figure 3.2).

3.3 Field Schools

In conjunction with the 1990 field season of the Minas Basin Archaeological Project, a Memorial University Archaeology Unit field school took place at St. Croix. Under the supervision of Michael Deal, a datum was established and seventeen 1m by 1m units were excavated, including three test units (Figure 3.3). A three metre cut line was made in the former river bank face to observe and document the stratigraphy of the site. The stratigraphic sequence revealed by the cutline closely resembles the stratification of excavated units (Figure 3.4). Soils were determined to be "water deposited materials with numerous boulder and cobble inclusions" (Deal, 1991:4).

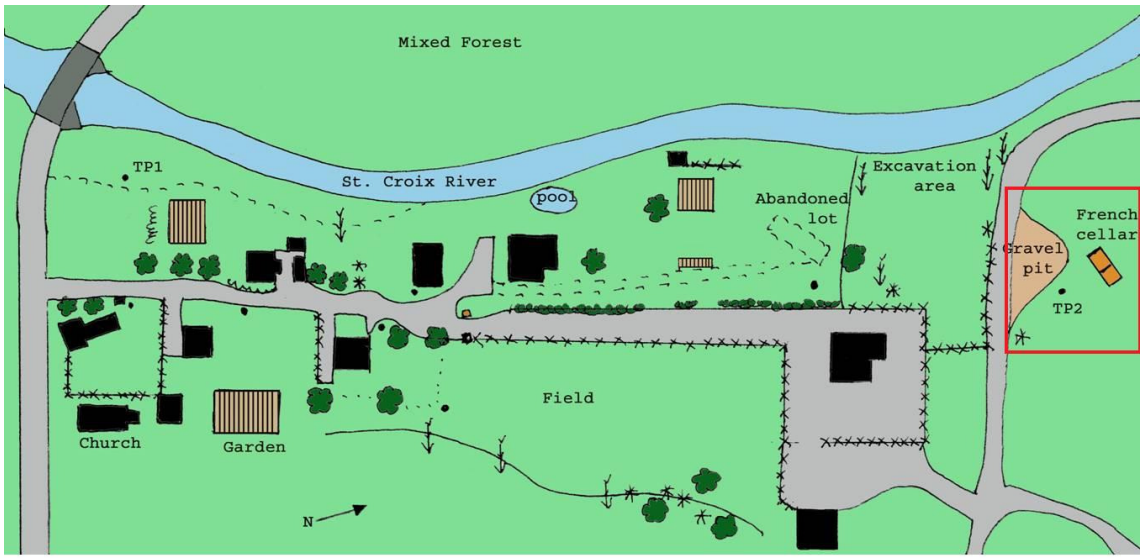

Figure 3.2: The Acadian cellar is highlighted in red at the far right. The excavation area is labeled to the left of the cellar (Source: Image courtesy of Michael Deal)

From the cutline a 20cm² soil sample was taken. Along with samples from each excavation unit, these samples were subjected to flotation utilizing an IDOT water screen system (see below: Methodologies - Ecofacts – Palaeoethnobotany) (Deal, 1991:4).

Excavations during the 1990 field season found the site to be rich in cultural material. Ceramic sherds totaled 306 elements, with a possible 32 inferred vessels. Decorative techniques include fabric paddling, pseudo scallop shell, dentate stamping of a variety of types, punctuates and incised lines. Lithic artifacts totaled 7284 artifacts. The assemblage contained five small stemmed and three corner-notched projectile points, 52 bifaces, 16 unifaces, 85 non-formed unifaces, a drill and 7059 flakes of mostly quartzite, jasper, quartz and chert (Deal, 1991:6-11).

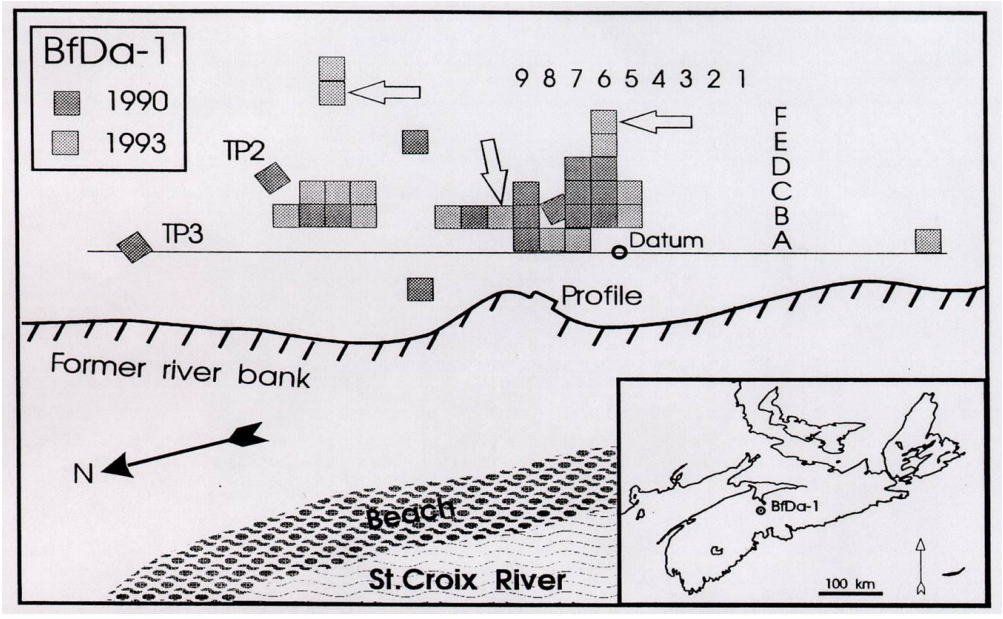

Figure 3.3: Diagram of the 1990 and 1993 field school excavations. (Source: Image courtesy of Michael Deal)

The wealth of artifacts and the potential of the site to shed further light on aboriginal lifeways in southwestern Nova Scotia prompted further excavations in 1993. Michael Deal, in conjunction with Acadia University's Geology Department held a

second field school in the area. Utilizing a theodolite, the datum and 1990 grid plan were re-established and contour mapping of the site was undertaken. Sixteen 1m by 1m units were excavated to expand upon the work of the 1990 field school (Figure 3.3). The 1993 excavations again revealed an abundance of cultural heritage materials. Ceramic sherds totaled 674 elements, with 208 decorated pieces resulting in a possible 49 vessels (Deal, 1994:9). Fabric impression, pseudo scallop shell, oblique and linear dentate, punctuate and cord wrapped stick were among the decorative techniques found on the sherds. The 1993 excavations also uncovered 142 formal lithic artifacts and 3692 lithic flakes. Five complete projectile points were located, one of which is a large, side-notched

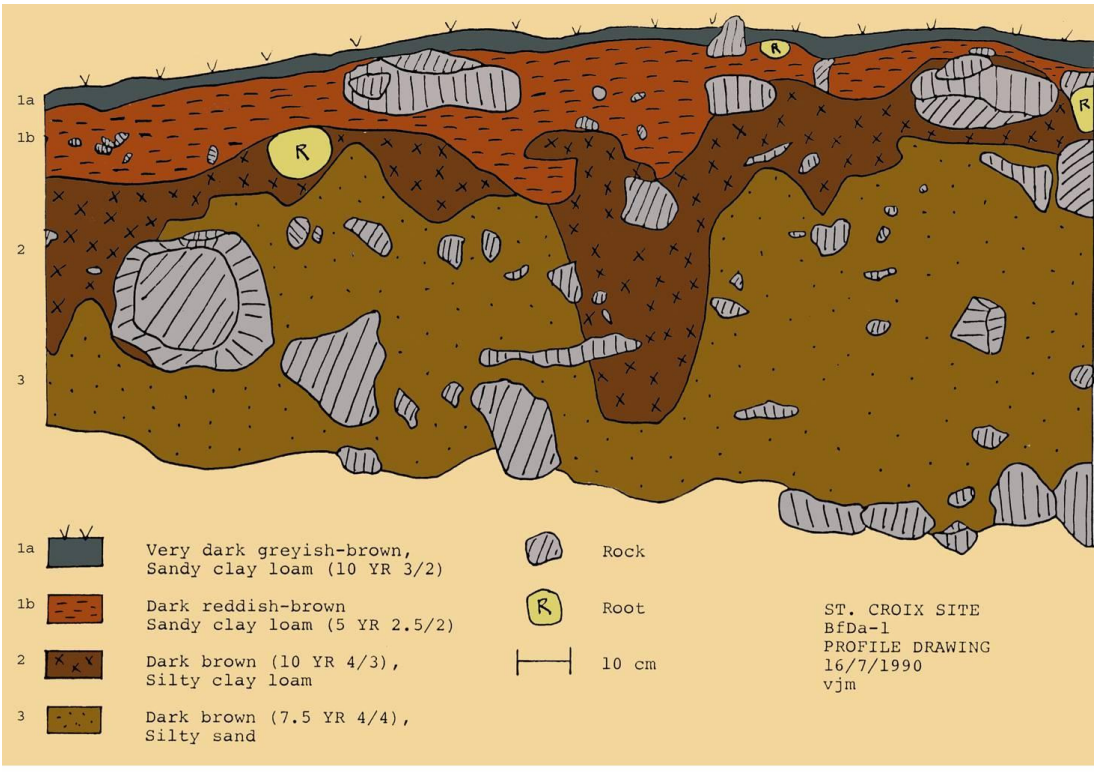

Figure 3.4: Stratigraphic representation of the Lot model established during the 1990 field school. (Source: Image courtesy of Michael Deal)

Meadowood style point made from an exotic chert. The point dates to the early Woodland period (Deal, 1994: 8-10).

Ecofact analysis from faunal and floral samples was also conducted. Twenty-five charcoal samples were taken from the St. Croix site, one of which has been radiocardon dated to 2500± 120 years BP. Seven hundred and eighty-six faunal elements were recovered during the 1993 excavations. Mammals account for 116 of the identifiable calcined bones, while only one element could be narrowed down to a species; the distal tibia of a fox (*Vulpes fulva*). One distinguishable non-mammalian element is that of a fish vertebra, although the genus and species cannot be determined. Soil in the area is particularly acidic so bone does not preserve well, making identification of the remaining elements unlikely (Deal 1994: 6).

Table 3.1 Palaeoethnobotanical remains recovered during the 1990 and 1993 field schools

Unit-Lot	Number	Taxonomic (Common) Name
A7-3	1 seed	*Prunus* sp. (cherry)
A8-1	1 seed	*Seteria* sp. (foxtail)
B14-1	3 needles	*Picea rubens* (red spruce)
B15-1	1 needle	*Abies balsamea* (balsam fir)
C5-2	2 needles	*Abies balsamea* (balsam fir)
C5-2	2 needles	*Pinus strobus* (eastern white pine)
C14-1	1 seed	*Rumex* sp. (dock)
C15-1	6 needles	*Picea rubens* (red spruce)
C15-1	2 needles	*Abies balsamea* (balsam fir)
C15-1	5 needles	*Picea rubens* (red spruce)
C15-1	3 needles	*Pinus strobus* (eastern white pine)
C16-2	1 seed	unidentified
E6-1	1 seed	*Sambucus canadensis* (elderberry)
H14-2	1 needle	*Abies balsamea* (balsam fir)
Total	5 seeds	
	25 needles	

Sediment samples taken during the 1993 excavations were also analyzed using flotation with an IDOT style screen. Extracted seeds and identifiable plant material were collected and identified. Table 3.1 is a cumulative list of the charred seeds and needles recovered. Cherry, elderberries and dock were identified, and fungal fruiting bodies (*sclerotia*) were ubiquitous (Deal 1994:8).

3.4 Thermoluminescence Dating

Samples of the decorated ceramic assemblage from both field schools at St. Croix were submitted for thermoluminescence (TL) dating by D.I. Godfrey-Smith (TL Dating Laboratory, Dalhousie University). As St. Croix is one of the few sites where ceramics from the full breadth of the Woodland period have been found, it offers a chance to create specific decoration-date associations for southwestern Nova Scotia. It is the 'first successful application of TL dating to ceramics from the Minas Basin area' (Godfrey-Smith, *et al*. 1997:251). TL dating measures the time since a mineral found in the ceramic sherd, such as feldspar or quartz, was exposed to a "clock resetting" event, such as the heating of the mineral to approximately 500˚ C (Godfrey-Smith, *et al*. 1997:255). When a 'clock resetting' event occurs, such as when the ceramic was fired, these minerals absorb radiation energy. When reheated, the minerals in the sherd release an amount of light, called thermoluminescence, proportional to the amount of energy absorbed. By measuring the thermoluminescence and comparing it with other control data, a close absolute date can be determined (Godfrey-Smith, *et al.*1997:255-257).

Of the decorated sherds found during the 1990 and 1993 excavations, five samples were chosen based on quality and thickness. Often pieces with interlocking pairs

were chosen so as to have an existing record of the destroyed sample sherd (Godfrey-Smith, *et al*. 1997:255). The date range produced from the TL dating spanned the full Woodland period, running from 2620 ± 290 BP to 1150 ± 150 BP. Sherd BfDa-1:1961, a pseudoscallop shell design sherd was the earliest date, followed by sherd BfDa-1:1924, the earliest date for cord-wrapped stick decorated pottery in Nova Scotia, dated as early as 2150 BP. BfDa-1:1796 and BfDa-1:1986 were two linear dentate stamped sherds dated to 1880 ±210 BP and 2080 ± 100 BP, respectively, in keeping with Petersen and Sanger's model of earliest use of the design in Ceramic Period 2. Fabric impressed sherd BfDa-1:1771 was the latest date, 1150 ± 150 BP or the end of Ceramic Period 4, which is when Petersen and Sanger indicate the beginning of a resurgence in fabric impressed pottery in the Maritimes. These dates correspond with their respective decorative techniques as per the Petersen and Sanger (1991) model for ceramic decoration in Maine and the Maritimes and are depth-age appropriate, reaffirming the undisturbed quality of the archaeological record in the areas excavated at St. Croix during the 1990 and 1993 field schools (Godfrey-Smith, *et al*. 1997:268-271).

3.5 Undergraduate Student Projects

3.5.1 Kim Jenkins and Rob Lackowicz (1991)

Jenkins and Lackowicz, two Memorial University undergraduates, were responsible for the analysis of sediment samples taken during the 1990 field school at St. Croix. Six samples were processed, either through dry screening or flotation with the IDOT screen. The recovered organic material was examined under a binocular microscope. Using seed identification manuals, including F.H. Montgomery's 1977 *Seeds and Fruits of Plants of Eastern Canada and Northeastern United States* and Greta

Berggren's 1981 *Atlas of Seeds and Small Fruits of Northwest*, and a reference collection of known botanicals from the area, many seeds were identified (Jenkins and Lackowicz, 1991:2).

The majority of the macrobotanical remains found by Jenkins and Lackowicz were fungal fruiting bodies (*Cenoccum* sp.). Of the remaining 34 seeds, only two *Rumex martinus* seeds were charred indicating their age as preserved organics from an aboriginal occupation and not modern seed litter. The charred *Rumex martinus* seeds, a species of dock, were not found in a known cultural feature, so their relevance as an indicator of cultural activities is limited. In fact, macrobotanicals from a feature, Feature 3 of unit A-9, also showed no evidence for charring. In total, 28 uncharred seeds were found, two charred seeds, two seed cases and two spruce buds. Insect parts, twigs and needles were also recovered (Jenkins and Lackowicz, 1991:3-4).

Jenkins and Lackowicz note that due to the limited charred macrobotanical remains and the remainder being modern inclusions, they were unable to produce a palaeoenvironmental reconstruction without further evidence. This difficulty is further exacerbated by the circumstances of the soil matrix. The lower the sample was taken from, the less botanical remains were recovered indicating a correlation between the duration of time a macrobotanical specimen has been on the site and its likelihood of surviving in the soil. This means that as the depth of recovery decreases so do the chances of recovering macrobotanical remains and that the soil is not conducive to botanical preservation. The authors attribute this to the fluctuations in humidity and temperature at the site, and promoted the application of pH and microbiological testing for confirmation (Jenkins and Lackowicz, 1991:4-5).

3.5.2 Kevin Osmond (1993)

Kevin Osmond undertook the examination of sediment samples taken during the 1993 field school. Taking a different approach than Jenkins and Lackowicz, a 150ml subsample of sediment was agitated in a tray with 500ml of water. Organics that floated to the surface were collected using a sieve and the remaining solution was allowed to set for 24 hours. After settling, any remaining floating organics (or 'flot') were collected and dried. These were then viewed, sorted and identified using identification manuals and a reference collection (Osmond, 1993:1-2).

Cherry, dock and several berry species were the most common seeds recovered. Charcoal, sclerotia and bone fragments were also common. Charred seeds include cherry, dock, elderberry and foxtail seeds, as well as needles from balsam fir, red spruce and eastern white pine trees. Osmond looked at the ethnographic uses for the charred species, listing cherries and elderberries as edible, while the roots of the dock and the flowers of elderberries were used in cooking. The bark of the Eastern White Pine and the Balsam Fir were used as a beverage or for medicinal purposes, while the boiled needles and boughs of the Red Spruce were said to stave off disease (Osmond, 1993:8).

3.6 Graduate Research

Until the 2012 field season, the St. Croix site had gone unexcavated since the 1993 field school. However, the artifact and ecofact assemblages from the site became part of several research projects undertaken by graduate students at Memorial University.

3.6.1 Helen Kristmanson

Kristmanson utilized the ceramic collection from St. Croix as part of her analysis of ceramic variation in southwestern Nova Scotia with the intent of refining Petersen and Sanger's (1991) model of ceramic development in Maine and the Maritime provinces. Only nine of the 76 sites used to create Petersen and Sanger's model were in Nova Scotia, leading to a heavy emphasis on sites in Maine and New Brunswick. Kristmanson addressed both this research gap and the applicability of the model for Nova Scotia by analyzing ceramics from fourteen sites in the province. The ceramics from St. Croix were one of fourteen assemblages analyzed by Kristmanson.

Ceramics from these sample assemblages were analyzed in terms of their stylistic and morphological attributes such as decoration techniques, shapes, wall thicknesses and temper types. Kristmanson put this data into a database program and used the program to question particular statements put out by Petersen and Sanger in their model. Generally, the ceramics from the Nova Scotia sites adhered to the Petersen and Sanger model, but there were some discrepancies (Kristmanson1992:61).

Vessels found at St. Croix in general association with a dated hearth feature radiocarbon dated to 2500 ± 120 BP (Beta – 49256) suggest an early introduction of that pottery type into the province. The presence of undecorated, fabric impressed ceramics from the Melanson, Rafter Lake and Landing sites help to confirm the idea that undecorated, fabric impressed ceramics of that date were much more widely distributed than previously thought (Kristmanson 1992:64). This is a confirmation of Petersen and Sanger's suggestion that Ceramic Period 1 "fabric paddled, undecorated ceramics did not make many, if any inroads into portions of Maine and much of the Maritimes (Petersen

and Sanger 1991:123)". It should be noted that this observation was made before the aforementioned thermoluminescence dating study (Godfrey-Smith, *et al*. 1997) where a fabric paddled sherd from the 1993 excavations was dated to Ceramic Period 4 (1997:271).

Several issues within Petersen and Sanger's (1991) model were addressed by Kristmanson in terms of their relative applications in southwestern Nova Scotia. Drag stamping was not evident among the Ceramic Period 1 specimens (Kristmanson 1992:64), despite the prevalence indicated by Petersen and Sanger (1991:124). Petersen and Sanger's observations that wall thickness increased between Ceramic periods 2 and 3 (1993:129) and decreased during Ceramic Period 6 (1993:143) were supported through Kristmanson's analysis of Nova Scotian ceramics (1992:66, 76). Statements regarding the geographical associations of S twist and Z twist cord wrapped stick design, in that S twist was an interior decorative element and Z twist was a coastal element (Petersen and Sanger 1991:140-141), were also addressed by Kristmanson. Kristmanson found that Petersen and Sanger's assessment was generally supported, but that there was at least one vessel from the Eel Weir site (BbDh-6) which did not conform. Kristmanson suggests that a temporal element may be a significant factor but the lack of dated sherds precluded a definitive explanation (1992:69). Evidence from the Nova Scotia sample supports Petersen and Sanger's observation of shell temper's rise to prominence during Ceramic Period 5 and subsequent decline during Ceramic Period 6 and 7 (Kristmanson 1992:74). Interior channeling marks in Petersen and Sanger's model were said to be uncommon in Maine and the Maritimes during Ceramic Period 2 (1991:125), a fact which Kristmanson confirms. Kristmanson's sample also suggests that interior channeling was associated

exclusively with cord-wrapped stick decorations and may have been a common element of ceramics at some point during Ceramic Periods 4 through 7 (1992:79). Kristmanson's refinements of Petersen and Sanger's model for Nova Scotia, particularly its southwest, are essential for the analysis of ceramics recovered during the 2012 season.

3.6.2 Catherine Jalbert

In her 2011 Masters thesis, Jalbert examined lithic resource use and craft skill learning through sampled collections from a variety of sites in the Minas Basin area. Sites at Davidson's Cove, Clam Cove and St. Croix were her focus. In discussing the composition of lithics in her sample from St. Croix, Jalbert notes that approximately 50% were knapped from Scots Bay cherts while 36% were made from quartzite from the White Rock formation (Jalbert, 2011: 68). This is an indication of a 'regional network of lithic procurement and use' where Scot's Bay cherts were collected at the quarry and redistributed throughout the province (Jalbert, 2011: 80). An analysis of the stem forms of projectile points found at St. Croix reveals that Late Woodland period corner- or side-notched points were made of Scot's Bay chert, while stemmed points were made from White Rock quartzite. Bifaces made from local quartz were both stemmed and notched (Jalbert, 2011:80). One projectile point appears to be made from Misstasstini chert, an exotic chert native to Quebec. The appearance of exotic materials may point to broader trade and exchange networks outside the Maritime Provinces.

The presence of pre-forms and formal tools on site suggests St. Croix was an area for the curation and creation of lithics. Pre-forms and cores would be brought down from the Scots Bay area, particularly from Davidson's Cove in between low tides when

outcrops were accessible. These would be further reduced at staging camps, such as Clam Cove, on Cape Split, where workers would prepare tools for distribution to inland sites (Jalbert, 2011:112). Size differences between the smaller bifaces of Scot's Bay chert and larger bifaces of White Rock quartzite appear to show this preference for preform reduction prior to transport of Scot's Bay cherts to the St. Croix site. White Rock quartzite may have been reduced more frequently on site due to its greater proximity to St. Croix (Jalbert, 2011:81). What can be emphasized from Jalbert's work is St. Croix's position as part of a regional exchange network where preforms from Scot's Bay would arrive for quick exploitation in addition to the on-site reduction of local sources at White Rock.

3.6.3 Sara Halwas

In Halwas' 2006 MA thesis on the palaeoethnobotanical remains at Clam Cove, Kings County Nova Scotia, she provides a comparative analysis of previous similar work conducted at St. Croix. Her work not only provides a model by which palaeoethnobotanical analysis has been conducted for samples taken during the 2012 excavations at St. Croix, but also a concise picture of previous palaeoethnobotanical research undertaken at St. Croix.

Palaeoethnobotanical remains at St. Croix consist of primary refuse: waste found where it was prepared, cooked and eaten, such as living floors and roasting pits (Halwas, 2006:6). The blanket style sampling strategy utilized during the 1990 and 1993 field schools produced 31 pinch samples (small amounts of sediment collected across a level) from excavation units. Extra samples were taken from features and the cutline (Halwas,

2006: 43-44). From each sample, a 150ml subsample was taken for analysis at Memorial University. Students Kevin Osmond (1993) and Kim Jenkins and Rob Lackowicz (1991) analyzed the samples (See above).

Utilizing a variety of sources, Halwas discussed the charred plant remains found and the various ethnobotanical functions of each species. Several kinds of berry including blueberry (*Vaccinium* sp.), cherry (*Prunus* sp.), hawthorn (*Crataegus* sp.), raspberry (*Rubus* sp.), elderberry (*Sambucus canadensis*) and bunchberry (*Cornus canadensis*) were identified. The berries of these plants were often eaten fresh, dried or cooked. Some of the plant parts of the berries were used to create medicines, including a tonic made from blueberries and their stems and leaves. The bark of elderberry plants was used in a tea (Lacey, 1993:80), as were entire bunchberry plants which were boiled to create a tea for treating stomach illness and bedwetting (Lacey, 1993:84; Halwas, 2006:44).

Charred tree remains found on site also point to medicinal use. Needles from eastern white pine (*Pinus strobus*), red spruce (*Picea rubens*) and fir (*Abies* spp.) were found on site. The bark of firs and spruces can be used to create medicinal teas for fighting colds and sore throats, as well as scurvy due to their vitamin C contents (Halwas, 2006:45; Lacey, 1993: 38, 54). Charcoal specimens recovered on site were primarily spruce, but birch and fir species were also identified. Halwas notes that the predominance of spruce specimens could be indicative of a seasonal occupation during warmer times of the year (Halwas 2006:45). Given that softer woods such as spruce and fir burn more quickly with less heat (Residential Wood Heating 2002:52), they would have easily met the limited heating and cooking requirements of warm season occupation (Halwas 2006:45). Floral remains were located mostly in units surrounding features hearths or

areas of high artifact concentration. Halwas hypothesizes that this is due to the long period of occupation, with centuries of people trampling and kicking material around rather than a concerted effort towards cleaning or sweeping areas of repeated use (Halwas 2006 46).

3.6.4 Sara Halwas and Michael Deal

For an article in *Current Northeast Paleoethnobotany II* (Hart, 2008), Sara Halwas and Michael Deal combined their palaeoethnobotanical research into a comprehensive look at palaeoethnobotanical archaeology in the Minas Basin area. As in Sara Halwas' thesis, St. Croix is mentioned along with Clam Cove and the Melanson site as one of the places where palaeoethnobotanical research has been undertaken extensively. The article adds a focus on fuel wood and construction materials and includes the details of a charring experiment used by researchers to create a comparative collection of charcoal from local species in the Minas Basin area (Deal and Halwas 2008:174). In 2005, local species at Clam Cove were collected and burned off site. These charred samples were used to compare charcoal samples from Clam Cove and St. Croix. Halwas identified 36 softwood samples including 29 spruce, 3 fir and 4 unidentified specimens, and 3 hardwood samples, all of which were birch (Halwas, 2008:175). As mentioned in her thesis, Halwas proposes that the high percentage of softwoods at St. Croix may indicate a summer occupation. The presence of birch on site is not surprising considering the importance of birch to aboriginal groups at this time. Birch was used in the construction of canoes, wigwams, containers, burial shrouds, in hunting for torches, in moose calls and as bait in rabbit traps (Halwas, 2008:175).

3.7 Summary

Past research at St. Croix has been varied and extensive with an emphasis on lithics, ceramics and paleoethnobotany. In-depth analysis of a broad range of subjects has created a fuller picture than some of the other sites within the province. St. Croix is one of the best dated sites in Nova Scotia and is one of the few sites in the province that has received substantial palaeoethnobotanical analysis. The involvement of St. Croix within the research projects of so many individuals is a testament to its value as a source for information about aboriginal lifeways during the Woodland Period. It is through the synthesis of this comprehensive spectrum of knowledge that the past at St. Croix is better understood.

Chapter 4: Theoretical Framework

Because St. Croix is a site left by seasonal hunter-gatherers, human ecology (Butzer 1982), which deals with how humans interact with their environment, was chosen as the primary theoretical approach. In particular, the material culture recovered from the site provides information on the technology and economy of the people who lived there. To address issues of stratigraphic integrity at the site, site formation theory (Schiffer 1987) was selected as a secondary approach. Each of these approaches is discussed in detail in this chapter.

4.1 Human Ecology

Johnson (1999:173) notes that "a powerful argument in much of 'cultural ecology' is the observation from ethnography that humans usually have a deep and sophisticated understanding of their environment, and will modify their behaviour to adapt to changes in their environment." So if behaviour is modified by the environment, then by understanding the environment, we can better understand behaviour. Human ecology seeks to 'define characteristics and processes of the biophysical environment that provide a matrix for and interact with socioeconomic systems…' (Butzer 1982:6). As hunter-gatherers, the Mi'kmaq living at St.Croix during the Woodland period were intrinsically linked to the local environment.

By understanding the environment a culture lived in, we can better understand the varying interactions between human communities with other humans, non-human

communities and their surrounding environment. All these interactions create different patterns and aggregates of varying scales, which require multiple approaches for analysis. Human ecology draws from geological, environmental, zoological and botanical analyses to form a cohesive picture of a site's environmental matrix. Through this integration of data, the behaviour of those aboriginal groups living and working at St. Croix can be understood. In Butzer's book on human ecology, he suggests using a method that highlights site formation aspects, not only natural formations but the human interactions with the site, modifications and disturbances that express themselves archaeologically (Butzer 1982:98).

