An Analysis of the Flaked Stone Assemblage from the Hiikwis Site Complex, Barkley Sound, British Columbia

by

Kelsey MacLean
BA, University of Victoria, 2009

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Supervisory Committee

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Abstract

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This thesis analyses the flaked stone assemblage from the Hiikwis site complex (DfSh-15 and DfSh-16) in Barkley Sound, British Columbia. The Hiikwis flaked stone assemblage is anomalous within Barkley Sound due to the presence of relatively abundant flaked stone in late contexts. Prior to Hiikwis, the most recent flaked stone in Barkley Sound dated to approximately 2000 BP. Hiikwis has flaked stone beginning at approximately 2800 BP and lasting until the final occupation of the site in the early 1900s.

Artifacts are classified based on a descriptive lithic analysis and then the behavioural implications of the assemblage are discussed through use of the *chaîne opératoire* and theories of technological organization and design theory. Spatial and temporal differences become apparent throughout the site and demonstrate changes in the types of tools used over time. The Hiikwis site complex is compared to other sites within the region, as well as beyond. A discussion of the attributes of the West Coast culture type and the Gulf of Georgia traditions makes it clear that the findings at Hiikwis support the Wakashan Migration Hypothesis. In turn, this assemblage calls for a re-evaluation of the West Coast culture type, while suggesting that there may be other unexcavated sites in Barkley Sound with flaked stone in recent components.

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Acknowledgments

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Dedication

This thesis is dedicated to my parents, Scott and Colleen MacLean, whose endless support made this endeavour possible.

Chapter 1: Introduction

1.1 Hiikwis Archaeological Site Complex

Hiikwis is located off the west coast of Vancouver Island in northeastern Barkley Sound along the north side of Sechart Channel. Hiikwis is an archaeological site complex involving two sites: DfSh-15 and DfSh-16. The first occupied locale was Uukwatis (DfSh-15), but the village later moved west along the beach and was re-established at Hiikwis proper (DfSh-16) (see Figure 1). In its final stage, the village seems to have encompassed both sites. As such, the Hiikwis Archaeological Project examined the total site complex. Excavation began at Uukwatis in 2008, continued at Hiikwis proper in 2009, and was completed at Uukwatis in 2010. Radiocarbon dates demonstrated that occupation began at Uukwatis around 2800 cal BP while the Hiikwis occupation began at around 1200 cal BP. Both sites were occupied into the 20th century (as is discussed in Chapter 3), and numerous historic artifacts occur in the upper layers. A wide variety of artifacts were recovered from both sites, including a diversity of ground bone items, ground stone, historic artifacts, and for the first time in relatively large numbers in an assemblage in Barkley Sound, flaked stone. This thesis examines the flaked stone assemblage and represents the first analysis of materials from the Hiikwis site complex.

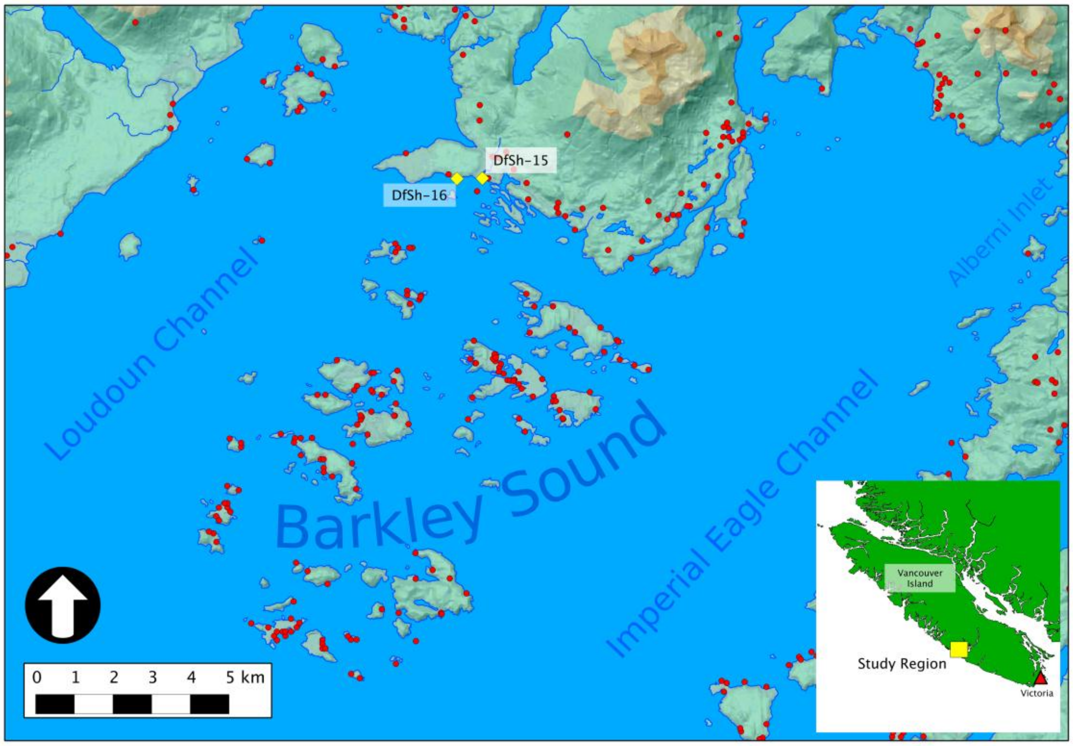

Figure 1: Map of DfSh-15 and DfSh-16, map courtesy of Nick Waber

1.2 Thesis Goals

The Hiikwis flaked stone assemblage is anomalous within Barkley Sound due to the presence of abundant flaked stone in late contexts, causing this research project to take an exploratory approach. The research questions guiding this study are:

1. What types of flaked stone tools were being produced and/or used at this site?
2. What technologies were employed in the production of these tools?
3. Were the raw materials local or imported? What was the availability of these materials?
4. What spatial and/or temporal patterns are evident within the assemblage?
5. Although this assemblage is unique within Barkley Sound, how does it relate to other industries in the immediate region, and beyond?

1.3 Methodology Employed

The assemblage is first characterized by taking basic measurements and describing specific attributes (Chapter 5). Both quantitative and qualitative measures are involved in this characterization. Following this descriptive analysis, a basic statistical analysis is employed to demonstrate patterns within the assemblage (Chapter 5). The results of the analysis are then further discussed within the framework of the *chaîne opératoire* and design theory (Chapter 6).

1.4 Thesis Organization

Chapter Two reviews the archaeological research that has been conducted in the region, beginning with the excavations at Yuquot in the 1960s, to the excavations at Huu7ii in 2004 to 2006. This review demonstrates how unique the Hiikwis site complex is in the region and demonstrates why this research was undertaken. It examines the similarities in artifact types between sites in the Barkley Sound region and considers changing temporal patterns in both raw materials and technologies employed. This chapter also introduces Mitchell's West Coast culture type, as well as the Wakashan Migration Hypothesis (Mitchell 1988; McMillan 1999, 2003).

Chapter Three is a brief review of the ethnographic knowledge of Hiikwis, setting the context for the research. Nuu-chah-nulth social structure is reviewed, as well as the use of the site, first by a local group known as the Nash'as7ath and later by the Tseshaht. The amalgamation of various groups over time is considered as it relates to changing territories over time, including ownership of Hiikwis.

Chapter Four introduces the two Hiikwis archaeological sites. A description of the sites is provided, as well as a discussion of the excavation methodology employed. Unit placement, site stratigraphy, and radiocarbon dates are also included in this chapter.

Chapter Five introduces the Hiikwis flaked stone assemblage. This chapter begins by describing which variables were measured as well as how each measurement was taken. It then moves into the descriptive lithic analysis of the various categories recognized during analysis. The artifacts are first classified as tools or debitage, and then by specific artifact categories. The number of artifacts is listed, as well as their dimensions, raw material, and a brief qualitative description. Following the artifact classifications, the artifacts are examined based on their reduction strategy. Summary statistics are provided for each category as well as a brief discussion.

Chapter Six includes further analysis and discussion of the flaked stone assemblage. This chapter presents interpretations of the data offered in Chapter 5 by drawing on the *chaîne opératoire*, as well as theories of technological organization and design theory. These theories are used to discuss several artifact types as well as raw material availability, behavioural implications of the tool and debitage assemblages, and the replacement of knives with microliths over time. The temporal and spatial aspects of the site are discussed as well as the regional relationships to Barkley Sound and farther.

Chapter Seven draws conclusions regarding regional raw material availability, design variables and technological strategies present at the site, spatial and temporal differences within the site, and regional relationships within Barkley Sound and beyond. In addition, this chapter briefly discusses the way in which the Hiikwis lithic assemblage supports the Wakashan Migration Hypothesis and postulates possible reasons why flaking technology continued at this site into the historic period.

Chapter 2: Archaeological Context and Review of Previous Work

2. Introduction

Archaeological research on the west coast of Vancouver Island began in 1966 with the excavations at Yuquot, beginning extensive research that has continued along the coast into the present. The primary purpose of this chapter is to briefly outline the archaeological research that has been conducted in this region. It summarizes the primary features of the West Coast culture type and outlines the major results of the excavations at Yuquot, Hesquiat Harbour, Shoemaker Bay, Little Beach, Grappler Inlet, the Toquaht Project sites, Ts'ishaa, Huu7ii, Nitinat Lake, and the Juan de Fuca Marine Trail.

2.1 Definition of a Culture Type

A culture type is "a group of components distinguishable by the common possession of a group of traits" (Spaulding 1955:12). The definition purposely does not define the nature of the traits used in determining similarity, making this term useful for a variety of circumstances. The term 'culture type' is a conveniently vague term, allowing the researcher to determine the degree of similarity necessary for classification, as well as the attributes selected for comparison (Spaulding 1955:13). It is important to note that this most basic definition of a culture type does not limit its use with either temporal or spatial considerations.

2.2 West Coast Culture Type

The West Coast culture type is a concept devised by Mitchell (1990:356) to describe the past 5,000 years of Nuu-chah-nulth technology on the Western coast of

Vancouver Island. The West Coast culture type is an analytical unit based on Yuquot and Hesquiat Harbour, which were the only major excavated sites at that time (Mitchell 1990:356). Following Dewhirst (1980) and Haggarty (1982), writing about Yuquot and Hesquiat respectively, Mitchell (1990:356) lists the distinctive archaeological characteristics of this area to include:

> "…ground stone celts; ground stone fishhook shanks; hand mauls; abrasive stones; unilaterally barbed bone points; single barb points; bone fishhook shanks; unilaterally and bilaterally barbed bone nontoggling harpoon heads; bone single points; bone bipoints; large and small composite toggling harpoon valves of bone or antler, small ones with two-piece 'self-armed' variety with ancillary valve; sea mammal bone foreshafts; bone needles; bone splinter awls; ulna tools; whalebone bark beaters; whalebone bark shredders; perforated tooth and deer phalanx pendants; mussel shell celts; and mussel shell knives" (Mitchell 1990:356).

In constructing the culture type, Mitchell (1990:356) emphasizes the lack of flaked stone technology and the infrequency of ground stone technology, while stressing the importance of numerous types of ground bone objects. Due to the abundance of ground bone technology, the majority of stone artifacts are abrasive stones that would have been used in the production of these artifacts, as well as those of wood that have not survived (Mitchell 1990:356).

The West Coast culture type has been considered to encompass all of the West coast of Vancouver Island, including Barkley Sound, over the last 5,000 years. It is seen as the archaeological record of the evolving Nuu-chah-nulth culture (Mitchell 1990:356). McMillan (1999:45) argues against Mitchell's characterization of the culture type as essentially unchanging over time and space, and notes that more recent excavations in Barkley Sound show temporal and spatial differences evident in the region.

2.3 Yuquot and Hesquiat

2.3.1 Yuquot

Yuquot is located at Friendly Cove on the southeast end of Nootka Island at the entrance to Nootka Sound (Dewhirst 1980:19). The midden deposits are extensive, stretching 215 m along the beach and forming a 4.5 m high bank (Dewhirst 1980:24-25). An excavation trench extended for 19.5 m in length "with a maximum width of [4.5 m]" (Dewhirst 1980:28). In total, 231.8 m^3 of deposit was removed (Dewhirst 1980:29).

Recovered artifacts were made of bone, antler, tooth, shell, stone, and wood (Dewhirst 1980:65). The majority of the artifact classes and faunal remains show remarkable similarity throughout the archaeological record, indicating cultural continuity spanning 4300 uncalibrated radiocarbon years, with tools becoming increasingly specialized for the outer coastal environment over time (Dewhirst 1980:336).

Despite noting the high level of continuity, Dewhirst divides the Yuquot occupation into four periods: Early (pre-4300 to 3000 BP), Middle (3000 to 1200 BP), Late (1200 to 210 BP), and Historic (210 BP to 1966) (Dewhirst 1980:337-347). Artifact types recovered from the Early Period include a series of abraders, abrasive saws, celts, flaked stone wedges, a worked flake, and various awls, needles, and shuttles (Dewhirst 1980:337). Tools first introduced in the Middle Period but also present in later periods include abraders, celts, awls, needles, and bark-working tools (Dewhirst 1980:339). Also present in this period are gorges, harpoons, stemmed points, points with multiple barbs, isolated fragmentary points, a wide range of pendants, beads, drinking tubes, whistles, and whalebone clubs (Dewhirst 1980:339-341). Several new tool types were introduced in the Late Period, including iron cutting tools, large slotted harpoon valves and small valves of composite whistles, and there is a general shift from non-toggling to toggling harpoon heads (Dewhirst 1980:342-345). In the Historic Period there is an increase in "arrow points with widely spaced barbs" (Dewhirst 1980:347) and a wide range of artifacts of introduced materials. In all components, there is a general paucity of flaked stone, which became a defining feature of the site as well as the West Coast culture type. Due to this large volume of data, Yuquot is a prominent and important site in this region.

As previously noted, Mitchell's West Coast culture type is largely based on the Yuquot data and is greatly influenced by Dewhirst's argument for over 4000 years of cultural continuity (Dewhirst 1980). The West Coast culture type is apparent at Yuquot by at least 4300 BP and present at Hesquiat Harbour by ca. 1860 BP (Mitchell 1990:356).

2.3.2 Hesquiat Harbour

Between 1971 and 1979 the Hesquiat Archaeological Project studied 34 sites within traditional Hesquiat territory and considered the faunal and artifactual data based on their association with one of the five Hesquiat local groups (Calvert 1980:104; Haggarty 1982:84,178). Calvert (1980:134-137) discusses three excavated sites; DiSo 16, DiSo 9, and DiSo 1, from which she analyzed the faunal remains. Haggarty (1982:181) analyzed the artifacts, organizing them based on their raw material and presumed function. The use of bone and antler for tool production is prevalent within each local group's traditional territory while flaked stone and other stone artifacts were only found in certain locales (Haggarty 1982:186,181).

Evidence emerging from ethnographic, stratigraphic, and chronological information places each of the five local groups in their traditional territory by at least ca 800 BP and shows an occupation extending into the present (Haggarty 1982:191). Based on stratigraphy and chronology, there is evidence of human occupation as early as ca

1900 BP (Haggarty 1982:191). Mitchell notes the similarities between the Yuquot and Hesquiat Harbour sites by arguing that the West Coast culture type was clearly present at Hesquiat Harbour from the earliest dated materials (Mitchell 1990:356).

2.4 Sites That Challenge the West Coast Culture Type

There are a number of sites investigated since Mitchell's 1990 proposal of the West Coast culture type in modern Nuu-chah-nulth territory south of Yuquot that differ from the West Coast culture type. These include Shoemaker Bay, Little Beach, and Grappler Inlet.

2.4.1 Shoemaker Bay (DhSe 2) and survey work in the Alberni Valley

Shoemaker Bay (DhSe 2) is sheltered behind Johnstone Island at the head of the Alberni Inlet (McMillan and St. Claire 1982:51). Although most of the site has been disturbed at one point or another, approximately 60 by 45 m of the site was still intact at the time of excavation (McMillan and St. Claire 1982:51). In their 1973 and 1974 excavations, McMillan and St. Claire (1982:51,54-55) aimed to determine whether the site had closer ties to Nuu-chah-nulth sites on the open west coast or to those on the Strait of Georgia. This area was Nuu-chah-nulth historically, but ethnographic information suggests that the Nuu-chah-nulth arrival was relatively recent.

In total, 43 2 x 2 m units were excavated, as well as three extensions of particular units (McMillan and St. Claire 1982:55). The depth of deposits in the excavated area ranged from 0.5 to slightly over 1 meter below the surface. The total matrix removed was 132 m^3. This resulted in the recovery of 2,558 artifacts found in situ as well as a large collection of artifacts from the disturbed surface (McMillan and St. Claire 1982:55).

McMillan and St. Claire recognize two components: the earlier component labelled Shoemaker Bay I (stratigraphic zones B, C, and D), and the more recent component, Shoemaker Bay II (stratigraphic zone A) (1982:58). The beach gravel (Zone D) was radiocarbon dated to 4080 BP and is said to represent the initial date of occupation while Zone C dates to 2910 cal BP and probably indicates the beginning of intensive occupation of the site (McMillan and St. Claire 1982:58,61). The termination of Shoemaker Bay I is unknown as a suitable dating sample from Zone B was not recovered; however, Shoemaker Bay II included dates of 1500 cal BP and 1180 cal BP (McMillan and St. Claire 1982:61). The site was abandoned by at least 535 BP, which was determined by a core sample from the stump of a tree that grew on top of the site following abandonment (McMillan and St. Claire 1982:61).

Several types of flaked stone artifacts were recovered from Shoemaker Bay I, including various stemmed points, triangular points, leaf-shaped points, flaked point fragments, stemmed knives, flaked bifaces and knives, flaked pebbles, used flakes, cores, quartz crystal microblades, and quartz crystal and obsidian detritus (McMillan and St. Claire 1982:61,63-65,67). Flaked stone artifacts were recovered in lesser numbers from Shoemaker Bay II, but included small stemmed points and triangular points, larger flaked point fragments, flaked pebbles, and retouched flakes (McMillan and St. Claire 1982:93-94).

In conducting survey work in the Alberni Valley, McMillan located nine sites with lithic artifacts and detritus (1996a:211). Although dates were not available, they are most likely of considerable age due to their association with older sea levels and the similarity in artifacts to those found at Shoemaker Bay I (McMillan 1996a:211). Microblade technology was found at six of the nine sites, with a total of 23 microblade cores and over 30 microblades. In addition, three sites contained bifacial leaf-shaped points, many had large flake tools including retouched cortex spalls, a few sites included pebble tools and cores, and flaking detritus was abundant (McMillan 1996a:211).

The Shoemaker Bay site has ties to both the west coast of Vancouver Island and the Strait of Georgia (McMillan and St. Claire 1982:127). Key artifact types at this site, such as flaked stone tools, ground stone points and knives throughout the site, and microblades at lower levels, link the site to the Locarno Beach time period in the Gulf of Georgia (McMillan and St. Claire 1982:127). Conversely, the faunal remains show ties to Barkley Sound, particularly in Shoemaker Bay II; the presence of certain species at this site indicates direct interaction with the west coast environment (McMillan and St. Claire 1982:128). Ethnographic and linguistic data inform us that although there is currently a Nuu-chah-nulth presence in this region, it is a recent occupation as a Salishan population occupied this area until quite recent times (McMillan and St. Claire 1982:129). All excavated materials from Shoemaker Bay, therefore, pre-date Nuu-chah-nulth arrival.

2.4.2 Little Beach (DfSj 100)

Little Beach (DfSj-100) is a shell midden site located in present day Ucluelet, at the Western edge of Barkley Sound (Stryd et al. 1991:5). The site extends 115 m from north to south and approximately 45 m from east to west across two beach terraces with the main part of the midden being located on the higher terrace (Stryd et al. 1991:5). Although covered by approximately 1.5 m of humic soil, the midden itself is about 3.3 m deep (Stryd et al. 1991:iii). The basal level of the cultural deposits appears to be associated with a higher sea level that would have been present approximately 5,100 to 4,000 BP (Stryd et al. 1991:5).

Archaeologists used a combination of four construction trenches and four 1 x 1 m excavation units (Stryd et al. 1991:17). Combined, the four mechanically excavated trenches extended 180 m but stopped at several places where human remains or boulders possibly associated with human remains were discovered (Stryd et al. 1991:17). The excavation units varied in depth from 196 to 340 cm, resulting in the removal of 10 m^3 of cultural deposits (Stryd et al. 1991:17).

There were 68 artifacts collected from the Little Beach site; 27 artifacts were recovered from the backdirt and 41 came directly from the excavation units (Stryd et al. 1991:29). Several distinctive traits present at both Little Beach and Shoemaker Bay I include contracting stem projectile points, "thick ground stone points, labrets, and cairn burials," which link the sites to each other, and also to the Locarno Beach culture type in the Strait of Georgia (McMillan 1999:78). There were 17 unequivocal human burial features as well as six possible burials found in the midden (Stryd et al. 1991:34).

Based on radiocarbon dating, the earliest cultural deposits at the Little Beach site date to ca 4000 BP, while the "humic black deposit which overlies the midden" dates to ca 2510 BP (Stryd et al. 1991:37), making it contemporaneous with the lower levels of Shoemaker Bay I. These dates are also consistent with the predicted sea level curve established for this area (Stryd et al. 1991:38).

2.4.3 Grappler Inlet (DeSg-10)

Site DeSg-10 is located on the northern side of Grappler Inlet in southeastern Barkley Sound (Mackie and Williamson 1984:1). The shell midden extends 170 m along the shoreline (Mackie and Williamson 1984:1-2). Although no formal excavation has occurred at this site, the property owners have uncovered six stemmed and leaf shaped points made of basalt and chalcedony, five stone celts, three abraders, and several retouched obsidian flakes while gardening (Mackie and Williamson 1984:1). Despite its size, this small assemblage is relevant to this study due to its strong resemblance to the Gulf of Georgia complexes (specifically the Locarno Beach and Marpole phases) based on the stemmed and leaf shaped points and the retouched flakes, in spite of its location within Barkley Sound (Mackie and Williamson 1984:2). The property owners also indicated where there was a rectangular house depression, which had included several foundation logs (Mackie and Williamson 1984:2). At the time the site was recorded, only one corner of the depression remained.

2.5 More Recent Work in Barkley Sound

2.5.1 The Toquaht Project

Between 1991 and 1996, the Toquaht Project involved test excavation and intensive survey throughout Toquaht traditional territory in western Barkley Sound, as well as oral history research and interviews with Toquaht elders (McMillan 1996b:96). This research included excavation at Ma'acoah, T'ukw'aa, Ch'uumat'a, and the George Fraser Islands sites (DfSj 30 and DfSj 29). A total of 2,451 artifacts made from indigenous materials were found from the five sites combined (McMillan 1999:74). The following sites are from this project.

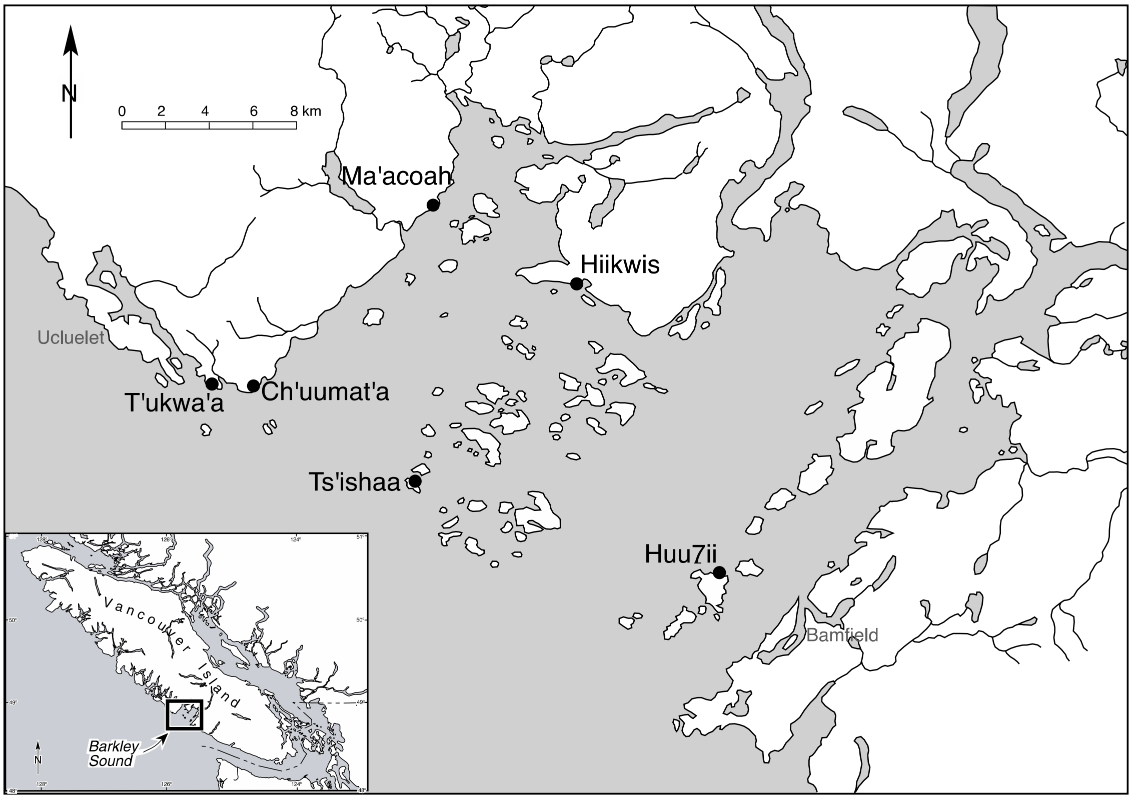

Figure 2: Map of Barkley Sound showing excavated sites (McMillan and St. Claire 2012:1)

2.5.1.1 Ma’acoah (DfSi 5)

Ma’acoah (DfSi 5) is an ethnographic winter village that has been largely disturbed due to the construction of modern houses, roads, logging, and gardening (McMillan 1996b:98; McMillan and St. Claire 1993:83). McMillan and St. Claire excavated five 1 x 2 m excavation units, resulting in the removal of 18.2 m^3 of archaeological deposits (McMillan 1999:65). A total of 61 artifacts were recovered, of which 48 were made of indigenous materials, mainly consisting of bone points, bipoints, and abrasive stones (McMillan 1999:65). There were several stone tools including a stone fishhook shank, “a fragment of ground slate, a flake tool, two edge pecked and ground cobbles, three hammerstones, and five abrasive stones” (McMillan and St. Claire 1993:91). In addition to those recovered through excavation, the authors also examined artifacts from private collections. The stone tools in these collections included five adze blades, three abrasive stones, and a basalt biface (McMillan and St. Claire 1993:88). Bone preservation was good at the site, making it possible for Monks (2006) to identify many of the faunal remains in his analysis. In his NISP calculations, Monks (2006:279) found that fish were the most dominant species, followed by birds, mollusks, and lastly, mammals. The earliest radiocarbon dates place the initial occupation of this site at approximately 2,000 years BP (McMillan 1999:65-66).

2.5.1.2 T'ukw'aa (DfSj 23)

T'ukw'aa (DfSj 23) consists of two terraces with house platforms and shell middens that are in close proximity to a steep, rocky defensive area (McMillan 1999:68). In the village area, 38 m^2 was excavated, reaching a maximum depth of 2.75 m and dating to 1200 BP (McMillan 1999:69). In the defensive area, dated to 800 BP, 30 m^2 of deposit was excavated with a maximum depth of 1.4 m (McMillan 1999:69). A total of 106 m^3 of archaeological deposits was removed, resulting in the recovery of nearly 1500 artifacts (McMillan 1999:69). Although the majority of the artifacts are made of bone and antler, stone tools are present. The stone tools uncovered at T'ukw'aa include 61 abrasive stones, 11 hammerstones, two ground slate points, one ground slate fragment, three flake tools, two fishhook shank fragments, one celt, one edge-ground pebble, one perforated stone, one piece of mica, and one small carved whale effigy (McMillan and St. Claire 1993:119). Although there are slight differences such as the flake tools and ground slate points, T'ukw'aa can be encompassed within the West Coast culture type.

2.5.1.3 Ch'uumat'a (DfSi 4)

Three field seasons of excavation took place at Ch'uumat'a, involving 115.7 m^3 of deposit and yielding 750 artifacts (McMillan 1999:71). Four 2 x 2 m units were excavated at the front of the site to the base of cultural deposits (McMillan 1999:71). The depth of deposits ranged from two to four meters, and the basal dates varied between 1100 to 2500 BP (McMillan 1999:71). Soil probe testing at the back of the site identified shell midden under a thick layer of forest deposit (McMillan 1999:71). A large trench was excavated; at the surface it stretched 11 m x 2 m, but due to safety concerns it was stepped down so the base was seven meters long at a final depth of four meters (1999:71). A radiocarbon date taken directly under the forest humus indicates that this part of the site was abandoned by approximately 720 BP (McMillan 1998a:11). The top of the shell stratum dated to 2500 BP (uncalibrated) while the dates taken from the base of the trench dated to between ca. 3760 and ca. 4000 BP (uncalibrated) (McMillan 1998a:11). These earlier dates are contemporaneous with Shoemaker Bay I and Little Beach, as well as the late Charles and Locarno Beach culture types in the Strait of Georgia.

Waterworn artifacts were uncovered in the lowest levels at Ch'uumat'a, indicating that the site has been occupied during various sea levels; Ch'uumat'a was initially occupied prior to 4000 BP and was continuously used until early historic times (McMillan 1999:112). The archaeological assemblage can be divided at about 2000 BP (McMillan 1998a:11). Of the 750 artifacts found at Ch'uumat'a, 340 are found within the earlier component (McMillan 1999:114). Among several other artifact types, flaked stone objects are only found within this period, while several distinctive West Coast culture type artifacts such as stone and bone fishhook shanks, are limited to the later component (McMillan 1999:114). In the earlier component, the presence and style of the projectile points, schist knife, ground stone artifacts, 'whatzits', and cairn burials are characteristic of the Locarno Beach culture type in the Strait of Georgia, and are similar to those found at Shoemaker Bay I and Little Beach (McMillan 1998a:12). Due to these attributes, all three sites are closely related and are more similar to the Locarno Beach culture type than the West Coast culture type (McMillan 1998a:14). However, Ch'uumat'a does not have quartz crystal microblades and microflakes that are distinctive Locarno Beach traits and are present at Shoemaker Bay I (McMillan 1998a:14).

2.5.1.4 George Fraser Islands Sites - DfSj 30 and DfSj 29

DfSj 30 is a small shell midden lookout site that is 15 m high and surrounded by steep cliffs on the George Fraser Islands off the tip of the Ucluth Peninsula (McMillan 1996b:108). A single 10 x 2 m trench was excavated resulting in a total of 239 artifacts recovered. Radiocarbon dates show that the site was first used about 400 BP and was abandoned in the early historic period (McMillan 1996b:110). Of the 13 stone artifacts recovered, nine are abrasive stones and two are abrasive slabs (McMillan and St. Claire 1994:34). The remaining two include a broken, finely polished stone bar with an unknown use, as well as a complete fishhook shank (McMillan and St. Claire 1994:34). This late site is a part of the West Coast culture type.

DfSj 30 spans several levels of a rocky island surface where four 2 x 2 m excavation units were opened (McMillan and St. Claire 1996:46-48). The cultural layers at this site were extremely thin, resulting in 3.84 m^3 of excavated cultural matrix, and 10 artifacts, all of which were made of bone (McMillan and St. Claire 1996:50), as is characteristic of the West Coast culture type.

2.5.2 Ts'ishaa (DfSi 16 and DfSi 17)

The large village of Ts'ishaa has three spatially separate segments: the main village area and back terrace (DfSi-16), and adjacent Himayis (DfSi-17) (McMillan and St. Claire 2005:37). The main village area has three prominent terraces, consisting of two house platforms and an activity area (McMillan and St. Claire 2005:40). Significant excavation has taken place at this site. Several trenches and excavation units were opened, including a 10 x 2 m trench known as Excavation Area 1 (EA 1), a 14 x 2 m trench (EA 2), and two 2 x 2 m units (EA 3) (McMillan and St. Claire 2005:40). The depth of these units varied between 1.5 and 3.7 m, resulting in the removal of approximately 163 m^3 of deposit (McMillan and St. Claire 2005:40). A sample dating from 1870 to 1560 cal BP just above the basal sand in EA 1 represents the initial occupation in the front portion of the site (McMillan and St. Claire 2005:44). Based on five radiocarbon dates, the base of EA2 is estimated at ca 1300 cal BP and the base of EA 3, based on one radiocarbon sample, was dated to 1690 to 1350 cal BP (McMillan and St. Claire 2005:44). This period of occupation corresponds to the late period at Ch'uumat'a, which falls within the West Coast culture type.

The back terrace of the site is located behind the main village site and represents an initial occupation beginning as early as 5900 to 4500 cal BP, corresponding with a period of higher sea levels. Upper levels date to about 3360 to 2950 cal BP (McMillan and St. Claire 2005:72). One 4 x 2 m unit, nine 2 x 2 m units, and two 1 x 2 m units were excavated in this area (McMillan and St. Claire 2005:72). The depth of the deposits ranged from 70 cm to just over 1 m, with a total volume of excavated materials of 44.7

m^3 (McMillan and St. Claire 2005:72). Flaked stone artifacts are relatively abundant in the back ridge deposits, in contrast to the main village site (Table 1) (McMillan and St. Claire 2005:78).

The back terrace yielded 96 flaked stone artifacts, which is 43.4% of the total artifacts from that portion of the site. Several different flaked stone artifact types were observed, including an obsidian biface, an obsidian microblade core ridge flake, schist knives, choppers, cores, bipolar pebbles and cores, split pebbles, retouched and utilized flakes, spalls, and other flakes (McMillan and St. Claire 2005:78; Magne 2005). The obsidian biface is of particular interest; it is made of Glass Buttes obsidian from central Oregon, which was also the source of a flake found at Shoemaker Bay. This roughly bipointed leaf-shaped biface measures 12.7 x 3.6 x 0.8 cm and although broken, both segments were recovered. Although sourced to Oregon, this provides another link to the Gulf of Georgia region, where a number of sites have recovered artifacts from this same obsidian source (McMillan and St. Claire 2005:86-87). Also of interest is the obsidian microblade core ridge flake, which is the only evidence of microblade technology at this site. Sourced to Newberry Caldera in central Oregon, this flake provides another tie to Shoemaker Bay as well as the Strait of Georgia region, which both also have obsidian artifacts sourced to this quarry (McMillan and St. Claire 2005:87).

Although physically removed from Ts'ishaa, Himayis is clearly a part of the same village complex (McMillan and St. Claire 2005:95). A 2 x 2 m unit was excavated to 2.3 m (with the lowest level dated to 970-740 cal BP) but not reaching the base of the cultural materials (McMillan and St. Claire 2005:95-96). A 1 x 2 m unit was also excavated, reaching basal sand at 1.35 m and dating to 930 to 670 cal BP (McMillan and

St. Claire 2005:96). A total of 11 m^3 of matrix was removed from the two units (McMillan and St. Claire 2005:96). A total of 34 artifacts were recovered with a complete absence of flaked stone at this site (McMillan and St. Claire 2005:96). This may be due to both its limited number of artifacts, few excavation units, and recent occupation, which falls within the West Coast culture type.

2.5.3 Huu7ii (DfSh-7)

Huu7ii is located on the northeast shore of Diana Island, which is in the Deer Group Islands a short distance from Bamfield (McMillan and St. Claire 2012:1). The site extends approximately 300 m and has a row of 10 to 12 clearly visible flat house platforms (Mackie and Williamson 2003:107; McMillan and St. Claire 2012:1). A back ridge midden reaching a maximum of two meters in height runs the entire length of the site, following the back of the house platforms (Mackie and Williamson 2003:107; McMillan and St. Claire 2012:1). The separate back terrace, behind and elevated above the main site and the back ridge midden, corresponds to an earlier sea level and therefore marks an early occupation of the site.

The 2004 and 2006 excavations focused on the largest house platform, which was designated House 1 (McMillan and St. Claire 2012:29). A total of 106.1 m^3 was excavated within House 1. The earliest date procured, from the midden below House 1, 1560 to 1320 cal BP, was obtained from just above sterile beach deposits. The most recent date from the top of the cultural deposit was 530 to 290 cal BP (McMillan and St. Claire 2012). Of the 960 artifacts found in House 1, the majority are small bone points and bipoints. There were 154 stone artifacts, of which only two were flaked stone; a flaked pebble (pièce esquillée) and a large flaked sandstone slab of unknown function (McMillan and St. Claire 2012).

Two 2 x 2 m units excavated on the raised back terrace reached a maximum depth of 2.3 m^3. Six radiocarbon dates were taken from this area; the earliest date, 4980 to 4630 cal BP from the base of the deposit, and the latest date, 3090 to 2780 cal BP from the uppermost stratum, are both significantly older than those dating House 1 (McMillan and St. Claire 2012). A total of 61 artifacts were recovered from the back terrace, which included 20 stone artifacts. Eight of these were flaked, including a flake and core tools, several of which were made of chert (McMillan and St. Claire 2012).

The House 1 materials are part of the West Coast culture type with a few small differences. Conversely, the back terrace is similar to the back terrace at Ts'ishaa and the early component at Ch'uumat'a, none of which fit comfortably within the West Coast culture type.

2.6 Minor Work to the South

2.6.1 Nitinat Lake (DeSf 9 and DeSf 10)

An extensive inventory and assessment of the Ditidaht reserve lands led to two excavations in 1994 at the mouth of Nitinat Lake, including a waterlogged intertidal component (McMillan 1999:83). DeSf 9 is a large shell midden known as Wikpalhuus, a former Ditidaht winter village (McMillan 1999:83). The DeSf 10 site is extensive and includes two clusters of houses, which correspond to the ethnographic names Hitats'aasak and Hit'ilhta7sak (McMillan 1999:83). At DeSf 9, two 1 x 1 m units were excavated, while three were excavated at DeSf 10 on flat terraces where there were waterlogged deposits with perishable materials (McMillan 1999:84). In addition, radiocarbon samples were obtained from shovel tests from the back of the sites, dating between approximately 2400 to 600 BP (McMillan 1999:84-85).

The recovered artifacts include many types typical of the West Coast culture type including, “small bone points, mussel shell knife fragments, and abrasive stones” (McMillan 1999:84), the latter being the only stone tools recovered. Artifacts that normally perish were preserved in the waterlogged component of the site and included, “basket and mat fragments, cordage, bentwood fishhooks, wedges, small wooden points, and several unilaterally barbed wooden points” (McMillan 1999:84). Radiocarbon samples were taken from a stratum that was approximately 2 m thick, and produced dates that are “essentially contemporaneous,” demonstrating that this part of the midden built up quickly around 2,400 BP (McMillan 1999:84). A sample from the front of the site dated to 600 BP, suggesting the possibility of two discrete periods of occupation (McMillan 1999:84).

2.6.2 Juan de Fuca Marine Trail

The Juan de Fuca Marine Trail is in Pacheedaht traditional territory on the west coast of Southern Vancouver Island near Port Renfrew. The project area is in a ‘transitional area’ between the Central Coast Salish and the Nuu-chah-nulth territories (Dahlstrom and Wilson 1996:4,6). Multiple sites were found during the initial surveying and mapping of the area, resulting in the excavation of a single 1 x 1 m test unit at DdSc 12 (Dahlstrom and Wilson 1996:1). The basal deposit of the site was dated to ca 4120 cal BP, indicating the earliest use of the site, while the date of final use is unknown (Dahlstrom and Wilson 1996:29).

The 33 recovered artifacts were considered based on their raw material and manufacturing attributes and were divided into four categories: flaked stone, ground stone, bone and antler, and shell (Dahlstrom and Wilson 1996:25). Almost half (16) of the artifact total is of flaked stone. These include a projectile point and point preform made of basalt, as well as flake tools and debitage (McMillan 1999:84-85).

The artifacts and faunal remains suggest the use of both marine and terrestrial animal resources and the rock type of the debitage suggests the materials were procured locally (Dahlstrom and Wilson 1996:29). The approximately 4000 BP date and the relative abundance of flaked stone relates this site to Shoemaker Bay I and the early components at Ch'uumat'a, Ts'ishaa, and Huu7ii.

2.7 Discussion

The time depth and continuity of pre-contact west coast culture history is remarkable, with both artifacts and faunal remains showing similarities lasting over 5000 years (Marshall 1993:39; McKechnie 2005). However, Marshall notes that to "suggest that artifact continuity is the only significant feature of Nuu-chah-nulth prehistory is reductionist" (Marshall 1993:39). Marshall continues by noting that flaked stone, which is commonly utilized in archaeology to construct culture history sequences, is virtually absent on the west coast, and bone points and abraders are relatively non-diagnostic artifacts and therefore unsuitable for constructing these categories as they are stylistically limited (Marshall 1993:39). While bone points may be useful in determining specific activities, they are not necessarily stylistically diagnostic of different culture types or groups of people. After studying an assemblage of bone points from Barkley Sound, King (2007:110) stated "we simply do not yet have sufficient data to solve the functional interpretation of small bone points once and for all." Consequently, the preservation of organic materials would be necessary to construct a reliable culture history sequence, a situation that is currently poorly known in the west coast environment due to poor preservation at many sites (Marshall 1993:39). Mitchell defines the West Coast culture type almost exclusively on the presence of specific artifact types and the general absence of flaked stone (1990:357). Mitchell (1990) and Dewhirst (1980) stress continuity over time, but still divide the Yuquot occupation into four periods. Marshall adds focus on change and continuity operating simultaneously and argues that Mitchell's characterization is limited due to its focus on artifacts, noting that he has overlooked drastic changes in settlement patterns (Marshall 1993:39). From approximately 500 to 1000 BP, settlement patterns changed extensively along the outer coasts and in the sounds (Marshall 1993:40). At this time, whaling harpoons and stone shanked trolling lures for salmon fishing first appear archaeologically, and Yuquot demonstrates an increase in usage of outside coastal resources (Marshall 1993:40). This, Marshall argues, does not suggest the 'relatively little change' that was noted by Mitchell but rather, serves as an indication of the high degree of changes in cultural patterns that occurred in Nuu-chah-nulth society during this period (Marshall 1993:40). However, both Mitchell and Marshall were operating with minimal information south of Hesquiat Harbour, and therefore largely relied upon data from Yuquot and Hesquiat Harbour.

These changes are best demonstrated by those sites with early components. Shoemaker Bay I, Little Beach, the back portion of Ch'uumat'a, the back terrace of Ts'ishaa, and the raised back terrace at Huu7ii all predate 2000 BP and yet fall outside Mitchell's 4000 BP to present West Coast culture type. All have some form of flaked stone, but others share more specific attributes with each other. Shoemaker Bay I, Little Beach, and the early component of Ch'uumat'a all have flaked projectile points, including stemmed points, triangular points, and leaf-shaped points, as well as ground stone artifacts, and cairn burials, linking them to the Locarno Beach culture type in the Strait of Georgia (McMillan 1999:78). Shoemaker Bay I, the back terrace of Ts'ishaa, and the raised back terrace of Huu7ii all have flakes and core tools. These sites yielded drastically different artifacts than those characteristic of Mitchell's West Coast culture type, which was defined based on the excavations at Yuquot and Hesquiat Harbour. The early components of these Barkley Sound sites are very different than contemporaneous materials from Yuquot, while later components are much more similar to Yuquot, with minor regional variation.

Regardless of the list of sites with flaked stone in early components, there are still many sites or site components that unequivocally fall within Mitchell's West Coast culture type. For several of the sites with Locarno Beach attributes in their earliest stages, the later components are characteristic of the West Coast culture type, as can be seen at Ch'uumat'a, Ts'ishaa, and Huu7ii. The more recent components of these sites have a preponderance of ground bone technology such as bone points and bipoints, and many artifact types that would have been used in fishing and sea mammal hunting. Ma'acoah and T'ukw'aa are also West Coast culture type sites with the majority of their artifacts being bone points and bipoints, although they also have a few flaked tools. The Nitinat Lake excavation was also characteristic of the West Coast culture type with many small bone points, mussel shell knife fragments, and no flaked stone artifacts.

2.7.1 Wakashan Migration Hypothesis

The Wakashan language family originated from a northern and northwestern Vancouver Island homeland, which split into northern and southern branches. The northern branch expanded into the central coast while the southern branch moved along western Vancouver Island (Mitchell 1988, 1990, McMillan 2003). The northern branch consists of Kwakwala, Heiltsuk, and Haisla, while the southern branch includes the Nuu-chah-nulth, Ditidaht, and Makah. McMillan (1999) argues that the West Coast culture type obscures the Nuu-chah-nulth's culture historical changes, which should be considered as an evolving tradition.

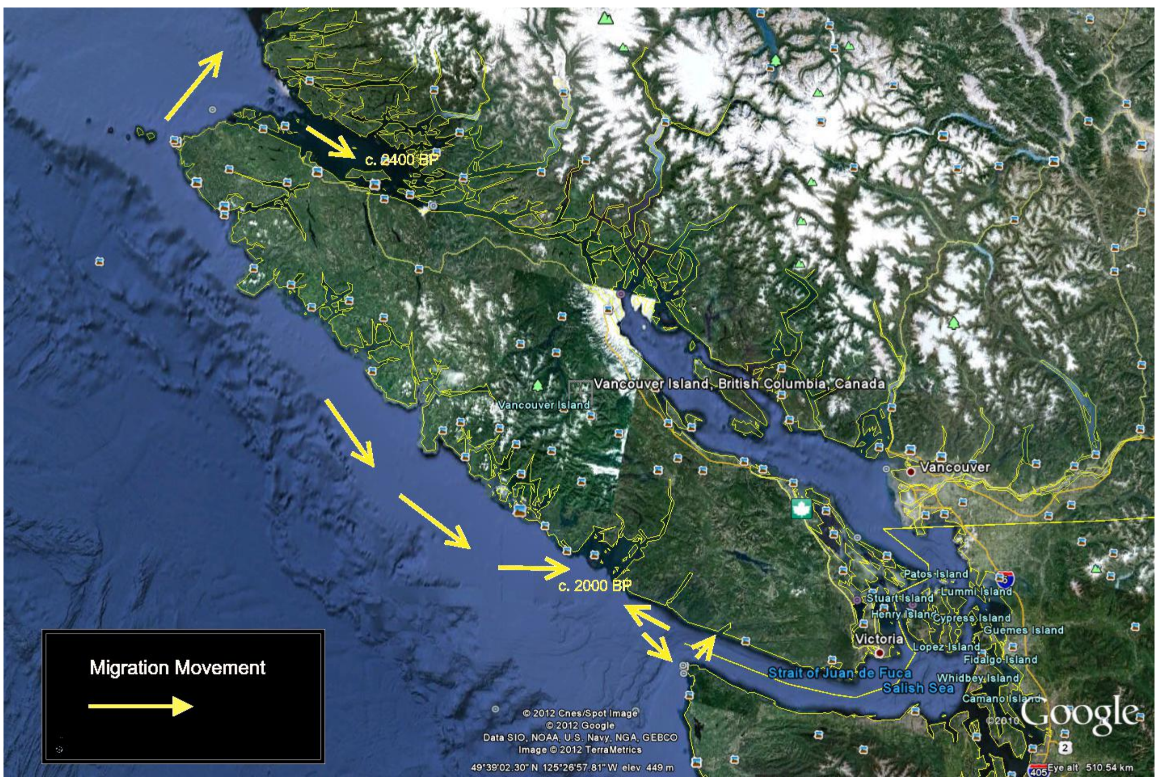

Figure 3: Theorized Wakashan Migration Route, adapted from McMillan 2003

Historical linguistics can provide insights into past population movements. Such studies suggest that although Salishan populations occupied the southern coast and parts of the interior Plateau at the point of contact, they originated on the coast (Suttles and

Elmendorf 1963). Linguists argued this based on the considerable variability in the coastal languages and asserted that Salishan populations likely occupied territories extending as far north as the Nuxalk on the central coast near Bella Coola (Suttles 1987:260). As such, the Wakashans are theorized to have previously occupied northern Vancouver Island and later expanded to the adjacent mainland, either displacing or absorbing Salishan populations, and thereby separating the Nuxalk from the other Salish-speaking peoples (Suttles and Elmendorf 1963). Simultaneously, the southern branch of the Wakashan speakers continued their movements along the west coast of Vancouver Island, to the northern Olympic Peninsula (Suttles and Elmendorf 1963).

By use of the linguistic method of glottochronology (McMillan 2003:249, from Swadesh), the divergence of the Wakashan branches is estimated at 2900 BP, which works reasonably well with Mitchell's archaeological findings at Queen Charlotte Strait (Mitchell 1988), and with recent archaeological findings in Barkley Sound, estimating this change at approximately 2000 BP. Mitchell equated the Obsidian culture type with early Salishan populations and the Queen Charlotte Strait culture type with the Wakashan (Mitchell 1988:282, 284; McMillan 2003:249). If this deduction is correct, the Wakashan population expanded from northern Vancouver Island starting at approximately 2400 BP (McMillan 2003:250).

Archaeologically, a site supporting the Wakashan Migration Hypothesis would have a pre-2000 BP component that was characteristically most similar to the Locarno Beach culture type and therefore would include a variety of flaked and ground stone tools. This would be followed by a more recent component most similar to the West Coast culture type, which would be dominated by bone technology. As previously noted, this transition from one culture type to another is demonstrated most clearly at Ch'uumat'a and Shoemaker Bay. The Hiikwis site complex, with its relative abundance of flaked stone, has the potential to add to the discussion of Wakashan migrations.

It is important to note that an opposing theory has also been presented in recent publications: Croes argues for a northern population movement from a Cape Flattery origin (Croes 2005:235). Croes states,

> "if we survey the population centers and spread of the cultural foci at contact, we actually see that it appears to increase as we move south along the West Coast. Possibly this tendency to credit the north (and central West Coast) as the cultural foci and center of this broad West Coast tradition may be derived from the early European writings and 'advertisement' of these Yuquot communities – initially, simply more accounts were written about them" (Croes 2005:234).

Croes looks to the records of John Jewitt, an American slave of Chief Maquinna, to support his argument. In his journal, Jewitt recorded population densities along the west coast, noting that the Makah had more warriors than either the central Nuu-chah-nulth or Chief Maquinna (Croes 2005:234). Jewitt also noted that the cloth found at Yuquot, a medium of wealth, was a Makah product. This is supported archaeologically as spindle whorls, loom roller bars, loom uprights, and wooden weaver's swords were found at Ozette, while none have been found north of the Hoko Rockshelter on the West Coast (Croes 2005:234-235).

Despite their differences, both theories agree about the relatively recent arrival of the Ditidaht in their territory (McMillan 2003:251; Croes 2005:235). According to oral tradition, the Ditidaht originated from a group of people occupying Tatoosh Island off Cape Flattery (McMillan 2003:251; Croes 2005:235). However, Croes disagrees with McMillan's assertion that the "lack of internal dialects, as well as close similarity with Nuu-chah-nulth, suggests relatively recent separation [of Ditidaht and Makah] as distinct languages," leading him to suggest that the divergence of Ditidaht and Makah may have occurred approximately 1,000 years ago, based on glottochronology (McMillan 2003:250). Further support for the late arrival of the Makah is supported by the lack of a strong language differentiation between the Chimakuan and Quileute peoples, who are both a part of the Chimakuan language family, and whose territories are separated by the Makah (McMillan 2003:250). The similarities in their languages suggest that they were separated in relatively recent times, presumably by the arrival of the Makah (McMillan 2003:250).

Although Croes presents an interesting alternative hypothesis, the Wakashan Migration Hypothesis is strongly supported by both archaeological and linguistic evidence that Croes (2005) does not address. Therefore, the Wakashan Migration Hypothesis will be evaluated in this thesis.

2.8 Conclusion

The sites and components of sites with flaked stone generally fall within the period of 2000 to 4000 BP, after which point there seems to be a transition to the West Coast culture type. In this on-going discussion of flaked stone in the Barkley Sound region, Hiikwis has the ability to make a unique contribution due to the relative abundance of flaked stone dating to later than 2000 BP. At Hiikwis, the earliest date obtained is cal 2870 to 2750 BP, which is towards the end of the flaked stone dates for the previous excavations within this region. In addition, the level with the largest number of flaked artifacts is dated to cal 1140 to 940 BP, which is much more recent than any of the other sites with a relative abundance of flaked stone. Flake technology at Hiikwis persists even further into the late period with the presence of flaked glass just below the surface at the most recently used component of the site complex. The site of Hiikwis and the types of flaked stone artifacts uncovered at the site will be discussed in the following chapters.