The ecological aspects that make up St. Croix, such as its climate, its location, and its biological communities, make it a viable place to establish a settlement. St. Croix provided food in the form of anadromous fish resources, as well as interior terrestrial and avian animal resources. Botanical resources for both food and medicine were available. St. Croix sits on a navigable river which connects the Minas Basin via portages to the Atlantic coast, making it not only strategically important but also easy to access. Lithic resources at White Rock and Scots Bay are accessible by watercraft from the Minas Basin. Even the shape of the land, a collection of broad, flat terraces along the river's edge which allow for the establishment of camps, make St. Croix an easily exploitable and desirable site.

Previous excavations during the 1990 and 1993 field schools collected a large quantity of data concerning both the archaeological site and its environment. Through several research projects, this information was analyzed and synthesized to develop a better understanding of the site. Through the integration of geographic,

paleoethnobotanical, pedological and zoological analysis a picture was constructed of life at St. Croix during the Woodland period. Information collected during the 2012 excavations has been examined in the same fashion and its synthesis is presented here.

4.2 Site Formation Theory

Schiffer's model for discussing site formation processes is very much compatible with cultural ecology. Site formation theory states that the archaeological record was not determined solely by the action of human behaviours and that to focus solely on that aspect is insufficient (Schiffer 1987:5). Archaeologists must take into account all types of transformative processes, both cultural and natural. This can be applied not only to sites but to artifacts.

Schiffer puts forward the idea that specific transformative processes such as erosion and human occupation leave traces on sites. These transformative processes are caused by 'specific causative variables', which make them highly predictable and the effects of these processes, their traces, are thus regular and predictable (1987:21). These transformative processes can be natural, dubbed n-transforms, or cultural in origin, dubbed c-transforms. Much like cultural ecology, site formation theory integrates information from different disciplines such as environmental, geological, ecological and hydrological sciences to observe these processes. Through the discovery and analysis of these traces, the transformative processes which have affected a site can be determined and a history of the site's past transformations can be established.

Most informative to the research objectives of this thesis is site formation theory's focus on disturbance processes that affect the archaeological record. Since an assessment

of disturbance at St. Croix is one of the major objectives of this research, analysis of the traces of disturbances, both natural and cultural, is a priority. Schiffer's discussion of plowing (1987:129-132) and its affects on the archaeological record is one of the major draws of this particular model's methodology. Site formation theory eschews the entropy view, that the progression of time slowly degrades that quality and quantity of evidence available in the archaeological record. Under this viewpoint, heavily disturbed sites are sometimes 'written off' as without useful information (Schiffer 1987:9). Under site formation theory, the passing of time is viewed as adding information to the archaeological record, disturbed or otherwise.

Traces are not just alterations to the physical properties of surfaces, but also relate to artifacts (Schiffer 1987:14). An artifact is not static and is affected by a variety of transformations during its life, leaving traces that can be analyzed to determine the life of an object, both while in use and in the ground. Schiffer highlights four dimensions of variability in artifacts: formal dimensions, spatial dimensions, frequency dimensions and relational dimensions. All are affected by transformative processes and have traces that can be analyzed. The formal dimension of an artifact refers to the physio-chemical properties of the object, including size, weight, hardness, colour, morphology (Schiffer 1987:15) while the frequency dimensions refers to how many occurrences of a particular kind of object are found (18). The spatial dimension refers to an object's location (Schiffer 1987:17), while its relational dimension refers to the patterns of an object's co-occurrence with other objects (19). Traces of an object's life through manufacture, reuse and life after deposition all alter these dimensions.

4.3 Summary

The research objectives during the 2012 excavations at St. Croix necessitate a review of a broad and comprehensive array of data. In continuing with the procedures of the previous 1990 and 1993 excavations, large and diverse quantities of information were collected. Although the most recent excavations were certainly on a smaller scale than previous years, the breadth of data is the same. Multiple projects concerning aspects of the 1990 and 1993 excavation's data assemblages have been completed through the years prior to this thesis. It is the goal of this thesis to synthesize the information from previous work and information garnered from the 2012 project to gain a better understanding of St. Croix's place in Nova Scotia and to answer the research objectives set out by this project. Only through theoretical frameworks that can incorporate and integrate a broad range of data types will this goal be accomplished. Butzer states that no individual will be able to master more than a few of the fields incorporated by human ecology, but it is the job of the researchers be able to evaluate and utilize data created through a variety of fields to create an integrated perspective on a site (1982: 35).

Chapter 5: Methodologies

This chapter outlines the methodology utilized during the sub-surface testing at St. Croix in the summer of 2012 and those applied during the analysis of the results of those excavations. When designing these methodologies, it was decided that the previous research at St. Croix, both in the field and in further research would serve as a model upon which the new methodologies would be designed. Alterations accounting for advances in technology over the past twenty years were taken into account.

5.1 Field Work Methodologies

The first actions on site were the reestablishment of the site datum through triangulated measurements from the visible cut-line and what outlines could be perceived of past excavation units. Using a compass, the baseline was established and units were placed within areas of interest. Areas of interest were determined based on previous artifact counts on surrounding units and areas that had similar qualities to the site excavated in 1990 and 1993, such as being flat, open areas next to the river. Units were be placed at semi-regular intervals of approximately 10 metres where possible although the morphology of the research area would determine the actual placement. At least one unit was placed at the northern most edge of the Wasowski/Geres property to address questions about the extent of aboriginal occupation at St. Croix. The investigation of any perceived Acadian elements would warrant excavation, although only if time permitted.

To explore areas of known disturbance, the baseline was extended south and east into the open areas of the Wasowski/Geres property. A contemporary datum was created

70 metres South and 30 metres East of the original datum for ease of measurement. A unit was placed within the Sullivan's Garden area. Due to extensive surface finds, surface collection occurred regularly to look at the broad spectrum of finds which were evident in the Sullivan's Garden area.

In order to push the boundaries of the known site further into the community of St. Croix, a unit was placed on the property owned by the Ross family, immediately east of the Wasowski/Geres property and henceforth referred to as the Ross Garden area. The area chosen for the Ross Garden Unit (RGU) was a large open section of yard that had previously been utilized for domestic agriculture but had been seeded for grass for several years. Due to extensive tree cover between the Ross and Wasowski/Geres properties, measurement from the contemporary datum proved impossible so the unit was placed within ten metres of an electrical pole for reference.

Units were 1m by 1m in dimension and were dug via trowel and brush through strata referred to as 'Lots' which are visually and geophysically discernible. The presence of cultural material or human modification was also used to indentify a change in Lot, either through the creation of an entirely new Lot or through Sublots (ie. Lot 8A, Lot 8B). Each stratum was removed in thin sections via trowel pass, removing small amounts of sediment across the whole unit or in rotating 50cm x 50cm sections, depending on the technique of the excavator. Each Lot was given a number and recorded in terms of soil texture and colour using basic tactile texture tests and Munsell colour comparison charts keyed for geological use. Soil textures were further refined in the lab during pedological analysis. Lots were taken down until the stratum began to change, at which point the unit was photographed and drawn on Lot record forms. Parts of the units that had an area of

obvious human modification such as unnatural stone placement, pits or dense areas of colour change which were not broad enough to warrant a Lot change were recorded as 'Features'. Features were recorded on Feature record forms.

Artifacts found in situ were recorded on a Lot record form and their respective northings (X coordinate) and eastings (Y coordinate) were recorded on separate artifact record forms. Additionally, the depth of the artifact (Z coordinate) was recorded utilizing the Northwest corner as a reference. Soil removed from the unit was then sifted utilizing either a rocker style or shaker screen with ¼ inch wire mesh, allowing for the collection of fine flakes and those artifacts which were not readily apparent during excavation. Artifacts with known proveniences were bagged separately while artifacts found in screens were bagged by Lot and date found. Flakes were not considered formal artifacts as their abundance would cause extensive delays in excavation, so their provenience was recorded as a mere presence point on the Lot record form and then subsequently placed in bags separated by Lot and date found. Soil samples were taken from Lots where cultural material was present.

When units reached sterile soil (Lot 3), archaeologists continued to dig for approximately 5-10cms for absolute certainty. Digging only ceased after five 13L buckets worth of sediments produced no material culture. Upon completion of a unit, profiles of the units were photographed and drawn, most often the South and West walls. Total station measurements were taken of the four corners of each unit as well as depths at the Northwest corner. Units were then backfilled and their sods replaced when available for aesthetic purposes.

5.2 Lab Methodologies

5.2.1 Artifacts

Lab work began during the 2012 field season at a temporary lab space in Acadia University's Environmental Sciences building. Artifacts were laid out to dry. Utilizing the information from their bags and the artifact record forms, a master artifact catalogue was created and each artifact was given an individual number. Once dry, these artifacts were dry brushed to preserve any possible residues which may be of interest to future researchers. Flakes were washed using tooth brushes and examined for retouch. Any flake found to exhibit retouch was given the status of a formal artifact and added to the master artifact catalogue. The artifacts were then brought to Memorial University and subjected to more in-depth analysis.

5.2.1.1 Lithic Artifacts

Lithic artifacts are pieces of stone that have received some form of modification by humans, most often through a process of flaking off small pieces of stone to create a specific shape. The shape of the tool is often an indication of its intended function although its function may change several times throughout the use life of a particular artifact. Lithic artifacts found during the 2012 excavations were first separated into a number of categories based on form and function. Projectile points consist of bifacially worked lithic artifacts with some sort of modification to the base, either the creation of a stem or notching. These were intended to be attached to a shaft which could then be propelled as an arrow, spear or dart. Bifacial tools consist of lithic artifacts with two worked edges for cutting. Although these often have some sort of treatment at the bottom

for hafting purposes it is not always so. Bifacial tools would often be attached to some manner of handle.

Unifaces are lithic artifacts with only one worked edge for cutting. Differing from unifaces are 'scrapers', lithic tools with one worked edge used for scraping a variety of materials. For the purposes of distinguishing the two, scrapers are defined as unifaces with a working edge of 70-90 degrees and a flat underside while the worked edge on a uniface has both sides angled to meet at a central edge. Drills are bifacial tools which are less wide but not as thin as normal bifaces to allow for burrowing action. Cores from which other pieces of lithic material have been removed are separated from those that are in the process of being shaped into formal tools forming the bifacial core group. Lithic tools not formed through flaking are relegated to the category of groundstone tools. Groundstone tools are those formed from igneous and metamorphic rock, shaped to their ideal form through abrasion and pecking (Odell 2004:75). Some debitage flakes have evidence of use as expediency tools for cutting and scraping and are termed utilized flakes.

Each lithic artifact was then measured using digital calipers and recorded utilizing the Nova Scotia Museum's standard for artifact catalogues. Projectile points were placed into categories based on Ritchie's 1978 typology for New York projectile points and Buchanan's 2004 classification of contracting stemmed 'Tusket' style points. By adding each point to their respective attribute based category, broad dates can be applied to the artifacts and therefore to the artifacts around it. Artifacts were then labeled with their respective catalogue numbers using fingernail polish as a removable base. India ink was

used to inscribe the information. Artifacts were then stored in Memorial University's collections room.

5.2.1.2 Ceramic Artifacts

First Nations pottery recovered from the 2012 excavations was first dried and re-bagged with its information. Consisting mostly of small sherds, these artifacts were then carefully dry brushed not only to preserve possible residues for future analysis but also because the fragile state of First Nations ceramics requires them to stay dry. Decorated sherds were then removed and recorded separately for closer analysis. Clusters of undecorated pottery were kept together for ease of recording. Once dried and brushed clean, the sherds were measured using digital calipers according to the Nova Scotia Museum's cataloguing standards.

Decorated sherds were analyzed and their decoration type, temper and portion recorded. Decoration type was determined using Kristmanson's analysis of ceramic sherds recovered from the Melanson Site (BgDb-7) in King's County (Nash and Stewart, 1990) as a reference guide. Utilizing information regarding decoration, temper and thickness, each decorated sherd has been placed into a range of possible time frames (Ceramic Periods) according to Petersen and Sanger's aboriginal ceramic sequence for Maine and the Maritime provinces (1991). Changes outlined by Kristmanson's 1992 thesis concerning refinements to the Petersen and Sanger model with a particular focus on Nova Scotia's Southwestern shore was also taken into account.

Decorated sherds were then labeled with their respective catalogue numbers using fingernail polish as a removable base upon which India ink was used to inscribe their

information. Groupings of decorated pieces retained the same number. Undecorated fragments were left unlabeled and kept in their bags due to small size, fragmentary nature and larger groupings for ease of cataloguing.

5.2.1.3 Historic Artifacts

The historic and modern presence at St. Croix resulted in a wide variety of artifacts. Pieces of pottery, glass and certain miscellaneous artifacts were brushed clean in warm water and re-bagged with their respective information. Metal artifacts were dry brushed for preservation purposes. Nails of identifiable form were separated from metal clusters for ease of cataloguing. Those artifacts whose surface would allow were labeled with their respective catalogue numbers by applying a small amount of nail polish and writing on the dried polish with India ink. Metal artifacts were left in bags due to difficulty in labeling the artifacts themselves.

Those ceramics which could be readily identified were recorded as such using the Nova Scotia Museum's standards for cataloguing. Measurements of length, width and thickness were taken using digital calipers. Ceramics of unknown make and fabric were identified by Adrian Morrison, a fellow MA student with experience in historical archaeology both in Nova Scotia and Ontario. Nails were identified using a reference guide (date unknown, pp. 42) compiled by Archaeological Services Incorporated of Ontario. Much of the glass was damaged by heat and not in a form which could be readily identified. Miscellaneous historic items were identified through personal experience of either the author or Adrian Morrison.

5.2.2 Ecofacts

Ecofacts are organic remains found on archaeological sites that have been altered or placed there by human activity. Faunal material, seeds and charcoal are all ecofacts and can each provide unique information about a site's past. Each requires different analysis techniques, outlined below.

5.2.2.1 Pedological Analysis

From each of the soil samples taken during the 2012 excavations, a 50ml portion was set aside for pedological analysis. The 50ml sample was divided into two subsamples, one 30ml and the other 10ml with 10ml set aside for additional tests should the need arise. The 30ml test was mixed with ionized water to a consistency of a thick milkshake and left for sixty minutes. After the allotted time, the sample was tested for pH and retested using a pH strip calibrated for specific levels of acidity.

The 10ml subsample was dried and sifted using United States Standard Geological Sieve 35 (0.5mm) and 60 (0.125 mm). Portions were weighed and the soil texture determined using the texture triangle (Harpstead and Hole 1980:15). The subsample was then examined under a binocular microscope where the particles were described in terms of shape, sphericity and roundness. A small amount of the sample was also placed on a 60mm by 100mm tray, enough to fill a 10mm by 10mm square, and examined under a binocular microscope. Using a thin metal probe, mineral particles were separated creating two subsamples. Each particle in each subsample was counted and a mineral ratio was produced.

5.2.2.2 Palaeoethnobotany

The remaining soil samples were subsequently subjected to palaeoethnobotanical analysis. Depending on the size of the sample taken, the entire sample may be subjected to analysis or if it is quite large, only a subsample may be taken. Soil not used for analysis is stored as an archive. Soil subjected to analysis was measured in terms of volume (millilitres) and weight (grams). The sample was then floated using one of two different mechanisms.

The IDOT (Illinois Department of Transportation) screen is a manual flotation device. It consists of a fine 0.5mm mesh screen in the form of a metal bucket with handles. A large tub is filled with water. The IDOT screen is placed in the water to a depth where the top five inches remain above water and the soil sample is placed inside the screen where it becomes engorged with water. The screen is then agitated by shaking it and the sample separates into three parts. Organic material floats to the surface of the water in the screen and is skimmed off using brushes and hand held sieves. This organic material is referred to as 'flot'. Fine particles smaller than the mesh escape into the water and settle at the bottom forming the fine sample. The larger particles left in the IDOT screen is referred to as the coarse sample. Each of these samples are collected on trays and dried. The IDOT screen is favoured for small samples due to a higher recovery rate for organic material.

The Flote Tech style flotation machine is a mechanical flotation machine that uses forced air to agitate samples like the manual action of the IDOT screen. Due to its ability to process large volumes, the forced-air flotation machine, henceforth referred to as simply 'the flotation machine', is favoured for floating large samples. The flotation

machine consists of two drums at different heights connected by pipes and an overshoot from the higher drum. Both drums are filled with water and screens are placed into trays in the drums so that they sit just above the water. In the higher drum, air is pumped through pipes into the drum, agitating the water. This agitation causes the water to rise up through the screen placed at top of the higher drum and water spills down through the overshoot into the next drum. The soil sample is placed on the screen on the higher drum, where heavier soil dissipates through the water and settles at the bottom. Organic material is floated by the bubbles and pours over into the lower drum where it is collected on a fine screen. When organic material ceases to bubble over into the lower drum, the fine screen in the lower drum is removed and the flot collected on it is dried. Any stray organic material is collected with hand held sieves and dried with the flot on the fine screen. The soil that settles in the bottom of the higher drum is collected as a fine sample. Any large stones, artifacts or miscellaneous material that is collected in the screen of the higher drum is saved as a coarse sample.

The flot, fine and coarse are dried and subjected to inspection. Of the fine and coarse samples, a 10% subsample is taken for further examination, while 100% of the flot is tested. The remains of the fine and coarse samples are stored together with any of the soil sample that was preserved as an archive. The flot and subsamples are analyzed under a binocular microscope and picked apart using tweezers and brushes in search of identifiable organic material including seeds, needles, buds, fungal fruiting bodies, nuts, bracts, insect remains, charcoal fragments and micro artifacts such as flakes. Recovered organics are placed in gel capsules, grouped by type and subsequently separated into floral and faunal groupings.

Recovered organics are examined under a binocular microscope at 4x magnification. Seeds and other visually recognizable materials are compared to a variety of resources including the MUN Paleoethnobotany Laboratory Seed Collection. The most commonly used references for seed identification were Montgomery's *Seeds and Fruits of Plants of Eastern Canada and North Eastern United States* (1978), Hosie's *Native Trees of Canada* (1969), Harlow's *Trees of the Eastern and Central United States and Canada* (1957) and Halwas' 2006 *Seed Identification Manual for the Minas Basin Region of Nova Scotia*, a product of her work on the palaeoethnobotanical remains from the Western Minas Basin (Deal and Halwas, 2008) and her MA thesis work on Clam Cove (2006). Identified seeds were recorded using MUN Palaeoethnobotanical Record Sheets.

5.3 Summary

Field and laboratory methodologies for the 2012 investigations at St. Croix closely follow the methodologies of the previous research projects on the site. The utilization of the aforementioned methodologies allows for the synthesis and interpretation of a wide body of knowledge for the benefit of providing a comprehensive update of research at St. Croix. By undertaking both field excavations and laboratory analysis the undertakings of 1990 and 1993 can be more fully integrated into the 2012 research. This creates a more solid research base upon which the future research at St. Croix can be placed. The application of these methodologies both in the field and in the lab are outlined in Chapters 6, 7 and 8.

Chapter 6: Discussion of 2012 Excavations

The 2012 field season at St. Croix ran from July 3rd to July 20th with several extra visitations until the site was finally closed on the 27th of July. This chapter discusses the execution of fieldwork methodologies outlined in Chapter 6. A unit by unit description follows discussing the decisions which determined unit placement and a brief synopsis of the excavation of the unit including Lots and Features.

6.1 Field Methodology Execution

After an almost twenty year absence of archaeological investigations on the St. Croix site, the clearing where the 1990 and 1993 field schools took place featured little evidence of its past. Outlines of excavation units could still be identified by looking at growth levels of grasses along straight edges of the baseline. The original datum spike is lost but through triangulation from what prior excavation units could be identified and the cut line from the 1990 excavation, a new datum was established as close to the original as possible. Utilizing the datum, a compass and remnants of previous excavation units, a baseline was established running north 65 metres to the end of the Wasowski/Geres property. A cut line was made for line of sight (Figure 6.1). The original clearing of the 1990 and 1993 field school will hence forth be referred to as the 'base site'.

From July 2nd, 2012 to July 27th, 2012, the author and fellow MA candidate Adrian Morrison pursued subsurface testing at St. Croix. Assisting us in our efforts were MA supervisor Michael Deal and volunteers Heather MacLeod Leslie, head of

KMKNO's Archaeology division, her son Jake Leslie and Jodie Howe, a volunteer from the Millbrook Mi'kmaq community. Also present for two days were volunteers Steve Wall, a student of St. Mary's University's Anthropology undergraduate program, and Keith Pierce, a local resident with a keen interest in the Mi'kmaq presence in the area.

In keeping with the excavation practices of the 1990 and 1993 field schools, one metre square excavation units were strung in key areas in both the base site (Figure 6.2) and along the baseline (Figure 6.3). Excavation units in the base site were set due to their proximity to known areas of heavy artifact concentration along

Figure 6.1: View of the cutline and baseline extension north. (Source: Cameron Milner)

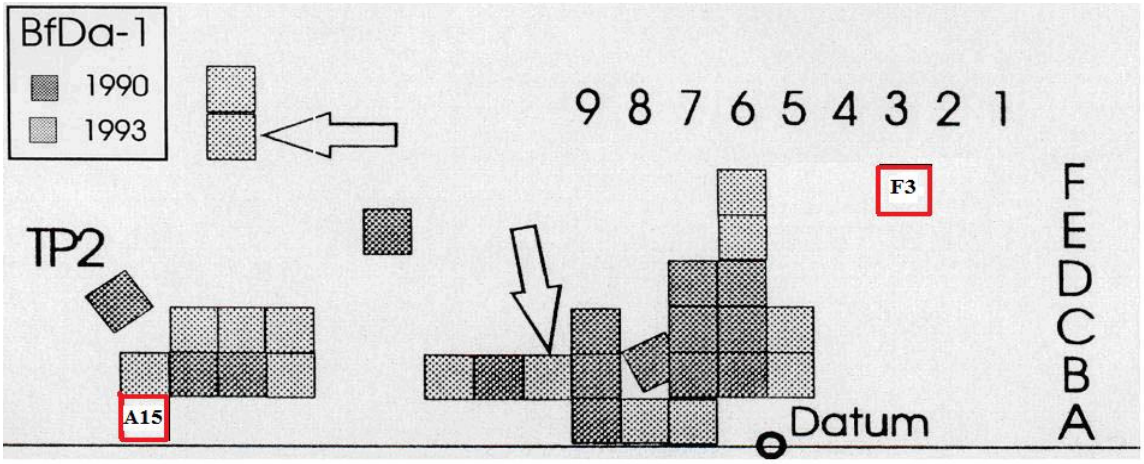

Figure 6.2: Diagram of 1990 and 1993 excavations with units A15 and F3 inserted. The new units are highlighted in red. (Source: Image courtesy of Michael Deal)

the outer edges of the clearing in the hopes of establishing the outer edges of the occupation area. Units A15 and F3 are the units in the base site.

Four units were initially set along the baseline in areas of interest. Unit A25 was set due to its proximity to a depression. Due to the possible Acadian cellar found during the 1989 Minas Basin Archaeological Project survey, the depression were suspected of being another Acadian cellar. The presence of hawthorn bushes within and around the depression added to this notion as both Native and European species are frequently found around Acadian sites (Erskine 1975:49). Unit A25 was placed so that part of the unit was on the outer edge of the depression and the rest was on the inner slope to maximize its recovery potential. Unit F25 was placed on the opposite side of the depression to confirm the findings of A25. Due to time constraints, F25 was 50cm by 50cm instead of the normal 1m x 1m unit.

Further north along the baseline were three other units. A38, A53 and A62 were placed on the edges of large, clear, flat areas similar to the base site. Surrounding these

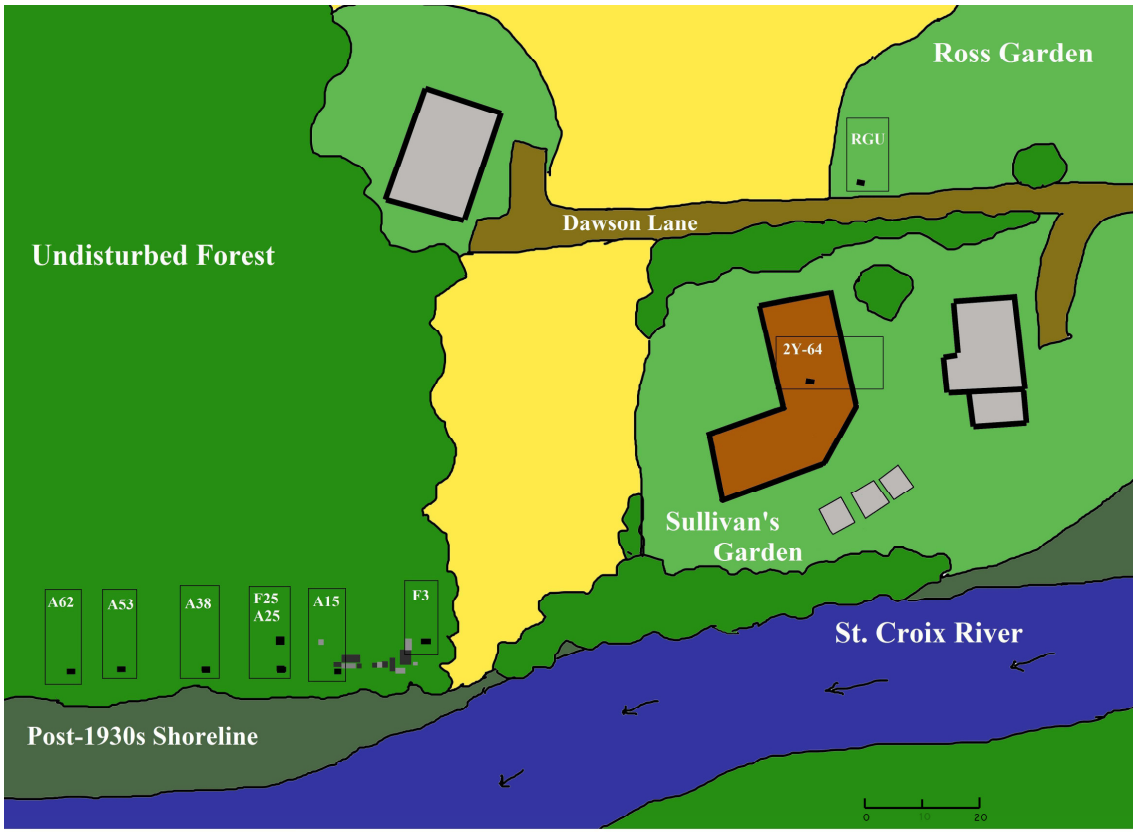

Figure 6.3: Scale map of the 2012 excavations depicting units north along the baseline and in areas of domestic cultivation. (Source: Cameron Milner)

clear areas were trees much like those found at the base site, which Deal established were approximately 150 years old (1994:12). There is no known historical use of these areas other than cattle pasturing (Deal, 1994:12), so the integrity of the archaeological record in these new units was thought to be of a similar quality as the base site.

In order to investigate the integrity of the archaeological record in areas of known domestic cultivation, the baseline was extended south and east towards the landowners' home and the larger community. A contemporary datum was established near the home to allow for ease of measurements. Two units were placed in previously cultivated areas. Unit 2Y-64 was placed within the garden area of the Wasowski/Geres property known as

Sullivan's Garden. The Sullivan's Garden area is what originally drew archaeologists to the site. It was in Sullivan's Garden that Clarence Burton found the pieces in his collection and it was near there that John Erskine dug his test units. The evidence of the aboriginal occupation on the site is scattered across its surface, which proved to be very rich in artifacts even after years of personal collecting by the landowners. In addition to excavation, surface collection occurred on a semi-regular basis after rainfalls and the regular release of the land owner's chickens. The actions of the rains eroded the soil and the chicken's scratching exposed new artifacts.

The second unit placed in an area of known domestic cultivation is RGU, or the Ross Garden Unit. The unit was named for both its location in the neighbouring property owned by the Ross family and due to our inability to properly establish its position on the grid due to extensive tree coverage and a fence. GPS points were taken in lieu of grid measurements. The unit was placed in a large field once used for small scale farming by the Ross family but since turned to grass. A GPS point was also taken for the unit (N 44˚ 57.824 W 064˚ 01.902).

Upon completion of the units, measurements were taken by total station surveying machine of the ordinal corners of each unit and a final depth measurement of the Northeastern corner. Profile drawings were taken within each unit. Units were then backfilled.

6.2 Units

The excavation process complied as closely as possible to the practices set out during the 1990 and 1993 field schools (see: 5.1 Fieldwork Methodologies). The

following is a description of the individual units including variations in stratification and soils, artifact densities and qualities, and the presence of features. Actions taken in regard to particular features or changes are also discussed. A comparative model of each unit's stratigraphy is provided in Table 6.1.

6.2.1 A15

Unit A15 was set along the edge of B15, part of a larger collection of units from 1990 and 1993. The unit's proximity to the edge of the original river bank and the outer edges of the base site as well as the large size of the collection of heritage material recovered from B15 were the primary deciding factors in its placement. The unit followed the same stratification as observed by the 1990/1993 field schools (Figure 4.4). Artifacts collected were exclusively lithic. No ceramic material was recovered. A sediment sample was taken from the occupation layer but was unaccounted for upon the arrival of the 2012 sediment samples at Memorial University's Palaeoethnobotany lab. As the first completed unit, excavation continued after Lot 2 ceased and Lot 3 failed to produce any heritage material, a shovel was employed to explore the depths of Lot 3 to determine if there was any evidence for earlier deposits. Explorations went to a depth of 50-60cm and recovered no evidence of an earlier occupation layer.

6.2.2 F3

Unit F3 was set at the edge of the base site in a clear area surrounded by large trees to test the outer reaches of the base site in an area that had not been tested. Just South of the large trees is an abandoned lot, part of the Wasowski/Geres property once used for cultivation. The unit followed the same stratification as set out by the 1990/1993 field schools (Figure 6.4). Artifacts continued to be found into Lot 3, possibly from

bioturbation from the large roots systems which criss-crossed the unit. Ceramic sherds were the most common formal artifact with only a few formal lithic artifacts and flakes making up the rest of the unit's assemblage. A soil sample was collected from the occupation layer (Lot 2). After Lot 3 ceased to produce any more cultural material, excavation continued by shovel to a depth of 50cm to determine if there was any evidence of earlier occupations. No evidence for an earlier occupation layer was found.

6.2.3 A25

As mentioned above, A25 was placed across the sloping western edge of a depression suspected of being an Acadian cellar. The unit's strata progressed according to the stratification set out by the 1990/1993 field schools (Figure 4.4). A small depression containing pottery sherds and a darker soil than the surrounding Lots was found extending into the east wall (Figure 6.4). It was labeled Feature 1. Ceramic, lithic and historic artifacts were recovered in A25, including a pipe stem fragment. No evidence was found to indicate an Acadian origin to the depression. A sediment sample was taken from Lot 2.

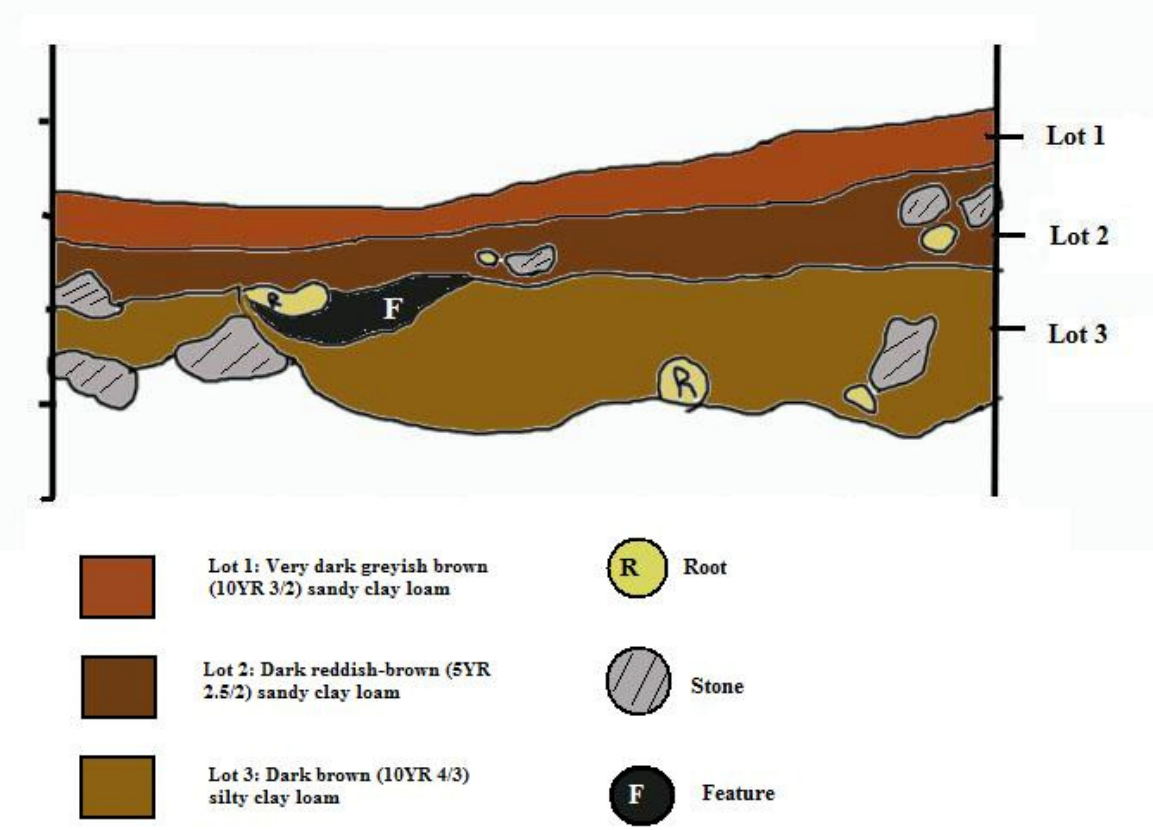

Figure 6.4: The eastern profile of unit A25. (Source: Cameron Milner)

6.2.4 F25

Despite the lack of evidence found in A25 for an Acadian origin for the depression, it was decided that a unit would be placed at the top of the depression where a small earthen mound was located. A 50x50cm unit was dug to explore this hypothesis and to determine if there was any evidence of a foundation wall on the eastern side of the depression. The unit's strata were in line with the 1990/1993 field schools except for a layer of coarse sand and pebbles labeled Lot 7 extending into the western wall. The

lighter colour of the soil may be an indication of leaching but it its position between two layers established it as its own Lot. In addition to ceramic and lithic artifacts, a small cluster of what is believed be red ochre was found where Lot 2 meets Lot 7. No formal artifacts were found in Lot 7.

6.2.5 A38

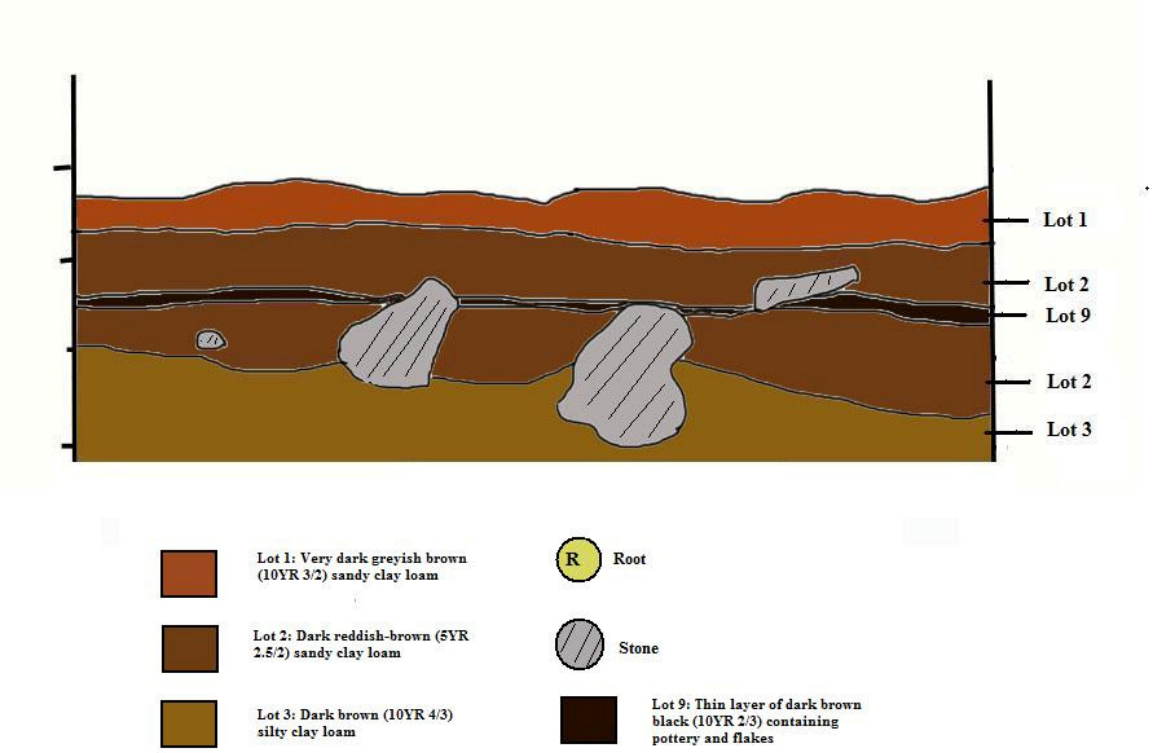

Figure 6.5: Western profile of unit A38 showing the Lot 9 deposit. (Source: Cameron Milner)

A38 was placed at the edge of a large clearing, similar to the one found at the base site. In terms of stratification the unit progressed in the same manner as the other units except for a thin layer of mottled dark soil dubbed Lot 9 (Figure 6.5). Lot 9 contained flakes and pottery and highly fragmentary charcoal throughout. Concentrations of charcoal thought to be hearth scatter were designated Feature 5, although no direct evidence of heat alteration was found in the soil. Lot 2 of A38 was rich in cultural material including

lithics, ceramics and flakes. Of keen interest are three projectile points found near the edges of the unit and a number of pottery clusters throughout. A large amount of quartz crystal was also found strewn about the unit, in both Lots 2 and 9. Two small historic glass fragments were found within Lot 1. Two sediment samples were taken, both from Lot 2. The shallow depth of Lot 9, only a few centimetres, precluded it from sediment sampling.

6.2.6 A53

Unit A53 was placed on the edge of another clear area, separated from the clearing next to A38 by a bank of young trees. A53 followed the stratification determined by the 1990 and 1993 field schools but contained a number of features. Lots 8 refers to a change in soil determined to be related to a hearth feature. The Lot was subdivided into Lot 8A, a dark soil with highly fragmentary charcoal and a high concentration of flakes, and Lot 8B, a small depression of heat altered soil extending into the North wall (Figure 6.6). Combined, Lot 8A and 8B constitute Feature 6. Two runs of stone in parallel lines extend north to south along the eastern edge of A53. When excavated, the soil around them was loose and filled with air filled hollows. An ant colony within the stones appears to account for the hollows. Sediment samples were taken from Lots 2, 8A and 8B.

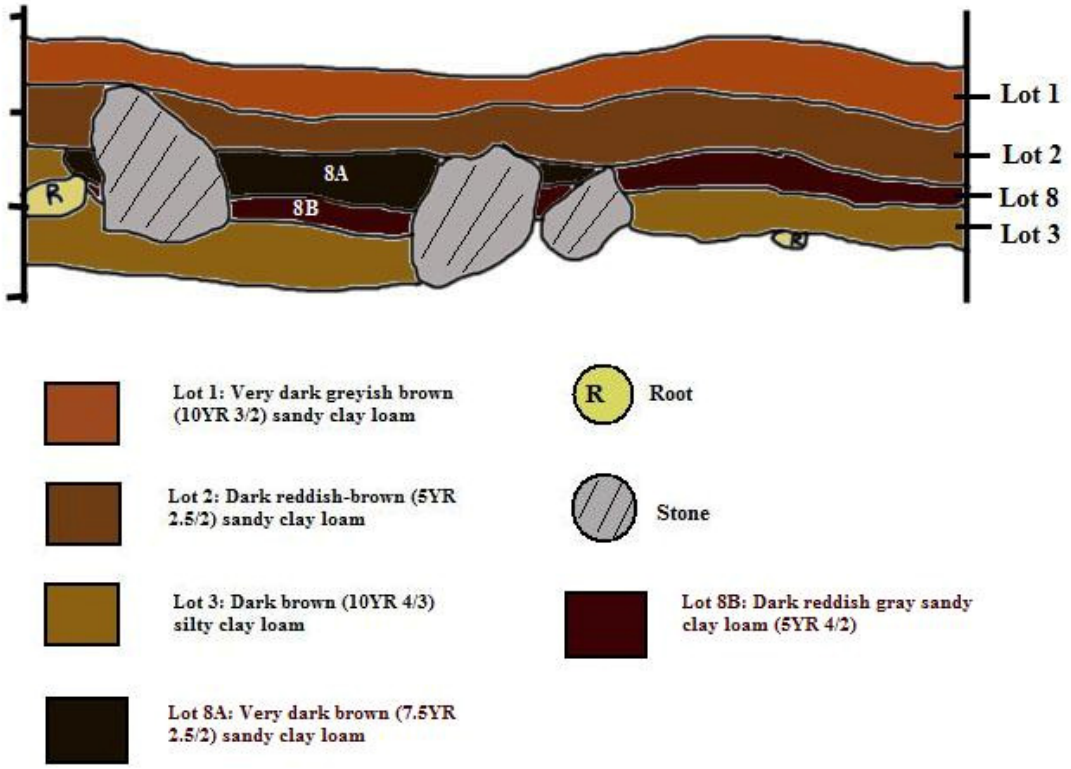

Figure 6.6: The northern profile of unit A53. The hearth Feature 6 is visible in Lots 8A and 8B. (Source: Cameron Milner)

6.2.7 A62

A62 was set in a small flat area close to the northern edge of the Wasowski/Geres property. The area is surrounded on all sides by young trees and represented the most accessible location for a unit at the far reaches of the property. The stratification of A62 followed the 1990/1993 field school stratigraphy but on a very shallow scale, reaching a depth of between 12 and 15 centimetres with a shallow Lot 1. Artifacts recovered include bifacial lithics and a number of ceramic sherds, as well as flakes. A sediment sample was taken from Lot 2.

6.2.8 2Y-64

Unit 2Y-64 was placed within Sullivan's Garden to investigate the level of disturbance found in areas of known cultivation. The strata of this unit were dramatically different than other units due to decades of ploughing. The soil below the tilled garden surface was designated Lot 6, a mottled mixture of Lots 1 and 2 and possibly soil additives like manure and compost. As with the surface, Lot 6 was rife with archaeological material, including formal lithics, ceramic sherds, a variety of historic materials, and flakes.

Below Lot 6 was a thin layer of dark soil which appears to be a remnant of the

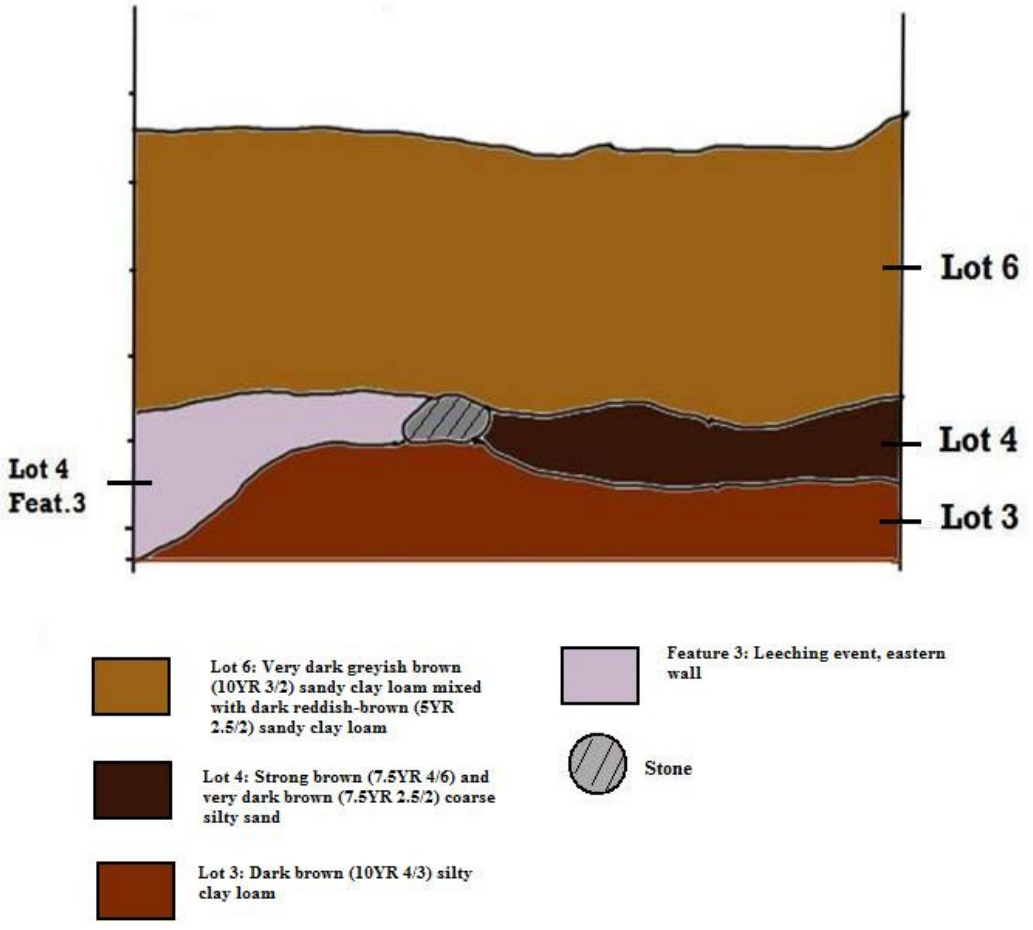

Figure 6.7: The southern profile of unit 2Y-64. The undisturbed layer, Lot 4, is located at the same depth as Feature 3, a leaching event. (Source: Cameron Milner)

occupation layer, although visually and geophysically different (Figure 6.7). This thin layer was dubbed Lot 4 and also contained lithic and ceramic artifacts while containing no historic material. As with other excavation units, Lot 4 ceased to produce archaeological material and changed into Lot 3. A sediment sample was taken from Lot 6 and the juncture between Lot 4 and Lot 3 meet.

6.2.9 RGU (Ross Garden Unit)

The Ross family whose property is across the road from the Wasowski/Geres property (Figure 6.8) allowed us to place a unit within a field adjacent to their house. Having been previously utilized for domestic cultivation, the unit sought not only to look at disturbance levels in the broader St. Croix community but to determine how far into the community the site might extend. Unlike 2Y-64, the field where RGU is located was seeded for grass and had a Lot of a similar composition to Lot 1. Underneath however was Lot 6, the same mottled mixture of Lots 1 and 2 and possibly soil additives like manure and compost found in 2Y-64. Artifacts from Lot 6 include formal lithic tools, flakes and ceramic sherds, as well as some historic material. As with 2Y-64, under Lot 6 was a thin layer of sediment of a different colour and composition labeled Lot 5 (Figure 6.8). This Lot contained a number of lithic and ceramic artifacts and no historic material. Below Lot 5 was Lot 3, which contained no cultural material. A sediment sample was taken from Lot 6.

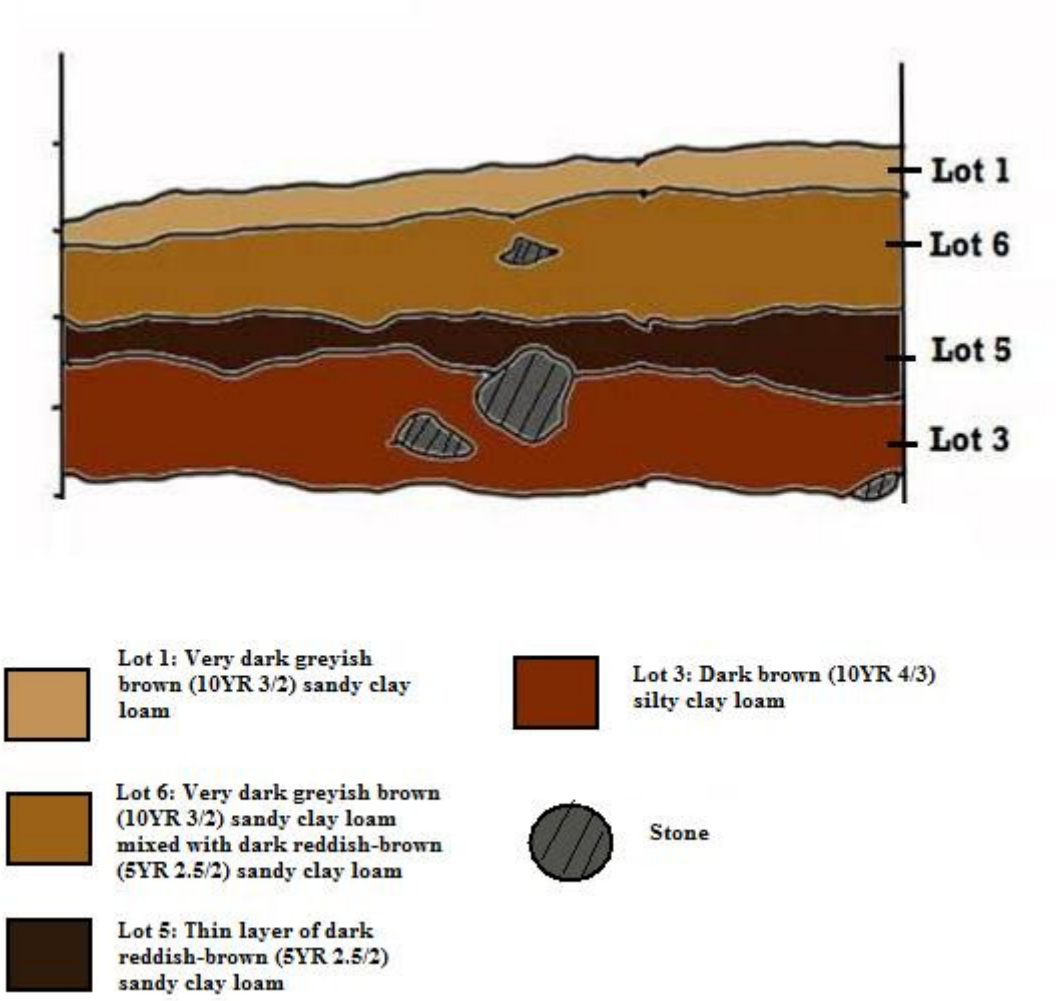

Figure 6.8: The southern profile of RGU. The undisturbed layer, Lot 5, is visible below the plow zone, Lot 6. (Source: Cameron Milner)

Table 6.1: Lots and Features present within each unit.

Unit	Lot	Lot	Lot	Lot	Lot	Feature	Feature
F3	Lot 1 :Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 3: Dark brown (10YR 4/3 to 10YR 4/4) silty clay loam				
A15	Lot 1: Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 3: Dark brown (10YR 4/3 to 10YR 4/4) silty clay loam				
A25	Lot 1: Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 3: Dark brown (10YR 4/3) silty clay loam			Feature 1: small depression containing dark soil and pottery fragments.	
F25	Lot 1: Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 7: Brown (7.5YR 5/2) Sandy clay with coarse to fine pebbles throughout	Lot 3: Dark brown (10YR 4/3) silty clay loam			
A38	Lot 1: Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 9: Thin layer of dark brown black (10YR 2/3) containing pottery and flakes	Lot 3: Dark brown (10YR 4/3) silty clay loam		Feature 5: Possible hearth or charcoal scatter.	
A53	Lot 1: Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 8A: Very dark brown (7.5YR 2.5/2) sandy clay loam	Lot 8B: Dark reddish gray sandy clay loam (5YR 4/2)	Lot 3: Dark brown (10YR 4/3) silty clay loam	Feature 4: Odd run of stone along one side, little soil throughout.	Feature 6: Hearth in Lot 8, north wall.
A62	Lot 1: Very dark greyish brown (10YR 3/2) sandy clay loam	Lot 2: Dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 3: Dark brown (10YR 4/3) silty clay loam				
2Y -64	Tilled garden surface	Lot 6: Very dark greyish brown (10YR 3/2) sandy clay loam mixed with dark reddish-brown (5YR 2.5/2) sandy clay loam	Lot 4: Strong brown (7.5YR 4/6) and very dark brown (7.5YR 2.5/2) coarse silty sand	Lot 3: Dark brown (10YR 4/3) silty clay loam		Feature *3*: Leeching event, eastern wall	

6.3 Summary

Units dug during 2012 closely followed previous excavations in 1990 and 1993. Lots followed the 1990 excavation model with several differences related mostly to

human activity. Excavations in areas of domestic cultivation lead to the discovery of an undisturbed layer of sediment containing cultural material unaffected by ploughing, thereby disproving previous assertions that those areas were completely destroyed by human action. The analysis of artifacts and ecofacts recovered during the 2012 excavations follows in Chapters 7 and 8.

Chapter 7: Artifact Analysis

During the 2012 field season, lab space was provided in Acadia University's Environmental Sciences labs in Huggins Science Hall building. It was there that flakes were washed, artifacts were dry brushed and the initial catalogue of artifacts was formed. In autumn of 2012, the artifacts were transferred to Memorial University's Palaeoethnobotany Lab in Queen's College. These artifacts were further separated, organized and numbered according to a final artifact catalogue. Artifacts were numbered individually through the application of nail polish and India ink and remain in Queen's College collections room.

7.1 Lithic Artifacts

Lithic artifacts are one of the more numerous types of artifacts found at St. Croix, and indeed most aboriginal sites in Nova Scotia. Lithic tools were used every day and often created or modified regularly and the evidence for this reliance on lithic technology is found across St. Croix. The following is a description of the lithic artifacts found at St. Croix, divided by form and function into the following tool types: projectile points, bifaces, scrapers, unifaces, cores, groundstone tools, and debitage flakes. In-depth analysis of those tools which feature recognizable attributes is provided with each section.

7.1.1 Raw Materials

The raw materials found on site are congruent with other sites in the area, utilizing mostly local lithic resources. Stone quarries in Scots Bay produce many of the cherts found at St. Croix, notably the red and brownish yellow jaspers. Based on the

MUN lithic reference collection, the grey brown chert used to create artifacts such as biface BfDa-1:2150 may originate from Ross Creek, Nova Scotia. Using the same MUN reference collection, the pink and white chert lithics may originate from Davidson's Cove within Scot's Bay. The distinctive tan brown quartzite from quarries in White Rock is likely the source of the large quantity of quartzite objects. The origin of quartz lithics, which are abundant across Nova Scotia, is unlikely to be determined.

In the discussion of raw materials, chert variants like jasper and chalcedony are counted separately from cherts to determine any preference toward a specific variety and to keep with the recording practices of previous excavations at St. Croix. It should be noted that the majority of the author's experience is with cherts found in the Scots Bay region of the province, creating an identification bias. Some cherts within the 2012 assemblage from St. Croix may be forms of chalcedony and jasper not visually similar to those from Scots Bay and may be labeled simply as cherts. Thus, all artifacts labeled jasper and chalcedony are Scots Bay jaspers and chalcedonies.

7.1.2 Projectile Points

The 2012 field season recovered 14 projectile points, including 8 complete specimens (Table 7.1). For the purposes of differentiation, projectile points are diagnostically identifiable bifacially worked tools with a triangular shape and an intentional modified stem. Some fragmented point tips have been labeled projectile points due to the delicacy of the tip, indicating a highly worked blade and thus more likely a projectile point than a simple biface. This is a subjective assessment and is recognized as a potential source of bias. The projectile points are presented in figures 7.1 and 7.2.

Of those that could be identified, the majority of the projectile points are contracting stemmed, 'Tusket' style points (Buchanan, 2004) from the Early Middle Woodland Period (ca. 2350-2150 B.P.). Contracting stemmed points represent 9 of the 13 points recovered. BfDa-1:2138, BfDa-1:2143, BfDa-1:2183, and BfDa-1:2214 are all of the shallow shouldered, long bladed contracting stemmed style, perhaps all with rounded stem points as with 2138. The most visually striking point, BfDa-1:2240 with its fine point, wide shoulders and contracting stem was also most likely from the Early Middle Woodland period. It is possible that point BfDa-1:2274, despite its wider blade, may also have been contracting stemmed.

Two of the 13 points are corner-notched points from the late Middle to Late Woodland Period (2000-500 B.P.). BfDa-1:2206 and BfDa-1:2226 (Figure 7.1) are both corner-notched and are dated as such due to their relatively large size and corner-notching in comparison with points from the end of the Late Woodland which are smaller and often side notched. Their larger size may have precluded them from use as arrow heads, dating them before the trend towards smaller projectile points used for bow and arrow. It is also possible that the points simply represent the parallel use of darts and bows or the beginnings of arrow manufacturing. BfDa-1:2226, with its distinctive black chert, may be related to BfDa-1:2221, a scraper of the same material.

BfDa-1:2182 and BfDa-1:2183 bear a striking resemblance to pieces from Ritchie's collection of New York Lamoka points, encompassing both the straight stemmed and slightly side notched varieties, a style that Ritchie notes was still in use until the Middle Woodland Period (1971:29). However, it is more likely that point BfDa-1:2183 is a re-sharpened contracting stemmed projectile point similar to BfDa-1:2138.

Considering the thickness of the center of BfDa-1:2183 relative to the width of the projectile, BfDa-1:2183 would make more sense as a point that had once been much wider but had been reworked to a much smaller point, retaining its original thickness in the middle.

Quartzite was by far the dominant source material used for the production of projectile points. The expediency of quartzite from the White Rock Formation as a raw material source may explain the prevalence of the stone on site. The projectile points from 2012 are in keeping with Jalbert's observations of the dominance of quartzite for contracting stemmed projectiles and chert for notched projectiles (Jalbert, 2011:80).