Table 1: Compilation of Sites by Artifacts, Raw Material, and Technology

Site	Site Component and Date	Flaked Stone	Ground Stone	Ground & Pecked & Misc. Stone	Bone	Antler	Shell	Tooth	Wood	Historic	Total	Reference
Yuquot	Early Period 4300-3000 BP	3	57	-	34	*	0	0	0	0	94	Dewhirst 1980
	Middle Period** 3000-1200 BP									0	1027	
	Late Period** 1200-210 BP									0	913	
	Historic Period** 210 BP - 1966										660	
Hesquiat Harbour	DiSo 16 595-740 BP to 530-650 BP	1	1	5	24	0	3	0	0	0	34	Calvert 1980:123, 135-136
	DiSo 9 1595-1855 BP to 1040-1220 BP	1	3	21	129	3	14	1	0	0	172	Calvert 1980:123, 135-136
	DiSo 1 1070-1250 BP to 510-610 BP	4	15	115	147	1	0	0	0	0	282	Calvert 1980:123, 135-136
Shoemaker Bay***	SB I 4080 BP	575	738	7	175	36	1	11	-	-	1543	McMillan & St. Claire 1982:124-126
	SB II 1500-535 BP	20	338	5	464	11 1	6	9	-	-	953	McMillan & St. Claire 1982:124-126
Little Beach	4000-2510 BP	11	0	25	28	1	3	0	-	0	68	Stryd et al. 1991:29
Ma'acoah	2000 BP	1	7	5	22	*	-	1	-	13	49	McMillan and St. Claire 1993:94
T'ukw'aa	1200 BP	3	69	13	1302	*	8	12	-	-	1407	McMillan 1999:172-173
Ch'uumat'a	4000-720 BP	38	87	3	612	*	3	4	-	3	750	McMillan and St. Claire 1996:24-25
DfSj 30	400 BP	-	13	-	212	*	6	7	-	1	239	McMillan and St. Claire 1994:36-37
DfSj 29	No dates available	-	-	-	10	-	-	-	-	-	10	McMillan and St. Claire 1996:50
Ts'ishaa	Main Village 1870-1560 BP to 1690-1350 BP	5	73	-	606*	-	41	8	-	3	736	McMillan & St. Claire 2005:46
	Back Terrace 5900-4500 BP to 3360-2950 BP	96	48	8	65	-	4	-	-	-	221	McMillan & St. Claire 2005:77-78
	Himayis	-	-	2	31*	-	-	-	-	1	34	McMillan &

	970-740 BP											St. Claire 2005:98
Huu7ii	House 1 1560-1320 BP to 530-290 BP	2	124	28	775	14	4	11	2	-	960	McMillan & St. Claire 2012
	Back Terrace 4980-4630 BP to 3090-2780 BP	8	10	2	37	2	2	-	-	-	61	McMillan pers. Comm. 2011
Juan de Fuca	4120 BP	16	7	0	0	9	1	0	-	0	33	Dahlstrom & Wilson 1996:25

* Authors combined the bone and antler categories.
****** Author categorized artifacts according to Manufacturing Technology, Fishing, Hunting, and Personal Adornment and Ceremonialism, and did not always describe the raw material.
******* There were also surface finds.

Chapter 3: Ethnographic Knowledge of Hiikwis

3. Introduction

The Barkley Sound region, and the Hiikwis site complex specifically, have a long oral history demonstrating that territorial overlap and dispute are a part of the story of this place. Although it is Tseshaht territory today, this land has a dynamic history and has changed hands many times, which may have affected the use of the site over time. This chapter reviews the ethnographic knowledge of this site to demonstrate these changes over time, as well as many of the known uses of the site.

Edward Sapir's extensive ethnographic notes on Nuu-chah-nulth life in Barkley Sound, collected in the early 1900s, provide numerous insights into the people who lived at Hiikwis. Increased warfare and exposure to diseases drastically reduced Nuu-chah-nulth populations, forcing many groups to amalgamate while others disappeared entirely; this resulted in the Tseshaht gaining a substantial territory covering the central portion of Barkley Sound, including the Broken Group islands and the upper shoreline (McMillan 1999:26), including the Hiikwis site complex. These changes directly impacted the residents of Hiikwis and led to changes in the use of the site over time.

3.1 Local Group Control of Hiikwis over Time

3.1.1 Nuu-chah-nulth Basic Social Structure

Traditional Nuu-chah-nulth social relationships are primarily based on hereditary rank and kinship (Drucker 1951:219). The 'local group' was the basic political unit and was centered around "a family of chiefs who owned territorial rights, houses, and various other privileges" (Drucker 1951:220). These groups held a name, often based on the location of their primary village or occasionally their chief, and had shared beliefs, traditions, and descent from a common ancestor (Drucker 1951:220). Each local group was divided into several subgroups known as *ushtakimilh* (McMillan and St. Claire 2005:9). Each *ushtakimilh* had its own chief as they represented "different descent lines from the original founding ancestor" (McMillan and St. Claire 2005:9). The head of the senior descent line was the *taayi hawilh* (head chief) of the entire local group. The *taayi hawilh* was the owner and manager of all the lands and resources held by the local group.

3.1.2 Amalgamations in Barkley Sound

In the late eighteenth century, Nuu-chah-nulth social and economic life was drastically changed. The Broken Group Islands and northern Barkley Sound shoreline were once divided into numerous territories, each held by an autonomous local group. Over time, these groups either disappeared or were incorporated into the Tseshaht (McMillan and St. Claire 2005:15). Amalgamations of neighbouring groups became necessary as populations were decimated by "introduced diseases and intensified warfare," resulting in new economic strategies to effectively harvest the resources of their newly acquired larger territories (McMillan and St. Claire 2005:15). At least five independent local groups with recorded names amalgamated with the Tseshaht, including the *Nash'as7ath* of the upper sound. The original Tseshaht local group had a small territory in the outer islands of the Broken Group. After amalgamation with many of their neighbours, the Tseshaht possessed one of the largest territories in Barkley Sound encompassing the Broken Group islands, "the western portion of the Deer Group islands, most of the northern shore of Barkley Sound, and much of Alberni Inlet and the lower

Somass River in the Alberni Valley" (McMillan 2009:632). The amalgamation to form the Tseshaht continued into the early 19th century.

3.1.3 The Nash'as7ath

Sapir's ethnographic notes indicate that the early occupants of the Hiikwis area were the *Nash'as7ath* local group. In a Nuu-chah-nulth tradition, the *Nash'as7ath* originated from a chief's daughter who gave birth to an illegitimate child (St. Claire 1991:42). Due to the disgrace of the pregnancy, she gave birth to her child alone in an area of thick bushes. Therefore, her child and his "descendants became known as the *Nash'as7ath* or 'people of thick bushes'" (St. Claire 1991:42).

The *Nash'as7ath* originally resided at their main village of Uukwatis, which is "at the east end of the present day reserve of Equis" (St. Claire 1998:30; McMillan and St. Claire 2005:17). The beach at Uukwatis is a wide mudflat, which makes it difficult to drag canoes above the high tide line, causing the village to eventually shift west down the beach several hundred meters to Hiikwis (St. Claire 1998:30). The entire reserve (Equis) now takes its name from this location (St. Claire 1998:30).

Although the location of the main *Nash'as7ath* village of Uukwatis is known, the boundaries of their traditional territory are less certain (St. Claire 1991:41; 2003:11). At the very least it included the "western portion of Sechart Channel and the adjacent islands to the south" (St. Claire 2003:11). Sapir refers to *Nash'as7ath* potlatches held on Hand Island, therefore making it likely that Hand Island, the Brabant Islands and other surrounding islands were likely also originally within *Nash'as7ath* territory (St. Claire 2003:13).

The *Nash'as7ath* initially consisted of four *ushtakimilh*: *Uukwatis7ath*, *K'iina7aa7ath*, *Ch'uumapis7ath*, and *Tl'asimiyis7ath* (St. Claire 2003:9). Later, a fifth *ushtakimilh* was formed through the marriage of a *Maktli7ii7ath* (one of the first formerly independent groups to be absorbed by the Tseshaht) and the daughter of the *Uukwaatis7ath hawiilh* (St. Claire 2003:9). The son of this marriage began a new *ushtakimilh*, the *Wanin7ath*, who took their name from the creek that runs alongside Uukwatis (St. Claire 2003:9).

Tom Sayach'apis, Sapir's primary Tseshaht informant, recounts the story of the *Wanin7ath* origins at Uukwatis. It is said that three chiefly brothers were paddling a canoe together when they spotted a hair seal (Sapir et al. 2000:39). Suddenly, a supernatural being clawed the hair seal on the head. The brothers took the hair seal home and cooked it. The slave took his son out in a canoe for evening fishing. When they returned, they found everyone dead because they had eaten the hair seal. The slave took his late chief's valuables and paddled with his son to Uukwatis, where they landed at a place called *Wanin* (Sapir et al. 2000:40). *Huhinikwup,* who later became the Chief of the *Wanin7ath,* and his brothers came to see the slave and his son, and brought them and their canoe up to the house of *Huhinikwup* (Sapir et al. 2000:40). *Huhinikwup* hosted a feast at which the Uukwatis chief was given gifts. The Uukwatis chief gave them the stream called *Wanin*, which allowed them to become a separate tribe, the *Wanin7ath* (Sapir et al. 2000:41).

3.1.4 *Nash'as7ath* Amalgamation with the *Ts'ishaa7ath*

The *Nash'as7ath* "were one of the last of the formerly-independent groups to fuse with the *Ts'ishaa7ath*" (St. Claire 1991:41). Although the reason for their amalgamation is not definitely known, it is likely that the *Nash'as7ath* amalgamated with the Tseshaht (*Ts'ishaa7ath)* due to a severe decline in their population resulting from warfare with the *Hach'aa7ath* (St. Claire 1991:42). The date of this amalgamation is unknown, but it is believed to have been around the last few years of the 18th century (McMillan and St. Claire 2005:19).

Due to conflicting ethnographic accounts, the details of the Tseshaht acquisition of Hiikwis are unknown; two explanations were given by Sapir (St. Claire 1991:43). According to Sapir, Hiikwis originally belonged to the *Wanin7ath*, and was therefore absorbed by the Tseshaht with that group's amalgamation (St. Claire 1991:43; 1998:34). Conversely, Sapir also stated that the Tseshaht acquired Hiikwis through *his7ukt* ('spoils of war') from the *Nash'as7ath* (St. Claire 1991:43; 1998:34). It has also been suggested that following a conflict with the *Hach'aa7ath*, the *Wanin7ath* moved to join their kin at *Maktl7ii* on Wouwer Island, one of the outer islands of the Broken Group, while the *Nash'as7ath* remained at Hiikwis (St. Claire 1991:43).

If these accounts are correct, it is possible that the Tseshaht – *Nash'as7ath* war was the result of the Tseshaht trying to claim Hiikwis (St. Claire 1991:44). The *Nash'as7ath* lost their autonomy when they joined the Tseshaht and became an *ushtakimilh* of that group.

3.1.5 Tseshaht Use of Hiikwis

The Tseshaht greatly expanded their territory through politically absorbing their neighbours (McMillan 2009:635). They originally accessed their economic resources from their permanent base at *Ts'ishaa*, located on Benson Island, an outer island of the Broken Group in central Barkley Sound. After amalgamation with other groups, the

Tseshaht developed a pattern of seasonal movement to exploit their newly expanded territory (McMillan 2009:635). *Ts'ishaa* became a summer camp for fishing and sea mammal hunting and the Tseshaht began using Hiikwis as their main winter village (McMillan and St. Claire 2005:23; McMillan 2009:635). This move may have been because of Hiikwis' sheltered location and access to a wide variety of resources, including shellfish beds, a salmon run, a herring spawning area, and plenty of fresh water (McMillan and St. Claire 2005:23).

During the nineteenth century, the Tseshaht moved their winter home to the lower Somass River near Port Alberni, but continued using their traditional territories in Barkley Sound "as resource camps from spring through fall" (McMillan and St. Claire 2005:23-24). They developed a pattern of seasonal movement to best utilize the resources available throughout their extensive territory (McMillan and St. Claire 2005:24). In January they would begin moving to the sheltered locations of upper Barkley Sound, including Hiikwis, Nettle Island, and Keith Island, until May when they would extend further into the Broken Group islands to a number of sites including *Ts'ishaa* (McMillan and St. Claire 2005:24). The Tseshaht tended to break into their pre-amalgamation groups during these months, with the descendants of the *Nash'as7at<u>h</u>* and *Wanin7ath* staying at Hiikwis (Sapir and Swadesh 1955:45; McMillan and St. Claire 2005:24).

3.1.6 Ucluelet Control of Hiikwis During the Long War

The Long War in Barkley Sound began in the 1840s due to a dispute regarding an escaped slave (Sapir and Swadesh 1955:412; McMillan 1999:193). During this war, the Ucluelet seized Tseshaht lands in central Barkley Sound, including Hiikwis. Sapir's primary Ucluelet informant *Kwishanisham* stated that "the Ucluelet houses filled the space from end to end at Hiikwis" (Sapir and Swadesh 1955:412). Following the Ucluelet attack, the Toquaht chiefs approached the Huu-ay-aht, Tseshaht, Hupacasath, and the Uchucklesaht, giving them women as the five groups formed an alliance against the Ucluelet (Sapir and Swadesh 1955:413). The ensuing attack killed many Ucluelet men, and enslaved many women and children, causing the remaining Ucluelet to flee (Sapir and Swadesh 1955:414). This was followed by a series of raids by both parties, beginning a series of complex changes as groups repeatedly made and broke alliances (Sapir and Swadesh 1955). Although raiding continued for a while, eventually peace was achieved through the Ucluelet offering women as gifts, after which *Kwishanishim* states "the tribes became friendly [… t]hey stopped warring" (Sapir and Swadesh 1955:427). The Tseshaht then regained their former locations, including Hiikwis.

3.2 Ethnographic Accounts of Hiikwis

3.2.1 Place Names for the Sites

Hiikwis and Uukwatis are two archaeological sites that are a part of a single village complex. Uukwatis is the larger and older site. Located beside a major stream, it is the original village of the *Nash'as7ath*. The name Hiikwis originally referred to the "large village site at the west end" of Equis Reserve (St. Claire 1991:134). Initially, Hiikwis, with its better water access, was a place used to leave canoes. Later, many of the houses were moved there from Uukwatis and the entire area became one large village complex (St. Claire 1991:135). After the Tseshaht amalgamated with the *Nash'as7ath*, the Tseshaht local group would gather at this site for the wolf ritual (St. Claire 1991:134-135). However, the "size and depth of the midden at Hiikwis… argue for the site having a considerable age and a … complex history" (St. Claire 1991:135). Due to the complexity of this area and the presence of a number of named social units, there are many areas within the site complex with traditional names and meanings. Following Nuu-chah-nulth tradition, place names give rise to the names of social units by adding the ending "7ath" which means the "people of."

As previously mentioned, the *Nash'as7ath* consisted of five *ushtakimilh*: the *Uukwatis7ath*, *K'iina7a7ath*, *Ts'omapis7ath*, *Tl'asimiyis7ath*, and the *Wanin7ath* (St. Claire 2003:9*).* *Uukwatis* is at the eastern end of Equis Reserve. This was the location of the house(s) of the *Uukwatis7ath ushtakimilh*, which was the senior branch of the *Nash'as7ath* (St. Claire 1991:133). The name translates to 'very pretty beach,' 'fine-on-the-beach,' or 'pleasant beach' (St. Claire 1991:134). ***Kiina7aa*** is the location of the house(s) of the *K'iina7aa7ath ushtakimilh* of the *Nash'as7ath* local group (St. Claire 1991:133). The name has been translated as 'herring-guts-on-rocks' because many herring were taken in this area and were processed on the rocks (St. Claire 1991:133). In close proximity was ***Ts'omapis***, which was the location of the house(s) of the *Ts'omapis7ath ushtakimilh* (St. Claire 1991:133). The name has been translated as 'little point' or 'little creek' (St. Claire 1991:133). ***Tl'asimiyis*** is a small stream that was the location of the house(s) of the fourth *ushtakimilh* of the *Nash'as7ath*, the *Tl'asimiyis7ath* (St. Claire 1991:134). Originally referring to a small stream, the name ***Wanin*** came to represent the fifth *ushtakimilh* of the *Nash'as7ath* (St. Claire 1991:134). *Tl'asimyis* and *Wanin* were both later abandoned and the residents moved to *Hiikwis* due to the difficulty of moving canoes (St. Claire 1991:134).

The traditional name of the large beach in front of Equis Reserve near the eastern midden is ***Sayach'naqis***, which was translated by Sapir and Swadesh to mean 'wide beach' (St. Claire 1991:133). ***Saapi7a*** is the location of a village site that was adjacent to *Hiikwis*. During the 19th century, houses spanned the space between the two sites (St. Claire 1991:135). When the Wolf Ritual took place at Hiikwis, the wolves would emerge from the forest at *Saapi7a* (St. Claire 1991:135). ***Tl'asatis*** refers to a place within this same general village area, although the specific location is unknown (St. Claire 1991:134).

3.2.2 Economic Activities at Hiikwis

Sapir's ethnographic accounts contain translations of Tom Sayach'apis' stories of his life and of his ancestors. In "The Yearly Round," Sayach'apis' discussed *Hiikwis* from his experience living there as a small boy when the "[Tseshaht] Tribe ceased to be at war with the Ucluelet" around the mid-19th century (Sapir and Swadesh 1955:27). He recounts how the economic seasonal round worked during his childhood, discussing the success of fishing at Hiikwis for silver spring salmon, herring, and sardines (Sapir and Swadesh 1955:30). The Tseshaht would acquire so much fresh herring and salmon spawn at Hiikwis that Sayach'apis states "it was like many blankets stretched out to dry the whole length of the village front at Hiikwis, because the whole [Tseshaht] Tribe would be drying spawn" (Sapir and Swadesh 1955:30). The Tseshaht would also hunt sea lions, porpoises, and hair seals from Hiikwis with great success (Sapir and Swadesh 1955:29). Following the herring spawning, he recounts that flocks of birds, including swans and geese, came to Hiikwis and would be caught in long traps at Wide Beach (Uukwatis) (Sapir and Swadesh 1955:31, 39). For feasts, the Tseshaht would also harvest fern and clover roots from around Hiikwis. Sayach'apis notes, "the people of Hiikwis ate very well, with everyone giving feasts" (Sapir and Swadesh 1955:32).

3.2.3 Accounts of Whaling and Whaling Rituals at Hiikwis

Whaling was an important economic enterprise for many Nuu-chah-nulth groups and was closely intertwined with ceremonial practices. Several ethnographic accounts of whaling are associated with Hiikwis. Sapir refers to sea-lion hunters heading out from Hiikwis to help others who had harpooned a Humpback whale, as well as hunters heading out directly from Hiikwis to hunt whales (Sapir et al. 2004:30,167). Once killed, whales were tied up on the beach at Hiikwis for butchering. An eminent whaler, *Naawii7ik*, had a house located at the "back part of Hiikwis" which had "carved whales hugging each housepost" (Sapir et al. 2004:31,32).

The son of the owner of Uukwatis and the daughter of the Chief of the *H̲ach'aa7ath̲,* who was a distinguished whaler known as the "getter of fat whales," were married. Their first son was named *Naawii7ik* (Sapir et al. 2004:23). *Naawii7ik's* mother taught him how to ritually bathe by imitating a whale. *Sayach'apis* describes the ritual bathing:

> "He would start bathing from *Wanin* when he was living at [Uukwatis]. He would start first at *Wanin*, going into the river four times. Four times he would pretend to blow, humping his back up out of the water… Then he walked to *Kiina7aa* up the river doing what he was engaged in. He was using his thumbs for rubbing while there at *Kiina7aa* [Herring-Guts-Rock], and he dove four times down into the water, humping his back, and pretending to blow as he dove" (Sapir et al. 2004:26).

As the Tseshaht settled at Hiikwis for the season, they started getting ready to hunt Humpbacks (Sapir et al. 2004:30). *Naawii7ik* harpooned a total of ten whales in five hunting trips, which he shared between the *H̲ach'aa7ath̲* and Tseshaht (Sapir et al. 2004:32). The story of *Naawii7ik* clearly illustrates the importance of ceremonial bathing in Nuu-chah-nulth culture, as it is linked with being able to catch many whales. His success brought *Naawii7ik* wealth, prestige, and respect.

3.2.4 The Wolf Ritual

The Wolf Ritual is an important tradition that took place at Hiikwis, as was told by Sayach'apis to Sapir. In his childhood, Tom Sayach'apis lived at Hiikwis following the Long War, when the Tseshaht regained Hiikwis from the Ucluelet (Sapir and Swadesh 1955:27). The Wolf Ritual was one of many important ceremonies to take place there. Recalling the Wolf Ritual at Hiikwis, Sayach'apis states, "I was a boy when I witnessed the wolves creeping out of the woods at Pleasant-Beach. It was at Hiikwis that I watched it" (Sapir and Swadesh 1955:27). The ritual involves a young boy being captured or 'bitten away' by the wolves and held captive for four days. The wolf-skirmishers tried to rescue the boy but struggled to do so. The whole tribe assembled in the house of the person giving the wolf ritual and chanting and drumming began. That evening, the wolves "went growling the whole length of the village, each with branches round his head" (Sapir and Swadesh 1955:28). Four days were then spent dancing and giving out potlatch gifts (Sapir and Swadesh 1955:29).

3.2.5 Hiikwis in Oral Tradition

Hiikwis features prominently in a number of oral traditions told to Sapir by Tom Sayach'apis. In addition to the Yearly Round and Wolf Ritual accounts discussed above, the story of the Dog Children was an important narrative that took place at Hiikwis (Sapir and Swadesh 1939:54-63).

While the Tseshaht were living at Hiikwis, a young woman was approached by a man who promised to marry her, and she had his children (Sapir and Swadesh 1939:55). It turned out that he was actually a dog, and her children were dogs as well. Disgraced, her father moved himself and the entire village, leaving her and her children abandoned (Sapir and Swadesh 1939:55). The girl's uncle returned to build her a house, and promised that he would always return to bring her and her children food (Sapir and Swadesh 1939:55). For four days the woman was digging clams when she heard singing. As she returned home, she realized it was her children singing, but as soon as she came inside they would stop (Sapir and Swadesh 1939:55). When this happened four more times, the woman decided she wanted to catch them singing, as this was strange for dog-children (Sapir and Swadesh 1939:57). To do so, she set up her digging stick on the beach with her clothes on it, and crept stealthily back to the house. As she got closer, she could hear that they were singing a lullaby, and saw that they were now human. The young woman surprised them, stole their robes and threw them on the fire so that they couldn't transform back into dogs.

The woman was overjoyed to have human children, who grew up quickly into young men. She made bows so they could hunt, and rope and hook-lines so they could fish. One of the boys caught a whale with his little hook, because he had supernatural powers (Sapir and Swadesh 1939:59). The young men started skinning the whale, and one of them formed the whale into a bird. He threw it into the air four times and it was transformed into a real bird. Then, he taught the bird to talk and had it deliver a piece of whale blubber to the woman's family who had abandoned her (Sapir and Swadesh 1939:59, 61).

The bird found her mother and told her that the young woman had a drift whale. The girl's uncle went to see her to find out how she got the whale. Upon seeing the boys instead of dogs, the girl was able to convince him to gather his things and move back there with her. He set out the next morning but before he left he told the tribe that the girl they had abandoned had a drift whale. The tribe was excited, and decided to all move back as well. The girl's uncle arrived first, and when the girl saw the others coming she sent her boys to the beach to bathe (Sapir and Swadesh 1939:63). As the canoes neared, the boys called up a storm, which capsized the canoes and drowned the people, who were transformed into rocks. The sons had chosen to take revenge on those who had abandoned the girl because of her dog children. Only the girl and her uncle lived, and "then the boys disappeared, they went off to another land" (Sapir and Swadesh 1939:63).

3.3 Conclusion

Hiikwis has been home to several different social groups, and many different areas of the site complex have been used over time for a variety of activities. The *Nash'as7ath* were the first known group to occupy this area, which later became Tseshaht land with their amalgamation during the last years of the 18th century (McMillan and St. Claire 2005:19). There are stories depicting the wide range of resources available at Hiikwis, and that although the site is in the upper portion of Barkley Sound, whalers still departed from Hiikwis. Many important ceremonial activities also took place there, including ritual bathing and the Wolf Ritual. With the extensive knowledge of this site complex, the project directors Dr. Alan McMillan and Denis St. Claire decided to excavate in the two major named areas; Uukwatis, the home of the original *Nash'as7ath* local group, and Hiikwis, the later major village location. Both locations contained extensive archaeological deposits.

Both of these areas were significant during the *Nash'as7ath* and Tseshaht occupations of the site complex, and therefore have the potential to inform us about the changes in site use over time, as well as possibly informing us about greater population movements over time, as suggested by the Wakashan Migration Hypothesis.

Chapter 4: Site Description and Excavation Methodology

4.1 Paleoshorelines

The proposed sea level curve for the central west coast of Vancouver Island is based on data from Clayoquot Sound and Barkley Sound. Early Holocene sea levels were at least 10 meters lower than present levels. Through their study, Friele and Hutchinson were able to establish an "early to middle Holocene submergence cycle followed by unsteady late Holocene emergence" (1993:838). There was a rapid rise in relative sea level from 7600 to 6100 BP. At approximately 7000 cal BP the sea level was at the present level, but continued to rise, resulting in mean sea level being between 3.0-3.2 m asl (above mean sea level), lasting from 6000 to 4800 cal BP, after which sea levels gradually dropped (Hutchinson 1992:37; Friele and Hutchinson 1993:838). Changes in sea level after 4800 cal BP are attributed to tectonic uplift (Hutchinson 1992:37). Sea level then fell between 4800 to 4000 BP, followed by a slight rise in relative sea level from 2700 to 2000 BP (Friele and Hutchinson 1993:838). Continuous, gradual emergence has continued since 2000 BP (Friele and Hutchinson 1993:839).

Shell deposits inland at Uukwatis, well behind the later house area, demonstrate that this site was initially occupied at a time of higher sea levels. This has been noted at other sites in the region including Ts'ishaa, Huu7ii, Little Beach, and Ch'uumat'a.

4.2 Site Descriptions

4.2.1 DfSh-15

The front beach has an extensive mud flat, with a tidally influenced creek that cuts through the eastern side of the site. This is a major creek in the area, which supports a salmon run, adding value to the site (see Chapter 3). The site is located just off the beach into the forest on each side of the creek. Probing revealed shell midden across a large area. The more recent component is located just above the beach, while the older component is further inland at a slightly higher elevation. There is a flat platform across the front portion of the site with surface evidence of recent disturbance through logging. Behind that platform is a clearly evident midden ridge. The land drops to a low area behind the ridge, with no midden evident. However, midden continues along the creek and is continuous to the back elevated portion of the site.

Figure 4: View coming into DfSh-15 by boat, photo courtesy of Alan McMillan

4.2.2 DfSh-16

Hiikwis is approximately 650 m west along the beach from Uukwatis. This is a more recent occupation with a less prominent shell midden. This part of the site was occupied into the early 1900s and still has two visible flat platforms. They are at different elevations, and at least the top one is definitely a house platform. A large house beam, still raised from the ground, is evident just east of the excavation units on the higher terrace, and traces of several posts can still be seen on the site surface.

Figure 5: View from DfSh-15 looking west towards DfSh-16 (near centre of picture), photo courtesy of Alan McMillan

4.3 Unit Placement, Extent of Excavation, and Volume Removed

4.3.1 DfSh-15

Judgmental sampling was employed in determining the locations of the excavation units to ensure all major portions of the site were included. Prior to beginning excavation, the project directors were aware of three specific areas which each warranted archaeological investigation: a front house area, along the major creek near the eastern edge of the site, and on the elevated back terrace some distance inland. As discussed in Chapter 3 (pages 35-36), different areas of the site are known to have been used by different *ushtak̲imilh*, or descent lines within the local group. In the 2008 field season, five 2 x 2 m units were excavated (Figure 6). The units were laid out in a magnetic N-S orientation and used a vertical datum of one corner at the surface, which was later shot in with a total station to ensure accuracy in mapping the site. Unit 1 was established near the front edge of the site, where early 20th century houses stood on pilings and midden deposits sloped towards the beach. Units 2 and 5 were opened on the main house platform, which is located above the rise from the beach and in front of the back midden ridge. Large traditional plank houses would have stood in that area. Unit 3 was further inland, close to the creek that runs along the east side of the house area. Units 1, 2, 3, and 5 are all approximately 2.5 m above the current sea level. Unit 4 was furthest away from and more inland than the other units, on a low back terrace where shell deposit was discovered through probing. Unit 4 is at a higher elevation than the other units, at approximately 6 m above current sea level. Two 1 x 2 m extensions were added to Unit 4 in 2010. This gives a total coverage for the site of 24 m^2.

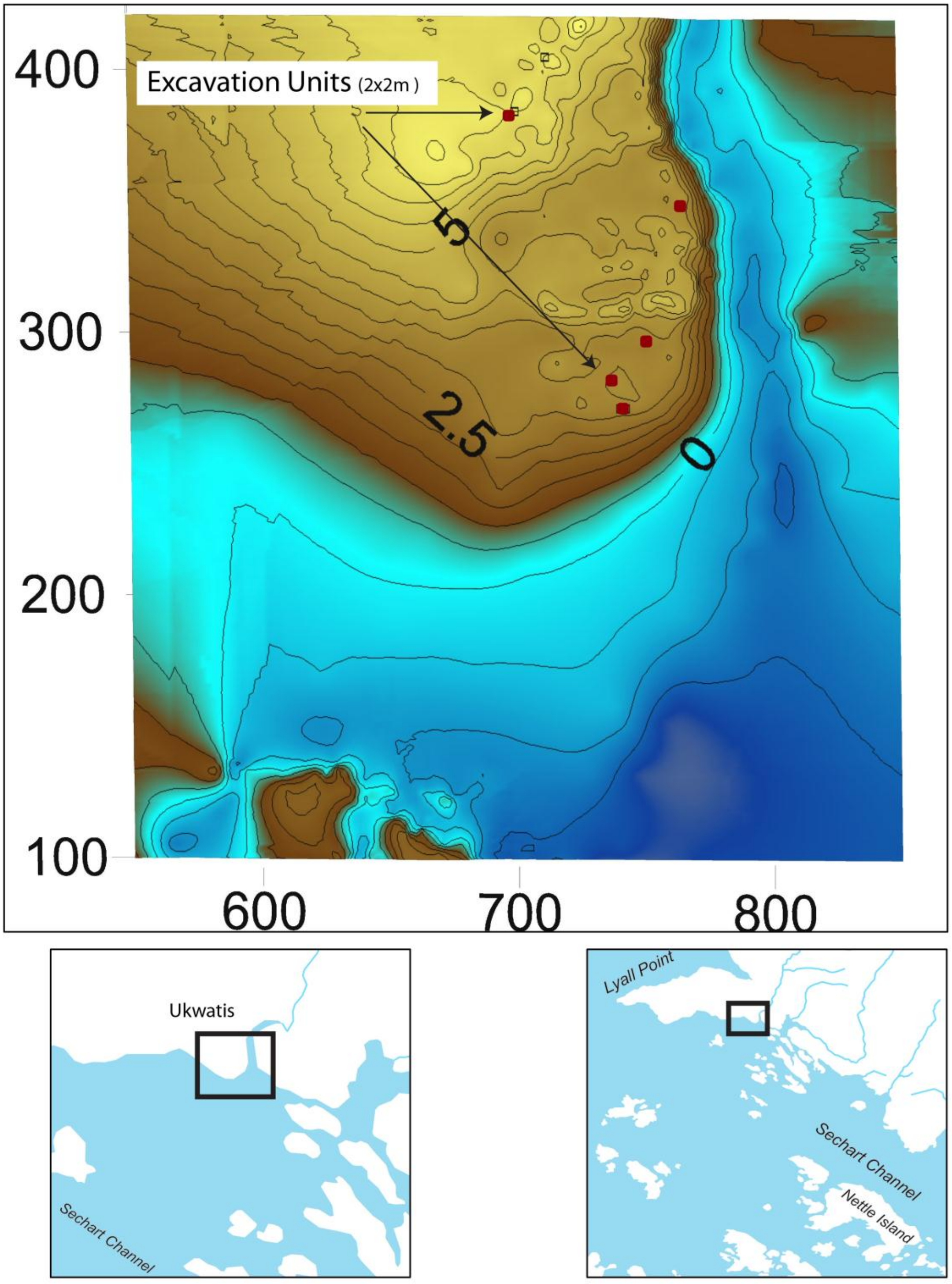

Figure 6: Contour Map of Uukwatis, courtesy of Iain McKechnie

The elevation and distance from the beach of this back terrace suggest an earlier occupation. Elevated back terraces characterize other excavated Barkley Sound sites, such as Ch'uumat'a, Huu7ii, and Ts'ishaa. However, the elevation difference was less in the Hiikwis case and the dates consequently not as early as the other sites. However, they do significantly predate the front units at Hiikwis, demonstrating that this area was occupied at a time of higher sea level.

All units were laid out as 2 x 2 m units. Due to time constraints, Unit 4, the deepest unit, was reduced to 1 x 2 m at Level 12, at a depth of 120 cm, to ensure completion before the end of the 2008 field season. In the 2010 field season, Unit 4 was reopened. The unexcavated 1 x 2 m section was completed and two additional 1 x 2 m units were excavated along the southern (4B) and eastern (4A) walls to basal sand. All units were excavated in 10 cm arbitrary levels while separating any natural stratigraphic layers. All matrixes were dry screened through ¼" mesh to uncover artifacts and faunal remains. Column samples were taken from each unit to fine screen for small faunal elements under controlled laboratory conditions. Due to the quantity of small lithics present in Unit 2, this unit was gridded into 50 cm blocks, which were kept separated, and the matrix was water-screened through 1/8" mesh. The depth of the excavations and the volume of matrix removed from each unit can be seen in Table 2.

Figure 7: Unit 4 Reopened and Excavated in 2010

Table 2: Total Volume Excavated from each Unit at DfSh-15, Uukwatis

Unit	Average Depth	Total Volume
1	1.3 m*	4.5 m^3
2	0.9 m	3.6 m^3
3	1.9 m	7.6 m^3
4	2.7 m	10.8 m^3
4A		4.1 m^{3**}
4B		4.6 m^{3**}
5	1.3 m	5.2 m^3
DfSh-15 combined total		40.4 m^3

Note: Excavated volume was calculated using estimates of average depth from the level notes and the unit profiles. All radiocarbon dates came from charcoal samples.
* Partially unexcavated 1 x 2 m near the base.
** Volume was calculated separately for Unit 4, 4A, and 4B.
(Figures provided by Alan McMillan 2012)

4.3.2 DfSh-16

At DfSh-16, five 2 x 2 m units were excavated, covering a total surface area of 20 m^2. The units were placed on a grid system following magnetic N-S. The 0-0 horizontal datum is marked by a spike driven into a large spruce tree at the front of the site. Three units were excavated on a level surface believed to be a house platform. The other two units were joined and located on a slightly higher house platform, which had a collapsed house beam nearby. Two units (N6-8 W2-4 and N14-16 E4-6) were not completed, while the other three were excavated to basal sand. The depth of the excavations and the volume of matrix removed from each unit can be seen in Table 3.

Table 3: Total Volume Excavated from each Unit at DfSh-16, Hiikwis

Unit	Average Depth	Total Volume
N4-6 E0-2	1.35 m	5.4 m^3
N4-6 W4-6	1.2 m	4.8 m^3
N6-8 W2-4	0.7 m (unfinished)	2.8 m^3
N12-14 E4-6	1.45 m	5.8 m^3
N14-16 E4-6	1.0 m (unfinished)	4.0 m^3
DfSh-16 combined total		22.8 m^3

Note: Excavated volume was calculated using estimates of average depth from the level notes and the unit profiles. All radiocarbon dates came from charcoal samples. (Figures provided by Alan McMillan 2012)

4.4 Site Stratigraphy and Chronology

4.4.1 DfSh-15

The site stratigraphy is discussed only for Units 2 and 4 as the great majority of the flaked stone artifacts came from these two units.

Table 4: DfSh-15 Radiocarbon Age Estimates

Lab Number	Unit Number	Depth Below Surface (m)	Radiocarbon Years	Calibrated Years BP*	Comments
Beta-250328	1	1.3-1.4	890 +/- 40	920-720	Near bottom
Beta-250325	2	0.7-0.75	1120 +/- 40	1140-940	Level with the abundant chert flakes
Beta-250329	2	0.9-1.0	1410 +/- 50	1390-1270	Just above basal sand
Beta-250323	3	0.9	1750 +/- 40	1740-1560	From a hearth feature
Beta-250327	3	1.8	1820 +/- 50	1870-1620	Just above basal sand

Beta-250324	4	0.65-0.7	2020 +/- 40	2100-2090 and 2060-1880	
Beta-250326	4	1.2-1.25	2210 +/- 40	2340-2120	From a hearth feature
Beta-250330	4	2.3-2.35	2710 +/- 40	2870-2750	From the second to lowest level

Calculated using two standard deviations. Figures provided by Alan McMillan 2012

Unit 2

The stratigraphy in Unit 2 was simple, involving only two distinct depositional layers. Humic soil persisted until 20 cm dbs (depth below surface), where the first cultural layer began. The most recent stratigraphic layer, Layer A, consisted of a greasy black sandy silt (Munsell code 7.5 YR 2/0) mixed with some fine fragments of shell. Sand, gravel, and pebbles were throughout the deposit, as well as a limited number of poorly preserved faunal remains. Layer A began at 20 cm dbs and continued to 80 cm dbs, at which point the matrix turned to a light gray sand (Munsell code 5R 6/2) designated as Layer B. This layer became increasingly sandy but still included some shell fragments, fire-cracked rocks, and a small number of faunal remains. Layer B extended to 100 cm dbs, where the original beach sand was encountered.

Two radiocarbon samples were taken from Unit 2. Level 7, Layer A at 0.7 to 0.75 m depth was dated to 1120+/-40 (1140 to 940 cal BP). This date is important as it was taken in the level with abundant chert flakes, which are analyzed in this thesis. The second date was taken at the bottom of Layer A on basal sand at 0.9 to 1.0 m depth, marking the earliest date for this unit at 1410+/-50 (1390 to 1270 cal BP).

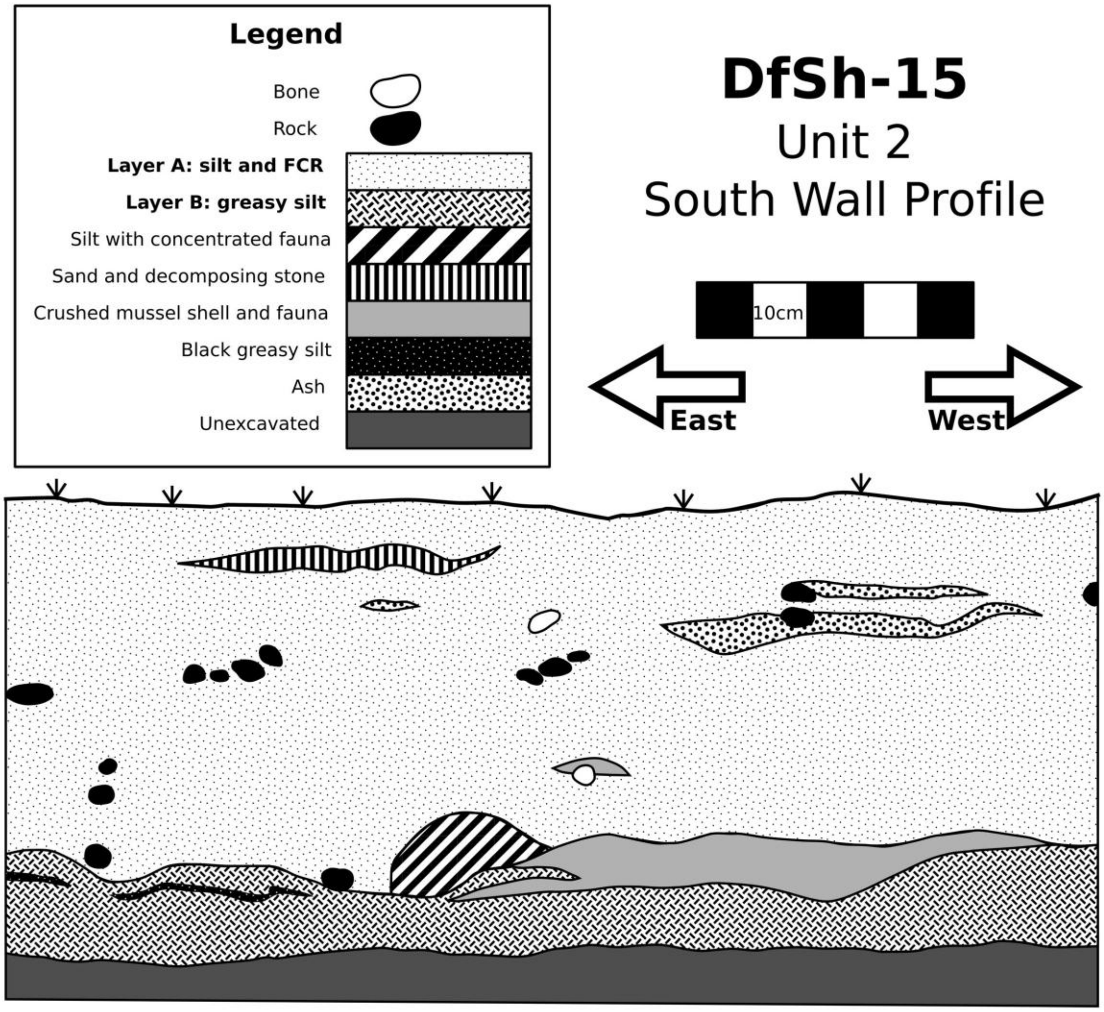

Figure 8: Profile of Unit 2, South wall, courtesy of Nick Waber

Unit 4

Compared to Unit 2, the stratigraphy in Unit 4 was considerably more complex due to the significant depth reached and the number of stratigraphic layers. The most recent stratigraphic layer, Layer A, consisted of medium/dark brown to black greasy silt with gravel and pebbles. Fire-cracked rocks serve as evidence of this being a cultural layer, despite the absence of shell or faunal remains.

Layer B began at 30 cm dbs and was a dark brown/black greasy silt with fire-cracked rocks. Fire-cracked rocks became prevalent throughout this level and the first stone artifact (a piece of quartz shatter) was uncovered.

Layer C, which was a very compact medium to dark brown greasy silt, began at 40 cm dbs. Fragmented shells and faunal remains started in this layer, and the fire-cracked rock continued.

Layer D started at 50 cm dbs and marked a significant increase in shell, as well as a decrease in fire-cracked rocks. The matrix was a black greasy silt (Munsell code 10YR 2/5) with shell and beach gravel. Although faunal remains were still limited, they included land mammal bones as well as fish, whereas in previous layers there were only fish bones.

Layer E, beginning at 70 cm dbs, was a greasy black silt (Munsell code 10 YR 2/5) with gravel, shell, ash, and fire-cracked rocks. A hearth feature in the northwest quadrant became visible in this layer and carbon samples were taken for radiocarbon dating. Also, more and a greater variety of faunal remains were found around the hearth feature, including birds, land mammals, and fish.

Layer F, beginning at 80 cm dbs, was a dark greasy silt (2.5YR 2.5/0) with gravel. Shell decreased in this layer and also became increasingly fragmented. There were still some fire-cracked rocks but they were mostly associated with the hearth feature that was still in place.

Layer G began at 110 cm dbs and was a dark brown to black greasy silt (2.5Y 2/0) with gravel, pebbles, and sand. Some small shell fragments were found in concentrations of fire-cracked rocks. An increase in faunal remains was noted, including sea mammals, land mammals, birds, and fish. In Level 13, Layer G, a flaked and ground stone (artifact DfSh15:298) was recovered.

Layer H began at 140 cm dbs and was a medium to dark brown greasy silt (7.5YR 2.5/1) with trace amounts of very fine shell and an increase in fire-cracked rocks. The number and variety of faunal remains decreased in this layer as well. There was a significant increase in artifacts at this point, including two quartz crystal microblades (artifacts DfSh-15:337 and DfSh-15:345) and a significant amount of schist, some culturally modified and some not.

Layer I began at 160 cm dbs and was a black greasy silt (5YR 2.5/1) with sand, gravel, and pebbles. There is a significant increase of shell in this layer, predominantly comprised of clams, mussels, and barnacles, as well as an increase in faunal remains.

Layer J, beginning at 180 cm dbs, was a dark brownish black silt (2.5Y 3/2) with a high concentration of sand, as well as some gravel and pebbles. There were also some large sand patches (5Y 6/1) along the east wall and in the northwest quadrant. This layer also had a decrease in shell and fire-cracked rock.

Layer K began at 205 cm dbs and was a blackish grey sandy silt (2.5YR 3/0). Very few shells and fire-cracked rocks were in this layer, and the faunal remains continued to decrease. Schist fragments were numerous and several quartz flakes and pieces of shatter were recovered from the northwest quadrant. The sandiness of this matrix makes this layer distinct from all the previous layers.

Layer L began at 245 cm dbs and was a medium brown sandy silt (2.5YR 3/0) with rounded pebbles. There was a combination of water-worn and non-water-worn fire-cracked rocks in this level, as well as a small number of faunal remains. This thin layer appears to be a result of cultural materials that have filtered down through the beach gravels. Several scattered chunks of charcoal provided a sample for radiocarbon testing.

The final layer, Layer M, began at 260 cm dbs and was a medium brown sand (2.5Y 3/2) with rounded pebbles. This layer became increasingly sandy with depth, but had a decreasing amount of shells, fire-cracked rocks, and faunal remains. However, a significant number of bone artifacts were recovered at the top of this layer, but decreased quickly. This layer became sterile beach sand and excavation ended at 280 cm dbs.

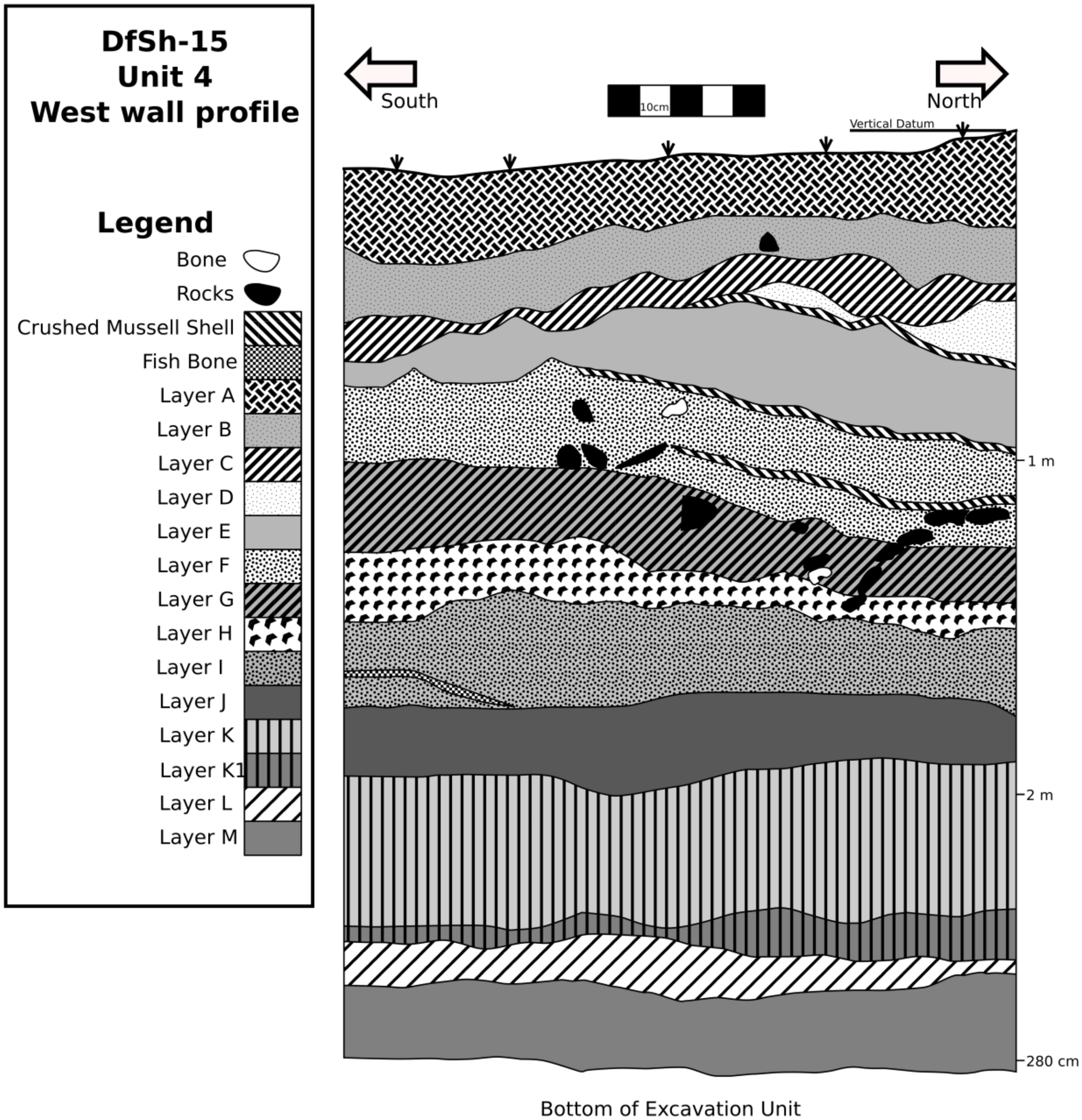

Figure 9: Profile of Unit 4, West wall, courtesy of Nick Waber

The majority of the charcoal samples were very small and degraded, limiting the number of radiocarbon dates from this unit. Three radiocarbon samples were taken from Unit 4. The first adequate sample that could be tested came from Level 6, Layer D at a depth of 0.65 to 0.7 m and was dated to 2020+/-40 (2100 to 2090 and 2060 to 1880 cal

BP). The second radiocarbon sample was taken from a hearth feature in Level 12, Layer G at a depth of 1.2 to 1.25 m dating to 2210+/-40 (2340 to 2120 cal BP). The third radiocarbon date was taken from Level 23, Layer K at a depth of 2.3 to 2.35 m, in the second to last level. This produced a date of 2710+/-40 (2870 to 2750 cal BP). These dates are all considerably older than the front units (Units 1, 2, and 5).

4.4.2 DfSh-16

Five units were excavated at DfSh-16, resulting in four radiocarbon dates from three of the units. As more historic artifacts were found at this site than at DfSh-15, the project directors radiocarbon dated the layers without historic materials.

Table 5: DfSh-16 Radiocarbon Age Estimates

Lab Number	Unit Number	Depth Below Surface (m)	Radiocarbon Years	Calibrated Years BP*	Comments
Beta-250331	N4-6 E0-2	1.2-1.3	880 +/- 40	920-700	Second to lowest level
Beta-265976	N4-6 W4-6	1.2-1.3	840 +/- 40	900-870 and 800-680	Just above basal sand
Beta-265975	N12-14 E4-6	0.7-0.8	380 +/- 50	520-310	
Beta-265977	N12-14 E4-6	1.53-1.58	1290 +/- 40	1290-1160	Lowest layer

Calculated using two standard deviations.

Four flaked stone artifacts came from this site; three were from N4-6 E0-2 and one came from N4-6 W4-6. As such, the stratigraphy is only discussed for these particular units.

Unit N4-6 E0-2

Layer A consisted of a dark, reddish brown soil (5YR 3/3). The three flaked artifacts from this unit all came from Layer A. Layer B began at 10 cm dbs and was a loose, non-greasy, gray silt (7.5 YR 2/0). Layer C was a dark, silty black (7.5 YR 2/0) with minor shell, which began at 20 cm dbs. At the northern side of the unit, Layer C ended at 30 cm dbs, while at the southern side it finished at 50 cm dbs. Layer D was a very greasy, compact black silt (7.5YR 2/0) that ended at 75 cm dbs on the north side, and 100 cm dbs on the south side. Layer E was a loose, greasy black silt (7.5YR 2/0) with a high concentration of shell. The north side ended at 110 cm dbs, while the south side lasted until 120 cm dbs. At this point, basal sand (2.5Y 3/3) was reached.

Unit N4-6 E4-6

Layer A was a dark black greasy silt, Munsell code 7.5 YR 2/0, which began at 10 cm dbs. At 20 cm dbs, the matrix transitioned into Layer B, which was a black greasy silt (7.5YR 2/6) thick with fire-cracked rocks and charcoal. Layer C, a black silt (7.5YR 2/0) with shell inclusions, also started at approximately 20 cm dbs about 50 cm from the North wall, stretching towards the South wall. The only flaked artifact in this unit, a small glass flake, was found in Layer C. Layer D, the last cultural layer, began at approximately 90 cm dbs and was a black, greasy silt (7.5 YR 2/0). The final layer, Layer F, began at 100 cm dbs and was basal sand with a very thin layer of silt and charcoal on top (10YR 3/3).