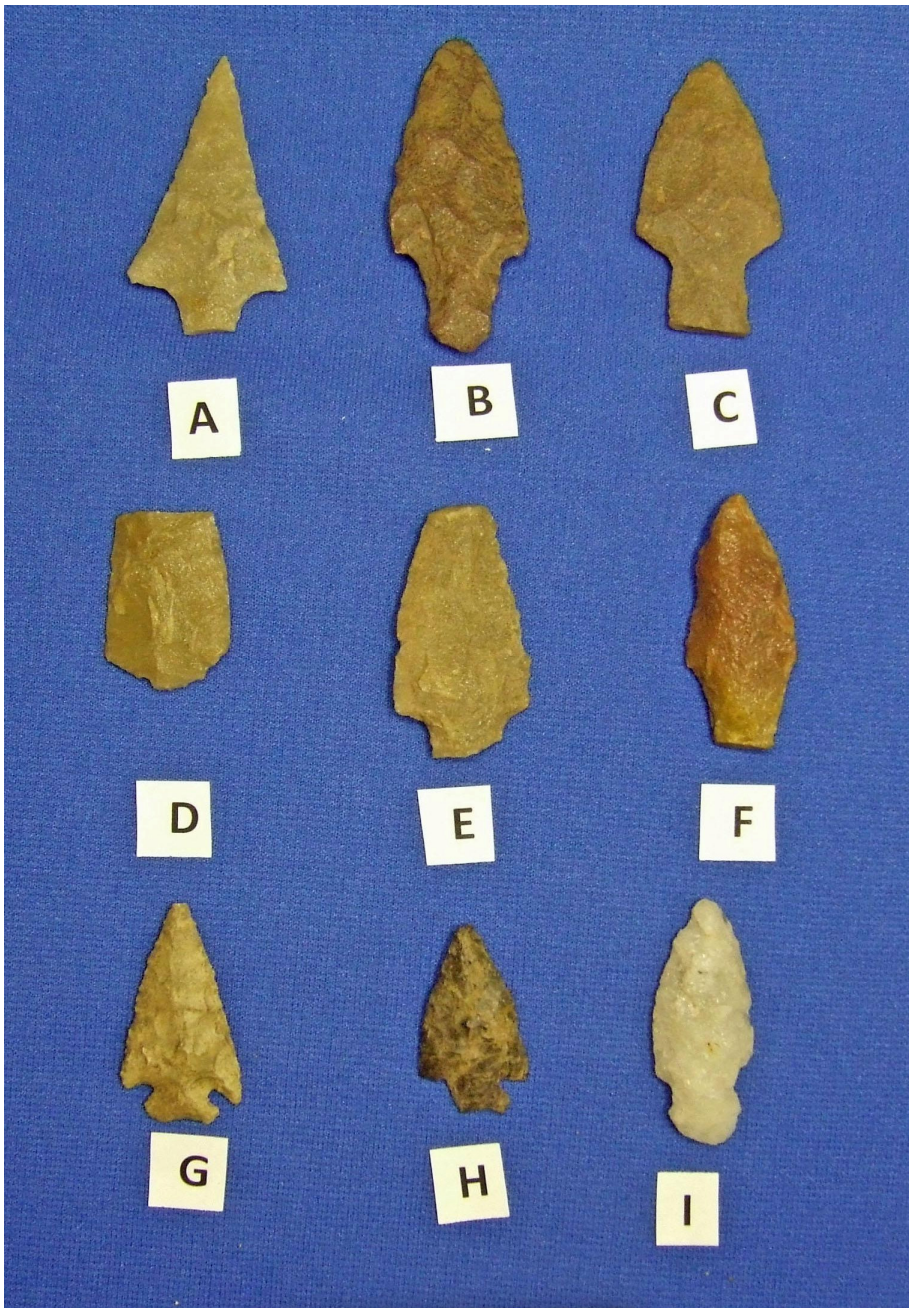

Figure 7.1: Projectile points BfDa-1:2240 (A), BfDa-1:2138 (B), BfDa-1:2274 (C), BfDa-1:2143 (D), BfDa-1:2214 (E), BfDa-1:2183 (F), BfDa-1:2206 (G), BfDa-1:2226 (H) and BfDa-1:2182 (I). (Source: Cameron Milner)

Table 7.1: Projectile points.

Number	Unit	Lot	Material	Quantity	Thickness	Width	Length
BfDa-1:2138	SG	Surface	Quartzite	1	8.90	24.69	61.67
BfDa-1:2143	SG	Surface	Quartzite	1	6.79	21.74	23.51
BfDa-1:2182	SG	Surface	Quartz	1	8.51	17.91	45.46
BfDa-1:2183	SG	Surface	Quartzite	1	8.62	19.21	47.14
BfDa-1:2201	2y-64	Lot 6	Quartz	1	7.04	18.25	26.86
BfDa-1:2206	SG	surface	White Chert	1	6.90	21.60	41.43
BfDa-1:2214	RGU	Lot 5	Quartzite	1	8.66	24.47	45.93
BfDa-1:2226	A38	Lot 2	Chert	1	7.33	19.36	35.64
BfDa-1:2227	A38	Lot 2	Quartzite	2	8.15	19.49	34.89
BfDa-1:2240	A38	Lot 2	Quartzite	1	7.15	28.73	54.73
BfDa-1:2260	A62	Lot 2	Quartzite	1	4.46	17.18	17.72
BfDa-1:2273	SG	Surface	Quartzite	1	4.23	13.71	18.66
BfDa-1:2274	SG	Surface	Quartzite	1	7.03	26.17	52.78

7.1.3 Bifaces

The 2012 excavations uncovered 35 bifaces, all of which are fragmentary (Table 7.2). For the purposes of identification, bifaces are tools with both the ventral and dorsal edges modified for cutting. The bottom of the tool may be worked for hafting purposes but there is no attempt at a formal stem. This category only includes finished bifaces. Those bifacial tools which appear to be in an unfinished state were instead placed with bifacial preforms. There is a potential for some of the highly fragmented bifaces to be projectile points but without the diagnostic features of a projectile point, it was decided to group them with the bifaces rather than skew the counts of formal projectile points. The bifaces are presented in figures 7.3, 7.4, 7.5 and 7.6.

Bifaces BfDa-1:2135 and BfDa-1:2247 are of a particularly high quality. BfDa-1:2135 is a small, lanceolate biface of red and yellow jasper from Scots Bay and is the only formal tool from A15. BfDa-1:2247 is another lanceolate biface made from chert, most likely from Scots Bay. Biface BfDa-1:2142 also has finely flaked cutting

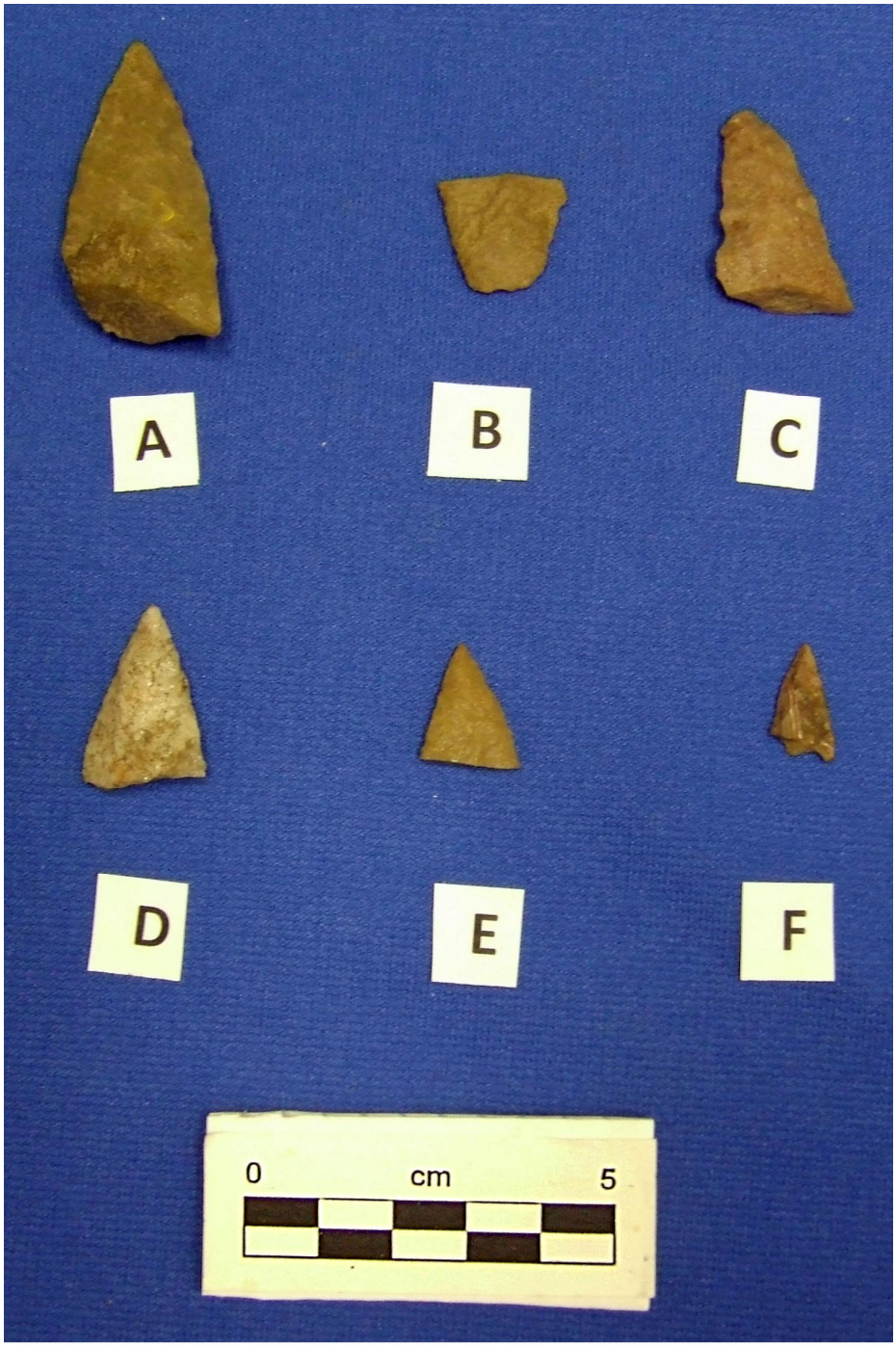

Figure 7.2: Projectile point fragments BfDa-1:2215 (A), BfDa-1:2260 (B), BfDa-1:2227 (C), BfDa-1:2201 (D), BfDa-1:2273 (E) and BfDa-1:2213 (F). (Source: Cameron Milner)

edges ending in a point. Biface BfDa-1:2178 is a long bifacial tool with a large raised area along its central ridge which may be the reason the blade edges do not exhibit use wear. The long, thin form of BfDa-1:2178 may also indicate its intended use as a perforating tool prior to its abandonment due to a large raised area in its center that may have been too difficult to knap. Biface BfDa-1:2217 is a long, thin bifacial blade with its tip missing. One of BfDa-1:2217's lateral edges closest to its base is worn, which may indicate use wear or purposeful grinding for hafting purposes. Based on their size, large bifaces BfDa-1:2211 and BfDa-1:2174 found in RGU may have been used as chopping tools.

A common biface form is an ovate, 'tear-drop' shaped blades with a convex base. Bifaces BfDa-1:2150, BfDa-1:2205, BfDa-1:2211 and BfDa-1:2153 are all ovate. In addition to cutting, these may have served as blanks for the creation of other tools such as projectile points and scrapers (Andrefsky, 1998:150). Biface BfDa-1:2153 has the tip broken off in what could be an intentional modification to produce a perforating tool.

The raw materials used to create bifaces run the full breadth of source materials found on site. Chert is the most commonly used material with 12 specimens, with an additional 5 more specifically made of jasper. Quartzite is also quite commonly used, represented by 11 bifacial tools. Quartz (4) is used less, perhaps because of the poor knapping quality of the stone. During the 1993 excavations, quartzite and quartz were found to be the dominant source material for bifaces representing 55% of the sample, while during the 1991 excavations quartz and quartzite represented 46%, indicating consistency with raw material use trends for bifacial tools (Deal, 1991:7; Deal, 1994:11).

Figure 7.3: Bifaces 2135 (A) and 2247(B). (Source: Cameron Milner)

Table 7.2: Bifaces.

Number	Unit	Lot	Material	Portion	Thickness	Width	Length
BfDa-1:2118	F3	Lot 2	Chert	Tip	8.11	39.58	51.08
BfDa-1:2135	A15	Lot 2	Jasper	Point tip	4.98	16.35	30.77
BfDa-1:2136	A15	Lot 2	Quartzite	Tip	5.48	18.75	31.37
BfDa-1:2141	SG	Surface	Chert	Tip	6.71	26.52	28.1
BfDa-1:2142	SG	Surface	Jasper	Tip and body	5.41	16.91	27.8
BfDa-1:2150	SG	Surface	Chert	Base	10.08	25.47	34.03
BfDa-1:2152	SG	Suface	Quartzite	Tip	8.12	37.59	38.5
BfDa-1:2153	SG	Suface	Chert	Base	7.74	27.35	40.31
BfDa-1:2154	SG	Suface	Quartz	Base	6.99	16.25	27.20
BfDa-1:2155	SG	Suface	Quartz	Base	7.19	21.65	23.30
BfDa-1:2165	2y-64	Lot 6	Chert	Fragment	10.2	29.07	36.25
BfDa-1:2174	RGU	Lot 6	Quartzite	Point	23.53	55.76	75.72
BfDa-1:2178	RGU	Lot 6	Chert	tip	14.26	25.32	58.65
BfDa-1:2179	SG	Surface	Jasper	Tip	5.28	11.94	55.74
BfDa-1:2198	2y-64	Lot 6	Chert	Fragment	7.26	29.69	34.31
BfDa-1:2205	2y-64	Lot 6	Chert	Base	6.89	26.66	33.41
BfDa-1:2210	RGU	Lot 5	Quartzite	Tip	8.80	23.95	41.61
BfDa-1:2211	RGU	Lot 5	Quartzite	base	12.84	34.14	53.81
BfDa-1:2213	RGU	Lot 5	Jasper	Tip	4.68	9.76	17.43
BfDa-1:2215	RGU	Lot 5	Quartzite	Tip	14.39	22.4	50.51
BfDa-1:2217	RGU	Lot 5	Quartz	Base	6.66	22.42	53.23
BfDa-1:2222	A53	Lot 3	Quartzite	tip	6.63	26.54	37.50
BfDa-1:2244	SG	Suface	Jasper	Base	6.42	22.23	29.36
BfDa-1:2247	A62	Lot 2	Chert	Tip	7.30	21.29	47.20
BfDa-1:2263	A53	Lot 2	Quartzite	Shard	11.30	25.54	43.45
BfDa-1:2271	F25	Lot 2	Chert	Base	7.58	24.94	29.37

Table 7.2 Continued: Bifaces

Number	Unit	Lot	Material	Portion	Thickness	Width	Length
BfDa-1:2272	2Y -64	Lot 2	Quartz	Base	13.49	25.45	40.09
BfDa-1:2277	SG	Suface	Quartzite	Base	7.93	23.41	30.66
BfDa-1:2278	SG	Suface	Quartzite	Shard	5.70	26.90	31.90
BfDa-1:2280	SG	Suface	Chert	Base	4.26	17.97	27.39
BfDa-1:2317	A53	Lot 8A	Quartzite	Tip	7.15	28.00	28.60
BfDa-1:2318	2Y-64	Lot 6	Chert	Utilized Flake	12.30	14.80	37.95
BfDa-1:2320	2Y-64	Lot 6	Quartz	Body section	5.20	17.70	5.50
BfDa-1:2323	A53	Lot 8A	Quartzite	Lateral edge	9.00	20.90	60.5
BfDa-1:2325	A38	Lot 3	Quartzite	Tip	6.70	19.40	35.00

Figure 7.4 Bifaces Bfda-1:2272 (A), Bfda-1:2178 (B), Bfda-1:2217 (C), Bfda-1:2155 (D), Bfda-1:2136 (E), Bfda-1:2154 (F), Bfda-1:2142 (G), Bfda-1:2277 (H), Bfda-1:2179 (I), Bfda-1:2118 (J), Bfda-1:2141 (K) and Bfda-1: 2280 (K). (Source: Cameron Milner)

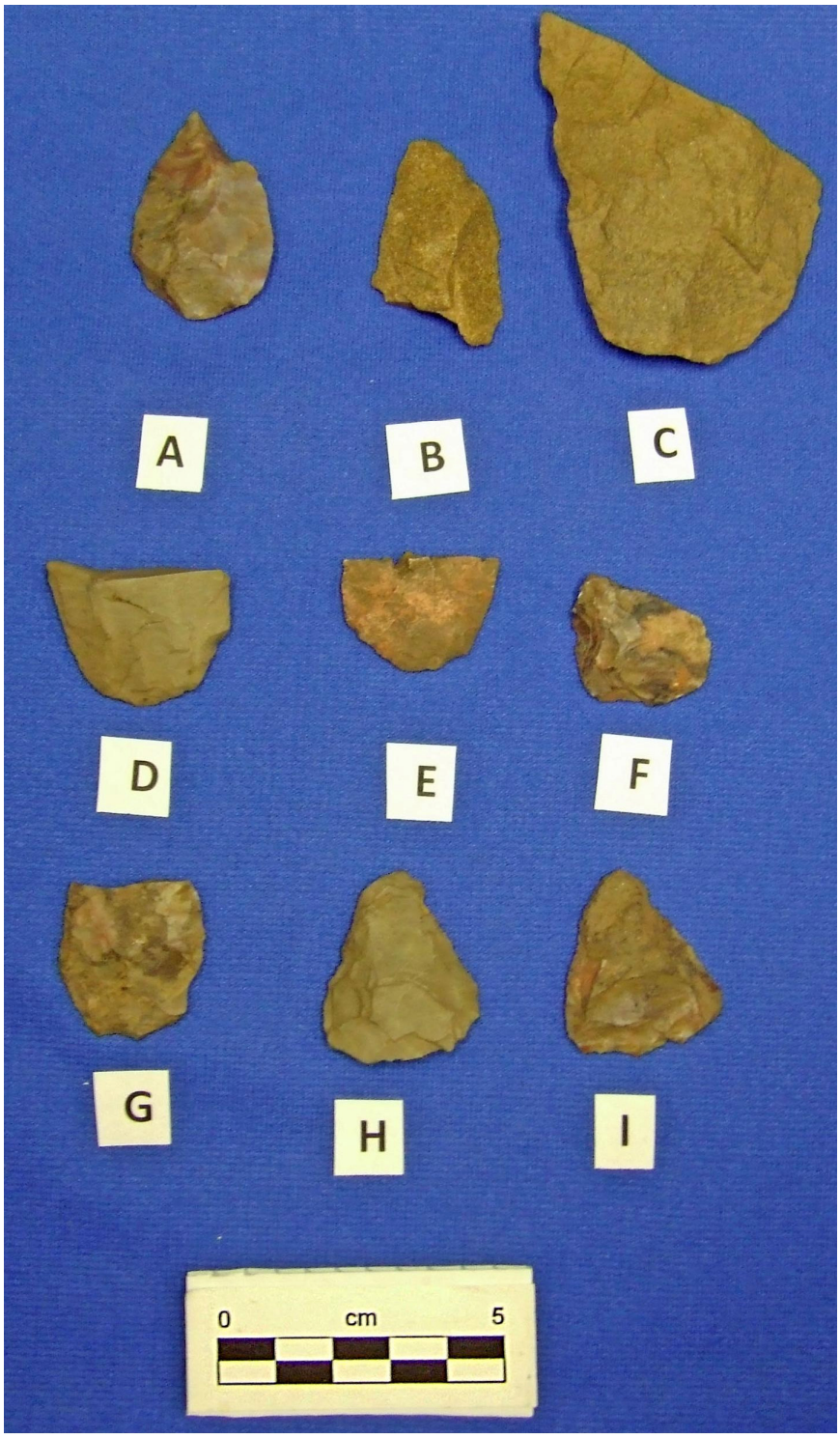

Figure 7.5: Bifaces BfDa-1:2153 (A), BfDa-1:2263 (B), BfDa-1:2174 (C), BfDa-1:2150 (D), BfDa-1:2244 (E), BfDa-1:2271 (F), BfDa-1: 2205 (G), BfDa-1:2165 (H) and BfDa-1:2198 (I). (Source: Cameron Milner)

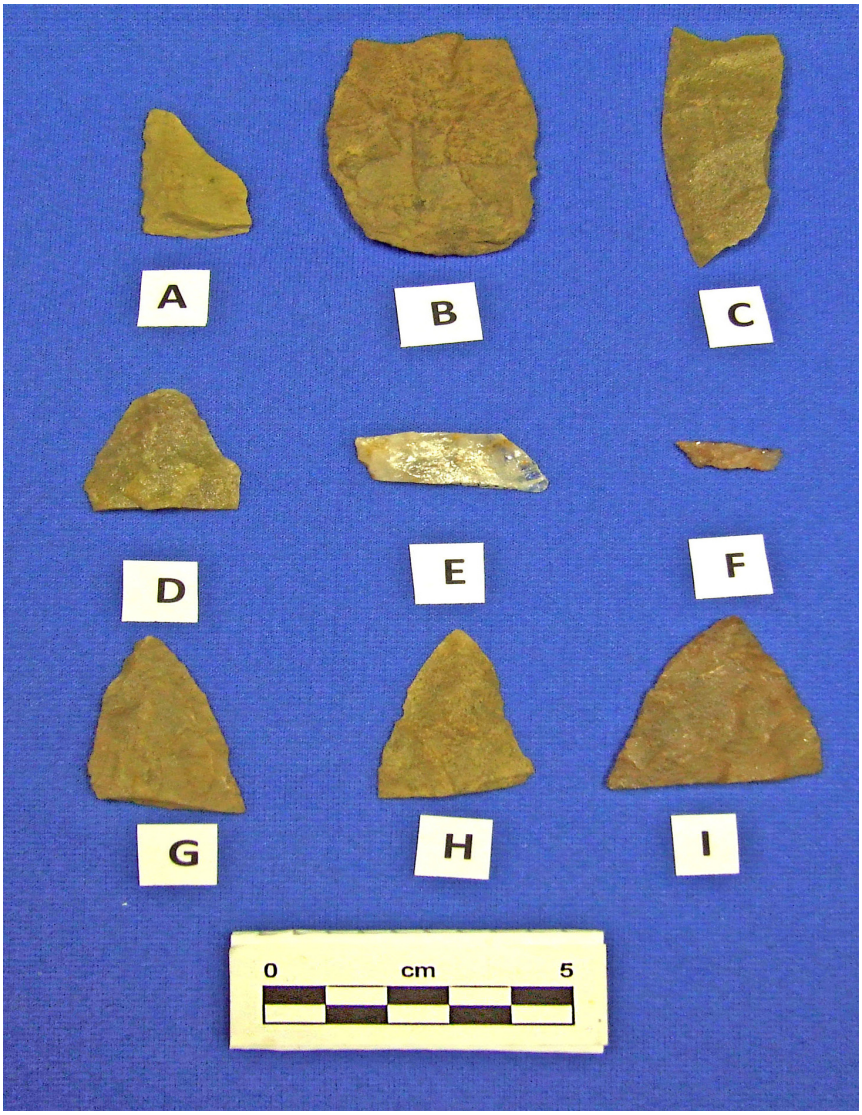

Figure 7.6: Bifaces BfDa-1:2325 (A), BfDa-1:2211 (B), BfDa-1: 2323 (C), BfDa-1:2317 (D), BfDa-1:2278 (E), BfDa-1:2320 (F), BfDa-1:2210 (G), BfDa-1:2222 (H) and BfDa-1:2152 (I). (Source: Cameron Milner)

7.1.4 Unifaces

Artifacts dubbed unifaces are lithic tools with only one worked edge. Their shape is highly variable as they are often simply utilized flakes with limited modification beyond the creation of a cutting edge. Unifaces were used as an impromptu cutting utensil, easily produced from flakes or damaged tools. They were used mainly as an expedient cutting tool. The unifaces are presented in figure 7.7 and in a breakdown in Table 7.3.

Six unifaces were recovered in 2012, mostly simple cutting tools with dorsal and ventral scaring along modified edges. Uniface 2145 (Figure 7.7 C) has a long cutting edge and a large spur that may have been used for engraving or puncturing. Wear on the tip of this spur may be indicative of these activities. Uniface BfDa-1:2147 features a series of large flake scars forming a cutting edge, but also a separate series of small scars forming what could be a scraping edge.

Table 7.3: Unifaces

Number	Unit	Lot	Material	Thickness	Width	Length
BfDa-1:2145	SG	Surface	Jasper w/ Cortex	10.55	28.85	47.04
BfDa-1:2147	SG	Surface	Chert	11.59	19.99	48.52
BfDa-1:2151	SG	Surface	Chert/Jasper	8.31	25.23	36.65
BfDa-1:2167	2y-64	Lot 6	Quartz	11.19	30.71	46.59
BfDa-1:2219	RGU	Lot 5	Quartz	14.30	42.90	34.80
BfDa-1:2233	A38	Lot 2	Quartzite	10.95	33.49	43.64

The raw materials of the unifacial assemblage are split evenly between higher quality silicates like jaspers and more difficultly knapped lithics like quartzite and quartz.

Uniface 2145 still has cortex on its dorsal surface, reinforcing the idea of a uniface as an impromptu cutting utensil made from whatever was available. Jasper and quartzite have been found to be the dominant raw materials for unifacial flakes during the 1990 and 1993 excavations indicating a possible preference for those raw materials for expediency tools (Deal 1991:9; Deal 1994:11).

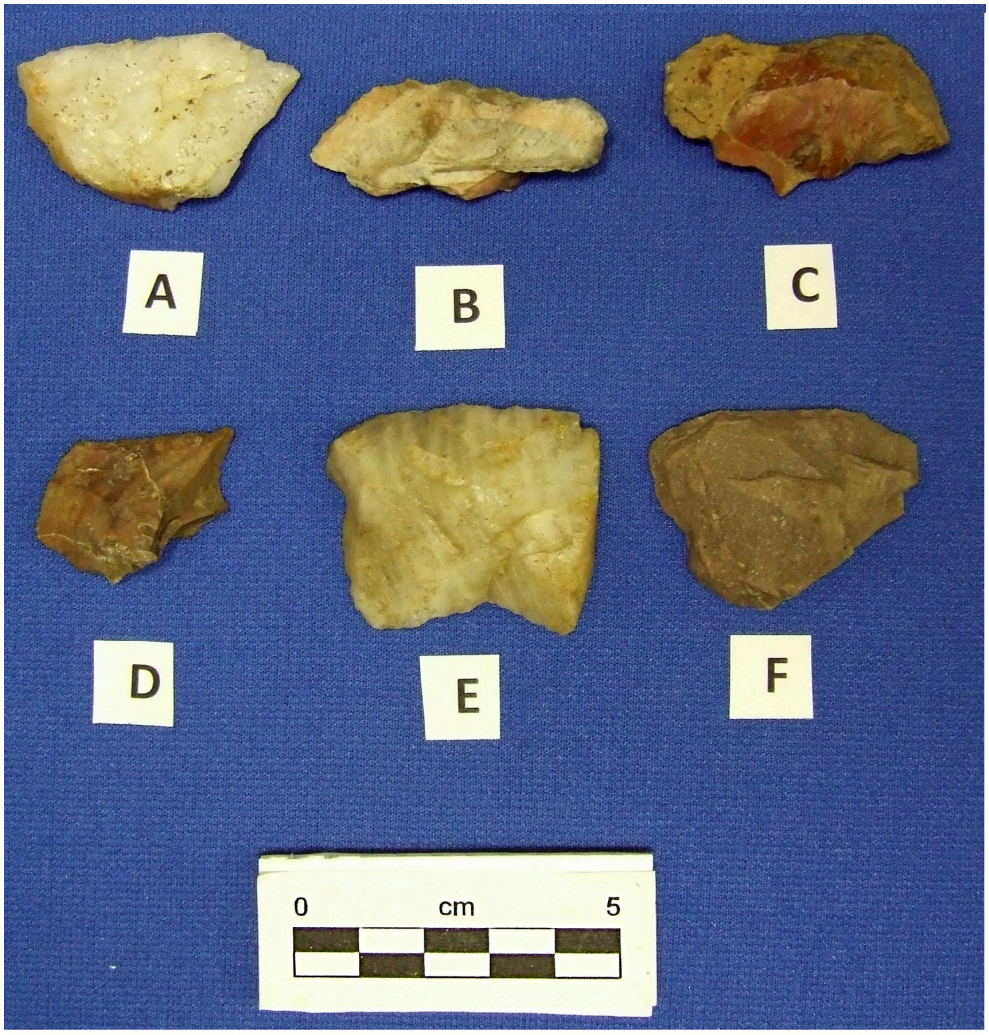

Figure 7.7: Unifaces BfDa-1: 2167 (A), BfDa-1:2147 (B), BfDa-1:2145 (C), BfDa-1:2151 (D), BfDa-1:2219 (E) and BfDa-1:2233 (F). (Source: Cameron Milner)

7.1.5 Scrapers

Scrapers are also unifacial tools, but for the purposes of distinguishing the two, scrapers are here described as having one flat or unmodified side and a working edge with an angle of approximately 60-90 degrees in keeping with Andrefsky's definition (1998:xxvi). Scrapers were used, as their name implies, as scraping implements to prepare hides through the removal of excessive fat, hair and tissue as well as modify other materials such as wood, antler and bone (Andrefsky 1998:193-194). The wooden elements of birch bark canoes and containers also required preparation with scraping tools. It is believed that the marked increase of scraping tools found during the Woodland period is attributable to the increase dependence on birch bark as a construction resource (Deal 2013). Scrapers are shown in Figure 7.8 and Table 7.4.