Four radiocarbon dates were attained from this site. The first was taken in 2008 from Unit N4-6 E0-2 from Level 13, Layer A, and was dated to 880+/-40 (920 to 700 cal BP). It was at a depth of 1.2 to 1.3 m, near the bottom of the unit, representing the initial occupation of the lower platform. The remaining three radiocarbon dates were taken in the 2009 field season. One was taken from Unit N4-6 W4-6, which was also on the lower house platform. The sample came from Level 12 at a depth of 1.2 to 1.3 m just above basal sands, and was dated to 840+/-40 (900 to 870 and 800 to 680 cal BP), essentially identical to the previous initial date for this platform. Two samples were taken from the upper house platform, from Unit N12-14 E4-6. The first sample came from Level 7 at a depth of 70 to 80 cm and was dated to 380+/-50 (520 to 310 cal BP). An iron knife with a bone or ivory handle was found just above the sample. Level 16 was also dated from this unit. It produced a date of 1290+/-40 (1290 to 1160 cal BP) from near the base of cultural deposits at a depth of 1.53 to 1.58 m, providing the oldest age estimate for the site.

Although no radiocarbon dates were taken from upper levels, levels 1 through 7 contained historic materials, indicating a late occupation. Also, it is known ethnographically that this site was used into the 20th century. The wooden post and beam surface features also demonstrate 20th century occupation.

4.5 Methodological Concerns

The use of ¼” mesh in the majority of the excavation may be considered a methodological concern. Many small artifacts pass through ¼” mesh screens, including projectile point fragments, debitage, bone tools, and stone and glass beads (Ozbun et al. 2012:2). Ozbun et al. (2012:4) note that “the smallest two dimensions of an object, such as a flake, control its ability to slip through the square holes of a screen and therefore flakes much longer than the 9 mm diagonal of the square holes in a coarse mesh screen easily escape”. The authors used nested screens to sort debitage in an experimental project to demonstrate their point; 31 flakes were caught with the ¼” screen, 260 with 1/8” mesh, and 29,952 went through both (2012:7). This is significant as some attributes only occur on the smaller flakes of a reduction sequence, and typically, the larger flakes are the intended product, and therefore removed by the knapper (Ozbun et al. 2012:7, 8).

Although hundreds of small flakes were found at the Hiikwis site complex by using ¼" mesh for the entire site and 1/8" mesh for part of Unit 2, based on the experiments conducted by Ozbun et al. it seems likely that many more flakes were missed. However, it is significant to note that the debitage density in Unit 2 was observed prior to the use of 1/8" mesh, and therefore represents a true event.

4.6 Conclusions

The flaked stone materials were mostly restricted to Units 2 and 4, with small numbers recovered from Units 1 and 3, as well as from DfSh-16. The lithic assemblages from Unit 2 and 4 differ markedly in raw materials and reduction strategies. These differences are presumably related to the temporal and spatial separation of these units, which will be further discussed in the following chapters.

Chapter 5: Descriptive Methods and Results

5.1 Introduction

As was introduced in Chapters 2 and 4, the Hiikwis site complex has a substantial flaked stone assemblage of 703 artifacts, which is by far the largest found to date in the Barkley Sound region. The rest of the artifact and faunal assemblage has not yet been analyzed and therefore cannot be commented on or included in this thesis.

The study collection includes various types of bifacial projectile points, bifacially flaked schist/phyllite knives, a bifacial chopper, bifacial scrapers, a spokeshave, various microliths, microblades, cores, bipolar cores, flakes, and shatter. These artifacts predominantly came from two units, Units 2 (582 flaked artifacts) and 4 (106 flaked artifacts), which are temporally and spatially separated. However, many of the other units had small numbers of flaked stone and glass as well; at DfSh-15, Unit 1 had six artifacts and Unit 3 had five, while flaked stone was absent from Unit 5. At DfSh-16, Unit N4-6 E0-2 had three flaked artifacts and Unit N4-6 W4-6 had one flaked artifact.

As has been seen at other British Columbian sites occupied through the contact period, the occupants of the site began to use items of European manufacture, often modifying these items to fit their needs (e.g., Martindale and Jurakic 2006:415). This can be seen through the glass flakes, which were produced through similar methods as the other flaked artifacts, but using a European-sourced material. Martindale and Jurakic note that "glass is mineralogically similar to lithic materials commonly used for tool production in archaeological contexts… [as it] fractures and breaks easily under compressive forces due to its low tensile strength and surface imperfections" (Martindale and Jurakic 2006:416). Glass breaks through conchoidal fracture, and therefore follows the same breakage patterns as other flakeable materials.

5.2 Recorded attributes and Methods of Measurement

As this is an exploratory data analysis, I chose to begin with very basic measurements that could be taken from all artifact types to quantitatively characterize the assemblage. I also made qualitative assessments based on general morphology and absence or presence of usewear to help define and create artifact categories for further classification. A digital caliper was used for all dimensional measurements to .01 mm.

<u>Length (mm)</u>

Length was measured as the maximum dimension between the proximal and distal ends of a tool or flake following the direction of the striking platform. With the shatter, which is the debitage that could not be oriented, the longest dimension was measured as the maximum length.

<u>Width (mm)</u>

Width was measured as the maximum dimension of the tool or flake perpendicular to its length for both orientable and non-orientable artifacts. Width was recorded for all artifacts.

<u>Thickness (mm)</u>

Thickness was measured as the maximum dimension from the dorsal to the ventral side of an artifact. With non-orientable artifacts, this was taken as the third-dimensional measurement in comparison to the length and width measurements.

<u>Weight (g)</u>

The weight of each artifact was recorded to 0.01g using the iBAL 201 electronic scale, with a 200g capacity.

Complete or Incomplete

Complete flakes had an intact proximal and distal end, with no obviously broken or missing aspects. The proximal end is the segment of the flake with the striking platform, while the distal end is opposite the proximal end, showing the termination of the flake (Andrefsky 2005:20). Non-orientable shatter was classified as complete unless it was very clear that it had broken, rather than just ended in a termination.

Type of Artifact

Type of artifact was recorded using very basic categories. Each artifact was looked at under the microscopic to look for distinguishing attributes. Cores were identified based on the presence of multiple flake scars resulting from the removal of many flakes. Most of the cores were bipolar cores, meaning that they had been reduced bipolarly and therefore had bipolar attributes such as crushing at both the proximal and distal ends. Flakes were characterized by one or more of the following attributes: presence of a striking platform, compression rings, radial striations, bulbs of percussion, and previous flake scar removals. Shatter includes those pieces that could not definitively be classified as flakes as they did not have well-defined flake attributes, but were nonetheless a part of the reduction process. Microliths and the other tools were categorized based on their general morphology, retouch, and evidence of use-wear. Lithic identifications were based on Andrefsky (2005), as well as personal communication with Daniel Stueber (2011), Daryl Fedje (2011), and Darcy Matthews

(2011). Mike Wilson identified the raw material types (pers. comm. to McMillan 2008, 2010).

Specific Artifact Category/Technological Typology

This category was used to provide more detailed information about the individual artifacts. Where possible, the type of flake would be identified here (bifacial thinning flake, platform preparation, etc.). If that could not be determined, the technology employed was stated (bipolar reduction, direct percussion, etc.). In some instances, neither could be determined.

Platform Type

The platform type was classified as either simple or complex, based on a qualitative assessment of the surface of the platform. Several characteristics were taken into consideration, including whether or not it was flat, the number of facets, and whether or not there was evidence of grinding (Andrefsky 2005). Flat platforms with a single facet and no grinding were considered simple, while those with multiple facets and evidence of grinding were classified as complex.

Raw Material

The raw material was visually determined by Mike Wilson, Dan Stueber, and myself, and was classified into a number of categories; the most predominant were chert and quartz.

Cortex Percentage

Cortex was defined as “the naturally altered or weathered (mechanically or chemically) outer surface of lithic material” (Kooyman 2000:170). The cortex was recorded following Debénath and Dibble (1994). Their categories are 0%, 1-10%, 10-

40%, 40-60%, 60-90%, 90-100%, and 100%.

Special Notes

This category was created to allow for any interesting notes or thoughts that did not specifically fit into one of the aforementioned categories.

The analysis of the artifacts following these categorizations is presented in Appendix A as a table, and in Section 5.3 as a descriptive analysis.

5.3 Descriptive Lithic Analysis

5.3.1 Tools

5.3.1.1. Bifacial Points (N=11)

There is considerable variation in the points, which include stemmed points (4), triangular points (2), a lanceolate point (1), a foliate point (1), a side notched point (1), and basal fragments (2). The descriptions and form types for these were based on McLaren and Steffen (2008). The average size of the points is 51.82 mm x 21.17 mm x 5.56 mm and they weigh between 1.21 g and 22.15 g, as is presented in Table 6. The sizes differ significantly, as is demonstrated in Tables 6 and 7, and Figure 10. The materials also vary considerably and include andesite (4), basalt (3), argillite (1), a metamorphic light brown material (1), red chert (1), and white chert (1), as is shown in Table 6 (Mike Wilson, pers. comm., 2008, 2010). Only one of the points has any cortex on it; it has between 10 and 40%.

Figure 10: Points (from left to right, DfSh-15:615, DfSh-15:150, DfSh-15:241, DfSh-15:270, DfSh-15:537, DfSh-15:364, DfSh-15:535, DfSh-15:320, DfSh-15:349, DfSh-15:529, DfSh-15:613), photo courtesy of Justin Kimball

Table 6: Bifacial Points

Artifact Number	Unit Number	Level	Dimensions (L - W - T) in mm			Raw Material
DfSh-15:150	3	13	46.02	25.19	6.09	Red chert
DfSh-15:241	3	13	48.37	33.57	6.32	Andesite
DfSh-15:270	4	10	(49.1)	40.0	7.35	Basalt
DfSh-15:320	2	7	(39.85)	18.88	6.32	Andesite
DfSh-15:349	2	8	50.34	16.55	5.42	Andesite
DfSh-15:364	2	9	32.45	13.16	4.61	Andesite
DfSh-15:529	4	7	(22.02)	(25.81)	6.83	Metamorphic light brown
DfSh-15:535	4	8	50.32	17.85	5.87	Basalt
DfSh-15:537	4	17	99.67	29.67	7.74	Argillite
DfSh-15:613	4	24	(29.37)	24.32	9.45	Basalt
DfSh-15:615	4	14	(43.29)	(22.71)	6.6	White chert

The numbers in brackets are measurements of incomplete attributes of the artifacts.

Table 7: Bifacial Points Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	32.45-99.67	51.82	22.28	0.43	6
Width	13.16-33.57	21.17	8.36	0.40	9
Thickness	4.61-7.74	5.56	1.52	0.27	11

Only includes complete dimensions. The C.V. is the coefficient of variation, which represents the ratio of the standard deviation to the mean.

5.3.1.1.1 Stemmed Points (N=4)

(DfSh15:150, DfSh15:241, DfSh15:270, DfSh15:364)

The first stemmed point (DfSh15:150) is made of red chert with some white patination and a slightly weathered surface that shows evidence of heat-treatment. It has a distinctive, tanged shape and other than flakes and debitage, this is the only artifact made of red chert. It has slightly excurvate blades, a convex base, and basal notches. It was excavated from Unit 3, level 13.

The second (DfSh15:241) is made of andesite, came from Unit 3, level 13, and has between 10 and 40% cortex. It has excurvate-incurvate blades, a pointed-convex base, and corner-basal notches. It appears to have been made from a beach cobble due to the presence of incipient cone cortex on part of one face. Incipient cone cortex is identified based on the presence of many incipient cones resulting from blows on a flat surface. This type of cortex is commonly produced through fluvial transport, and therefore is common on beach pebbles and cobbles (Whittaker 1994:17).

The third stemmed point (DfSh15:270) is made of basalt, has no cortex, and was excavated from Unit 4, level 10. It has incurvate blades, a straight base, and side and basal notches.

The fourth stemmed point (DfSh15:364) came from Unit 2, level 9, is made of andesite, and has no cortex on it. It has straight blades, a convex base, and rounded shoulders.

5.3.1.1.2 Triangular Points (N=2)

(DfSh15:320, DfSh15:349)

Both of these points came from Unit 2, are made of andesite, and lack cortex. The first (DfSh15:320) has straight, denticulate blades and a slightly convex base, and came from level 7. The second (DfSh15:349) also has straight blades but a much more pronounced convex base, and came from level 8.

As noted in Chapter 2, small triangular points occurred at Shoemaker Bay. Outside of the immediate region, small, triangular flaked points were also uncovered at Montague Harbour II (DfRu13), Cadboro Bay I (DcRt15), Maplebank site in Esquimalt Harbour (DcRu12), the Willows Beach site in Oak Bay, among many other sites in the Gulf of Georgia (Mitchell 1968:12; Keddie 2008:81-82). Despite their common appearance on southern Vancouver Island, small triangular points are unreported on the central part of eastern Vancouver Island prior to 1720 BP, at which time they are recorded at the Duke Point site (DgRx5) (Keddie 2008:82).

5.3.1.1.3 Lanceolate Point (N=1)

(DfSh15:537)

This point, from Unit 4, level 17, lacks cortex. It is made of argillite and is significantly larger than any of the others in the assemblage (see Table 6). Lanceolate was distinguished from foliate based on the position of the widest point. In lanceolate points, the widest part is “situated between the middle and the tip of the artifact” (McLaren and Steffen 2008:166).

5.3.1.1.4 Foliate Point (N=1)

(DfSh15:615)

This projectile point is made of white chert, and has excurvate, denticulate blades, and a straight base with grinding on one side. It was excavated from Unit 4, level 24. In comparison to lanceolate points, foliate points are widest between the middle and base of the artifact (McLaren and Steffen 2008:166).

5.3.1.1.5 Side and basally notched point (N=1)

(DfSh15:535)

This projectile point is made of basalt and came from Unit 4, level 8. It has no cortex on it and it was made on a bifacial thinning flake. It has excurvate blades, a pointed-concave base, and rounded shoulders.

5.3.1.1.6 Basal Fragments of Points (N=2)

(DfSh15:529, DfSh15:613)

Both of these are basal fragments of flaked stone points but are made of different materials. One is weathered, light brown schist (DfSh15:529) from Unit 4, Level 7. The other (DfSh15:615) is made from a basalt flake, with evidence of some grinding on the base and margins, and came from Unit 4, Level 14. Neither has any cortex remaining.

5.3.1.2 Bifacially Flaked Schist/Phyllite Knives (N=16)

Each specimen is thin and relatively flat with variously worked edges, having evidence of flaking as well as usewear. Microchipping and striations were also noted on the bifacially flaked schist/phyllite knives. They range from oval to roughly rectangular with both straight and rounded edges, with considerable variation in their size (see Table 8). Twelve were made from muscovite schist, while four were made from grey phyllite (Mike Wilson, pers. comm., 2008, 2011). Although primarily determined by their use-wear and general morphology, the classification of these artifacts as knives was partly due to their similarity to those uncovered from the early component at Shoemaker Bay (Shoemaker Bay I), the two recovered from the early component of Ts'ishaa, and those from the Gulf of Georgia region (McMillan and St. Claire 1982:64).

Figure 11: Bifacially Flaked Schist/Phyllite Knives (from left to right, DfSh-15:608, DfSh-15:401, DfSh-15:530, DfSh-15:404, DfSh-15:414, DfSh-15:360, DfSh-15:399, DfSh-15:372, DfSh-15:427, DfSh-15:371, DfSh-15:415, DfSh-15:298, DfSh-15:340, DfSh-15:406, DfSh-15:305, DfSh-15:253), photo courtesy of Justin Kimball

Studies of the development and organization of slate/schist/phyllite knife technology in the Gulf of Georgia region has been "most hindered by a tendency for archaeologists to uncritically classify all thin, chipped, ground, and/or bevelled slate artifacts that are not projectile points as knives or knife fragments" (Graesch 2007:582). By classifying all of these variations within a single type, inter-site comparison becomes increasingly difficult, adding to the challenge of analyzing and understanding larger regions. Hence, the bifacial knives will be referred to as 'bifacially flaked schist/phyllite knives,' in order to more clearly state the technology and material type of these artifacts. Despite these difficulties, the Uukwatis bifacially flaked schist/phyllite knives are definitely similar to several other sites, such as those recovered from Shoemaker Bay, Montague Harbour I (DfRu-13) and Cadboro Bay I (DcRt-15) (Mitchell 1968:11).

Table 8: Bifacial Knives Summary Statistics

Attribute	**Range (mm)**	**Mean (mm)**	**S.D.**	**C.V.**	**Number**
Length	33.74-79.37	58.03	15.60	0.27	16
Width	12.19-64.57	38.08	12.74	0.33	16
Thickness	1.96-10.92	5.05	2.86	0.57	16

5.3.1.3 Bifacial Chopper (N=1)

Bifacial choppers are core tools that are made through alternate flaking to create a transverse edge (Bordes 1968:243). There is one pebble chopper in the assemblage. It measures 79.94 mm x 56 mm x 23.3 mm and weighs 149.13 g. It is made of porphyritic andesite and is heavily weathered and water rolled (Mike Wilson pers. comm., 2008, 2010). It has between 60 and 90% cortex and was uncovered from excavation Unit 3.

Figure 12: Bifacial Chopper (DfSh-15:378), photo courtesy of Justin Kimball

5.3.1.4 Bifacial Scrapers (N=2)

Bifacial scrapers are a type of tool that generally has steep retouch on one side, and sometimes minimal retouch on the other (Loy and Powell 1977:63). The first is made of basalt and has steep retouch on one side. The second is made of dacite, has steep retouch on one surface, and minimal retouch on the opposing surface.

Figure 13: Bifacial Scrapers (from left to right, DfSh-15:557, DfSh-15:271), photo courtesy of Justin Kimball

5.3.1.5 Spokeshave (N=1)

Also referred to as notches, spokeshaves are concave-edged scrapers with steep retouch (Loy and Powell 1977:66; Kooyman 2000:102). Generally, they are assumed to be wood-working tools, although they were sometimes used on bone, and would likely have been useful in making arrow shafts or other wooden objects that are circular in cross-section (Kooyman 2000:102). This assemblage has a single spokeshave, made of green chert, from Unit 2. It measures 39.79 mm x 28.8 mm x 17.4 mm and weighs 19.84 g.

Figure 14: Spokeshave (DfSh-15:292), photo courtesy of Justin Kimball

5.3.1.6 Microliths (N=30)

Microliths are small, ‘miniature’ tools, which include both formed and unformed varieties. All have been utilized, defining them as tools, while some have been retouched.

The average size of the microliths is 13.67 mm x 7.16 mm x 4.32 mm and they weigh between 0.02 g and 19.84 g (Table 9). Twenty-seven are made of chert, one is made of clear glass, and two are unidentified materials - one a rough grey material and the other a grayish black material. The majority of the microliths had no cortex on them (25), but three have between 1 to 10% and two have between 10 to 40%. Each of these artifacts was classified as a microlith due to some type of evidence of use. Some were more diagnostic than others, which was noted during the analysis (see Appendix A). There were 14 artifacts included in this category due to retouched edges, and nine included due to indistinguishable use-wear. The remaining artifacts could be further classified as drills (3), a bipointed drill (1), burins (2), and a graver (1).

Table 9: Microliths Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	5.76-21.83	13.42	4.48	0.33	30
Width	3.45-13.44	6.58	2.45	0.37	30
Thickness	1.66-6.83	3.80	1.41	0.37	30

Only includes complete specimens.

5.3.1.6.1 Microlithic Utilized Flakes (N=23)

This category is meant as a broad and inclusive category that includes all of the microlithic flakes with evidence of retouch and/or usewear. Retouch was defined as the modification of a flake to make it into a functional tool, which can be seen based on the negative morphological characteristics of one or multiple flake removals (Inizan et al. 1999:81). Of these, 21 came from Unit 2 and were made of chert. One utilized flake came from Unit 4A and was made from an unidentified material, and one came from Unit 1 and was made of clear glass.

Usewear was defined as any physical evidence of use, including any of the following: microchipping, striations, rounding or smoothing, and micropolishes, all of which were observed within the assemblage (Vaughan 1985:10-13; Jensen 1994:12-14). Usewear was observed as a visual phenomenon based on surface alteration, with no further analyses being conducted to determine how the tool was used, or on what types of materials (Jensen 1994:11).

5.3.1.6.2 Microlithic Drills (N=3)

Drills are tools that are used in a rotary motion that generally “have a bifacially worked point, may be hafted, and are used on hard material” (Kooyman 2000:104). It is likely the drills in this assemblage were hafted due to their small size. Drills are distinct from other boring tools as they tend to have a longer and narrower shape (Kooyman 2000:104).

There are three microlithic drills in this assemblage. Two are made of chert and one is made from an unidentified material. All were excavated from Unit 2.

Figure 15: Microlithic Drills (from left to right, DfSh-15:124, DfSh-15:321-5, DfSh-15:285-13), photo courtesy of Justin Kimball

5.3.1.6.3 Microlithic Bipointed Drill (N=1)

Bipointed drills have the same characteristics as drills, except they have been utilized as drills at both ends. The one bipointed drill is made of andesite and came from Unit 2.

Figure 16: Microlithic Bipointed Drill (DfSh-15:132), photo courtesy of Justin Kimball

5.3.1.6.4 Microlithic Burins (N=2)

Burins are essentially small stone chisels, which are produced by removing one or two precise flakes. The first flake is removed “from the working end at a right angle to the long axis of the flake” (Kooyman 2000:104). The second flake, referred to as a burin spall, is removed at a right angle to the first flake, creating the chisel edge (Kooyman 2000:104). Burins are used as chisels for working wood, bone, and antler (Bordes 1968:242).

This assemblage has two microlithic burins, both of which are made of chert and came from Unit 2. One is complete while the other is the broken tip of a burin.

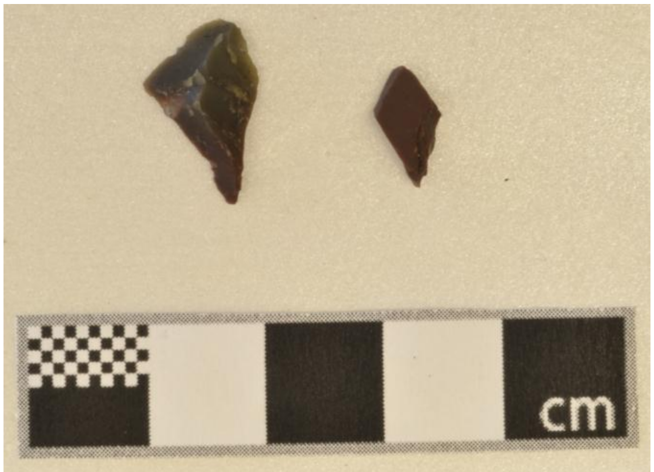

Figure 17: Microlithic Burins (from left to right, DfSh-15:275-2, DfSh-15:285-9), photo courtesy of Justin Kimball

5.3.1.6.5 Microlithic Graver (N=1)

Gravers are "small chisel-like implements" that are used in a scraping motion to create narrow incisions and grooves (Kooyman 2000:104). Although similar to perforators, they are differentiated by a thicker tip end, which allows them to withstand greater pressure (Kooyman 2000:104). They are made through retouch, rather than through burination.

There is one graver in this assemblage. It is made of green chert and was excavated from Unit 2. It measures 11.23 mm x 6.46 mm x 4.83 mm and weighs 0.33 g.

Figure 18: Microlithic Graver (DfSh-15:285-26), photo courtesy of Justin Kimball

5.3.1.7 Microblades (N=7)

A blade is a form of flake with parallel edges, which has a length of at least twice its width (Andrefsky 2005:253). A microblade is a small blade, often defined by being less than 5 cm long (Andrefsky 2005:258; Kooyman 2000:170). Blades and microblades come from a specific technology that requires a prepared core. The use of this type of core creates arrises or straight ridges from previous flake removals on the dorsal surface of the blade or microblade. The arrises created by previous flake removals direct how the following flakes are removed (Bordaz 1970:55-57). The arrises and flake scars can be used to determine whether they are the result of early or late stage reduction as they become increasingly straight, regular, and have no cortex as the reduction progresses (pers. comm. Dan Stueber).

The average size of the microblades is 15.17 mm x 5.00 mm x 1.88 mm and they weigh between 0.04 g and 0.36 g (see Table 11). Five are made of chert and came from Unit 2, while two are made of quartz crystal and were recovered from Unit 4 in Level 14 Layer H (see Table 10). All of the microblades are complete.

Figure 19: Chert Microblades (from left to right, DfSh-15:43, DfSh-15:188, DfSh-15:197-60, DfSh-15:197-65, DfSh-15:199-8), photo courtesy of Justin Kimball

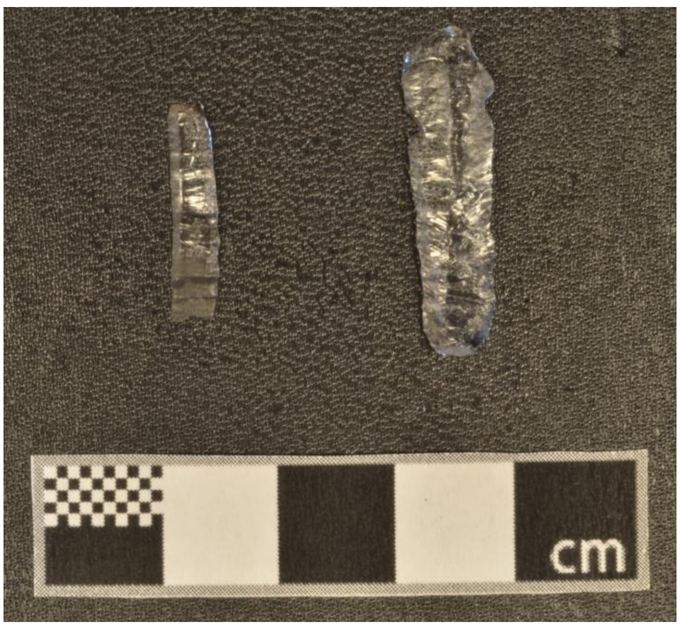

Figure 20: Quartz Crystal Microblades (from left to right, DfSh-15:337, DfSh-15:345), photo courtesy of Justin Kimball

Microblades are characteristic of the Strait of Georgia region, particularly in the Locarno Beach culture type (Mitchell 1990:341, 345). They are uncommon in Nuu-chah-nulth territory, with the exception of 91 found in the early component of Shoemaker Bay (McMillan and St. Claire 1982:65), and the 30 microblades and 23 microblade cores found during survey work in the Alberni Valley (McMillan 1996a:211). Some of the earliest known Gulf of Georgia sites with microblade technology include Montague Harbour (DfRu-13), Cadboro Bay (DcRt-15), Helen Point (DcRu-8), and False Narrows (DgRw-4) (Mitchell 1968:11-14). For these sites, microblades and microblade cores were made of obsidian, basalt, and quartz crystal. The microblades range in size from just over 1 cm to 4 cm, which is comparable to both Shoemaker Bay and Uukwatis. Montague Harbour I has a radiocarbon date of 2890 +/- 140 BP for the level with the microblades, while Helen Point I radiocarbon dates the microblade level to 3160 +/- 130 BP; both dates clearly place the microblade component within the Locarno Beach cultural phase (Mitchell 1968:14).

Table 10: Microblades

Artifact Number	Unit Number	Level	Dimensions (LxWxT) in mm			Raw Material
DfSh-15:43	2	3	16.33	6.18	2.75	Brownish red chert
DfSh-15:188	2	7	9.84	3.88	1.13	Green chert
DfSh-15:197-60	2	7	13.46	4.34	1.62	Green chert
DfSh-15:197-65	2	7	11.49	4.95	2.18	Green chert
DfSh-15:199-8	2	7	9.43	3.96	1.65	Green chert
DfSh-15:337	4	14	18.18	4.11	1.85	Quartz crystal
DfSh-15:345	4	14	27.48	7.56	2.0	Quartz crystal

Table 11: Microblades Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	9.43-27.48	15.17	6.32	0.42	7
Width	3.88-7.56	5.00	1.39	0.28	7
Thickness	1.13-2.75	1.88	0.51	0.27	7

5.3.2 Debitage

Debitage was found in every unit that had flaked artifacts. As previously noted, the majority came from Units 2 and 4 from DfSh-15; Unit 2 had 102 flakes, 437 pieces of shatter, and four cores while Unit 4 had 45 flakes, 25 pieces of shatter, and ten cores. The remaining units from DfSh-15 with flaked artifacts included Unit 1, which had four flakes and one piece of shatter, and Unit 3, which included one flake and one piece of shatter. For DfSh-16, Unit N4-6 E0-2 had one flake and two pieces of shatter, while Unit N4-6 W4-6 had one piece of shatter.

In considering these figures it is important to note that all of the units were initially screened through ¼' mesh, but with the discovery of many small lithics, Unit 2 was screened through 1/8' mesh. This change in methodology may have resulted in a higher rate of recovery than elsewhere on the site. Regardless, Unit 2 appears to be a part of a 'flaking station' due to the high quantity of flakes and shatter as well as the proportion of debitage to tools, as demonstrated in Table 24.

5.3.2.1 Cores (N=14)

A core is the lithic piece from which flakes are removed (Andrefsky 2005:14). The average size of the cores is 33.35 mm x 23.13 mm x 14.37 mm and the weight is between 0.28 g and 94.37 g (see Table 13). Four are made of chert, nine are quartz, and one is slate/phyllite/schist (see Table 12 and Figure 21). Figure 22 depicts the data collected on the cores. As shown in Figure 22, the length is skewed left, while the width and thickness are skewed right. The width and thickness also have smaller and more similar ranges than the length. None of the categories had any outliers. Differences were noted in the percentage of cortex remaining, with three cores having no cortex, two having less than 10%, six having between 10 to 40%, four with 40 to 60%, and one with 60 to 90%, creating no discernible pattern. Different types of cores were noted including multidirectional cores (3) and bipolar cores (11).

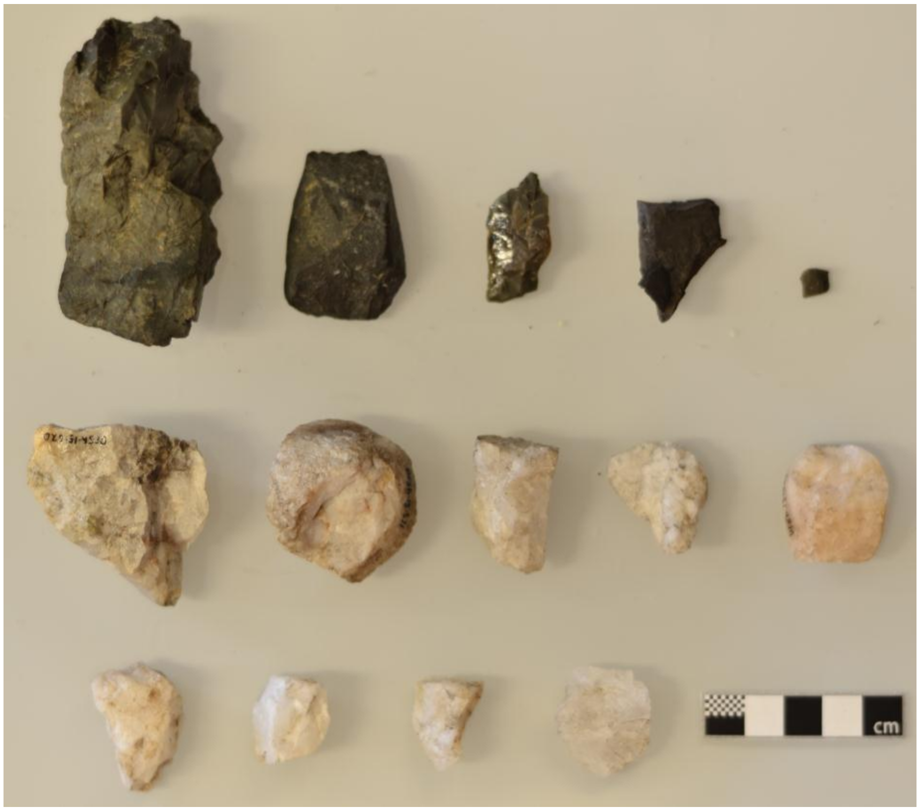

Figure 21: Cores, photo courtesy of Justin Kimball

Table 12: Core Raw Materials

Raw Material	Quantity
Chert	4
Quartz	9
Slate/Phyllite/Schist	1

Table 13: Core Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	7.99-84.66	35.02	17.18	0.49	14
Width	6.96-43.80	24.78	10.51	0.42	14
Thickness	4.95-34.85	15.37	8.02	0.52	14

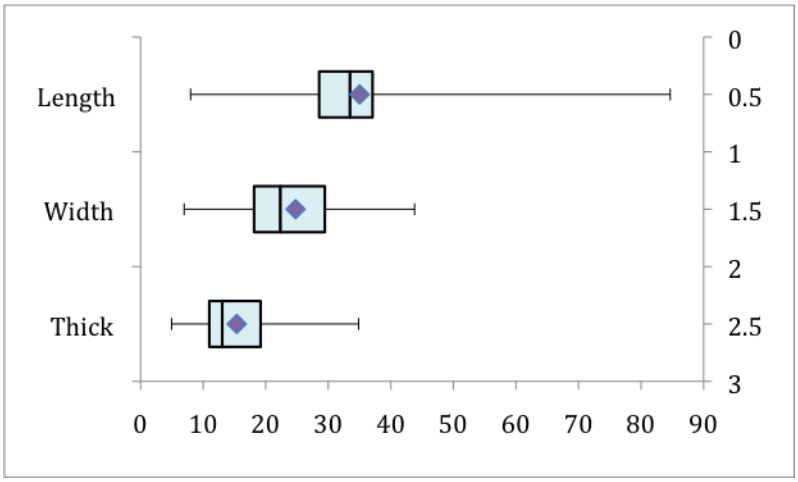

Figure 22: Cores Box and Whisker Plot

5.3.2.1.1 Multidirectional Cores (N=3)

Multidirectional cores are those that have flakes removed from multiple directions, and therefore have multiple striking platforms (Andrefsky 2005:16). Two of these cores are made from chert while the third is made of slate/phyllite/schist. All three came from Unit 2. As multidirectional cores cannot be oriented to a single direction, for measuring purposes the length was taken as the maximum distance, the width was taken as the maximum distance perpendicular to the length, and the thickness was taken as the maximum distance in the third direction.

5.3.2.1.2 Bipolar Cores (N=11)

Bipolar cores are distinct due to the irregularity of their morphology, which is often confused with angular shatter. Bipolar cores have crushing on at least two ends, and sheared dorsal surfaces with no bulb of percussion scar (Kooyman 2000:170). The compressive force of bipolar reduction also creates compression ring scars on bipolar cores that are closer together than regular compression rings (Cotterell and Kamminga 1987:685; Daniel Stueber pers. comm. 2011). Bipolar reduction with quartz in particular is often characterized by crushing at each end (Bordes 1968:242). For measuring purposes, the cores were oriented based on the direction of the removal of flakes.

There are 11 bipolar cores in this assemblage. Nine of them are made from quartz, one is made from green chert, and the other is made from an unidentified raw material. The green chert bipolar core was excavated from Unit 2. The nine quartz and one unidentified raw material bipolar cores were from Unit 4.

5.3.2.2 Flakes (N=153)

In the act of stone tool production, a flake is the piece of rock that is removed during percussion, pressure flaking, or bipolar reduction, all of which were observed in this assemblage (see Table 16) (Andrefsky 2005:255). The average size of the flakes is 10.34 mm x 7.41 mm x 2.12 mm and they weigh between 0.01 g and 19.09 g (see Table 15). They are made of a wide range of materials including chert (100), quartz (44), quartz crystal (1), clear glass (4), quartzite (3), and unidentified (1) (see Table 14). While the majority of the flakes had no cortex on them (116), eight flakes had less than 10%, another eight had between 10 to 40% and the remaining five flakes had between 40 to 60%. Although many of the flakes were unidentifiable, some were particularly diagnostic; there are alternate flakes (2), bifacial sharpening flakes (4), bifacial thinning flakes (4), distal flake fragments (6), early stage reduction thinning flake (1), an eraillure flake (1), medial flake fragments (18), platform preparation flakes (2), a pressure flake (1), and proximal flake fragments (6).

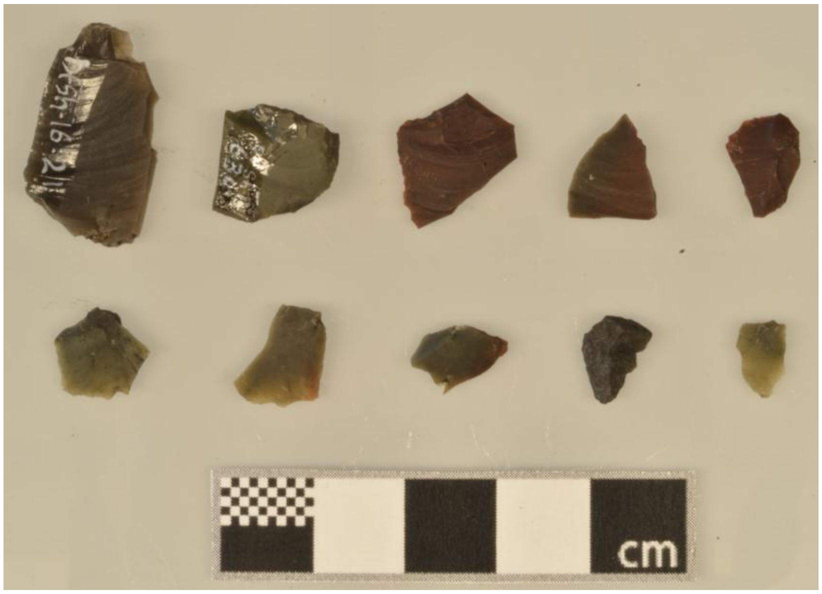

Figure 23: Sample of Flakes, photo courtesy of Justin Kimball

Table 14: Flake Raw Materials

Raw Material	Quantity
Chert	100
Quartz	44
Quartz Crystal	1
Clear Glass	4
Quartzite	3
Unidentified	1

Table 15: Flake Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	3.91-27.21	11.55	5.40	0.47	106
Width	2.63-23.10	7.89	3.48	0.44	106
Thickness	0.37-7.43	2.46	1.41	0.57	106

Only includes complete specimens.

Table 16: Flake Reduction Strategies

Reduction Strategy	Quantity
Bipolar Reduction	46
Percussion Flaking	51
Hard Hammer Percussion	38
Soft Hammer Percussion	7
Pressure Flaking	4
Undiagnostic	7

5.3.2.2.1 Alternate Flakes (N=2)

Alternate flakes are produced through the removal of flakes by striking a single edge from both sides, switching between the two with each strike (Andrefsky 2005:252). This strategy is often used in bifacial tool production while attempting to straighten and narrow an edge. This process results in flakes with right angle edges near the platform (Daniel Stueber pers. comm. 2011).

Both of the alternate flakes are made of clear glass and came from Unit 1 near the front of site DfSh-15. They were recognized as alternate flakes due to their curvilinear shape, and the presence of a right angle edge next to the striking platform.

5.3.2.2.2 Bifacial Sharpening Flakes (N=3)

Bifacial sharpening flakes are produced when a knapper flakes a dull bifacial tool edge to produce a sharper, rejuvenated edge. They can be identified by usewear on the striking platform (Kooyman 2000:176). All three of these flakes came from Unit 2 and were made of green chert.

Figure 24: Bifacial Sharpening Flakes (from left to right, DfSh-15:285-5, DfSh-15:295-3, DfSh-15:285-29), photo courtesy of Justin Kimball

5.3.2.2.3 Bifacial Thinning Flakes (N=6)

Bifacial thinning flakes are a byproduct from a later stage of bifacial tool reduction where the knapper is thinning the objective piece. They are generally long, narrow flakes characterized by a complex striking platform and dorsal surface, which generally have three or more flake scars (Kooyman 2000:170). Bifacial thinning flakes tend to have an acute striking platform angle as well as a lip distal to the striking platform (Kooyman 2000:51). They often have flake scars in multiple directions as well as a multi-faceted platform (Daniel Stueber per comm. 2011).

There are six bifacial thinning flakes in this assemblage, including an early stage reduction thinning flake. All of the bifacial thinning flakes are made of chert. Five were excavated from Unit 2 and the sixth came from Unit 4.

Figure 25: Bifacial Thinning Flakes (from left to right, DfSh-15:321-4, DfSh-15:144, DfSh-15:250-22, DfSh-15:275-3, DfSh-15:338, DfSh-15:107), photo courtesy of Justin Kimball

5.3.2.2.4 Eraillure Flake (N=1)

An eraillure flake is the small chip that often detaches from the bulb of percussion (Andrefsky 2005:255). The one eraillure flake is made of green chert and is from Unit 2.

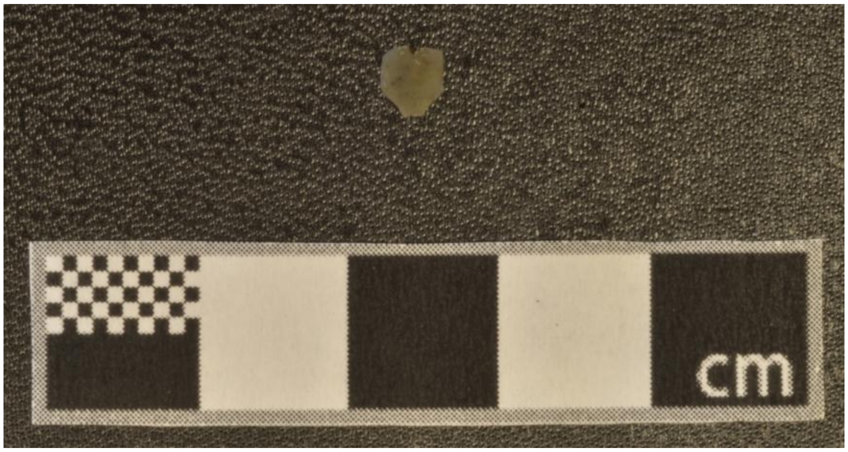

Figure 26: Eraillure Flake (DfSh-15:197-110), photo courtesy of Justin Kimball

5.3.2.2.5 Platform Preparation Flakes (N=2)

Platform preparation flakes are removed from the platform end of an objective piece in order to strengthen the platform for subsequent reductions. They are short flakes with thick and wide platforms (AINW 2012:5).

There are two platform preparation flakes from the site. Both came from Unit 2 and are made of green chert.

Figure 27: Platform Preparation Flakes (from left to right, DfSh-15:197-58, 197-61), photo courtesy of Justin Kimball

5.3.2.2.6 Pressure Flake (N=1)

Pressure flakes have "small isolated platforms oriented to one side of the flake, acute platform angles," and margins that are generally parallel to each other (AINW 2012:5). The one pressure flake is made of green chert and came from Unit 2.

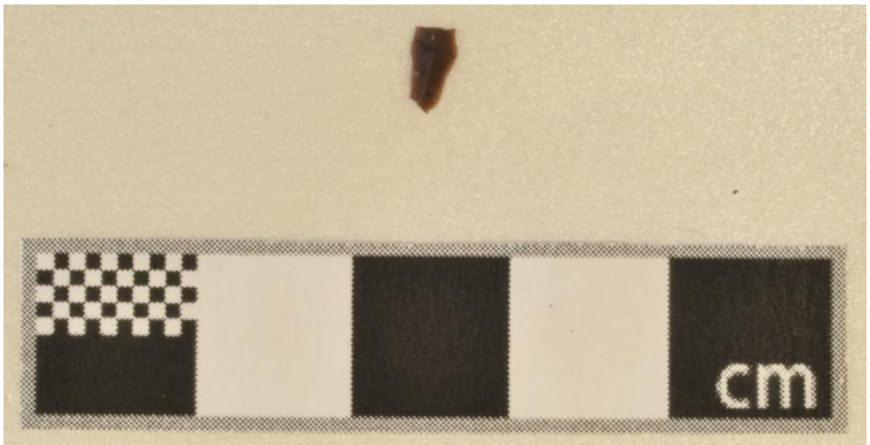

Figure 28: Pressure Flake (DfSh-15:285-19), photo courtesy of Justin Kimball

5.3.2.2.7 Incomplete Flakes (N=30)

The incomplete flakes were categorized as either proximal, medial, or distal flake fragments.

Proximal Flake Fragments (N=6)

The proximal end is the segment of the flake with the striking platform (Andrefsky 2005:20). All of these flakes are made of chert and came from Unit 2.

Medial Flake Fragments (N=18)

The medial flake fragments are the broken flakes that do not have either the striking platform or the flake termination, but still have attributes allowing them to be diagnosed as flakes, such as compression rings. All of these flakes are made from chert. The majority (16) came from Unit 2, while one was from Unit 4B and another was from site DfSh-16 Unit E 0-2 N 4-6.

Distal Flake Fragments (N=6)

The distal end is where the impact from the original strike causing the flake to be removed from the objective piece terminates (Andrefsky 2005:20). All of these flake fragments are made of chert and came from Unit 2.

5.3.2.3 Shatter (N=467)

Shatter encompasses the lithic materials that are a part of the lithic reduction but do not have diagnostic flake attributes such as conchoidal rings, platforms, radial striations and/or a bulb of percussion. Detached pieces that had at least one of these attributes and were therefore orientable were classified as flakes. Non-orientable pieces were classified as shatter.

The average size of the shatter is 9.07 mm x 5.94 mm x 2.79 mm and each artifact weighs between 0.01 g and 22.0 g (see Table 18). Chert is predominant with 410 pieces, followed by quartz (29), quartzite (11), schist (5), glass (4), andesite (2), and an unidentified material (6) (see Table 17). The majority of the shatter had no cortex (387) while 30 pieces had less than 10%, 57 had between 10 to 40%, and the remaining 13 pieces had between 40 to 60%.

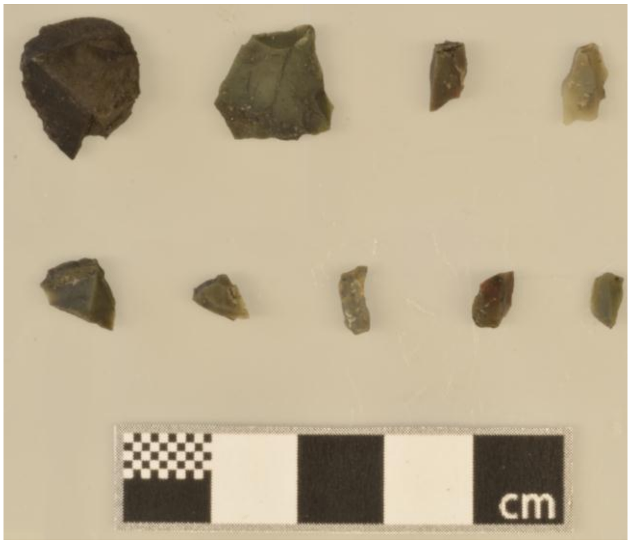

Figure 29: Sample of Shatter, photo courtesy of Justin Kimball

Table 17: Shatter Raw Materials

Raw Material	**Quantity**
Chert	410
Quartz	29
Quartzite	11
Phyllite/Schist/Slate	5
Glass	4
Andesite	2
Unidentified material	6

Table 18: Shatter Summary Statistics

Attribute	**Range (mm)**	**Mean (mm)**	**S.D.**	**C.V.**	**Number**
Length	2.78-46.43	8.95	5.15	0.57	467
Width	2.51-33.96	5.83	3.35	0.58	467
Thickness	0.33-14.34	2.81	2.02	0.72	467

5.3.2.4 Potlid (N=1)

Potlids are the flakes, or flake scars, detached by thermally induced differential expansion (AINW 2012:6). Usually initiating near a flaw in the material, the flake follows Hertzian principles to produce a plano-convex flake (Price et al. 1982:469;

AINW 2012:6). Potlids can result due to accidental or "post-depositional damage of lithic materials in a fire," or as a mistake in heat-treating (AINW 2012:6).

The one potlid uncovered came from Unit 2 and was made of green chert.

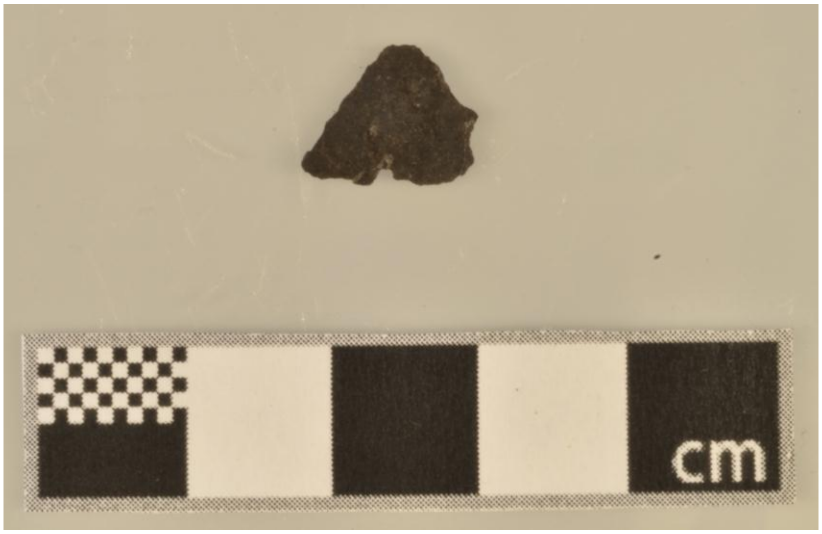

Figure 30: Potlid (DfSh-15:283-1), photo courtesy of Justin Kimball

5.3.2.5 Reduction Strategy

Three different reduction strategies were employed within this assemblage: percussion flaking, bipolar reduction, and pressure flaking (see Table 19).

Table 19: Reduction Strategies

Reduction Strategy	Number of Artifacts
Percussion Flaking	220
Hard Hammer Percussion	82
Soft Hammer Percussion	7
Bipolar Reduction	91
Pressure Flaking	18
Undiagnostic	292

Note: Some artifacts were made through multiple methods of manufacture and therefore were included in more than one category.

5.3.2.5.1 Percussion flaking (N=220)

Percussion flaking is a method of flake removal that strikes the objective piece with a percussor, often referred to as a hammerstone or billet (Andrefsky 2005:12). In debitage analysis, this technology generally produces detached pieces with thicker striking platforms that are centered on the detached piece (Kooyman 2000:79; Dan Stueber pers. comm., 2011). Also, the ripple marks are more common and prominent in percussion flaking than pressure flaking (Kooyman 2000:79). The size of the artifacts made through percussion flaking varied considerably, as is demonstrated in Table 20.

Table 20: Percussion Flaking Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	1.09-99.67	14.07	15.29	1.09	309
Width	1.03-64.57	9.25	9.53	1.03	309
Thickness	0.37-34.85	3.11	3.25	1.05	309

The type of percussor used in percussion flaking affects the flake attributes, therefore sometimes making it possible to differentiate between hard hammer and soft hammer percussion.

5.3.2.5.2 Hard Hammer Percussion Flaking (N=82)

Hard hammer percussion often results in a narrow striking platform, which seldom has a lip (Kooyman 2000:79). It produces a prominent bulb of percussion and often generates an eraillure flake. Conchoidal rings are more common with hard hammer rather than soft hammer percussion, and the flakes also tend to be larger and thicker. Flakes and shatter are also more likely to break with hard hammer percussion (Kooyman 2000:79).

5.3.2.5.3 Soft Hammer Percussion Flaking (N=7)

Soft hammer percussion operates similarly to hard hammer percussion, but utilizes a softer percussor; antler billets are commonly used. Soft hammer percussion tends to produce a wide striking platform with a diffuse bulb of percussion (Kooyman

2000:79). Eraillure flakes are less common in soft hammer rather than hard hammer percussion and ripple marks tend to not be prominent. Flakes and shatter generally end in feather terminations, and tend to be smaller and thinner than those produced through hard hammer percussion. Flakes and shatter also tend to break less often (Kooyman 2000:79).