Table 7.4: Scrapers

Number	Unit	Lot	Material	Thickness	Width	Length
BfDa-1:2144	SG	Surface	Chalcedony	7.10	23.70	22.22
BfDa-1:2146	SG	Surface	Jasper	7.69	31.75	37.44
BfDa-1:2175	RGU	Lot 6	Quartzite	8.43	40.44	48.77
BfDa-1:2204	2y-64	Lot 6	White Chert	7.08	26.81	31.66
BfDa-1:2221	F25	Lot 2	Chert	3.47	22.93	33.70
BfDa-1:2223	A53	Lot 2	Jasper	5.46	10.41	20.62
BfDa-1:2311	2Y -64	Lot 6	Chert	6.70	29.20	38.80
BfDa-1:2261	A38	Lot 2	Jasper	6.34	17.31	19.07
BfDa-1:2262	2Y -64	Lot 2	Jasper	5.42	18.20	22.21
BfDa-1:2268	2Y -64	Lot 2	Chert	3.82	13.17	22.84
BfDa-1:2270	2Y -64	Lot 2	Quartzite	9.92	30.26	43.15
BfDa-1:2279	SG	Surface	Jasper	6.68	22.03	30.35
BfDa-1:2311	2Y -64	Lot 6	Chert	6.70	29.20	38.80

Figure 7.8: Scrapers BfDa-1:2221 (A), BfDa-1:2144 (B), BfDa-1:2279 (C), BfDa-1:2204 (D), BfDa-1:2261 (E), BfDa-1:2262 (F), BfDa-1:2223 (G), BfDa-1:2268 (H), BfDa-1:2146 (I), BfDa-1:2175 (J), BfDa-1:2270 (K) and BfDa-1:2311 (K). (Source: Cameron Milner)

Morphologically, the scrapers found at St. Croix in 2012 can be assigned several different categories based on attributes, although the variability in tool design means these categories are not mutually exclusive. Scrapers BfDa-1:2311, BfDa-1:2146, and BfDa-1:2204 are endscrapers, in that their scraping edge is formed along the distal end of the flake. BfDa-1:2146 also has use wear along its right ventral side which suggests its use for multiple functions, most likely as a cutting instrument. Artifacts BfDa-1:2279 and BfDa-1:2270 have been categorized as scraping tools, particularly end scrapers, but their level of modification is limited so they may be simple expediency tools used for a number of tasks. Scraper BfDa-1:2175 is a side scraper, meaning its scraping edge is along the lateral edge instead of the proximal or distal edges. Scraper BfDa-1:2221 has scraping edges on both the side and distal edges. Scraper BfDa-1:2261, BfDa-1:2262, BfDa-1:2144, and BfDa-1:2223 are all thumbnail scrapers, exceedingly small scrapers approximately the size of a human thumbnail. Scrapers BfDa-1:2261, BfDa-1:2262, BfDa-1:2144, and BfDa-1:2223 are all tools with scraping edges along both the distal and lateral edges. Scraper BfDa-1:2268 is a thumbnail scraper with its working edge on the lateral sides. With the exception of scraper BfDa-1:2175, all the scrapers above exhibit use wear.

The majority of scrapers in the BfDa-1:2012 assemblage are made out of some form of chert including jasper from the Scot's Bay area. Scraper BfDa-1:2144 may also be a chalcedony from Scot's Bay. Scrapers BfDa-1:2270 and BfDa-1:2175 are made of White Rock quartzite. The increased proportion of higher quality silicates such as cherts and jaspers within the scraper assemblage may stem from the ease with which such materials are worked in comparison to quartz and quartzite.

7.1.6 Drills

Two probable drills were found at St. Croix during the 2012 season (Table 7.5). Drills are defined here for identification purposes as bifacial tools with a long, thin body coming to a point. Drills are often thicker and less wide than simple bifacial tools, forming a square cross section as opposed to a flattened diamond. Quartzite is the dominate choice of raw material for drills among this assemblage. Drills could be used for a number of day to day activities, including the modification of bone, wood or other materials. The drills are shown in Figure 7.9.

Table 7.5: Drills

Number	Unit	Lot	Material	Thickness	Width	Length
BfDa-1:2116	F3	Lot 2	Quartzite	5.95	13.73	22.37
BfDa-1:2148	SG	Surface	Quartzite	13.81	19.18	45.31

7.1.7 Bifacial Cores and Preforms

For the purposes of categorization, bifacial cores and preforms are combined because they are essentially the same artifact from a morphological perspective, different only in intention. Four bifacial core fragments were recovered during the 2012 excavation (Table 7.6). Artifacts BfDa-1:2140, BfDa-1: 2239 and BfDa-1:2236 are bifacial but retain at least one unmodified side due to either a large striking platform (BfDa-1:2140, 2236) or breakage (BfDa-1:2239). Artifact 2140 appears to have been an attempt at a biface that was thwarted due to its undesirable thickness. All four bifacial cores are made of chert from Scot's Bay, with BfDa-1:2140 and BfDa-1: 2245 being made of jasper specifically. Bifaces are shown in Figure 7.10.

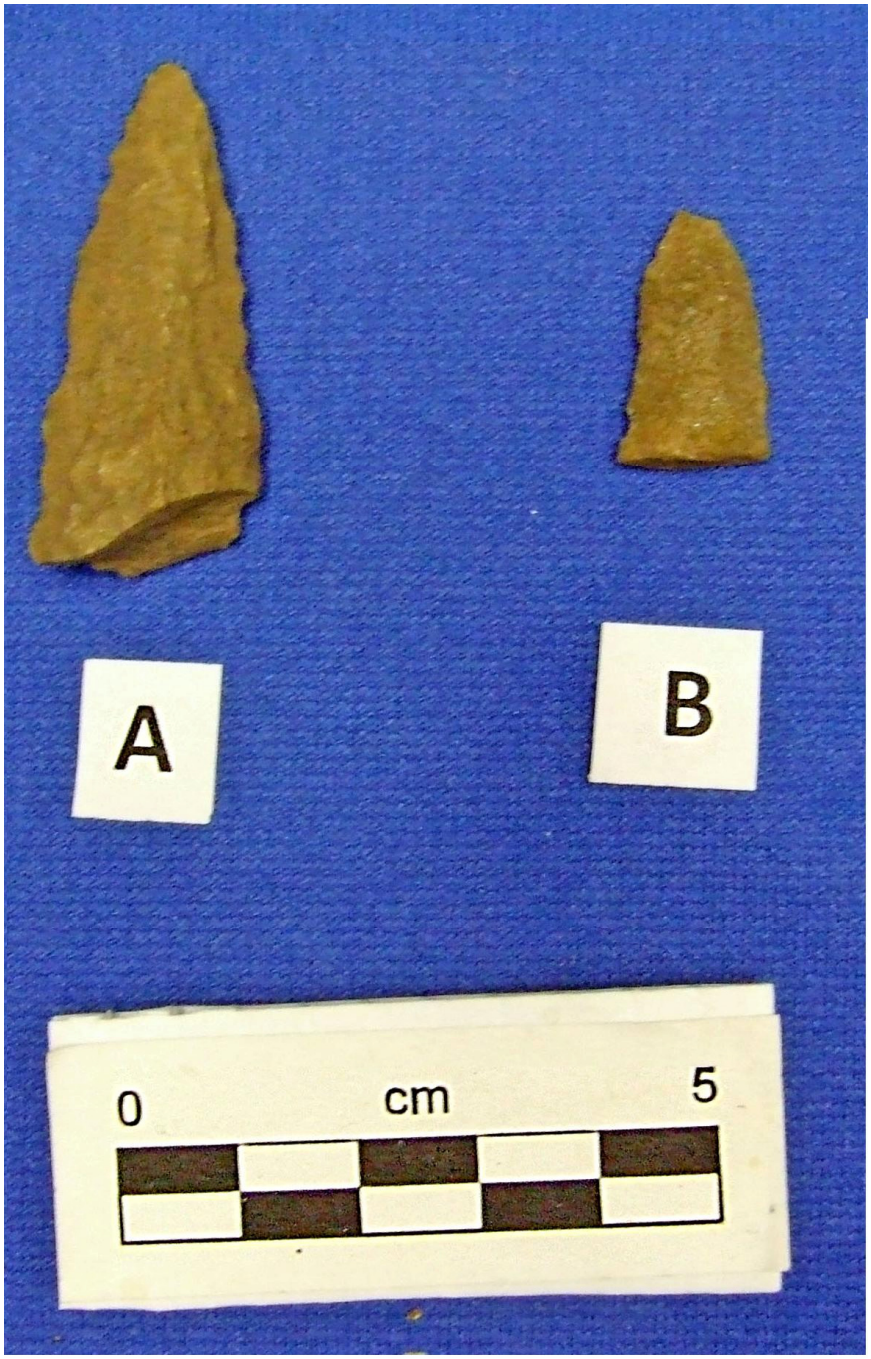

Figure 7.9: Drills 2148 (A) and 2116 (B). (Source: Cameron Milner)

Table 7.6: Bifacial Cores and Preforms

Number	Unit	Lot	Material	Thickness	Width	Length
BfDa-1:2140	SG	Surface	Jasper	20.94	34.43	48.61
BfDa-1:2236	A38	Lot 2	Chert	19.29	25.31	36.25
BfDa-1:2239	A38	Lot 2	Chert	18.07	43.29	44.82
BfDa-1:2245	SG	surface	Jasper	9.90	24.77	44.95

7.1.8 Cores

Seven cores were found during the 2012 excavations (Table 7.7). These have been designated cores because they are flaked stone objects without the smaller flake scars that occur during the refinement of flakes or tools to attune their form for a specific function. Most are radial or multidirectional cores (Odell 2004:63; Andrefsky 1998:81) and represent the final stage in the reduction of what might have been large nodules of source material. Core BfDa-1:2246 has small flake scars which may indicate use wear. Core BfDa-1:2202 does not feature flake scaring at all but the recovery of a river rounded quartz nodule so far from the river in an archaeological context makes its origin suspect. Core BfDa-1:2202 may represent a break used in order to turn the nodule into more manageable chunks either for transportation or manufacture. Of the cores, five were a form of chert from Scot's Bay while BfDa-1:2202 is quartz and BfDa-1:2309 is quartzite. Bifaces are presented in Figure 7.11.

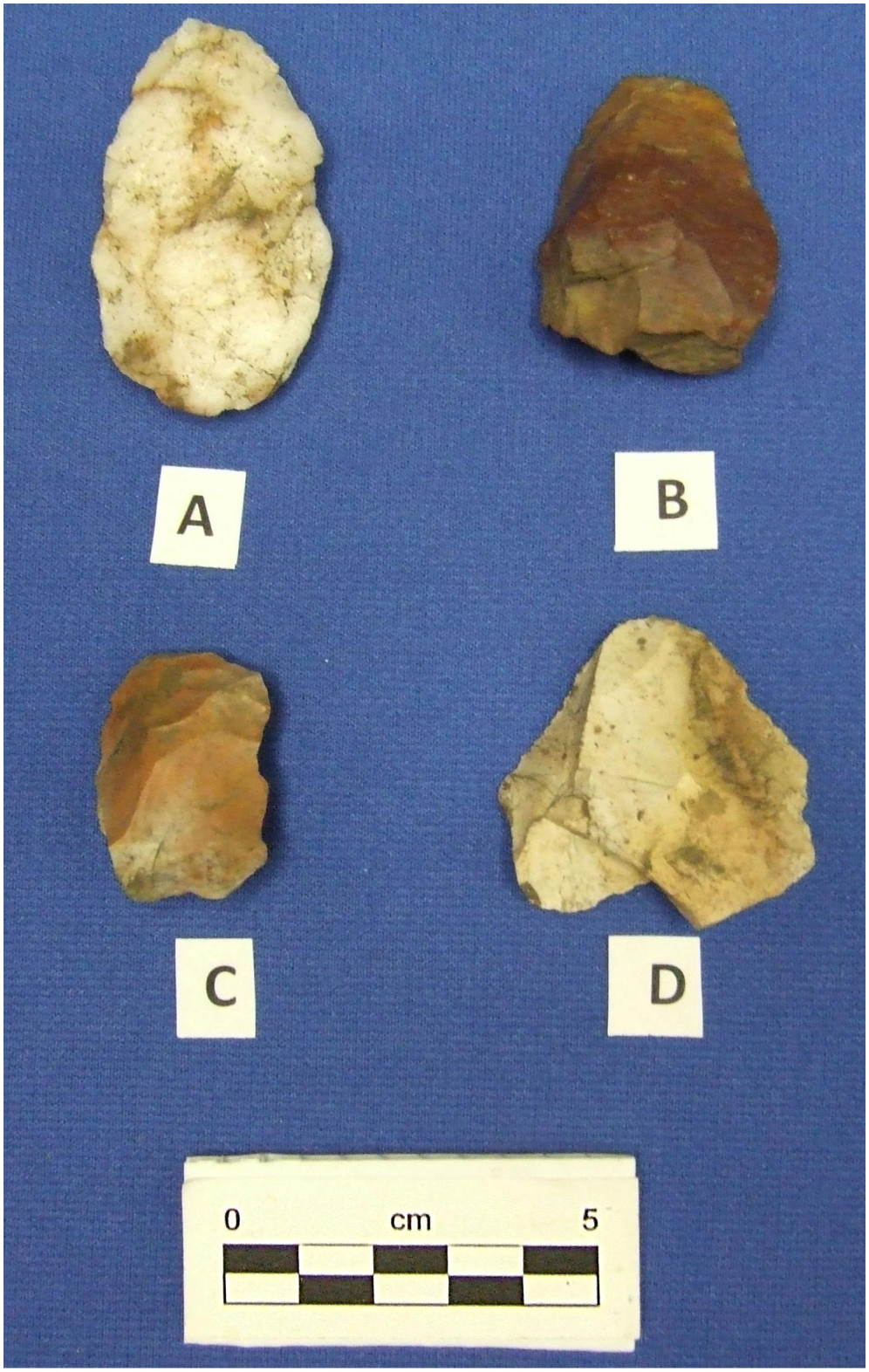

Figure 7.10: Bifacial cores and preforms 2245 (A), 2140 (B), 2236 (C) and 2239 (D). (Source: Cameron Milner)

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Table 7.7: Cores

Number	Unit	Lot	Material	Thickness	Width	Length
BfDa-1:2132	A25	Lot 2	Chert	19.8	33.48	48.1
BfDa-1:2161	2y-64	Lot 6	Jasper	17.7	38.7	68.86
BfDa-1:2173	RGU	Lot 6	Chert	30.2	61.22	43.6
BfDa-1:2202	2y-64	Lot 6	Quartz	32.6	46.5	53.9
BfDa-1:2246	SG	surface	Jasper	17.55	36.5	46.42
BfDa-1:2248	A62	Lot 2	Chert	12.28	32.9	47.73
BfDa-1:2309	A38	Lot 2	Quartzite	16.20	42.13	63.73

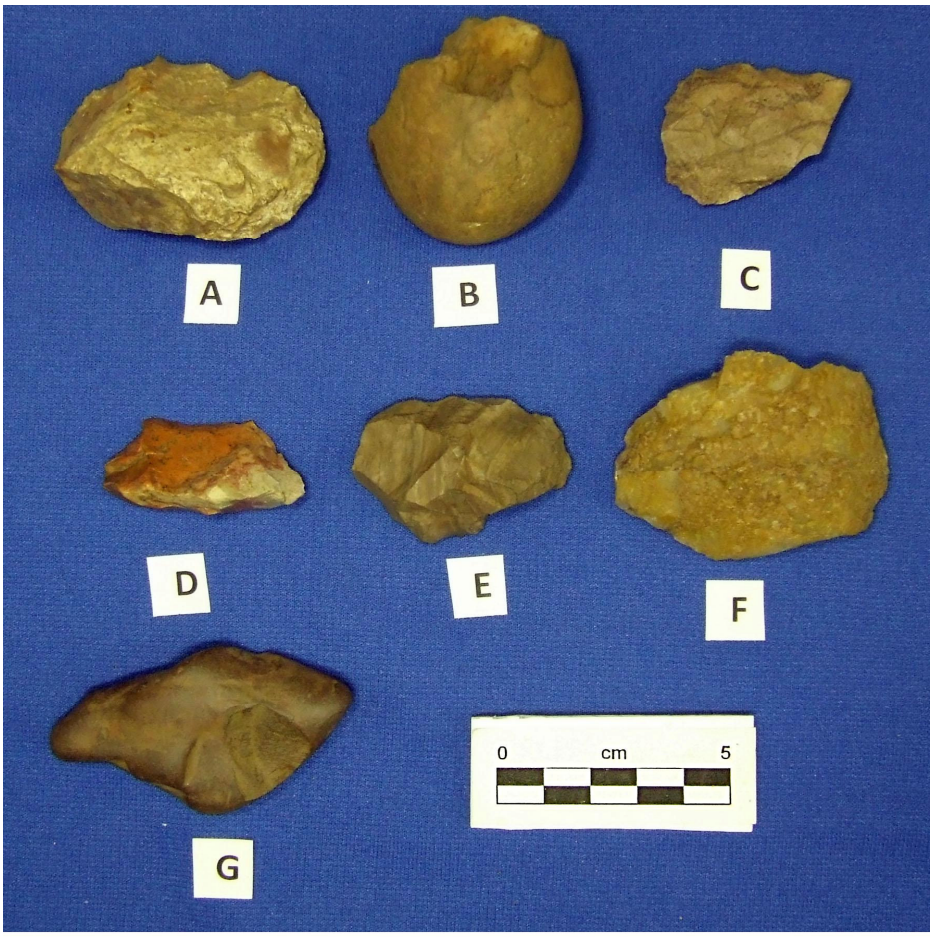

Figure 7.11: Cores BfDa-1:2309 (A), 2202 (B), 2248 (C), 2246 (D), 2132 (E), 2173 (F) and 2161 (G). (Source: Cameron Milner)

7.1.9 Utilized Flakes

Eight of the debitage flakes were found to exhibit use wear (Table 7.8). Flakes BfDa-1:2314, BfDa-1:2316, BfDa-1:2319 and BfDa-1:2209 all bear small flake scars on both the dorsal and ventral sides of at least one of their edges indicating use as a cutting implement. Flake 2209 also features heavier scaring on its dorsal side which may also indicate limited use as a scraping tool. Flakes BfDa-1:2315, BfDa-1:2321, BfDa-1:2322, and BfDa-1:2324 have a number of small flake scars on their dorsal side on a steep angle that appears to have resulted from use as a scraping tool. All the utilized flakes save for 2321 are made of some form of chert, with BfDa-1:2322 being made specifically of Scot's Bay jasper. Flake BfDa-1:2321 is made of quartz. Utilized flakes are shown in Figure 7.12.

Table 7.8: Utilized Flakes

Number	Unit	Lot	Material	Thickness	Width	Length
BfDa-1:2209	SG	Surface	Chert	9.52	26.45	35.87
BfDa-1:2314	SG	Surface	Chert	9.50	30.50	30.46
BfDa-1:2315	SG	Surface	Chert	9.64	22.70	29.00
BfDa-1:2316	2Y-64	Screen	Chert	3.25	14.00	16.96
BfDa-1:2319	2Y-64	Lot 6	Chert	5.50	22.80	30.40
BfDa-1:2321	2Y-64	Lot 6	Quartz	5.30	24.40	17.50
BfDa-1:2322	SG	Surface	Jasper	6.50	43.70	24.60
BfDa-1:2324	A53	Lot 2	Chert	4.50	17.90	19.40

Figure 7.12: Utilized flakes 2314 (A), 2315 (B), 2318 (C), 2324 (D), 2321 (E), 2316 (F), 2322 (G), 2319 (H) and 2209 (I). (Source: Cameron Milner)

7.1.10 Groundstone Tools

Only one groundstone tool was recovered during the 2012 excavations (Table 7.9). The specimen has two flat edges and a rounded lateral edge connecting the two. The tool is fractured with a small part of the tool broken off prior to its abandonment, evidenced by the smoothed and rounded nature of the break's edges (Figure 7.13). Damage to both ends of the slate like tool indicates its use as a hammer stone. Straight sides and some striations on its sides point to later use as an abrader or grinding tool.

Table 7.9: Groundstone tools

Number	Unit	Lot	Thickness	Width	Length
BfDa-1:2301	A25	Lot 2	42.40	49.30	164.00

Figure 7.13: Groundstone tool 2301. Inset shows damage from use as a hammerstone. (Source: Cameron Milner)

7.1.11 Debitage

Lithic debitage flake counts totaled 3914 flakes recovered from this summer's excavations. Chert was the most common material used on site, constituting 48.00% of all flakes. Chert varieties jasper and chalcedony and one kind of chert rife with inclusions were counted separately but included in the total chert percentage. Quartzite followed closely at 27.70% of total flakes, and quartz third at 23% of flakes. Flakes with cortex accounted for 14.1 % of total flakes. Unit 2Y-64 contained the most flakes of all excavated units, representing 28.00% of total flakes. Below is a list of total flake counts (Table 7.10) followed by unit specific breakdowns (Table 7.11).

Table 7.10: Total lithic debitage counts divided by raw material

Source Material	**Total Flakes**
Chert	1537
Quartzite	1085
Quartz	909
Jasper	203
Chalcedony	160
Inclusion Chert	20
Total	3914

Table 7.11: Flake counts by Unit and Lot

A)

2Y-64 Lot6	Number	With Cortex	Total
chert	450	57	507
quartzite	213	23	236
quartz	204	31	235
jasper	62	11	73
chalcedony	51	9	60
Total	980	131	1111

B)

2Y-64 Lot4	Number	With Cortex	Total
chert	31	0	31
quartzite	8	0	8
quartz	20	5	25
jasper	4	0	4
chalcedony	2	1	3
Total	65	6	71

C)

SG surface	Number	With Cortex	Total
chert	14	1	15
quartzite	15	3	18
quartz	8	3	11
jasper	10	3	13
chalcedony	12	2	14
Total	59	12	71

D)

A53 Lot 2	Number	With Cortex	Total
chert	45	16	61
quartzite	87	15	102
quartz	33	6	39
jasper	17	2	19
chalcedony	26	3	29
Total	208	42	250

E)

A53 Lot 8A	Number	With Cortex	Total
chert	10	12	22
quartzite	92	17	109
quartz	13	1	14
jasper	7	0	7
chalcedony	7	0	7
Total	129	30	159

F)

A53 Lot 2	Number	With Cortex	Total
chert	45	16	61
quartzite	87	15	102
quartz	33	6	39
jasper	17	2	19
chalcedony	26	3	29
Total	208	42	250

G)

A53 Lot 3	Number	With Cortex	Total
chert	4	2	6
quartzite	47	7	54
quartz	8	1	9
jasper	3	0	3
chalcedony	3	0	3
Total	65	10	75

H)

A25 Lot 2	Number	With Cortex	Total
chert	9	0	9
quartzite	17	3	20
quartz	32	3	35
jasper	0	0	0
chalcedony	0	0	0
Total	58	6	64

I)

A38 Lot 2	Number	With Cortex	Total
chert	125	40	165
quartzite	74	13	87
quartz	38	12	50
jasper	17	4	21
chalcedony	13	0	13
Total	267	69	336

J)

A38 Lot 3	Number	With Cortex	Total
chert	73	18	91
quartzite	45	2	47
quartz	21	10	31
jasper	15	0	15
chalcedony	7	5	12
Total	161	35	196

Table 7.11 continued: Flake counts by Unit and Lot

K)

F25 Lot 2	Number	With Cortex	Total
chert	58	10	68
quartzite	26	4	30
quartz	28	7	35
jasper	2	0	2
chalcedony	1	0	1
Total	115	21	136

L)

A15 Lot 2	Number	With Cortex	Total
chert	306	24	330
quartzite	91	12	103
quartz	128	13	141
jasper	17	0	17
chalcedony	0	0	0
Total	542	49	591

M)

RGU Lot 6	Number	With Cortex	Total
chert	84	20	104
quartzite	62	8	70
quartz	107	18	125
jasper	4	0	4
chalcedony	5	0	5
Total	262	46	308

N)

RGU Lot 5	Number	With Cortex	Total
chert	3	1	4
quartzite	8	5	13
quartz	26	3	29
jasper	0	0	0
chalcedony	0	0	0
Total	37	9	46

O)

A38 Lot 3	Number	With Cortex	Total
chert	6	1	7
quartzite	1	4	5
quartz	1	1	2
jasper	2	0	2
chalcedony	1	0	1
Total	11	6	17

P)

A62 Lot 2	Number	With Cortex	Total
chert	17	30	47
quartzite	23	1	24
quartz	55	10	65
jasper	4	0	4
chalcedony	4	0	4
Total	103	41	144

Q)

F3 Lot2	Number	With Cortex	Total
chert	24	21	45
quartzite	90	8	98
quartz	39	10	49
jasper	14	0	14
chalcedony	4	0	4
poor quality chert	20	0	20
Total	191	39	230

R)

F3 Lot3	Number	With Cortex	Total
chert	10	8	18
quartzite	26	1	27
quartz	12	0	12
jasper	1	0	1
chalcedony	0	0	0
Total	49	9	58

7.2 Ceramic Analysis

A large portion of the artifacts found at St. Croix are fragments of ceramic vessels, both decorated and undecorated sherds. The discovery of ceramic artifacts at St. Croix is an important factor, allowing for the site not only to be dated instantly to the Woodland Period, but also dated more precisely through the analysis of decorative

techniques and comparative models like Petersen and Sanger's (1991) model for Maine and the Maritime Provinces. Ceramics found on site were separated into decorated sherds and non-decorated sherds while maintaining their physical relationship to each other in the form of shared coordinates. Any clusters among these groups were kept together when catalogued and represented as such.

The fragmentary nature of the pieces as well as the distance between units limits the amount that can be said concerning the minimum number of inferred vessels. Based on the decorative techniques, all those pieces not within the same unit with different decoration could represent individual pots. This difficulty is further exacerbated by those units excavated in areas where repeated plowing has further disturbed the context of the sherds. For this reason, despite similarities, each piece from these units and from surface collection is thought to represent an individual vessel. Although they will remain as separate artifacts with their own numbers, sherds BfDa-1:2289 and BfDa-1:2291 are thought to represent a single vessel, V1-2012. Sherds BfDa-1:2292 and BfDa-1:2306 (A38 Lot2) feature linear dentate stamping and have a shared thickness of around 6.25mm, designating them pieces of inferred vessel V2-2012. Sherd BfDa-1:2310 is also from A38 and features linear dentate decoration. It was found slightly lower but may still be part of V2-2012. Based on these possible vessels and the remaining sherds, the minimum number of vessels determined is 17.

Aside from decorative techniques, the materials used to construct the pot can also be used to roughly date a specimen, regardless of the presence of decoration. The temper used to strengthen the clay during firing changed during the development of native ceramics from grit temper to shell and organic temper, and back again during the course

of the Woodland Period. According to Petersen and Sanger's model, the use of grit temper dominates from Ceramic Period 1 (3050-2150 BP) to Ceramic Period 4 (1350-950 BP). While shell temper was found in some areas during Ceramic Periods 3 and 4, it does not become dominant until Ceramic Periods 5 (950-650 BP) and 6 (650-400 BP). Similarly, grit temper does appear on coastal sites during Ceramic Period 6. In Ceramic Period 7 (400-200 BP), during the Protohistoric period when ceramic production among aboriginal groups declines, grit temper becomes the predominant temper and shell disappears.

The thickness of pot walls also changes during the Woodland period. Petersen and Sanger's (1991) aboriginal ceramic model states that the walls of pots grow thicker during Ceramic Period 3 and remain so until Ceramic Period 6 when they gradually become thinner. Kristmanson tested this aspect of the model with Southwestern ceramics and found this trend to be true (1991:76). A possible bias occurs with thinner pieces with decoration as they may simply be thinner due to a contracting formation of the rim. To overcome this bias, sherd thickness was prioritized less as a diagnostic attribute on decorated pieces as decoration motifs are better for dating purposes.

7.2.1 Decorated Ceramics

Almost every unit contained decorated ceramics, which is useful in terms of dating the excavation units using Petersen and Sanger's model, as well as the refinements put forth by Kristmanson (1992) to key the model for Southwestern Nova Scotia. All the basic decorative techniques laid out in the aforementioned studies are represented in the

2012 assemblage of ceramics. Table 7.12 lists all decorated sherds and their respective decorative techniques.