5.3.2.5.4 Bipolar Technology (N=91)

Bipolar technology is a reduction technique where a nodule of stone is placed on an anvil and struck with a hammer to detach a piece or several pieces (Andrefsky 2005:253). This results in impact damage or crushing at both the proximal and distal ends of the ensuing flakes and core, as well as a sheared ventral surface on the flakes and a sheared dorsal surface on the core (Kooyman 2000:170). Bipolar technology differs from percussion flaking and pressure flaking as it produces flakes through compression rather than purely conchoidal fracture. As explained by Cotterell and Kamminga (1987:685), "a compression flake is initiated by microscopic wedging and the fracture path is controlled by compression… these flakes are produced during bipolar flaking, though not all flakes detached from a bipolar core are of this type." Due to this difference in their formation processes, bipolar flakes have less prominent conchoidal attributes compared to percussion or pressure flaking. In addition, their large, irregular shapes often lead to their misidentification as bipolar cores (Cotterell and Kamminga 1987:685). In considering bipolar reduction with quartz, it is often characterized by crushing at each end (Bordes 1968:242).

Figure 31: Examples of Bipolar Technology, photo courtesy of Justin Kimball

The artifacts produced through bipolar reduction range in size from 6.07 mm x 3.93 mm x 1.77 mm to 46.43 mm x 12.5 mm x 7.92 mm and weigh between 0.01 g and 49.63 g (see Table 21). The majority are made of quartz (75), 12 are made of chert, one is slate, one is quartz crystal, one is quartzite, and one is an unidentified grayish black material (see Table 22). The percentage of cortex varied considerably with 45 pieces having no cortex, 14 had less than 10%, 24 had between 10 and 40%, seven had between 40 and 60%, and one had between 60 and 90%. Of the bipolar artifacts there are 46 flakes, 32 pieces of shatter, 11 cores, and two microliths.

Table 21: Bipolar Technology Summary Statistics

Attribute	**Range (mm)**	**Mean (mm)**	**S.D.**	**C.V.**	**Number**
Length	0.50-46.43	17.37	8.83	0.51	91
Width	3.73-43.80	11.34	6.83	0.60	91
Thickness	0.81-26.39	5.55	4.50	0.81	91

Table 22: Bipolar Reduction Raw Materials

Raw Material	Quantity
Quartz	75
Chert	12
Quartz Crystal	1
Slate	1
Quartzite	1
Unidentified	1

5.3.2.5.5 Pressure Flaking (N=1)

Pressure flaking is a method of flake removal that uses pressure to remove an objective piece (Andrefsky 2005:12). There are several characteristics that can be used when analyzing debitage to determine if pressure flaking was used. The striking platform is generally small in relation to the size of the piece. This technology also produces a diffuse bulb of percussion (Kooyman 2000:79). The detached pieces are also generally quite small, although this characteristic cannot be used alone (Kooyman 2000:79). Pressure flaking rarely produces eraillure flakes, and the detached pieces seldom break during production (Kooyman 2000:79). In addition, the striking platform is generally angled and not centered on the flake (Dan Stueber pers. comm. 2011).

5.3.2.5.6 Undiagnostic (N=292)

This category was created in response to flakes that were morphologically diagnostic as flakes, but the method of reduction was indeterminate. Their sizes are summarized in Table 23.

Table 23: Undiagnostic Summary Statistics

Attribute	Range (mm)	Mean (mm)	S.D.	C.V.	Number
Length	2.78-30.96	7.88	3.58	0.45	292
Width	2.69-22.31	5.13	2.17	0.42	292
Thickness	0.33-14.34	2.44	1.54	0.63	292

5.4 Conclusion

Although the Uukwatis flaked stone assemblage is relatively small, it represents a wide variety of lithic types and technologies, which are further discussed in Chapter 6. Chapter 5 classified and quantified the individual artifact types present at the site and identified the reduction strategies employed. Chapter 6 discusses several points introduced in Chapter 5, including the unusual diversity of projectile point styles, the presence of microliths, and the relation between microblades, flaked schist/phyllite knives and the Gulf of Georgia. In addition, the debitage will be further explored through the *chaîne opératoire*, particularly considering bipolar reduction within larger regional patterns, temporal and spatial differences within the site, and how the flaked stone from Uukwatis fits into larger regional patterns.

Chapter 6: Analysis and Discussion

6.1 Theoretical Discussion

Initially beginning with a culture historic approach, archaeological theory has become more scientifically inclined, and has now grown to develop a humanistic understanding (Johnson 1999). The previous chapter took an empirical approach, focusing on typology and descriptive statistics. This chapter moves into a discussion of these results, with the use of a more behavioural approach.

This section discusses the *chaîne opératoire*, design theory, and technological strategies in preparation for their implementation within the analysis. These theoretical approaches have been used in this study as they put the people at the forefront of this lithic analysis, aiding in deriving the behaviour and decisions that created this stone tool assemblage.

6.1.1 The Chaîne Opératoire

Interest has increased in discovering anthropological meanings within the archaeological record. This has led to a re-examination of traditional archaeological morphology-based typologies to explain cultural realities. Archaeology has moved away from its original goal towards a scientifically based analytical precision; material-cultural remains were initially studied to inform anthropologists about the behavioural context of prehistoric life. The typological system of classifying artifacts and constructing cultural taxonomies created descriptive culture history rather than informing researchers about specific behaviours (Bar-Yosef and Van Peer 2009:103). The *chaîne opératoire* attempts to move back towards an anthropological behaviour-focused analysis of lithic materials.

Chaîne opératoire is a conceptual method of descriptive comparison that recognizes the overall technology, embracing cultural norms and behaviour as well as assemblage composition and completeness (Bar-Yosef and Van Peer 2009:103; Shott 2003:98). By directing attention to process, the *chaîne opératoire* not only studies tools, but also debris, failures, use, and discard (Shott 2003:98-99). Flenniken's replicative systems analysis is very similar as it studies the "entire life of a stone tool from its inception to its deposition" but differs in that it also replicates the entire lithic system (Flenniken 1981:3).

Technological studies have been focused on conceptual knowledge, practical skills and how they work together in the conversion of raw materials into tools (Bar-Yosef and Van Peer 2009:104). To understand prehistoric artisans, technologists began to study the choices made in selecting raw material, methods of knapping stone tools, "the specific shape modification designed to obtain a set of products," and the larger regional scale encompassing a lithic economy, but rather than considering these individually, they are unified into a single, multi-stage process (Bar-Yosef and Van Peer 2009:104). With this increased focus on technological data, archaeologists became informed of the succession of gestures and events involved in technological production (Bar-Yosef and Van Peer 2009:104). To successfully collect the data necessary to complete these studies, all of the components of a lithic assemblage became part of the analysis (Bar-Yosef and Van Peer 2009:104). With a significant increase in the study of flakes and debitage, a systematic method became necessary, which involves the increased importance of situating sites and/or assemblages within their regional context (Bar-Yosef and Van Peer 2009:104), as previously noted by Nelson (1991).

The *chaîne opératoire* is an ideal heuristic model for the Uukwatis lithics due to its focus on all components of an assemblage, including complete tools, failures, and discards, as well as its emphasis on situating assemblages within their regional context. This method is well-suited to the Uukwatis lithics due to their unique nature within the Barkley Sound region, and the need to learn as much as possible from this small assemblage. Therefore, the *chaîne opératoire* will be used as a theoretical framework for the discussion of the Uukwatis tools and debitage in the following subsections.

6.1.2 Design Theory

Tool production represents a series of decisions and actions undertaken by the tool makers. Design is a variable, prompting toolmakers to select from a variety of options to create a solution to a problem (Bleed 1986:738). By altering any of the choices made in designing and constructing a tool, (whether it be raw material, shape, etc.) its effectiveness and/or applicability could be altered (Bleed 1986:738). Furthermore, some designs are more effective than others, but all must be considered in terms of the environmental and cultural conditions for which they were intended (Bleed 1986:738). As such, toolkits are composed of tool forms that are designed according to conceptual variables of utility (Nelson 1991:66).

6.1.3 Design Variables

Nelson considers five variables: reliability, maintainability, flexibility, versatility, and transportability. Reliable designs are dependable in that they consist of secure fittings and substitute components for emergency replacements (Nelson 1991:66). Their strengthened parts, solid construction, meticulous fitting of parts, and overdesign define their reliability and dependability, but require that any maintenance that is needed must be completed prior to use, rather than being integrated into the use time frame (Nelson 1991:66-67). Maintainable designs are able to work under a variety of circumstances (Nelson 1991:70). They maintain their structure and therefore do not change for different applications. Flexibility connotes a tool that can be easily remodeled to meet a multitude of needs and a range of uses (Nelson 1991:70). This differs from versatile tools “which are maintained in a generalized form to meet a variety of needs” (Nelson 1991:70). Flexible and versatile designs are advantageous due to their ability to be used in a variety of ways (Nelson 1991:71). For toolkits to be transportable, they must have few items, be lightweight, and be resistant to breakage (Nelson 1991:74). To ensure an individual is prepared for a variety of unforeseen circumstances, at least some of their tools must be either flexible or versatile. Carrying and therefore utilizing few items also leads to conservation of materials, wherein tools are resharpened and reshaped to maximize usage before replacement or discard (Nelson 1991:74). Archaeologically, this is reflected through a low proportion of waste flakes from tool manufacture at sites where transportable toolkits are utilized. Transportable designs need to facilitate mobility while anticipating future needs, such as the availability of resources (Nelson 1991:76).

6.1.4 Curation, Expediency, and Opportunistic Technological Strategies

Nelson recognizes three technological strategies: curation, expediency, and opportunistic behaviour. These categories refer to human planning and action when responding to environmental conditions (Nelson 1991:62). This differs from most standard methods of classification that utilize specific artifact types. Curation is a technological strategy that can include “advanced manufacture, transport, reshaping, and caching or storing” in caring for tools and toolkits (Nelson 1991:62). Anticipating inadequate conditions, this strategy prepares raw materials prior to the time of use (Nelson 1991:63). Expediency requires knowledge of the environment as it anticipates the presence of workable materials and sufficient time to produce tools at the time and place they are needed. As such, this involves the production of tools that require minimal technological effort (Nelson 1991:64). Opportunistic behaviour is unplanned and is responsive to unanticipated circumstances (Nelson 1991:65). However, these strategies are not exclusive of each other and therefore can be interwoven in the archaeological record (Nelson 1991:65).

Shott further considers curation, examining how it informs archaeologists about external factors, and environmental and social processes. Shott notes that curation is an attribute of all tools, and therefore influences the constituents of assemblages (1996:266). All tools have a predetermined amount of value or utility based on their size, design, and working properties (Shott 1996:267). Utility is reduced through usage, which includes wear, resharpening, and chemical alteration (Shott 1996:267).

In defining ‘tools’, Shott argues that all tools are used, and therefore, all tools are curated (1996:267). The level of curation occurring depends on social, economic, and environmental factors such as raw-material availability and mobility frequency (Shott 1996:268). Consequently, by analyzing the level of tool curation for a population, archaeologists can learn about external factors, as curation influences assemblage formation (Shott 1996:268).

The theoretical maximum utility is the absolute amount of work that tools can perform, which is determined by the tool’s size, design, and composition (Shott 1996:270). Shott discusses maximum utility in comparison to realized utility; maximum utility is the amount of workable material found on the tool prior to use, while realized utility is that amount removed during periods of use (Shott 1996:270). Shott notes that recycling is not an explicit part of a tool's utility, but rather an extension (Shott 1996:271). Recycling becomes an aspect of curation if utility is considered to include all of the ways in which a tool is used, rather than just those purposes for which it was originally designed and intended (Shott 1996:271). Curation can be seen archaeologically by measuring the amount of useable material left on tools (theoretically speaking) that have been discarded (Shott 1996:271).

The *chaîne opératoire* and design theory are being used concurrently to study the Hiikwis site complex assemblage as they are each able to make unique and important contributions to the analysis. The *chaîne opératoire* focuses on the raw materials used, all components of an assemblage including complete tools and failures, and situating the assemblage within its regional context, which is important for Hiikwis as this is a unique assemblage in Barkley Sound with considerable variation in tool types and raw materials. Design theory gives both conceptual and behavioural contributions as it gives researchers a way to consider what environmental and social aspects influenced toolmakers to design tools in a specific way. Together, the *chaîne opératoire* and design theory offer a well-rounded method of discussing the flaked stone assemblage from the Hiikwis site complex.

6.2 Tool Assemblage Discussion

The following subsections discuss several prominent tool types within the assemblage, while also considering some of the behavioural implications of the Uukwatis tool assemblage through use of the *chaîne opératoire* and design theory.

6.2.1 Bifacial Points

The eleven points found show considerable variation, both in morphology and raw material. As mentioned in Chapter 5, the assemblage includes four stemmed points, two triangular points, one lanceolate point, one foliate point, one side and basally notched point, and two basal fragments. They are made of andesite, basalt, red and white chert (which were both heat-treated), slate, argillite, and a metamorphic light brown rock. It is interesting to note that despite this wide variety of raw materials, none of the points is made of green chert, which was by far the most prominent flake and shatter raw material. This lack of a point made of green chert, as well as the wide variety of point styles and raw materials, with few of those materials present in the debitage assemblage, leads to the strong possibility that these points were imported from elsewhere. However, the presence of several bifacial sharpening and thinning flakes in the assemblage made of green chert substantiates that bifacial technology was taking place at the Hiikwis site. Regardless of this technology being used at Hiikwis, the non-local materials must have been imported. Using trade as a method of obtaining specific tools is an important behavioural decision. Other items must be made or procured to trade for these tools, and the actual trading process establishes a relationship with another group. In addition, the need to trade for these items speaks to the lack of appropriate materials available in the area for them to be made locally. As previously mentioned in Chapter 5, several of these points have morphological similarities to points found at Shoemaker Bay as well as in the

Gulf of Georgia region, which suggests a possible connection with these areas. Consequently, these points may act as a reflection of the trading relationship this population created with other groups.

Two of the projectile points from Uukwatis have been heat-treated. Heat-treatment is a sophisticated technology that can be used on certain materials to increase their workability. It is a curated technology that prepares raw materials prior to the time of use. Coarser micro-granular silica materials, including chalcedonies, jaspers, cherts, and flints, are difficult to flintknap in their natural state, but can become easier to work if properly heat-treated (Crabtree and Butler 1964:1; Price et al. 1982:467). A result of heat treatment of these materials is a change in the texture, lustre, and often the colour as well, which often takes on a pink or reddish hue (Crabtree and Butler 1964:1; Purdy and Brooks 1971:322; Price et al. 1982:468; Olausson 1983:1). This colour change is the result of the oxidization of minute amounts of iron present in the material (Purdy and Brooks 1971:323). In addition, heat treatment also decreases the occurrence of hinge and step fractures, allows the knapper to create longer and larger flakes, increases the compressive strength of the material, and produces sharper edges (Price et al. 1982:467; Olausson 1983:1). However, heat treatment also reduces the tensile strength of the material, causing it to break more easily when used on hard or tough materials (Olausson 1983:2).

The presence of heat-treatment is significant because it is a highly sophisticated technology representing a well-established lithic tradition. Although it cannot definitely be determined where these projectile points were made, they were made by someone with extensive knowledge of lithic technology.

6.2.2 Bifacially Flaked Schist/Phyllite Knives

As can be seen in Table 8 by the coefficient of variation, the length and width of the bifacial knives is similar, while the thickness is more variable. However, the variation evident in the thickness is mainly caused by a single outlier. Although the sample size is small, this suggests that the length and width was the attribute being focused on during manufacture, or perhaps demonstrates the approximate size of the largest raw materials available. It is possible that they were hafted and used as ulu knives. However, this is unsupported as similar tools from Hoko River, the best comparative site with a waterlogged component known to date, were not found hafted. It is also important to acknowledge the difficulty in determining whether or not these tools were complete. The raw material used fractures very easily and in some examples it is difficult to determine whether or not particular aspects were culturally modified or naturally broken. That being said, all examples included in this study had at least one attribute that was clearly culturally modified.

Through experimentation, Croes found that flaked schist knives were particularly effective in cutting through bone, such as ribs and vertebra, as opposed to hafted microliths and microblades, which were effective in cutting the skin and removing the meat (Croes 1995:211). In addition, at Hoko River the schist/phyllite knives were more abundant in the lower component block, which was associated with fish processing and drying, making it likely that they were a part of this activity (Croes 1995:211). Thin, ground slate knives are common in the Gulf of Georgia (Morin 2004:287). Although they are produced through grinding instead of flaking technology, the end product is similar. Ground slate knives from the Scowlitz site were fitted into wooden hafts, which Morin replicated for his experimental study of salmon butchering (Morin 2004:290).

Following the Scowlitz ground slate model, Morin (2004:297) found that the knives were highly efficient for filleting and scoring the salmon, but not for the initial incisions. Due to their effectiveness in fish processing, and the fact that Hiikwis is a coastal site, it is likely that they were being used similarly at Hiikwis.

At the Hoko River site, the bifacially flaked schist knives were found in the dry site component, and therefore it is unknown if they were hand held or hafted similarly to the microlithic tool assemblage. Based on the examples photographed, the Hoko River flaked schist knives appear to be similar in size to the larger ones from the Hiikwis site complex assemblage, being approximately 6 to 9 cm in length (Croes 1995:211), whereas the largest flaked schist/phyllite knife from Hiikwis Site Complex is just under 8 cm in length (Table 23). At the Hoko River site, the flaked schist/phyllite knives were more abundant in the earlier component (Gross 1986:121-122; Croes 1995:213). This is seen in a more extreme example at the Hiikwis site complex where they are only present in the earlier component.

These knives may be seen as a maintainable and versatile tool type as they are maintained in a generalized form, making them useful for a variety of tasks, as well as the ability to easily and quickly rejuvenate edges and then continue the task. With a few flake removals, the edges are quickly resharpened, allowing users to continue with their activity. Maintainable tools, such as these knives, maintain their structure and are not altered for different applications (Nelson 1991:70). This is the same reason why these knives are classified as versatile tools; versatile tools are maintained in a generalized form, allowing them to meet a wide variety of needs (Nelson 1991:70). Although these knives could have been used in a variety of applications, it seems likely that they were used for fish processing, as was found at the Hoko River site. With this process, it would be convenient to use a tool where you can quickly rejuvenate edges, allowing you to quickly return to your task.

6.2.3 Microliths

Through comparing the scatter plots of the different artifact types, it was noted that the dimensions of all of the microliths fit within the flake dimensions (see Figure 36). A difference was anticipated, specifically that the microliths would generally be larger than the unused flakes and shatter, indicating the careful selection of the largest pieces of stone. However, the lack of a difference indicates the possibility of the microliths being chosen opportunistically from the flakes. This, in turn, leads to the possibility of thinking of many of the flakes as potential, yet unused, tools. It is unlikely that all of the flakes and shatter would have been conceived of as possible tools, but rather, an indefinable subset. In terms of Shott's (1996) discussion of curation, these could be viewed as still having their original maximum utility, as they have not been used, and therefore do not have any realized utility.

As previously discussed in Chapter 5, the microliths consist of a variety of tools, including utilized flakes, drills, a bipointed drill, microlithic burins, and a graver. As such, these tools would have been used for a range of activities, such as cutting, drilling, and incising. Due to the small size of these tools, they could have been used for very detailed work. Although the finished items have not been recovered, it is possible that these artifacts may have been used to produce artistic pieces such as beads, pendants, and carvings.

Due to their small size, it is extremely likely that many of these tools would have been hafted to bone, antler, or wooden handles to make them more functional tools. The hafted microliths recovered from the Hoko River wet site may have been used as cutting tools for basketry and cordage, the manufacture of wooden artifacts, and for processing fish (Flenniken 1981:76). As shown in Table 9 (Chapter 5) and Figure 32, the microliths are fairly standardized in their width, making them ideal for hafting. For many tools, the flaked stone piece takes less time to create than the handle, and is often the part of the tool that fails (Semenov 1976:173). Therefore, toolmakers often design their handles to allow for the ejection of the broken piece, and reuse their handles after the stone part of the tool has been exhausted (Semenov 1976:173). Similarity in the shape and size of the stone piece facilitates replacing the broken or exhausted remnant. If used in this way, these tools could be classified as reliable tools within Nelson's (1991) discussion, as they would have easily replaceable parts to facilitate continued use. Also, due to their size and the ability to discard damaged pieces, these tools would have worked well within a transportable toolkit, thereby increasing their functionality and versatility.

In considering the microlithic drills and the microlithic bipointed drill, it is possible that these were used as bow drills, which tend to utilize very small stone drills (Semenov 1976:205). The bow drill facilitates quicker and better quality drilling of wood, bone, shell, and stone, and is twenty times more efficient than two-handed drilling (Semenov 1976:205). Unfortunately, the poor preservation of organic materials at this site has left us without any actual handles or bow drill assemblies. In addition, hafts seldom leave any traces of microwear on a tool, and even when they do, it is commonly confused with other types of wear (Jensen 1994:123). Therefore, unless a tool is found still in its haft, it is unlikely that the use of composite tool techniques can be determined conclusively. However, due to the extremely small size of the drills in this assemblage, it seems unlikely that they could have been used without a haft of some form. The dimensions of the drills are small, but they also come to a fine point (as can be seen in Figures 15 and 16), indicating that they were used for drilling very small and precise holes, possibly for beads, pendants, or carvings.

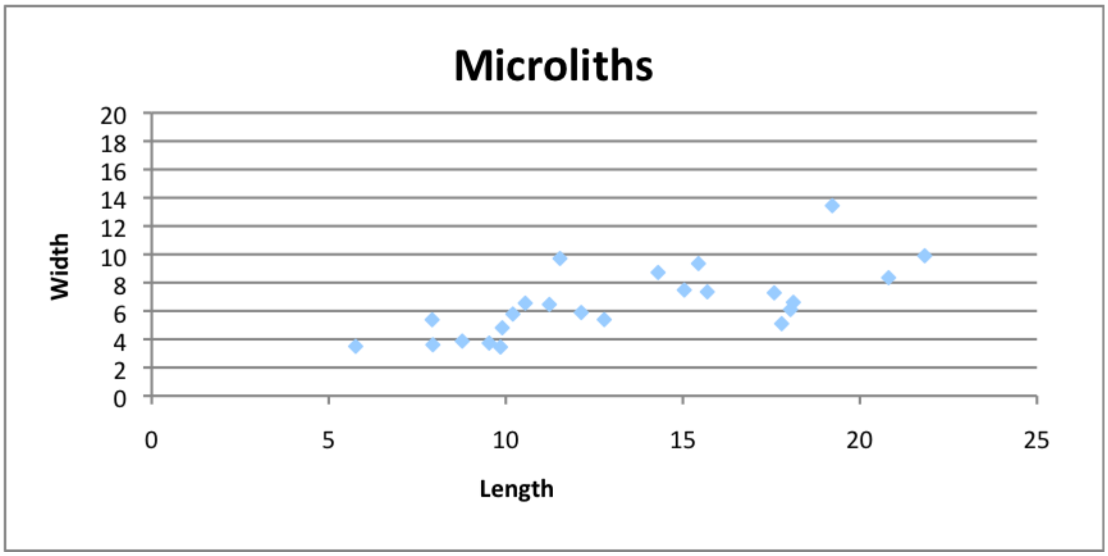

Figure 32: Microliths Length to Width Comparison, only includes complete specimens

6.2.4 Microblades

The summary statistics presented in Table 11 (Chapter 5) demonstrate that the width and thickness of the microblades is highly constrained, as would be expected with this technology. The length is more variable, especially between raw material types. It is also notable that all seven microblades are complete, as is discussed later in relation to hafting methods.

Microblades are an extremely efficient technology, providing the knapper with the most cutting edge per square unit of stone possible (Whittaker 1994:221). Bordaz asserts that blades and microblades can provide “up to five times the length of working edge" compared to other techniques (1970:57). As previously noted, this highlights the need to maximize the usage of available stone. Similarly to the microliths, microblades are generally hafted to become more functional tools. As cutting tools, microblades (and microliths) can be hafted in wooden or bone hafts in two different ways; they can be either end-hafted or side-hafted, as was seen at the Hoko River wet site component (Carlson 1983:19;1990:67, Croes 1995:180). Morin (2004:294) experimented with replicated hafted microliths based on the designs from the Hoko River wet site component, but had minimal success. Morin (2004) reported difficulty in maintaining the strength of the haft when applying pressure, and due to the small size of the cutting edge, the tool quickly became 'gummed up' with salmon flesh and skin. However, Flenniken found the microflakes to be effective in all stages of fish processing and reported no failure of any hafted microflake (1981:86). Regardless, we are unable to tell exactly how they were used at the Hiikwis site complex as the perishable elements have not been preserved. Following Nelson's design variables, not knowing the type of composite tools that these microblades were once a part of makes them more difficult to classify. Nelson (1991:69) does note that reliable designs are partially classified based on their secure fittings, which may be found in the design of hafting elements. Also, these tools would likely have been versatile as they were created and maintained in a generalized form, allowing them to be used in a variety of ways. A microblade can be either end-hafted or side-hafted without further modification, depending on the toolmaker's specific needs at the time of use. Further, these tools would have been very transportable, as microblades are very small and light and the hafts can be reused by being refitted with new microblades if the original microblade breaks.

Microblade technology can also be used as an alternative method to bifacial projectile points and knives, which also create stone cutting and piercing tools. In addition to side-hafting and end-hafting, microblades were also inset into wooden, antler, or bone slotted points to make them more effective (Waber 2011:58). With this method, microblades were affixed into grooves carved in the side of wooden or bone points, creating a continuous sharp edge that could more easily withstand impact with bone while hunting. The ability to replace individual microblades as they fail, as well as the ability for the tool to remain functional even if one of the microblades fails connotes a reliable design, as defined by their secure fittings and substitute components for emergency replacements. This technology is also an example of Nelson's (1991) curated technology due to the need for advance manufacture and the ability to reshape and replace components. As previously mentioned, it is unknown if the Uukwatis microblades were used in this way due to the lack of preservation of wood, but seems unlikely as there was preservation of bone and antler, and there were no examples of slotted points. In addition, it is unlikely that this method was used at Uukwatis as all of the microblades are complete. When using microblades to create slotted points, the microblades are often snapped in order to use the straightest part of the blade and eliminate any curved sections (Waber 2011). Therefore, the presence of only complete microblades at Uukwatis makes it less likely that this specific technology was being used at this site. Rather, it seems more likely that they were either end-hafted or side-hafted, as was seen at Hoko River in the wet-site component.