7.2.1.1 Fabric Impressed Decoration

Sherd BfDa-1:2101 (Figure 7.14) is a fabric impressed sherd on both its interior and exterior sides. Coupled with its grit temper, BfDa-1:2101 is difficult to date. Petersen and Sanger mention the prominent use of fabric impressed pottery in the first and sixth and seventh Ceramic Periods, dating the piece to either the beginning or the end of the Woodland Period. Kristmanson notes that fabric impressed Vessel 21 from St. Croix was found in general association with a hearth feature dated to 2500 ± 20 BP. Combined with Vessel 21's similarity to Vinette style pottery, it was concluded that Vessel 21 was from Ceramic Period 1 (Kristmanson 1992:53). However, thermoluminescence dating of ceramics from the 1993 excavations included a similar piece, sherd BfDa-1:1771, part of vessel V3 of the 1993 excavation (Godfrey-Smith, *et al.* 1997:271). Sherd 1771 was determined to be the youngest of the sherds tested with a date of 1500 ± 150 BP, placing it at the end of Petersen and Sanger's Ceramic Period 4. BfDa-1:2101 is also thick (9.67mm), close to the 11mm thickness of sherd BfDa-1:1771. For this reason, BfDa-2101 is considered to date between Ceramic Period 4 and 5.

Table 7.12: Decorated aboriginal ceramics.

Number	Unit	Level	Dec.	Temper	Length	Thickness	Width	#
BfDa-1:2101	F3	Lot 2	FP[1]	Grit	37.73	9.67	25.04	1
BfDa-1:2133	A25	Lot 2	CWS[2]	Grit	26.20	8.60	34.28	1
BfDa-1:2137	SG	Surface	LD[3]/P[4]	Grit	22.77	8.00/ 8.90 (rim)	28.03	1
BfDa-1:2160	2y-64	Lot 6	P / CWS (rim)	Shell	22.47	5.90 / 7.60 (rim)	28.20	1
BfDa-1:2163	2y-64	Lot 6	LD	Shell	15.58	n/a	21.21	1
BfDa-1:2177	RGU	Lot 6	PSS[5]	Grit	29.90	8.70	29.50	1
BfDa-1:2212	RGU	Lot 5	PSS	Grit	34.00	10.20	28.46	1
BfDa-1:2216	RGU	Lot 5	LD	Grit	33.00	6.03	22.00	1
BfDa-1:2218	RGU	Lot 5	PSS	Grit	35.97	7.00	32.24	1
BfDa-1:2234	A38	Lot 2	CH[6]	Grit	20.47	4.90	18.11	1
BfDa-1:2243	SG	Surface	CWS / P	Grit	21.00	5.80	19.00	1
BfDa-1:2252	A62	Lot 2	P	Grit	19.38	n/a	15.70	1
BfDa-1:2255	A62	Lot 2	CWS	Grit	23.75	n/a	28.28	1
BfDa-1:2282	F3	Lot 2	LD	Grit	20.50	n/a	15.86	1
BfDa-1:2283	F3	Lot 2	IC[7]	Grit	16.40	n/a	14.90	1
BfDa-1:2284	2Y -64	Lot 2	CWS	Shell	17.06	8.30	18.40	1
BfDa-1:2285	2Y -64	Lot 2	LD	Grit	13.02	n/a	14.23	1
BfDa-1:2286	SG	Lot 2	IC / P	Grit	15.56	7.90	19.40	1
BfDa-1:2287	2Y -64	Lot 2	CWS	Grit	25.50 - 13.08	10.00 - 6.41	34.7 - 17.36	3
BfDa-1:2288	2Y -64	Lot 2	IC	Grit	28.9	6.63	33.64	1
BfDa-1:2289	A62	Lot 2	LD	Grit	15.02	n/a	15.50	1
BfDa-1:2290	A62	Lot 3	IC / P	Grit	15.21	n/a	18.48	1
BfDa-1:2291	A62	Lot 2	LD	Grit	11.26	n/a	10.5	1
BfDa-1:2292	A38	Lot 2	RD[8]	Grit	17.60 - 21.10	6.25 – 6.00	21.00 – 16.00	2
BfDa-1:2293	A38	Lot 2	PSS	Grit	29.80	7.85	19.47	1
BfDa-1:2294	SG	Lot 2	CWS	Shell	39.50 - 16.20	9.87 - 7.44	25.30 - 15.80	4
BfDa-1:2295	SG	Lot 2	CWS	Shell	21.65	11.40 / 9.30 (rim)	22.50	1
BfDa-1:2306	A38	Lot 2	LD	Grit	30.74	6.89	26.20	1
BfDa-1:2310	A38	Lot 2	LD	Grit	9.80	n/a	9.90	1
BfDa-1:2312	SG	Surface	CWS / P	Shell	15.40	5.70	10.60	1
BfDa-1:2313	2Y -64	Lot 6	CWS	Shell	21.75	8.00	13.40	1

1) Fabric paddling
2) Cord-wrapped stick
3) Linear dentate
4) Punctate
5) Pseudoscallop shell
6) Cross-hatching
7) Interior channeling
8) Rocker dentate

7.2.1.2 Pseudoscallop Shell Decoration

Several sherds exhibited pseudoscallop shell stamping (Figure 7.15). Artifact BfDa-1:2218 is a sherd from Lot 5 of RGU and has pseudoscallop shell stamp decorations meeting at perpendicular angles. The sherd was positively identified as such through comparison with an image (Godfrey-Smith, *et al.* 1997:270) of sherd BfDa-1:1961, one of those selected for thermoluminescence dating from the 1993 excavations. Sherd BfDa-1:1961 is a rim sherd with a thickness of 6mm, making sherd BfDa-1:2218 likely of similar style as a body piece with a thickness of 7mm. Sherd BfDa-1:2218 was found in Lot 5 of RGU, an undisturbed layer of sediment below the plow zone (Lot 6). With its position at the lowest point in the unit and its pseudoscallop shell decoration, sherd BfDa-1:2218 is most likely datable to Petersen and Sanger's Ceramic Period 2 (2150-1650 BP). However, sherd BfDa-1:1961 was dated to 2.62 ± 0.29 ka, approximately five centuries earlier than Ceramic Period 2, placing it in Ceramic Period 1 (Godfrey-Smith, *et al.* 1997:270). This early adoption of pseudoscallop shell design is found at several other sites in Maine, such as the Kidder Point site in Penobscot Bay and the Oxbow site on the Mirimachi River in New Brunswick (Petersen and Sanger 1991:170). Sherd BfDa-1:2218 could also have an early date but without thermoluminescence dating or C14 dating of RGU, this remains to be seen.

Figure 7.14: Fabric paddled sherd BfDa-2101. (Source: Cameron Milner)

Sherds BfDa-1:2177 (RGU, Lot 5), BfDa-1:2212 (RGU, Lot 2) and BfDa-1:2293 (A38 Lot 2) all feature a decorative technique thought to be simple stamp pseudoscallop shell, but the quality of the impression is worn to the point where there is the possibility that it may be a linear dentate decoration on an oblique angle. Sherd BfDa-1:2177 is most likely pseudoscallop shell because of its position in Lot 5 of RGU, the same location as the aforementioned sherd BfDa-1:2218. Although slightly thicker than BfDa-1:2218 at 8.7mm, sherd BfDa-1:2177 can be attributed to Ceramic Period 2 as both pseudoscallop shell and dentate decorated were used during that time. Sherd BfDa-1:2212 features the juncture between two sets of linear stamps of what is most likely pseudoscallop shell decoration. Although thicker still at 10.2mm, sherd BfDa-1:2212 could be related to

sherd BfDa-1:2177 but BfDa-1:2212's position within the plow zone makes it impossible to be certain.

Sherd 2293 was found at around the same depth as other decorated sherds with linear dentate decoration (BfDa-1:2292, 2310, 2306) and one sherd (BfDa-1:2234) with a dragged, cross hatching design. Although the association with these artifacts does mean BfDa-1:2293 may not be as early as the thermoluminescence dated sherd BfDa-1:1961, sherd BfDa-1:2293 could still be from Ceramic Period 2. The single sherd from artifact cluster BfDa-1:2294 is one of four pieces found in conjunction with a cord wrapped stick and linear dentate decoration, adding to the confusion whether BfDa-1:2294's decoration is pseudoscallop shell or angled dentate. However, the sherd's recovery as part of surface collection within Sullivan's Garden mean its associations are negligible and could still be an example of a worn pseudoscallop shell design.

7.2.1.3 Dentate Stamp Decoration

Dentate decoration, specifically linear dentate, is one of the most common decorative elements found on pottery sherds during the 2012 excavations (Figure 7.16). Sherds BfDa-1:2282 (F3, Lot 2), BfDa-1:2289 and BfDa-1:2291 (A63, Lot 2; inferred vessel V1-2012), BfDa-1:2133 (A25 Lot 2), BfDa-1:2285 (2Y-64 Lot 6), BfDa-1:2306, BfDa-1:2292 and BfDa-1:2310 (A38, inferred vessel V2-2012), and sherd BfDa-1:2216 (RGU Lot2) all feature linear dentate decoration. Sherds BfDa-1:2216, 2285, 2282 and vessel V1-2012 feature dense stacks of dentate stamping, while the rest feature free floating lines of stamping.

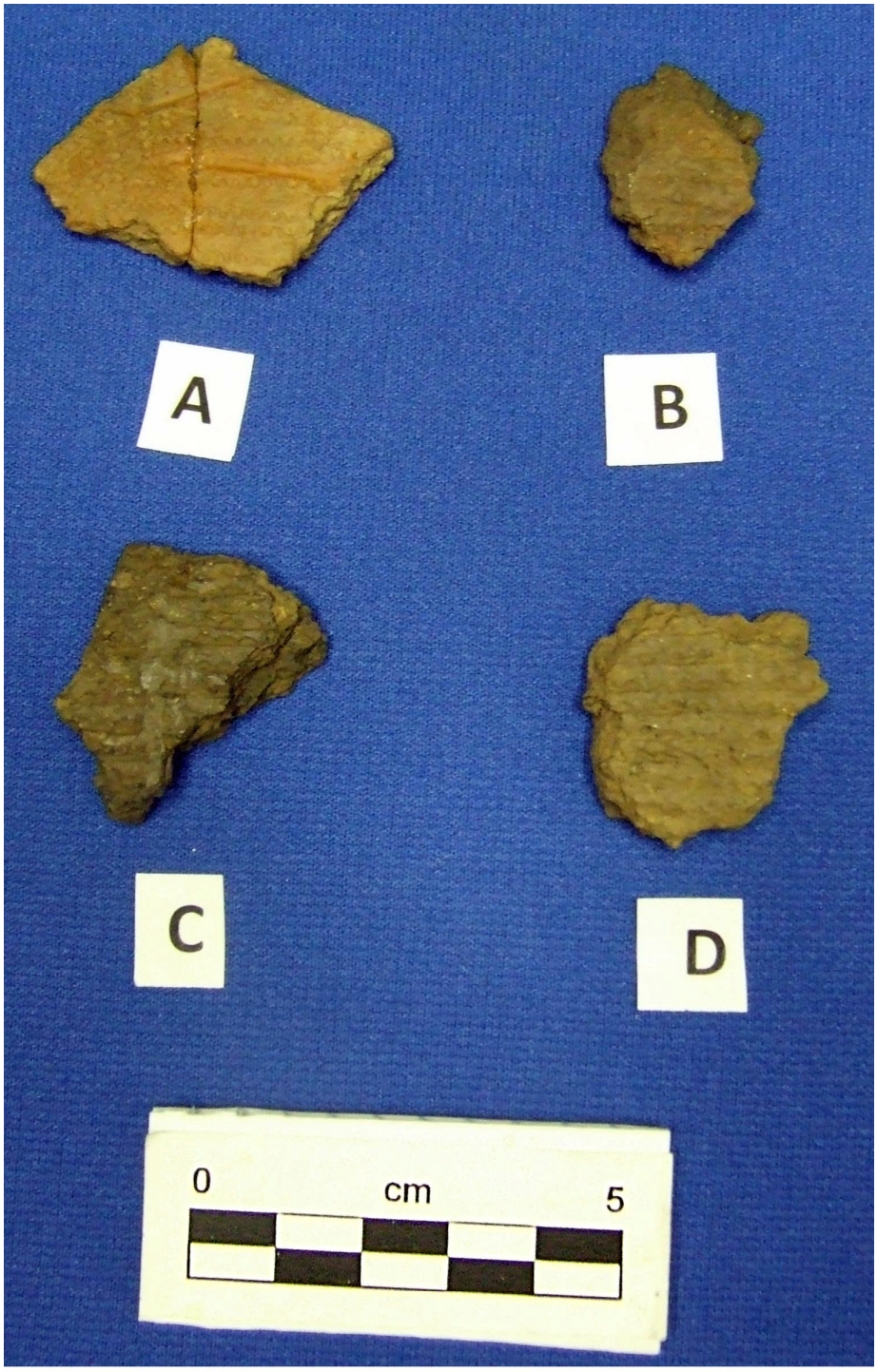

Figure 7.15: Pseudoscallop shell decorated pottery sherds BfDa-1:2218 (A), BfDa-1:2293 (B), BfDa-1:2212 (C) and BfDa-1:2177 (D). (Source: Cameron Milner)

One sherd of pottery cluster BfDa-1:2294 also features linear dentate decoration. Dentate stamping became the dominant decoration technique during Petersen and Sanger's Ceramic Period 3 (1650-1350 BP) but was also common during Ceramic Period 2 (1993:124-126). Two linear dentate decorated sherds (BfDa-1:1796 and BfDa-1:1986) were subjected to thermoluminescent dating and found to be between 1880 ± 210BP and 2080 ± 100 BP, pointing to an early Middle Woodland Period date, or Ceramic Period 2. This date also agrees with C14 dating from linear dentate sherds from Clam Cove (Godfrey- Smith, *et al.* 1997:270).

7.2.1.4 Punctate Decoration

A number of different punctate designs are also found on aboriginal pottery from Maine and the Maritimes (Figure 7.17). Almost all the rim sherds recovered during 2012 feature some form of punctate decoration. Sherd BfDa-1:2137 (SG) features large square punctates along both its exterior surface and in pairs along the surface of the rounded rim. Systematic punctate decoration is noted as a 'hallmark attribute' of Ceramic Period 4 of Petersen and Sanger's ceramic model, with cylindrical and circular punctates being the norm (1993:136). The motif is very similar to a sherd from Vessel 2 from the Cemetery site at Melanson which has rows of punctates just below the rim and on top. However the similarities stop there as Vessel 2 has a different rim form and interior channeling (Nash and Stewart 1990:136). Sherd 2160 (2Y-64 Lot 6) has a rocker stamped cord wrapped stick motif with vertical linear punctates underneath an outward extending lip which

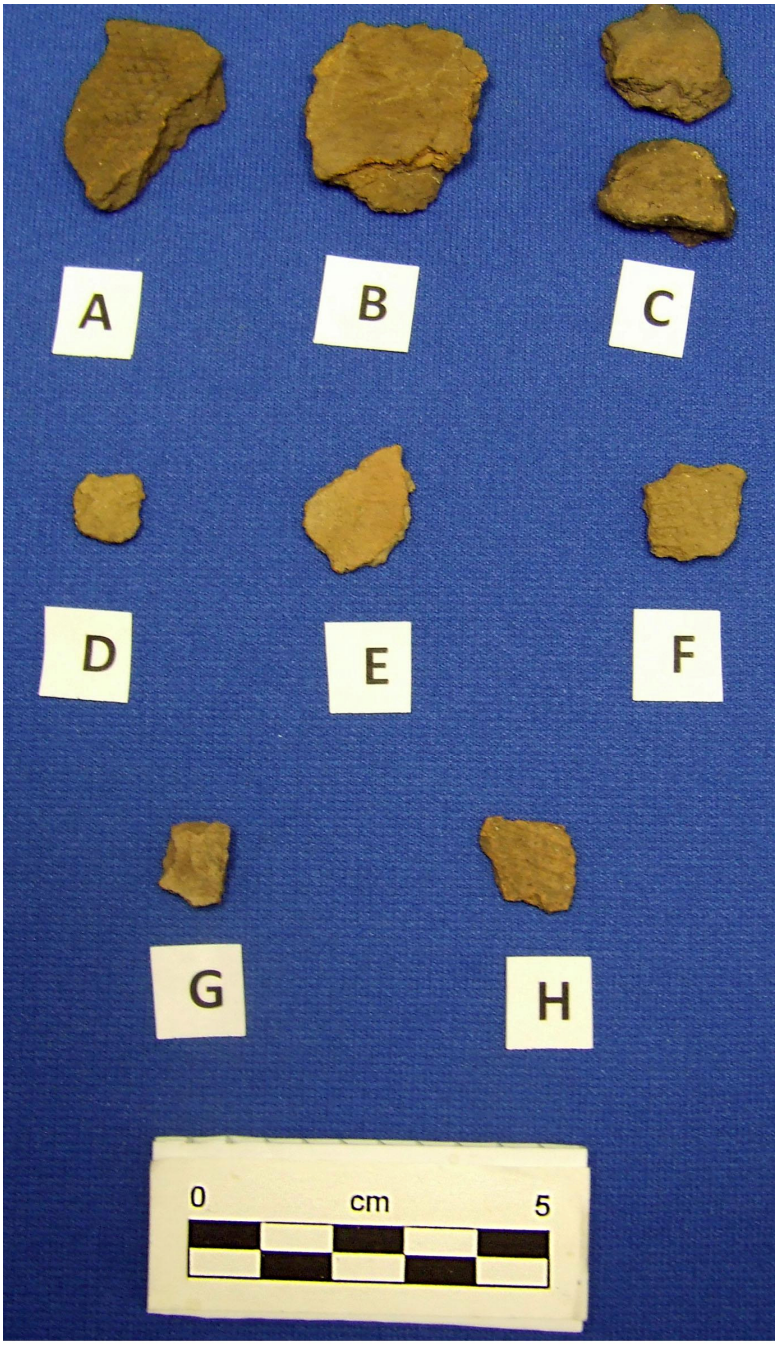

Figure 7.16: Dentate stamp decorated sherds BfDa-1:2216 (A), BfDa-1:2306 (B), BfDa-1:2292 (C), BfDa-1:2291 (D), BfDa-1:2282 (E), BfDa-1:2289 (F), BfDa-1:2310 (G), and BfDa-1:2285 (H). (Source: Cameron Milner)

features another cord wrapped stick motif along the top of the rim. It is very likely that the linear punctates were made with the stylus upon which the cord was wrapped. Given the decorative patterns and shell temper, sherd BfDa-1:2160 most likely dates to Ceramic period 5 or 6 (Petersen and Sanger 1991:143). Sherd BfDa-1:2312 also features a cord-wrapped stick motif but with a circular punctate.

A few body sherds also exhibit punctate decorations. Sherd BfDa-1:2286 (SG) features combed grooves coupled with the remnants of large square punctates in a row. These grooves are referred to as 'interior channeling'. The action by which interior channeling with no discernible pattern is produced is referred to as 'scraping' (Kristmanson 1992:77). It is possible that these punctates were also made with the same tool that made the groove marks. The combination of grooves and punctates in combination is often dated to Ceramic period 4 (Petersen and Sanger 1991:134) but after a review of the interior channeling specimens in Petersen and Sanger's sample, the only discernable connection of interior channeling was with cord-wrapped stick decorated sherds, meaning that dating the pieces to a specific temporal period between Ceramic Period 4 and 7 may be impossible (Kristmanson 1993:78).

An experimental study by Kristmanson and Deal (1993) sought to recreate finishing marks found on aboriginal ceramics. Using an array of tools thought to be utilized in ceramic manufacture such as shells, bundles of grass and stamping tools, Deal and Kristmanson created twenty examples of finishing markings (Kristmanson and Deal 1993). Of the recreated examples, the markings of an ark shell and a cord-wrapped stick stylus produced a close approximation to the regular undulating grooves found on sherds BfDa-1:2288 and BfDa-1:2290.

Figure 7.17: Punctate decorated sherds BfDa-1: 2137 (A) and BfDa-1:2252 (B). (Source: Cameron Milner)

Sherd BfDa-1:2290 (A62 Lot 3) features the remains of indentations along its rim, while the exterior is decorated in a series of undulating scraped grooves similar to BfDa-1:2886. Given the similar width of the grooves and the indentations, it is plausible that both the grooves and indentations were made with the same tool. It was not an uncommon practice for multiple markings to be made with the same tools (Deal and Kristmanson, 1993:76).

The decoration on sherd BfDa-1:2252 is difficult to determine. The remnants of two small indentations are visible, with the sharpness of the impression makes the decoration appear to be two small punctates, but the size and close proximity of the

markings could be interpreted as a cord wrapped stick motif. For the purposes of this paper, it has been interpreted as punctates.

7.2.1.5 Cord-Wrapped Stick Decoration

Cord wrapped stick motifs are also a very common decorative motif within the 2012 assemblage. Sherds BfDa-1:2163 (2Y-64 Lot 6), BfDa-1:2313 (SG), BfDa-1:2123 (F3), BfDa-1: 2243 (SG), BfDa-1: 2295 (SG), BfDa-1:2255 (A62 Lot 2), BfDa-1:2133 (F3 Lot 2) and three sherds from pottery cluster BfDa-1:2294 (SG) all feature cord wrapped stick decoration (Figure 7.18). Pottery cluster BfDa-1:2287 (2Y-64 Lot 6) contains three sherds with a rocker stamped cord wrapped stick motif. Sherd BfDa-1:1924, a rocker stamped, cord-wrapped stick decorated sherd from the 1993 excavations, was subjected to thermoluminescent dating. Sherd BfDa-1:1924 was found to date to 2140 ± 130 BP and serves as evidence for the use of cord-wrapped stick decoration as early as 2150 BP at the St. Croix site, which is significantly earlier than other dated sherds. Despite this early date, rocker stamped sherds are more likely to date after 1350 BP (Godfrey-Smith, 1997:269). Sherd BfDa-1:2284 (2Y-64 Lot 6) is a rim sherd with cord wrapped stick motifs on both the interior and exterior sides of the sherd, as well as on top of the rim.

As mentioned before, rim sherd BfDa-1:2160 has a rocker stamped cord wrapped stick motif along its exterior and on the top of the rim. Sherds BfDa-1:2295, sherds from pottery cluster BfDa-1:2287 and those with cord wrapped stick decoration from cluster BfDa-1:2294 are all shell tempered, the use of which is contemporaneous with the development of cord-wrapped stick decoration. As cord-wrapped stick decoration was

used from Ceramic Period 4 to 6, dating cord wrapped stick sherds to a specific temporal period without auxiliary decorations is difficult. Sherds BfDa-1:2163, 2243, 2255, and 2133 may date from Ceramic Period 4 as they have grit temper, but as the usage of grit temper continues during Ceramic Periods 5 and 6, however limited, this is not a firm conclusion.

7.2.1.6 Interior Channeling

As noted above, several sherds feature a combing or trailing motif. Much like sherds BfDa-1:2290 and BfDa-1:2286, sherd BfDa-1:2288 (2Y-64 Lot 6) has similar interior channeling grooves (Figure 7.19). The effect is similar to a sherd BgDb-5: (43)H from the Cemetery site at Melanson (Nash and Stewart 1990:140). As sherd 2288 was found in the plow zone of unit 2Y-64, there is a possibility the sherd is related to sherd 2286 which was found within Sullivan's Garden. Sherd BfDa-1:2234 (A38 Lot 2) is thin with a smoothed exterior and interior with fine cross hatching incisions across its exterior. The sherd is similar in decoration and composition to a sherd from Vessel 21 from the Melanson site (Nash and Stewart 1990:140). Sherd BfDa-1:2283 (F3 Lot2) features a simple trailed line across its exterior. Trailing and scraped interior channeling are common pot modifications throughout the Middle and Late Woodland Periods, so dating these sherds to a specific Ceramic Period without thermoluminescence and C^{14} dating is difficult.

Figure 7.18: Cord-wrapped stick decorated sherds BfDa-1:2284 (A), BfDa-1:2160 (B), BfDa-1:2295 (C), BfDa-1:2133 (D), BfDa-1:2243 (E), BfDa-1:2312 (F), BfDa-1:2163 (G), BfDa-1:2313 (H), cluster BfDa-1:2287 (I), BfDa-1:2255 (J) and cluster BfDa-1:2294 (K). (Source: Cameron Milner)

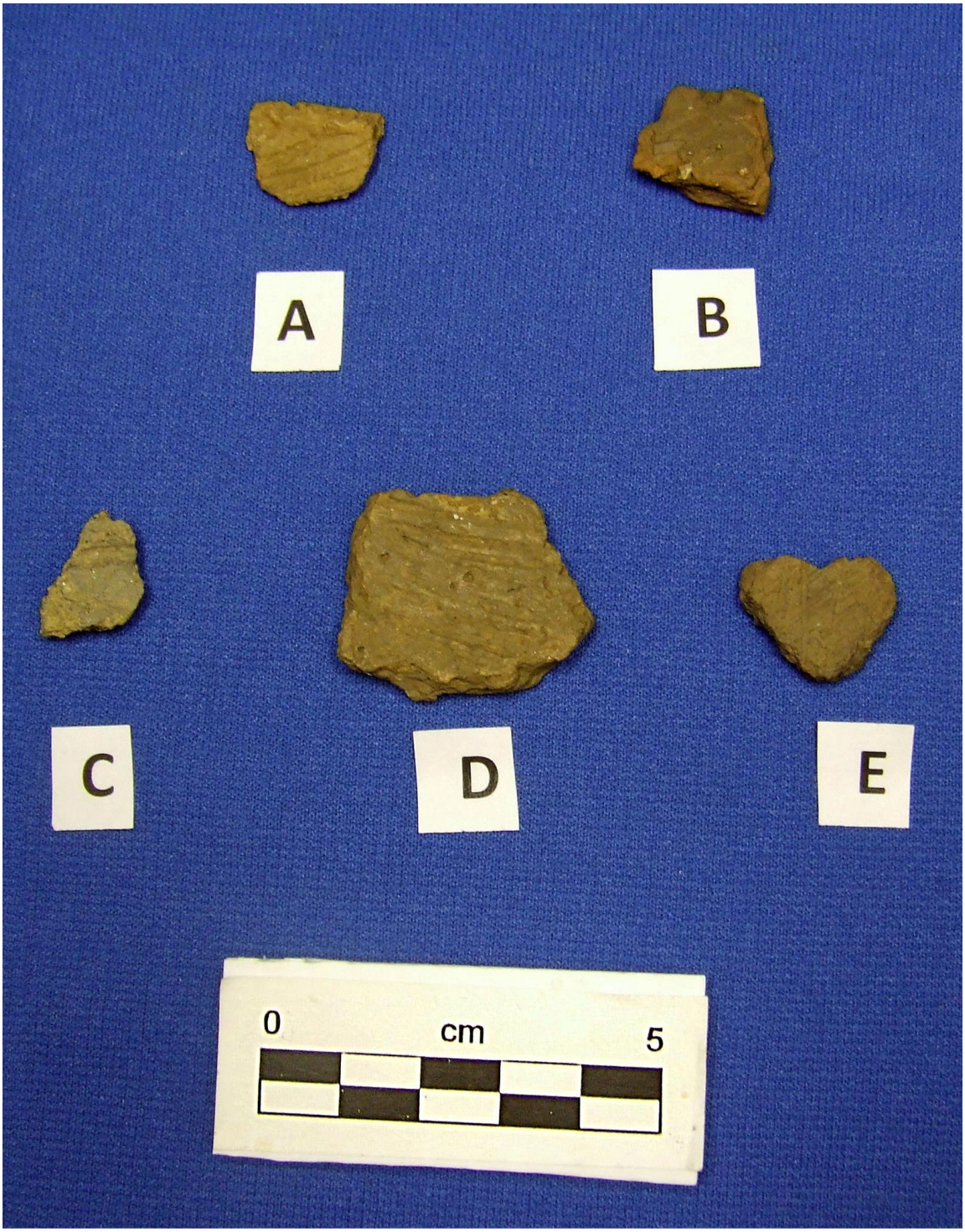

Figure 7.19: Ceramic sherds featuring interior channeling. BfDa-1:2290 (A), BfDa-1:2286 (B), BfDa-1:2283 (C), BfDa-1:2288 (D) and BfDa-1:2234 (E). (Source: Cameron Milner)

7.2.2 Undecorated Ceramics

The reliance on decoration as a diagnostic indicator for dating means very little can be said of the undecorated pottery. One hundred and sixty-eight undecorated sherds were found, some in small clusters (Table 7.13). They are almost exclusively body sherds, with the possible exception of exceptionally thick and curved sherd BfDa-1:2109 and one sherd from cluster BfDa-1:2158 which may be basal. Sherd BfDa-1:2127 may be the pointed bottom tip of a small conoidal pot. As noted previously, the temper used to strengthen a pot changes through the Woodland Period and can help identify a broad temporal period for undecorated sherds. It should be noted however that since the use of shell temper may rise and fall, the use of grit temper never disappeared, so grit tempered pottery could be contemporaneous with shell tempered sherds. Sherds BfDa-1:2170, BfDa-1:2305 and clusters BfDa-1:2237 and BfDa-1:2171 are shell tempered, indicating a manufacture date between Ceramic Periods 4 and 6 (1350-400 BP). Sherds in cluster BfDa-1:2156 feature evidence of interior smoothing. When compared to Kristmanson and Deal's replicative experiments with finishing marks on aboriginal pottery, the marks most closely resemble the markings of a grass bundle, fingers or leather smoothing techniques (1993:78-79).

Table 7.14: Undecorated aboriginal ceramics.

Number	Unit	Level	Temper	Portion	Quantity
BfDa-1:2102	F3	Lot 2	Grit	Body	1
BfDa-1:2103	F3	Lot 2	Grit	Body	1
BfDa-1:2104	F3	Lot 2	Grit	Body	1
BfDa-1:2105	F3	Lot 2	Grit	Body	1
BfDa-1:2106	F3	Lot 2	Grit	Body	1
BfDa-1:2107	F3	Lot 2	Grit	Body	1
BfDa-1:2108	F3	Lot 2	Grit	Body	8
BfDa-1:2109	F3	Lot 2	Grit	Base	1
BfDa-1:2110	F3	Lot 2	Grit	Body	2
BfDa-1:2111	F3	Lot 2	Grit	Body	2
BfDa-1:2112	F3	Lot 2	Grit	Body	3
BfDa-1:2113	F3	Lot 2	Grit	Body	1
BfDa-1:2114	F3	Lot 2	Grit	Body	1
BfDa-1:2115	F3	Lot 2	Grit	Body	1
BfDa-1:2117	F3	Lot 2	Grit	Body	6
BfDa-1:2119	F3	Lot 2	Grit	Body	3
BfDa-1:2120	F3	Lot 2	Grit	Body	10
BfDa-1:2121	F3	Lot 2	Grit	Body	4
BfDa-1:2122	F3	Lot 2	Grit	Body	5
BfDa-1:2124	F3	Lot 2	Grit	Body	3
BfDa-1:2125	F3	Lot 2	Grit	Body	2
BfDa-1:2126	F3	Lot 2	Grit	Body	2
BfDa-1:2127	F3	Lot 2	Grit	Base	1
BfDa-1:2128	F3	Lot 2	Shell	Body	2
BfDa-1:2129	F3	Lot 2	Grit	Body	3
BfDa-1:2130	F3	Lot 2	Grit	Body	1
BfDa-1:2134	A25	Lot 2	Grit	Body	9
BfDa-1:2149	SG	Surface	Grit	Body	1
BfDa-1:2156	F3	Lot 2	Grit	Body	6
BfDa-1:2157	F3	Lot 2	Grit	Body	7
BfDa-1:2158	F3	Lot 2	Grit	Base	4
BfDa-1:2159	F3	Lot 2	Grit	Body	2
BfDa-1:2162	2y-64	Lot 6	Shell	Body	1
BfDa-1:2169	2y-64	Lot 6	Grit	Body	1
BfDa-1:2170	2y-64	Lot 6	Shell	Body	9
BfDa-1:2171	2y-64	Lot 6	Grit	Body	2
BfDa-1:2176	RGU	Lot 6	Grit	Body	1
BfDa-1:2180	SG	Surface	Grit	Body	2
BfDa-1:2181	SG	Surface	Grit	Body	4
BfDa-1:2207	A38	Surface	Grit	Body	1
BfDa-1:2225	F25	Lot 2	Grit	Body	4
BfDa-1:2228	A38	Lot 2	Grit	Body	1

Table 7.14 Continued: Undecorated aboriginal ceramics.

Number	Unit	Level	Temper	Portion	Quantity
BfDa-1:2229	A38	Lot 2	Grit	Body	2
BfDa-1:2230	A38	Lot 2	Grit	Body	1
BfDa-1:2231	A38	Lot 2	Grit	Body	3
BfDa-1:2232	A38	Lot 2	Grit	Body	8
BfDa-1:2235	A38	Lot 2	Grit	Body	3
BfDa-1:2237	A38	Lot 2	Shell	Body	5
BfDa-1:2238	A38	Lot 2	Grit	Body	1
BfDa-1:2249	A62	Lot 2	Grit	Body	2
BfDa-1:2250	A62	Lot 2	Grit	Body	2
BfDa-1:2251	A62	Lot 2	Grit	Body	1
BfDa-1:2253	A62	Lot 2	Grit	Body	4
BfDa-1:2254	A62	Lot 2	Grit	Body	3
BfDa-1:2256	A62	Lot 2	Grit	Body	1
BfDa-1:2257	A62	Lot 2	Grit	Body	1
BfDa-1:2258	A62	Lot 2	Grit	Body	1
BfDa-1:2259	A62	Lot 3	Grit	Body	1
BfDa-1:2265	2Y -64	Lot 2	Grit	Body	2
BfDa-1:2267	2Y -64	Lot 2	Grit	Body	3
BfDa-1:2275	SG	Surface	Grit	Body	1
BfDa-1:2305	2y-64	Lot 6	Shell	Body	1

7.3 Historical Artifacts

South of the forested northern end of Wasowski/Geres property is cleared land once used for domestic cultivation, but now gone to grass and field, save for the well maintained lawn and garden plots. These actions have not only disturbed the integrity of the archaeological record, but historic artifacts have been mixed in with precontact artifacts, perhaps through the creation of garden and kitchen middens. Units 2Y-64 and RGU were both placed in areas of known disturbance and both feature historic artifacts. Units A25 and A38 contained historic artifacts as well. The following is a description of those artifacts (Table 7.14).

Table 7.13: Historic Artifacts

Artifact	Catalogue_No	Unit	Lot	Material	Object Portion	Quantity
Pipe stem	BfDa-1:2131	A25	Lot 2	Clay	Stem	1
Pipe stem	BfDa-1:2139	SG	Surface	Clay	Bit	1
Ceramic	BfDa-1:2164	2y-64	Lot 6	WRE	Body	1
Ceramic	BfDa-1:2166	2y-64	Lot 6	CEW	Body	1
Ceramic	BfDa-1:2168	2y-64	Lot 6	CEW	Body	1
Nails	BfDa-1:2172	2y-64	Lot 6	Metal		5
Nail	BfDa-1:2184	2y-64	Lot 6	Metal		1
Glass	BfDa-1:2185	2y-64	Lot 6	Glass		1
Glass	BfDa-1:2186	2y-64	Lot 6	Glass		1
Glass	BfDa-1:2187	2y-64	Lot 6	Glass		1
Glass	BfDa-1:2188	2y-64	Lot 6	Glass		1
Glass	BfDa-1:2189	2y-64	Lot 6	Glass		1
Glass	BfDa-1:2190	2y-64	Lot 6	Glass		1
Glass	BfDa-1:2191	2y-64	Lot 6	Glass		1
Nail	BfDa-1:2192	2y-64	Lot 6	Metal		1
Nails	BfDa-1:2193	2y-64	Lot 6	Metal		14
Brick	BfDa-1:2194	2y-64	Lot 6	Brick		1
Glass	BfDa-1:2195	RGU	Lot 6	Glass		1
Glass	BfDa-1:2196	RGU	Lot 6	Glass		1
Metal object	BfDa-1:2197	RGU	Lot 6	Metal		1
Slate Pencil	BfDa-1:2200	2y-64	Lot 6	Slate	Tip	1
Trade bead	BfDa-1:2203	2y-64	Lot 6	Glass		1
Ceramic	BfDa-1:2208	SG	Surface	WRE	Body	1
Glass	BfDa-1:2220	A38	Lot 2	Glass		1
Glass	BfDa-1:2241	A38	Lot 2	Glass		1
Nails	BfDa-1:2264	2Y -64	Lot 2	Metal		11
Pipe bowl	BfDa-1:2269	SG	Lot 2	Clay	Bowl	1
Nail	BfDa-1:2276	SG	Surface	Metal		1
Brick	BfDa-1:2281	SG	Surface	Brick		1
Fence staple	BfDa-1:2296	SG	Surface	Metal		1
Nail	BfDa-1:2297	SG	Surface	Metal		1
Ceramic	BfDa-1:2298	SG	Surface	WRE	Body	1
Glass	BfDa-1:2299	SG	Surface	Glass		1
Ceramic	BfDa-1:2300	SG	Surface	Porcelain		1
Ceramic	BfDa-1:2302	SG	Surface	WRE	Body	1
Ceramic	BfDa-1:2303	SG	Surface	WRE	Body	1
Ceramic	BfDa-1:2304	SG	Surface	WRE	Body	1
Shotgun Shell	BfDa-1:2307	2Y -64	Lot 6	Metal		1
Glass	BfDa-1:2308	RGU	Lot 6	Glass		1

7.3.1 Historic Ceramics

Nine examples of historic ceramics were recovered (Figure 7.20). White refined earthenwares were among the majority with different decorative styles including three transfer printed sherds. Sherds BfDa-1:2303 and BfDa-1:2298 are black transfer print while BfDa-1:2304 is red transfer print. Non transfer printed white refined earthenwares include BfDa-1:2302, a hand painted piece with a green and orange decoration and BfDa-1:2164, an undecorated piece of whiteware. Other types of ceramics were one sherd of undecorated ironstone (BfDa-1:2208) and another of porcelain (BfDa-1:2300).

Two pieces of coarse earthenwares were found. BfDa-1:2166 is from a wheel thrown pot and has a glazed exterior. BfDa-1:2168, the other coarse earthenware sherd, is without glaze and has a decoration across the rim, as if fingernails have pressed into a lip and produced a row of bumps. These may be locally produced craft pottery.

7.3.2 Glass

Glass fragments found during the St. Croix excavations are almost uniformly small to the point of being non-diagnostic (Figure 7.21). All the pieces were flat, clear glass with two exceptions: BfDa-1:2241 and BfDa-1:2186. BfDa-1:2241 is a thin, flat piece of green glass, most likely from a bottle. BfDa-1:2186 is a shard from a broken cup or bottle, with beveled corner edges and a flat base. BfDa-1:2190, BfDa-1:2188 and BfDa-1:2299 are all layers of clear glass that have been melted together.

Figure 7.20: Historic ceramic sherds BfDa-1:2166 (A), BfDa-1:2168 (B), BfDa-1:2281 (C), BfDa-1:2302 (D), BfDa-1:2208 (E), BfDa-1:2300 (F), BfDa-1:2298 (G), BfDa-1:2303 (H), BfDa-1:2304 (I). (Source: Cameron Milner)

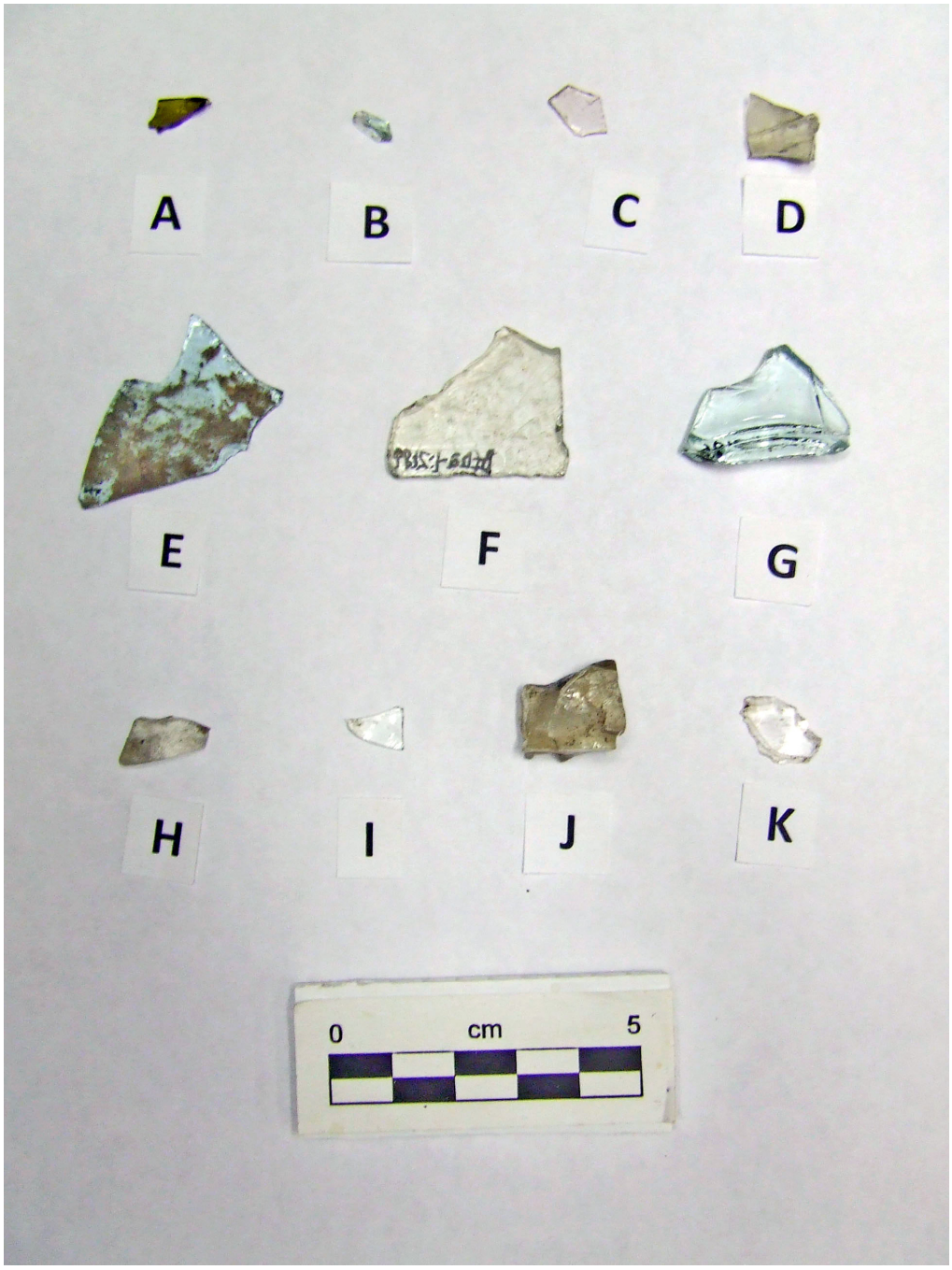

Figure 7.21: Historic glass shards BfDa-1:2241 (A), BfDa-1: 2220 (B), BfDa-1:2196 (C), BfDa-1:2190 (D), BfDa-1:2166 (E), BfDa-1:2189 (F), BfDa-1:2186 (G), BfDa-1:2191 (H), BfDa-1:2308 (I), BfDa-1:2188 (J) and BfDa-1: 2195 (K). (Source: Cameron Milner)

7.3.3 Metal Objects

Iron objects were found throughout Unit 2Y-64 and RGU, amounting to 38 specimens (Figure 7.22). Nails and other fasteners make up the bulk of the metal recovered (i.e., 35 nails and one fence staple). Most of the nails are modern wire nails but BfDa-1:2297, BfDa-1:2276, and BfDa-1:2192 are cut nails from the 19th century (Gilmour n/d/a: 4). The presence of such nails is not unexpected as the house on site was constructed during that time period. Other metal objects include BfDa-1:2197, an unidentified metal object, most likely a machine part, and BfDa-1:2307, part of a shot-gun shell.

7.3.4 Miscellaneous Lifestyle Objects

The 2012 excavations uncovered a number of objects related to the daily lives of the peoples who lived on the Wasowski/Geres property between European contact with aboriginal groups and the modern day shown here in Figure 7.23. Artifact BfDa-1:2203 (D in Figure 7.23) is a trade bead from the Protohistoric Period, consisting of a short, thin tube of white glass. The bead may be of a poor quality as it is partially closed on one end. A slate pencil tip, BfDa-1:2200, was recovered from unit 2Y-64.

Several pipe fragments were also found on site. A pipe stem fragment (BfDa-1:2131) was found in A25, while a pipe stem fragment (BfDa-1:2139) and a bowl fragment (BfDa-1:2269) were found in Sullivan's Garden. The pipe bowl fragment was embossed with a letter 'J'.

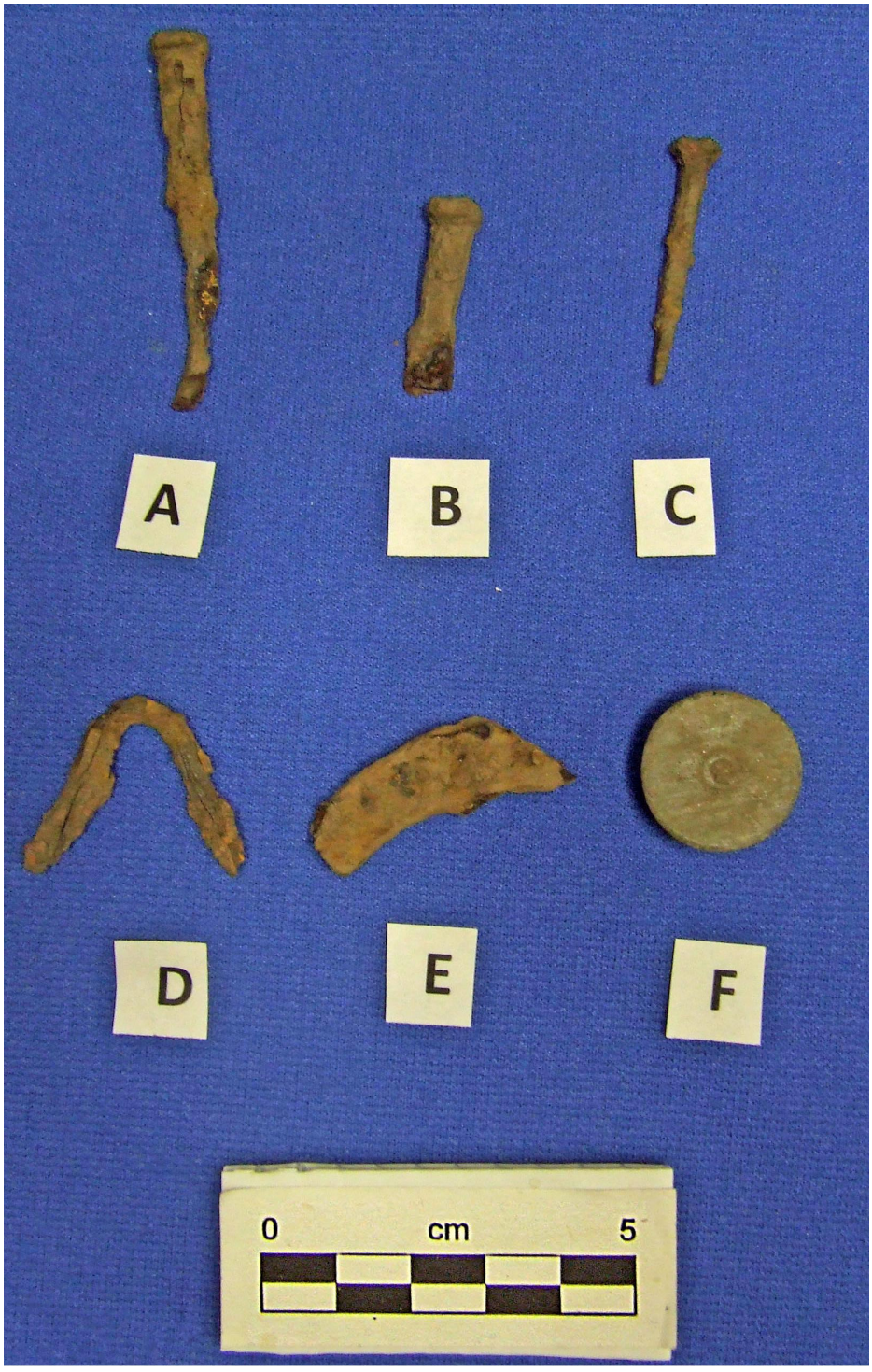

Figure 7.22: A selection of historic metal artifacts. BfDa-1:2276 (A), BfDa-1: 2192 (B), BfDa-1:2297 (C), BfDa-1: 2296 (D), BfDa-1:2197 (E) and BfDa-1:2307 (F). (Source: Cameron Milner)

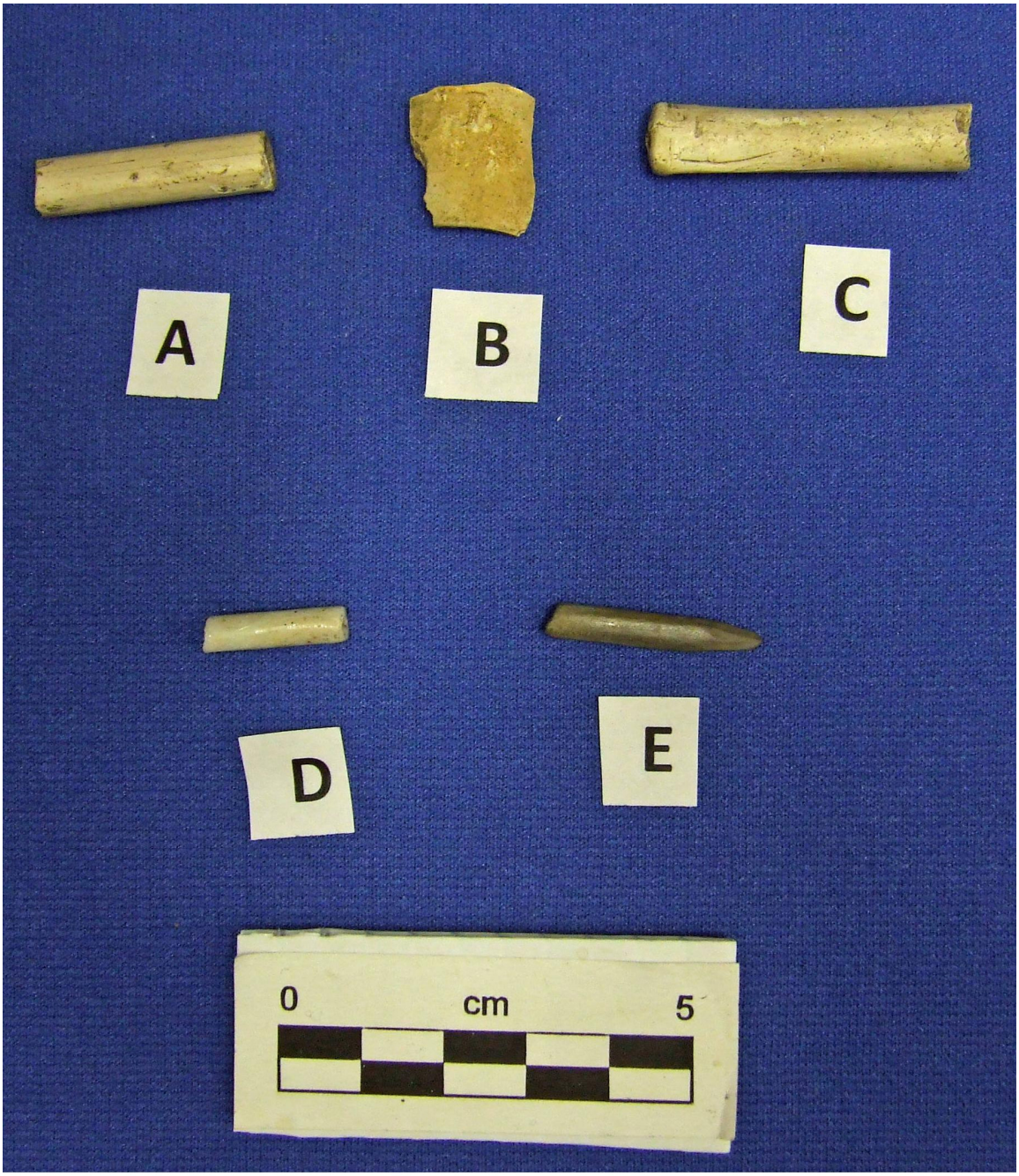

Figure 7.23: A selection of miscellaneous historic objects found at St. Croix in 2012. BfDa-1: 2131 (A), BfDa-1:2269 (B), BfDa-1:2297 (C), BfDa-1: 2197 (D) and BfDa-1:2307 (E). (Source: Cameron Milner)

7.4 Summary

Ceramics from the 2012 excavations continue to support the hypothesis that St. Croix was occupied for the whole breadth of the Woodland Period. St. Croix has some of the best dated ceramics in the province based on extensive thermoluminescence dating, and those decorative patterns tested by TL dating appear again in the 2012 assemblage. Pseudoscallop shell stamping from Ceramic Period 2 or earlier, dentate stamping from Ceramic Period 3 or earlier and cord-wrapped stick decorations from Ceramic Period 4 and beyond, suggest a long period of repeated occupation at St. Croix and showcase the breadth of development of ceramic manufacture in southwestern Nova Scotia. The assemblage of lithic artifacts ties very closely with these dates, with contracting stemmed projectile points and corner notched points reinforcing the Middle to Late Woodland Period dates. The abundance of scrapers is also fitting for this time period. Lithic raw material use is in keeping with observed trends during the Woodland Period in Nova Scotia's southwest, namely the utilization of local sources such as White Rock quartzite and the use of short range trade networks for the acquisition and distribution of cherts from Scot's Bay. The historic element at St. Croix is found to be fairly recent, but the presence of a trade bead points to some continued Native occupation into the Protohistoric Period.

Chapter 8: Ecofacts

Analysis of ecofacts, organic and environmental remains, found during the 2012 excavations is provided in this chapter. Ecofacts are subject to a wider spectrum of preservation difficulties and the findings at St. Croix are no different. Acidic soils, turbation through natural and cultural means and, despite the efforts of excavators, damage resulting from excavation all contribute to the limited size of ecofact assemblages. However, these small samples can contribute a lot of information and through analyses using the methodologies discussed in Chapter 6, as much data as possible was drawn from the 2012 ecofact assemblage. The results of those analyses are discussed below.

8.1 Faunal

Only two faunal elements were recovered during the 2012 excavations and both were small, fragmentary and in a poor state of preservation. Artifact BfDa-1:2266 is actually a small cluster of two pieces of bone, identified by Patty Wells of Memorial University as terrestrial mammal bone of an unidentifiable element. Artifact BfDa-1:2199 is a terrestrial mammal long bone of indeterminate species. It is also calcined.

Detracting from the information recoverable from elements BfDa-1:2199 and BfDa-1:2266 is their shared find location in Lot 6 of Unit 2Y-64, meaning their origins could be precontact, historic or even modern. The small amount of faunal material uncovered during 2012 is in direct contrast to the 802 samples collected throughout the

site during the 1990 and 1993 field schools. No determining factor in regards to the scarcity of faunal remains during the 2012 excavations could be found within the archaeological record.

8.2 Charcoal

Wherever available, charcoal was collected on site. St. Croix's status as one of the best dated sites in the province means that the charcoal found is less essential for dating purposes than for palaeoethnobotanical ones. Four small clusters of charcoal were analyzed by Memorial University MA candidate Jason Miszaniec. Charcoal specimens from A38 Lot 2 were found to be spruce, while the dark soil of A53 Lot 8A contained charred oak. Fragments from RGU were also found to be oak. Charcoal found during the 2012 excavations was almost uniformly fragmentary and very difficult to collect. In addition it was thought at the time of sampling that charcoal collected needed to be large enough for potential C14 dating and thus the largest pieces of charcoal were collected, creating in both cases a sampling bias towards larger specimens.

8.3 Pedological Analysis

Paleoethnobotanists distinguish between soils and archaeological sediments, with soils being the biologically active top layer of earth and archaeological sediments representing culturally modified soils horizons. Analysis of the archaeological sediments at St. Croix involved both on site assessment and laboratory analysis. Using the Munsell colour charts for use in geological contexts, sediment colours were identified in situ to be as accurate as possible. Units excavated during 2012 at St. Croix followed natural soil horizons and were consistent with the stratigraphic model created during the 1990 and 1993 field schools.

Table 8.1: Pedological analysis results

Unit-Lot	Colour	Munsell	Texture	Shape	Grain Sphericity	Roundness	pH	Mineral Content
A53-8B	Dark reddish gray	(5YR 4/2)	SCL[1]	A[3]/SB[4]/C[5]	-	-	4	13.30%
A53-8A	Very dark brown	(7.5YR 2.5/2)	SCL	A/SB/C	83 - 73	1 - 5	5	12.40%
2Y-64-6	Very dark greyish brown/dark reddish-brown	(10YR 3/2)/(5YR 2.5/2)	SCL	SB/C/G[6]	87 - 75	1 - 4	5	8.40%
RGU-6	Very dark greyish brown/dark reddish-brown	(10YR 3/2)/(5YR 2.5/2)	SCL	SB/C/G	85 - 75	3 - 6	5	14.30%
A25-2	Dark reddish-brown	(5YR 2.5/2)	SCL	A/SB/C	85 - 75	2 - 5	4	16.30%
A38-2	Dark reddish-brown	(5YR 2.5/2)	SC[2]	G/C	85 - 73	3 - 5	5	18.70%
F3-2	Dark reddish-brown	(5YR 2.5/2)	SCL/SC	SB/C/G	83 - 73	3 - 6	5	16.70%
A62-2	Dark reddish-brown	(5YR 2.5/2)	SCL	SB/C/G	81 - 71	1 - 4	4	17.20%
F25-2	Dark reddish-brown	(5YR 2.5/2)	SCL/SC	SB/C/G	81 - 73	1 - 4	4	17.90%
A53-2	Dark reddish-brown	(5YR 2.5/2)	SCL/SC	SB/C/G	83 - 75	1 - 4	4	17.20%
2Y-64-4/Feat. 3	Grayish Orange Pink	(5YR 7/2)	SCL	SB/C/G	83 - 73	1 - 5	4	42.20%
A38-2	Dark reddish-brown	(5YR 2.5/2)	SCL/SC	SB/C/G	83 - 67	1 - 5	4	20.90%

1) Sandy Clay Loam
2) Sandy Clay
3) Angular
4) Subangular Blocky
5) Crumbs
6) Granular

Lot 1 is a very dark greyish brown (10YR 3/2) sandy clay loam and was found across the site as topsoil (A Horizon), although it was absent in 2Y-64 due to tilling. Unit A62 had only a very thin layer of Lot 1. The separation of Lot 1 during the 1990 and 1993 field schools into two Sublots was discontinued during the 2012 excavations. The cultural occupation layer (B Horizon), known as Lot 2, is a dark reddish-brown (5YR 2.5/2) sandy clay loam. The C Horizon or sterile subsoil was dubbed Lot 3 and consisted of a dark brown (10YR 4/3) silty clay loam. Lot 3 contains boulder and cobble inclusions as well as some artifacts, most likely through root action or other natural processes. It is between Lots 2 and 3 that the most variation takes place. The breakdown of these further Lots can be seen in Table 8.1. Units 2Y-64, RGU, and F25 also contain leaching events.

From 50ml subsamples from the 12 sediment samples, laboratory analysis was completed. A further subsample of 30 ml was subjected to pH testing. The sediments at St. Croix were found to have a pH of between 4 and 5, meaning they are acidic. This is in agreement with observations on the deteriorated state of faunal remains, which do not survive in an acidic context.

Sediment texture was determined by drying a 10ml sample and separating it by particle size. The occupation layer at St. Croix is consistently a sandy clay loam, or on the verge of being either a sandy clay loam or a sandy clay. These were determined to be water deposited which is consistent with the presence of rounded cobbles and boulders found throughout. The original elevation of the river before the installation of the dam would have also placed the site in a position to receive alluvial deposits during periods of flooding (Deal 1993:4).

Granulometric analysis and particle analysis of the 10ml subsample yielded information about the make up of each sediment. Particles consistently had a range of shapes, including angular, granular, subangular blocky and crumbs, with the latter three being the most common. Particle sphericity fell within the range of 73 to 85, although outliers of 67 and 87 occurred. Roundness measurements place the particles within the lower half of the roundness scale, most often between 1 and 6. Analysis of the mineral content of each subsample fell between 10% and 20%, with an outlier of over 40% in the sample from 2Y-64. Whether or not this is due to leaching is uncertain. The results of sediment analysis are shown in Table 8.1.

8.4 Palaeoethnobotanical Analysis

For recovery of palaeoethnobotanical remains, 12 samples consisting of a total of 22,775.7g of sediment were floated. In previous palaeoethnobotanical analyses at St. Croix, subsamples of 150ml were used to provide empirically comparable results across a connected area. However, the areas excavated during the 2012 field season are far apart and it was decided that full samples would be floated in order to gain as much information as possible about the newly excavated areas. Large quantities of flot were recovered and examined under a binocular microscope for organic macroremains. Hundreds of seeds and other organic remains were recovered. The identification of macroremains was hampered by the often fragmentary nature of seeds and other organics left in the archaeological record but the use of comparative collections and reference material helped to aid identification efforts.

Fungal sclerotia (fungal fruiting bodies) were ubiquitous throughout the site, but their numbers dipped considerably in areas of domestic cultivation. Seeds from berries such as strawberries and elderberries, as well as *Rubus* species like blackberries and raspberries, were common. Lamb's Quarters species *Chenopodium album* and sandwort species *Arenaria stricta* were widespread in units placed in areas of domestic cultivation. Seeds, buds, charcoal and needles from a variety of trees including species of spruce, pine and hemlock were found in addition to charcoal. However, many of the recovered specimens proved to be uncharred and are therefore deemed to be modern in origin. Modern seeds find their way into archaeological sediments through a variety of means including windfall and the regular movements of excavators (Pearsall 1989:440). For this reason only charred remains will be discussed at length (Table 8.2). Palaeoentomological specimens recovered included a variety of insect parts, mostly weevils and ants, and insect eggs.

Charred remains were limited to three seeds identified through the use of Halwas' 2006 *Seed Identification Manual for the Minas Basin Region of Nova Scotia*. Two of these were the charred remains of blueberries (*Vaccinium sp.*) and were found in Lot 2 of F3 and Lot 8A of A53. Lot 8A is part of hearth Feature 6 so it may be related to cooking or raw consumption of blueberries or may simply be there as a result of burning food waste. Aside from having edible berries, the leaves and roots of the blueberry plant are boiled in water and either consumed as a tea or applied to the body as an anti-inflammatory by modern Mi'kmaq (Lacey 2012:43).

The third charred seed is part of a *Prunus* species, most likely *Prunus virginiana* in keeping with identifications made by Halwas of seeds present within the Minas Basin

area (Halwas 2006). The *Prunus virginiana*, or choke cherry, was found in unit A62. Cherries are frequently used in Mi'kmaq medicine and often taken as a tea in addition to the consumption of the bitter fruit. The inner bark of the chokecherry tree was steeped in water and consumed as a tea to treat diarrhea and possibly coughing (Lacey 2012:53).

Table 8.2: Charred seeds recovered during the 2012 excavations.

Unit-Lot	Number	Taxonomic (Common) Name
F3-2	1 seed	*Vaccinium sp.* (Blueberry)
A53-8A	1 seed	*Vaccinium sp.* (Blueberry)
A62-2	1 seed	*Prunus sp.* (Cherry)
Total	3 seeds	

Only seven charred seeds have been found during previous analyses of the sediments from St. Croix: two from the 1991 analysis by Jenkins and Lackowicz (1992) and five from 1993 sediment samples by Kevin Osmond (1993). The limited amount of floral macroremains may stem from a number of factors including preservation conditions, environmental stresses and animal actions. Macroremains suffer from a number of deposition and recovery biases. Archaeological plant remains are deposited through human activity and some natural actions. Unless charred, most will decay and be under represented. Seeds of plants used away from camp may never show up in the archaeological record of a site. When it comes to recovery, field and laboratory techniques may cause the loss or destruction of floral macroremains (Pearsall 1989:440). Flotation techniques also have limited accuracy. Accuracy tests of the flote-tech style flotation machine and the IDOT screen produced recovery rates of 46% and 72%,

respectively, although this is also affected by the relative experience of the analyst. Identification biases, both during the recovery and species identification processes also limit what can be determined from organic macroremains. What can be best provided by recovered plant remains is a glimpse into the diets and plant use habits of aboriginal groups. Research gaps caused by a variety of biases and difficulties can only be filled through further research.

8.5 Summary

As with the artifact analysis, ecofacts analysis reveals that new areas opened at the St. Croix site are very much in keeping with the results of the 1990 and 1993 excavations. Pedological analysis found the sediments in the area to be alluvial in nature and corresponded closely to previous research. Palaeoethnobotanical analysis found charred seeds in new areas of species found previously at the base site. Evidence for aboriginal consumption and use of blueberries and cherries was found during the 1993 excavations and analyzed charcoal revealed continued use of spruce as a fuel wood on the site, reinforcing a warm season occupation. The integration and interpretation of this data and data from Chapters 7 and 8 are discussed in the following chapter.

Chapter 9: Interpretations and Implications

The interpretation of the findings of the 2012 excavations at St. Croix occurs through the synthesis of new data and past data in order to paint a picture of life along the St. Croix River during the Woodland Period. This chapter will discuss the synthesis of this data on a unit by unit basis using artifact assemblages and stratigraphic data. The broader implications of this data are discussed later in this chapter. Responses to the previously mentioned research questions and secondary research objectives are addressed at the end followed by a discussion of future research possibilities.

9.1 Unit Focus

The information garnered for this paper from the units both on the base site and further afield adheres quite closely to those excavated during the 1990 and 1993 field schools. The strata of each unit fall quite closely to the model set forth during the field schools and any additional lots were created by human action. Lithic and ceramic artifacts continue to represent the human occupation during the full breadth of the Woodland Period. Lithic raw material use follows trends typical for southwestern Nova Scotia in this time period. Ecofacts point to continued use of local flora and poor preservation persists in precluding the inclusion of much faunal evidence. Moving north to south along the baseline, the following unit descriptions provide evidence for these assertions.

9.1.1 A62

Analysis of the ceramics found in A62 reveal occupation in that area from at least Ceramic Period 3 to Ceramic Period 5 and possibly later with the presence of dentate and cord-wrapped stick decorated pottery sherds. Lithic artifacts are non-diagnostic bifaces, although the recovery of a contracting biface stem (2260) may reinforce the Middle Woodland Period date if it is related to the contracting stems found on 'Tusket' style points 2240 and 2138. Flake counts for A62 show a large proportion of chert flakes with cortex, suggesting some first stage tool creation in that area. Flake size was generally small, indicating finer modifications were also taking place. Palaeoethnobotanical analysis identified the fragment of a charred cherry seed, suggesting that there is a hearth somewhere in the unit's vicinity. A62 was placed as close to the northernmost edge of the Geres/Wasowski property as possible. In the property opposite, a horse racing track may have destroyed much of the archaeological record, making A62 the end of the intact St. Croix site.

9.1.2 A53

Unit A53 did not contain many formal artifacts, nor was any pottery recovered. Lithic artifacts include a number of biface fragments, all of which are made from White Rock quartzite. A chert scraper, 2233, was also found in A53. Flakes from the unit were found to either be large quartzite flakes, often with cortex, or small chert flakes, suggesting the refinement or resharpening of chert tools and the initial production of quartzite tools, perhaps the very bifaces found within the unit. Feature 6, a hearth, contained the most quartzite flakes, suggesting a fire-side tool activity area. Charcoal from Feature 6 was found to be oak which may indicate a later season occupation in that area due to its higher heat output. The recovery of charred blueberry seeds, a crop

harvested in August in Nova Scotia, conflicts somewhat with this time frame although blueberries may also have been dried and consumed later in the season (Arnason, *et al.* 1981:2211).

9.1.3 A38

The artifact assemblage from A38 is particularly varied and has quite a few diagnostic artifacts. Decorated ceramics found in A38 are all grit tempered and have some form of dentate stamping, placing this part of the occupation layer most likely around the second or third Ceramic Period (ca. 2150-1350 BP) or the Middle Woodland Period. This is reinforced through the recovery of artifact 2240, a contracting stemmed or 'Tusket' projectile point which can be stylistically dated to the Early Middle Woodland Period. Both artifacts were found at approximately 16cm below the surface. Another projectile point, 2226, was also found in this unit at approximately 10cm below surface. Point 2226's relatively small size and corner notches place it within the Late Woodland Period. Confirming later use of this area is an undecorated ceramic sherd made with shell temper, dating the sherd to most likely between Ceramic Period 4 and 6 (ca. 1350-400 BP). A number of cores were also found in A38, and the unit produced quite a few flakes although the comparative amounts of internal and cortex flakes suggest the main activity was tool modification and maintenance, not primary production. Small shards of historic glass were found within Lot 1, meaning they may not necessarily date to the Historic or Protohistoric Periods. The size of the shards is such that they are not diagnostic and it is impossible to determine their respective dates.

Lot 9 of unit A38 was a thin vein of sediment across much of Lot 2 which was only determined to be a new Lot post-excavation. The soil was dark and contained highly

fragmented charcoal, lithic flakes, scattered pottery fragments and a number of small quartz crystals which make up Feature 5. The larger quartz crystals were collected as artifact 2242. Lot 9 may represent the only discernible living floor found on the site in 2012, as much of the occupation level across the site was homogenous throughout.

9.1.4 A25

Excavation of A25 confirmed that the depression located north of the base site and within which the eastern wall of A25 was dug was not in fact Acadian in origin. However, a fragment of a 19th century pipe stem was found in the unit. Non-historic artifacts include a bifacial tool, a bifacial core and a hammer stone which may have later served as an abrader. Lithic flake counts from the unit are almost completely without cortex, meaning tool modification and maintenance were most likely activities performed there. Ceramic sherds are all grit tempered, with the only decorated piece being a fabric paddled, dentate stamped sherd which may date to the 2nd or 3rd Ceramic Period (Petersen and Sanger 1993: 129).

Feature 1 is a small depression filled with dark sediments and pottery fragments located within the east wall heading down into the larger depression. Feature 1 may represent a hearth feature or some other human activity taking place within what is most likely a large natural depression.

9.1.5 F25

F25 also served to demonstrate that the origin of the depression just north of the base site was not Acadian in origin. Ceramics from F25 were not decorated but they were

grit tempered, serving to decrease the likelihood of the area's use during Ceramic Period 4 and 6 (ca. 1350-400 BP). Artifacts include several non-diagnostic lithic finds including a scraper and a biface. Flake counts point to the production of some chert tools but the quantity of cortex flakes is small, meaning primary production may have been limited while tool modification and maintenance were more common activities. The discovery of what appears to be red ochre may tie a pre- Ceramic Period 4 date with one of the earlier cultural traditions of the Early Woodland Period for whom red ochre held more symbolic meaning. The origin of Lot 7, a thin layer of course sand and coarse to fine pebbles, remains unexplained although soil leaching in the bottom of F25 may point to hydrological factors.

9.1.6 Units A15 and F3

At the fringes of the base site, F3 and A15 represent the outer edges of the originally excavated areas from 1990 and 1993, although artifact quantities do not appear to decrease. Lithic artifacts in A15 were limited to biface 2135, a small jasper bifacial point whose size may point to a Late Woodland Period date. Despite containing only one formal artifact, A15 did have the second highest quantity of flakes recovered during the 2012 excavations. Large quantities of chert and quartz with little in the way of cortex flakes indicate an area of consistent use for the modification and maintenance of lithic tools. The small quantity of cortex compared to internal flakes within the chert debitage assemblage is reflective of Jalbert's inferences about Scot's Bay cherts receiving reduction at the quarry site and at Clam Cove before their eventual dispersal into the interior (Jalbert, 2011:81).

F3 contained the most ceramics out of all the units excavated in 2012. Only three ceramic sherds are decorated: one dentate stamped, one cord-wrapped stick stamped and one with a trailing mark. All three are grit tempered suggesting the possibility that the cord-wrapped stick sherd is from Ceramic Period 4, when shell temper was less common. With the dentate stamped sherd dating to Ceramic Period 2 or 3, the area of F3 could have seen continual use from ca. 2150 to 950 BP. Fabric paddled sherd 2101 and a single shell tempered non-decorated sherd also extends the use life of the area to include Ceramic Periods 4 and 6. The large quantity of pottery and the recovery of a charred blueberry seed suggest food preparation as an activity that may have occurred there. Flake counts from F3 indicate modification and maintenance of quartz and quartzite tools, while a large proportion of chert cortex flakes indicates primary production of tools. Lithic tool finds include a broken quartzite drill and a chert biface. It should also be noted that, although F3 is on the outer edges of the base site, this edge is artificial. The large trees that mark the edge of the base site serve to denote the areas undisturbed by domestic cultivation and, had modern activities not disturbed the archaeological record, the base site would simply be another part of a larger occupation that stretched all the way to the Sullivan's Garden area.

9.1.7 2Y-64 and Sullivan's Garden

Unit 2Y-64 provides proof that although much of the archaeological record is destroyed within the Sullivan's Garden area, there is a thin layer of undisturbed sediment underlying the plow zone (Lot 4). However, only lithic debitage was found within Lot 4 so very little can be determined. Flake counts are almost completely without cortex,

indicating tool maintenance and modification taking place during the earliest occupation of the area within 2Y-64.

The rest of 2Y-64 is difficult to interpret due to the intense plowing action so only a general interpretation of those artifacts found within Sullivan's Garden can be provided. Decorated ceramics are almost exclusively cord-wrapped stick designs, sometimes with punctates and most commonly of grit temper. Dentate stamping and interior channeling were also present, extending the date range of the area between Ceramic Periods 2 and 6. Diagnostic lithic artifacts include the contracting stemmed quartzite projectile point 2138 and the corner-notched chert point 2206, confirming the date range of the area between the Early Middle Woodland Period and the Early Late Woodland Period, as the larger size of 2206, despite its corner-notched morphology, precludes it from a later Late Woodland date. Lithic debitage from Lot 6 of 2Y-64 alone is almost double the size of the second highest assemblage in A15 at 1111 flakes. Quartz, quartzite and non-specific cherts are heavily represented, with cherts outnumbering quartz and quartzite combined. Large quantities of jasper and chalcedony from Scot's Bay add to this total. With cortex flakes accounting for only 11.8% of total flakes, and chert cortex flakes accounting for 11.2% of total chert flakes, Jalbert's assertion that chert received previous reduction at Scot's Bay and Clam Cove is confirmed by this assemblage. However, quartz and quartzite cortex flakes are similar at 10 % and 15%, respectively.

A variety of historic household items were also found within the garden, although they appear to be quite recent. Dating mostly to the 19th century, there is one exception in the form of a trade bead which indicates that St. Croix saw at least some aboriginal use after European contact. What appear to be modern bone fragments, combined with the

very broken quality of the historic artifacts, demonstrates the use of Sullivan's Garden not only as a place for domestic cultivation but also a garden midden, or that refuse may have been added as fertilizer.

What can be said about unit 2Y-64 and the Sullivan's Garden area in general is that it is one of the most artifact-dense parts of the St. Croix site, but has been heavily affected by plowing. However, from the artifacts recovered we know that the area was well used during the Early Middle Woodland and Early Late Woodland Periods and was the site of a broad range of activities including tool production and maintenance as well as possible food preparation with ceramic vessels. The trade bead pushes the use history of St. Croix into at least the Protohistoric Period, and the inclusion of a number of historic artifacts indicates the shift of the land's use from an activity and living area for aboriginal groups to the modern garden and midden of the Sullivan household.

9.1.8 RGU and the Ross Garden

The Ross Garden Unit was an attempt to observe the quality of the archaeological record at another location of extensive domestic cultivation within the St. Croix community, but also served to look at artifact density further inland from the St. Croix River. This was to gain an idea about the size of the site and the extent of the aboriginal occupation within the larger community. RGU demonstrates that the occupation of St. Croix was wide and involved campsites at least 90m beyond the river's edge. Much like unit 2Y-64, RGU has suffered from extensive ploughing and only a thin layer of sediment remains undisturbed (Lot 5). The following assessment of Lot 5 then constrains

what we can know about RGU, and those artifacts found within the plow zone can tell us about the Ross Garden in general.

Within Lot 5, decorated ceramics are quite early, including some of the few pseudoscallop shell decorated sherds found during the 2012 excavations. This indicates that RGU may have an occupation as early as Ceramic Period 1 (Godfrey-Smith, *et al.* 1997:270). However, a broken contracting stemmed quartzite projectile point shows that occupation also occurred during the Early Middle Woodland Period. Lot 5 of RGU only contained a small amount of lithic debitage, but contained a large number of quartz flakes and a high proportion of cortex quartzite flakes in comparison to interior quartzite flakes. The majority of the lithic artifacts found within Lot 5 are quartzite, so within the particular area, quartzite and quartz may have been the raw materials of choice.

The plow zone of RGU contained only one decorated ceramic sherd which was dentate stamped and grit tempered, suggesting an occupation of the Ross Garden area during the 3rd Ceramic Period. Lithic debitage counts reveal heavy use of quartz, chert and quartzite. Historic material such as glass shards and metal fragments found within the plow zone suggest that, much like unit 2Y-64, the Ross garden also served as a household midden.

The combined evidence suggests that RGU is an area of earlier occupation than 2Y-64, although at certain points the areas would have been used contemporaneously. However, the Burton collection from the Sullivan's Garden area also contained artifacts from the Late Archaic, so an earlier occupation date must also be applied to 2Y-64. It must be noted that this is only the briefest glimpse into one square metre of the Ross

garden and further excavations are necessary before a more concrete image of settlement patterning through time at St. Croix can be established.

9.2 Research Questions

The research objectives of the 2012 excavations at St. Croix were to examine the geographic extent of occupation at the site and to determine the quality of the archaeological record in areas of domestic cultivation. In terms of the geographic extent of the St. Croix site, the discovery of artifacts in areas further north and east than previously excavated point to the site being even larger than previously thought. A current estimate places the site at 560m running north along the St. Croix River from the southernmost edge of the Route 1 Bridge at the end of Dawson Lane and at least 140m east of the St. Croix River bank in some areas. A total site area is impossible to determine; this is only an estimate based on evidence found through excavation. Further excavations may find the site larger or smaller if the Ross Garden area represents an outlier occupation area.

Excavations in the Ross and Sullivan's garden areas indicate that not only were these places occupied, but that they were not completely destroyed by modern disturbance. Previous excavations by Erskine found the site to be irrevocably disturbed by ploughing activities (Deal 1994), but the discovery of Lot 5 in RGU and Lot 4 in 2Y-64 indicate that this is not completely true. Excavations within the plow zone can provide some knowledge of the general occupations at St. Croix, but further excavations within the Sullivan's Garden and Ross Garden areas can yield valuable information about earlier

occupations at the St. Croix site. The discovery of intact occupation areas at least 60m north of the base site also suggest new opportunities for further research.

Recommended research objectives stemming from previous archaeological work garnered two subsidiary points of interest for the St. Croix site. The potential discovery of an Acadian cellar on an adjacent property prompted interest in the Acadian use of the St. Croix area and remained an ever present objective during the 2012 excavations. Despite the efforts of excavators, especially concerning a suspicious depression investigated through units A25 and F25, no evidence for an Acadian occupation was found during the 2012 excavations. However, excavations in the undisturbed forest area of the St. Croix community were limited to the first 20 metres along the St. Croix River bank, and excavations further inland may be more productive.

The Clarence Burton collection is the reason archaeologists were initially drawn to the St. Croix area and the presence of Late Archaic lithic tools in the collection drove excavators in the 2012 excavations to strive for the recovery of an intact Archaic occupation layer. In the effort towards this goal, units A15, A25, F3 and A53 were dug well beyond the established occupation layers to ascertain for certain that no Archaic Period occupation layer was present. Indeed, no evidence was indeed found for such an occupation. However, future excavations may shed light on the Archaic occupations of the St. Croix site.

9.3 The 2012 Excavations in the Context of Past Research

The findings of the 2012 excavations at St. Croix were very much in keeping with previous research on the site. Except for units with man-made alterations such as hearths

and plow zones, the soil strata followed the model worked out during the 1990 field school. Pedological analysis reveals similar trends in particle morphology and soil composition (Deal 1994: 4-6). Ceramic artifacts run the same chronological breadth from Ceramic Period 2 or earlier with pseudoscallop shell designs to Ceramic Period 6 with cord-wrapped stick decorations (Table 9.1). Lithic tool assemblages including drills, and unifacial cutting and scraping tools, and bifacial cutting tools were common to both the field school excavations and the 2012 excavations. Projectile point styles such as corner notching and contracting stem were common to both assemblages, although the 2012 excavations did not uncover another large side-notched Meadowood point like BfDa-1:1510.

Lithic raw material use trends observed within the 2012 assemblage are very similar to Catherine Jalbert's examination of the St. Croix lithic assemblage found during the 1990 and 1993 field schools. As with previous excavations, contracting stemmed projectile points were made of White Rock quartzite and later corner-notched points were made from Scot's Bay cherts (Jalbert, 2011: 80). Flake raw material percentages were very similar, with Scot's Bay cherts representing 48% of total flakes and White Rock quartzite slightly lower than previous years at 27% of total flakes compared to 50% and 36% respectively in Jalbert's analysis (Jalbert 2011: 68). The larger size of quartzite bifaces and small size of chert bifaces is also a continued trend within the 2012 assemblage (Jalbert 2011:81).

Palaeoethnobotanical analysis of the 2012 sediment samples revealed not only similar species but proportionally similar sample sizes suggesting consistent preservation conditions across the site. Blueberry (*Vaccinium sp*) and cherry (*Prunus sp.)* species were

found in both the 2012 and 1990 and 1993 analyses (Halwas 2006:44). The recovery of spruce charcoal in A38 is in keeping with previous excavations. Oak charcoal found in RGU is a new species, but the use of hardwoods is not unexpected as birch was also found during the 1990 and 1993 excavations.

9.4 Further Research

The excavations of 2012 have opened up a number of avenues for further research. The discovery of an undisturbed layer of the Sullivan's Garden and Ross Garden areas of the St. Croix community mean that areas once thought to be completely destroyed are now available for research. Further excavations in areas beyond the bank of the St. Croix River may lead to the discovery of more areas with undisturbed strata. Excavations in and around the Acadian cellar may also provide greater insight into the historic occupations of the wider St. Croix community.

In terms of expanding on the base site, the large, open clearings located next to units A38 and A53 are both of key interest to further excavations. The richness of the material culture recovered from these units, especially A38's multiple projectile points and features such as A53's hearth feature, which extends into its north wall, indicate that there is much left to be found at St. Croix. Its value as an archaeological site has already been shown through the wealth of its material culture, and as one of the best dated sites in the province, further research will only increase the importance of St. Croix within Nova Scotian archaeology.

Table 9.1: A breakdown of the maximum occupation ranges of each area by unit based on artifact assemblages.

A15								
F3								
A25								
F25								
A38								
A53								
A62								
2Y-64								
Sullivan's Garden								
RGU								
Ceramic Periods	Pre-CP	CP[1] 1	CP2	CP3	CP4	CP5	CP6	CP7
Developmental Periods	Archaic	EWP[2]	EMWP[3]	MWP[4]	LMWP/ ELWP[5]	MLWP[6]	LLWP[7]	Protohistoric

1) Ceramic Period
2) Early Woodland Period
3) Early Middle Woodland Period
4) Middle Woodland Period
5) Late Middle Woodland Period/Early Late Woodland Period
6) Middle Late Woodland Period
7) Late Late Woodland Period

Chapter 10: Conclusion

The St. Croix village site is one of the most important sites in Nova Scotia's southwest. It has been the subject of field schools and been the object of a number of research projects which have helped to shape archaeological knowledge concerning aboriginal life during the Woodland Period. Ceramic artifacts, some of the best dated in the province, exhibit decorations spanning the full breadth of the Woodland Period. Lithic artifacts from the Early and Late Woodland Period reinforce these dates and help to establish St. Croix's place in local and regional trade networks, as the receiving end of cherts from Scot's Bay and eastern Quebec. St. Croix has been the subject of extensive palaeoethnobotanical research and analysis has found evidence for aboriginal utilization of local edible and medicinal plants. Faunal remains are difficult to identify due to poor preservation and thus subsistence patterns are less well understood, but examinations of charcoal found on site has contributed to seasonality models, suggesting warm period occupations. Integrating this wide variety of data has resulted in a concise picture of life at St. Croix: a fishing village occupied during the spring and fall during the Early Woodland to the Late Woodland Periods.

Previous excavations at St. Croix focused on a small area of the undisturbed portion of the site. For further research to progress, glimpses of other areas of the site must be obtained. Excavations in 2012 opened up new areas of the St. Croix site to excavation and the results have certainly opened up new avenues of research. In keeping with previous excavations methodologically, the 2012 excavations expanded broadly north and southeast, and found new areas that assured future research opportunities. In

the forested area of St. Croix undisturbed by modern activities, excavation units exhibited similarities to the 1990 and 1993 excavations. Ceramic artifacts with pseudoscallop shell, dentate and cord-wrapped stick decorations reinforce the dates put forth by previous research. Lithic artifacts continued to represent Early Middle to Late Woodland period occupations and reinforce St. Croix's place as an area of production and maintenance of lithic tools. Lithic raw materials confirm Jalbert's hypothesis of St. Croix forming the final distribution phase of a regional trade network bringing cherts from Scot's Bay through staging areas at Clam Cove into the province's interior. Palaeoethnobotanical analysis also found similar plant use trends and the recovery of softwood charcoal strengthens the argument for a warm weather occupation.

What are most exciting about the 2012 excavations are the new avenues of research opened by its findings. Areas of known domestic cultivation once thought to be completely disturbed actually contain a thin layer of undisturbed occupation layer, meaning swaths of the St. Croix community that were deemed to lack intact archaeological deposits might now be fruitful areas of excavation. A trade bead found in an area of domestic cultivation suggests that Native occupation of some parts of St.Croix may have continued into the Protohistoric Period. The presence of material culture in unit A62 pushes the known boundaries of the site within the undisturbed forested area of the St.Croix community a further sixty metres, opening up several large areas for future excavations.

St. Croix is just beginning to reveal its secrets to archaeologists. The site is larger and older than previously thought and large new areas are open for further research. This thesis sought not only to add to and synthesize previous research but to present St. Croix

as we know it now; a large Proto-Mi'kmaq fishing village used possibly from the Archaic Period into the Protohistoric Period. St. Croix is poised to become one of the best researched sites in Nova Scotia and the information presented in this thesis serves to supply future researchers with the knowledge base of St. Croix's past and its potential future.

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