6.2.5 Behavioural Implications of the Tool Assemblage

In considering the tool assemblage, several themes become apparent. As previously mentioned, the projectile points exhibit considerable variation in both morphology and raw material. Several of the points are morphologically similar to those found in the Gulf of Georgia region. In addition, several of the material types that were used to make the points were not identified in the debitage from the site. Although this could result from them being made in an area of the site that wasn't excavated, combined with the variation of morphological styles it seems more likely that at least some of these points were imported from other sites, possibly from somewhere in the Gulf of Georgia or an area sharing the Locarno Beach culture type. The bifacially flaked schist/phyllite knives are also another connection between Uukwatis and the Gulf of Georgia. The bifacially flaked schist/phyllite knives are similar to those found at Shoemaker Bay I, Montague Harbour I (DfRu 13), Cadboro Bay I (DcRt 15), among many other Gulf of Georgia sites, as well as Hoko River. Bifacially flaked schist knives were also fairly common from the back terrace at Ts'ishaa and Ch'uumat'a. In addition, schist is not available in the local bedrock and is unlikely to be found in glacial erratics (Wilson 2005:122). Although the origin has not been determined definitively, it is likely that the schist was obtained either by means of trade or travel to the zone of the Leech River schist in southern Vancouver Island (Wilson 2005:123).

As previously mentioned, the microliths are similar in dimension to the flakes and shatter, meaning that they may have been opportunistically chosen from the debitage. Unlike the projectile points, the microliths appear to have been made on-site as they were found in the same excavation units and levels as the flakes and shatter. The likelihood of the projectile points being imported while the microliths were made on site also supports the previous assertion that there was a general shortage of suitable types of raw materials for flintknapping available in the area. The chert and quartz materials came from small cores, therefore making them suitable for microliths but not projectile points.

The microblades are a specific technology that was found in both the older and more recent components of the site. The two quartz crystal microblades found in the older component are similar to those found at Shoemaker Bay I as well as to numerous sites in the Gulf of Georgia specifically during the Locarno Beach Phase, including Montague Harbour (DfRu 13), Cadboro Bay (DcRt 15), Helen Point (DcRu 8), False Narrows (DgRw 4), and Crescent Beach (DgRr 1) (Mitchell 1968:11-14; Pratt 2010:11). Although quartz microblades are found at many Locarno Beach sites, they are not present at all Locarno Beach sites. For example, they are not present at Musqueam NE (DhRt 4), which is considered to be an influential Locarno Beach site (Matson and Coupland 1995:156).

The five chert microblades found in the more recent component are a little more unusual. Not only is chert a raw material that does not appear to have been widely used on Vancouver Island for microblades, these are also found in a far more recent component than is the case at other sites. It may be possible that microblade technology continued at this site into a later period than other areas because of the lack of raw materials available, and therefore the need for technologies that maximize the amount of cutting edge per stone.

6.3 Debitage Assemblage Discussion

6.3.1 Debitage

The debitage is generally very small and fragmented. The majority is made of either chert or quartz, and the technological differences are correlated to the raw material. The majority of the chert debitage is made from hard hammer percussion, while the majority of the quartz debitage is the result of bipolar reduction. Although chert is a micro-granular silica material, which has been used for flintknapping in many regions, the chert used at Uukwatis is a low-quality, highly fragmented chert, which is unpredictable and therefore difficult to work. The quartz seems to have come from small beach rolled pebbles, demonstrated by the cortex found on many of the pieces, and the size being derived from the curvature of the more complete pieces. Although the quartz materials haven't been chemically tested, it is likely that they were found opportunistically on the beach in front of the site as was seen at the Hoko River site. At Hoko River, the vein quartz materials were quarried within several hundred meters of the site at the mouth of the Hoko River. They appear to have weathered out the local conglomerate and are readily available in the surrounding gravels on the spit beach (Flenniken 1981:16). Although a thorough search has not been conducted, I was able to find several water rolled quartz pebbles on the rocky beach in front of DfSh-16 which were similar in size to those found in Unit 4, making it likely that the quartz pebbles were locally opportunistic.

As noted by Flenniken in his analysis of the vein quartz artifacts from the Hoko River site, "raw materials often dictate the outcome of the final product as well as the lithic pre-treatment and reduction technology; in short, the raw material influence[s] the use of techniques and the artifact type" (Flenniken 1981:13). Similarly to Flenniken's findings at Hoko River, bipolar reduction was used at Hiikwis due to the nature of the quartz raw material. With the size of the pebbles, bipolar reduction is the only possible way to reduce them into workable materials. Generally, for bipolar technology, the height of the core must be higher than where your hand is holding it securely in place, otherwise the hammerstone will simply bash your hand instead of the core. When analyzing the more complete bipolar pieces from the assemblage, I noticed that many of them were smaller than my hands. Using similar beach rolled quartz pebbles that were smaller than this usually necessary size, I experimented using twisted leather straps to hold the small cores in place. With a little practice, I found that twisting leather around the core allows you to hold it securely in place by stepping on one end and using one hand to hold the core at a safe distance, while still effectively reducing the core with similar results. It is possible that a similar method was used at Uukwatis to reduce the cores as much as possible.

It seems probable due to the size of the flakes and the reduction strategies employed that the raw materials were limited, and therefore the knappers were reducing their materials as much as possible to optimize the use of the materials. Figure 35 shows the flakes and shatter organized based on their raw material. Although there is considerable overlap, the quartz pieces tend to be larger than the chert. Due to the methods of reduction as well as the basic principles of these materials, this is as expected.

6.3.2 Comparison of the Flakes, Shatter, and Microliths

Both the flakes and shatter are mostly constrained under 30 mm in length and 15 mm in width, as is demonstrated in Figures 33 and 34. However, as is demonstrated in

Figure 33, the largest pieces are shatter, which may be indicative of people using the largest flakes and through their use, they became smaller. The larger pieces of shatter may serve as an example of the original size of at least some of the microliths and utilized flakes prior to use.

The similar dimensions of the flakes, shatter, and microliths opens the possibility for them to have a similar potential utility. As noted previously in the comparison between the microliths and flakes, the flakes could possibly be seen as ‘potential’ tools as they have similar characteristics to the microliths, but without the usewear and retouch. To follow this line of thought, the shatter could potentially be seen in this same way as it is similar in size and shape to the flakes and microliths, and therefore could have potentially become microlithic tools. Of course, there is no evidence that they were actually used as tools, but it is important to note that they had the same potential utility, and therefore could be seen as ‘tool blanks’. Also, the majority were found in a very concentrated area, which may have been a result of them being saved for later use. Alternatively, it could also signal a single reduction event.

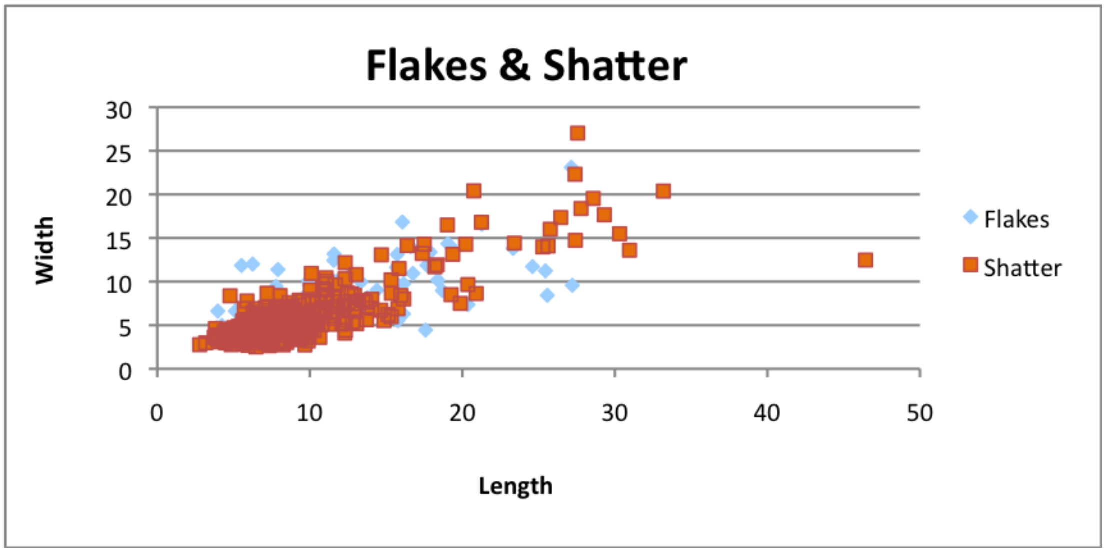

Figure 33: Flakes and Shatter Length Comparison

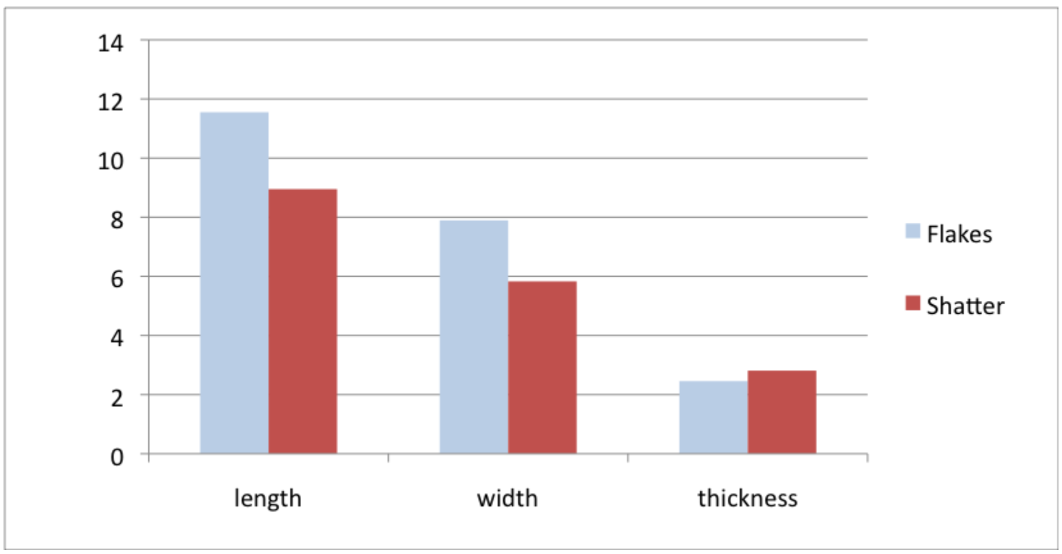

Figure 34: Flakes and Shatter Comparison of Length, Width, and Thickness

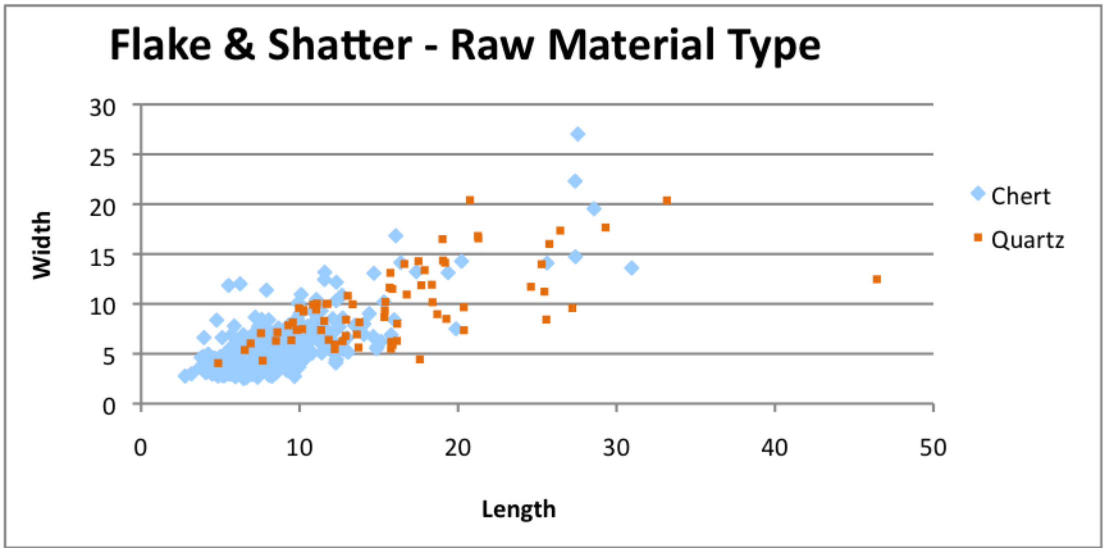

Figure 35: Comparison of Flakes and Shatter by Raw Material

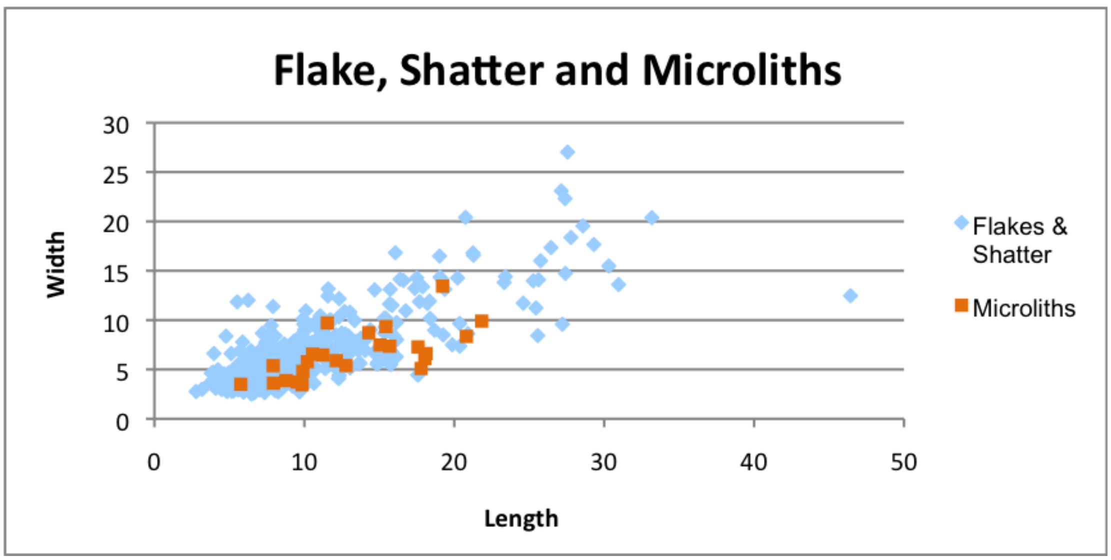

Figure 36: Size Comparison of Flakes and Shatter to Microliths

6.3.3 Significance of Bipolar Technology at Uukwatis

Bipolar technology is an unusual method of reduction that has only been noted once before in the Barkley Sound region, specifically in the early component at Ts'ishaa. As a one-dimensional reduction strategy, it is simple but can produce unpredictable results. As previously mentioned, bipolar reduction is often used on small cores that cannot be reduced by hand-held methods, as well as by toolmakers who are aiming to maximize the use of their material (Andrefsky 2005:28). Therefore, the use of this technology infers that there was a shortage of flakeable raw material at this site, and possibly in the larger region.

As previously mentioned, the Locarno Beach culture type includes microflakes made through bipolar reduction (Mitchell 1990:341), creating yet another tie to the Strait of Georgia region. Vein-quartz debitage made through bipolar reduction was also found on the Olympic Peninsula at Wa'atch River and Hoko River (Croes 1995; Wessen 2006). The Wa'atch River site is located on the edge of the Wa'atch River floodplain on the Makah Indian Reservation in Washington. Wa'atch River is a relatively poorly known site that has had a single 2 x 2 m test unit excavated. In that unit, archaeologists found 33 small, rounded vein quartz cobbles and pebbles that had been reduced through bipolar percussion that "appear to be indistinguishable from that reported by Flenniken at [Hoko River]" (Wessen 2006:37, 40). This part of the site was dated to 2920 to 2780 cal BP (2850 +/- 70) (Wessen 2006:29), which is contemporaneous with the oldest deposits at Uukwatis.

The Hoko River archaeological site complex is located less than one km upstream from the mouth of the Hoko River (Croes 2005:6). The vein-quartz debitage at the Hoko River site came from small, roughly spherical pebble cores, approximately two to five cm in diameter (Croes 1995:193). The site dates from 3000 to 2200 cal BP (Croes 1989:101). The size is comparable to those found at Uukwatis, which average 3.5 cm. They were easily reduced through bipolar reduction, producing a sharp, functional edge. The bipolar debitage included split cobbles, failed split cobbles, microliths, and bipolar cores (Croes 1995:193-194). Twelve side-hafted and three end-hafted knives were recovered in the wet site component at Hoko River (Croes 1995:180). Of the 12 side-hafted knives, one was made of green chert while the remaining 11 had vein-quartz cutting edges. Three variations of side-hafting were uncovered at the site. The majority (nine) used two thin, flat, split western red cedar handles, which were placed together over the microlith and bound at the top (Croes 1995:180). Two of the side-hafted knives also had "split insertion areas at the long-end tops of thin cedar sticks," and the final side-hafted knife had the "top edge of the stick split opened for insertion of a microlith" (Croes 1995:180). There were also three end-hafted knives which utilized square cross-section handles and had a split at the top, allowing for the insertion of a microlith or microblade, which were then bound and secured (Croes 1995:180). For each of the hafting methods, the binding elements were cedar-bark, spruce-root splints, or cherry bark (Croes 1995:180).

Although it cannot be proven if the Uukwatis bipolar debitage was being hafted in a similar fashion, it is likely that it was as it would make these into much more functional tools. In regards to the hafted microliths and microblades at the Hoko River wet site Flenniken notes that "the functional microliths (hafted) are not specifically diagnostic and would not be recognized as functional tools if they were recovered from archaeological contexts minus their wooden handles" (1981:46). Although they have been recognized as functional tools at the Hiikwis site complex, it is based on the use-wear and retouch noted during the initial analysis. Any possible tools that did not have these attributes were not included with the microliths, implying that many of the larger debitage pieces may have been potential tools.

6.3.4 Behavioural Implications of the Debitage Assemblage

Similar trends are noted between the tool assemblage and the debitage assemblage. As previously noted, the debitage is generally very small and fragmented, which is at least partially due to the low quality of the material used. The *chaîne opératoire* conceptual model considers the raw material used, reduction methods employed, the types of tools produced, as well as the larger region collectively, as these all influence each other in the final product created, while informing us about the behaviours involved.

The fragmented chert is native to Barkley Sound in small quantities, and is one of the only flakeable materials found locally (Wilson 2005:123). It is unclear exactly which source the chert comes from, as it would have to be analyzed in thin sections to determine if it is of primary deposition or replacement origin (Wilson 2005:124). Beach-rolled quartz pebbles were also used, and due to their size could only be reduced through bipolar reduction. The use of these materials indicates the absence of a more suitable flintknapping material. The size of the nodules constrained the possible size of any microliths, flakes, or shatter, explaining why they are all very small and similar in shape and size. As previously noted, all of the microliths fall within the dimensions of the flakes and shatter, making it possible that they were being chosen opportunistically from the reduction process.

The use of bipolar technology also points towards a lack of large cores available, thus the need to maximize the use of raw materials. It is likely that the sharp, quartz flakes produced through bipolar reduction were hafted and used as knives and various other tools, as was seen at Hoko River in the wet site component.

6.4 The Interdependence of Environmental and Social Conditions

Environmental conditions influence technological organization, forcing people to make decisions dependent upon their specific environment (Nelson 1991:60). Understanding lithic raw material availability frequently forms a basis for modeling how a particular technology came to be employed (Waber and MacLean 2011). Consequently, it is necessary to take environmental conditions and resource availability into account when studying technological organization and the choices made in choosing strategies as they reveal the community's perception of the environment (Nelson 1991:60).

Stone is easily manipulated due to its continuous availability at certain naturally occurring locales, meaning that some locations have an abundance of stone while others may not. However, if there is no raw material source in a locale, it is because the people who occupied that area accepted that aspect of their environment based on social, economic, and technological decisions (Nelson 1991:77). When residential sites are found in an area that does not have a raw material source, as appears to be the case at the Hiikwis site complex, Nelson argues that archaeologists should question what factors caused those people to choose to settle in that location. As noted in Chapter 3, the site is rich in consumable resources, including a salmon stream, a herring spawning area, shellfish beds, and plenty of fresh water (McMillan and St. Claire 2005:23). Archaeologists should expand their consideration to include other types of technology, such as tools made of bone, antler, wood, or other organic materials that may not have preserved within the archaeological record. If the group favoured organic materials over stone tools, settling in an area that is deprived of stone would be of less importance. This is pertinent to the Hiikwis site complex, as there do not appear to be any naturally occurring stone sources, and there seems to be a great reliance on bone technology, based on initial field observations. The examination of the Hiikwis bone assemblage will therefore greatly contribute to the interpretation of the site complex. However, it is important to remember the geographical location of this site. The Hiikwis site complex is located on the coast and the Nuu-chah-nulth were famed as canoe-builders, successfully creating open-ocean-going canoes for themselves, as well as trading them with other groups along the coast (Ames 2002:27). This establishes that a relationship existed between the Nuu-chah-nulth and other groups on Vancouver Island, meaning that among other things, they may have received raw materials and/or stone tools as a part of their trade, which could account for the imported projectile points.

Despite their small size, the flaked stone artifacts held an important role in the Hiikwis toolkit. The microliths would have been used for boring and drilling activities, which would be vital in various bone and wood working projects. The imported projectile points were likely used for both land and sea mammal hunting, and were possibly also seen as prestige items due to the lack of availability of these materials in this region. The bipolar quartz items, schist/phyllite knives, and microblades were likely used as fish butchering tools, as was seen at the Hoko River site. The different types of tools in the Hiikwis assemblage make them useful for a variety of different tasks that include making tools of bone and wood, hunting, and butchering, all of which are crucial activities to daily life.

6.5 Temporal and Spatial Differences within the Site

6.5.1 General Discussion

As noted in chapters four and five, there are significant temporal and spatial differences evident within the site. The majority of the flaked stone materials came from two units that were temporally and spatially separated, although some were from other areas of the site as well. Unit 2, located on the main house platform at the front of the site between the rise from the beach and the back midden ridge, had the majority of the chert debitage, mostly coming from a single level which was dated to approximately 1100 BP. Unit 4, the furthest away from the main excavation area, was located on a back raised terrace. All of the bipolar reduction quartz materials were found in this unit, beginning in Layer B at 30 cm dbs and ending in Layer K at 205 cm dbs. Unfortunately, there were no dateable materials found until Level 6 Layer D at 65 to 70 cm dbs, which was dated to approximately 2000 BP. Therefore, flaked stone materials were present at this area of the site beginning just after 2000 BP. However, Level 23 Layer K was dated to approximately 2800 BP, giving us a date for the earliest flaked stone tools found at this site. The distribution and frequency of the different artifact types, their reduction strategy, and the raw materials are displayed in Table 24, which demonstrates that these components are different in effectively every way possible.

Table 24: Comparison of Units 2 and 4 from Uukwatis (DfSh-15) and the Project Total

Evidence	Unit 2		Units 4, 4A, 4B		Project Total
	More Recent Component		Older Component		
Tools					
Bifacial Projectile Points	3	7.9%	6	23.1%	11
Bifacially Flaked Schist/Phyllite Knives	0	0%	16	61.5%	16
Bifacial Chopper	0	0%	0	0%	1
Bifacial Scrapers	1	2.6%	1	3.8%	2
Spokeshave	1	2.6%	0	0%	1

Microliths	28	73.7%	1	3.8%	30
Microblades	5	13.2%	2	7.7%	7
Tools Total	38	100%	26	100%	68
Debitage					
Cores	4	0.7%	10	12.5%	14
Flakes	102	18.8%	45	56.3%	153
Shatter	437	80.3%	25	31.3%	467
Potlid	1	0.2%	0	0%	1
Debitage Total	544	100%	80	100%	635
Reduction Strategy					
Percussion Flaking	191	32.6%	22	20.2%	220
Hard Hammer Percussion	73	12.5%	5	4.6%	82
Soft Hammer Percussion	7	1.2%	0	0%	7
Pressure Flaking	12	2.1%	5	4.6%	18
Bipolar Reduction	16	2.7%	74	67.9%	91
Raw Material					
Chert	543	93.3%	5	4.7%	550
Quartz	9	1.5%	71	67.0%	82
Quartz Crystal	0	0%	3	2.8%	3
Schist/Phyllite	5	0.9%	17	16.0%	22
Glass	0	0%	0	0%	9
Quartzite	13	2.2%	1	0.9%	14
Andesite	3	0.5%	2	1.9%	7
Dacite	1	0.2%	0	0%	1
Basalt	0	0%	4	3.8%	4
Argillite	0	0%	1	0.9%	1
Unidentified	8	1.4%	2	1.9%	10
Raw Material Total	582	100%	106	100%	703

Note: Some artifacts were made through multiple methods of manufacture, and therefore were included in more than one category.
The percentage figure represents the percentage of the total flaked stone assemblage from that unit.

6.5.2 Replacement of Bifacially Flaked Schist/Phyllite Knives with Microliths

Although flaked stone technology is present at the site in both the early and later components, the technological methods and the artifact types changed significantly over time. As previously noted, the older component mainly utilized beach-rolled quartz pebbles reduced through bipolar technology, whereas the more recent component used green chert reduced through percussion flaking. Bifacial schist/phyllite knives are exclusive to the older component and appear to be replaced over time with microliths. As previously noted, flaked schist/phyllite knives are most associated with the Locarno Beach culture type in the Gulf of Georgia, while also characterizing the early components at Ts'ishaa and Shoemaker Bay. However, microliths are uncommon in both Barkley Sound and the Gulf of Georgia. At the Hoko River site, schist and phyllite knives were most abundant in the earlier time period, which may have been due to a more readily available quantity of raw material (Gross 1986:121-122; Croes 1995:213). It is also interesting that these technologies serve different functions as the flaked schist/phyllite knives would be useful for cutting and the microliths would serve a variety of purposes including cutting, drilling, and incising. This need for different tools may indicate a change in the use of the site. Although most of the flaked schist/phyllite knives are large enough to be used on their own, the microliths would have to be hafted to be useable tools.

6.6 Regional Relationship to Barkley Sound and Further

6.6.1 Sites in the Barkley Sound Region

Five sites in particular in the Barkley Sound region seem to have a relation to Hiikwis through their material culture. Shoemaker Bay (DhSe 2) at the head of the Alberni Inlet is not technically within Barkley Sound, but is connected through the Alberni Inlet, which serves as a direct waterway. The early component of Shoemaker Bay (deemed Shoemaker Bay I) revealed a significant sample of flaked stone materials, including various styles of points, flakes, cores, microblades, and debitage (McMillan and St. Claire 1982:61,63-65,67). Although flaked stone materials were also uncovered from Shoemaker Bay II (the later component of the site), there were considerably fewer than in Shoemaker Bay I (McMillan and St. Claire 1982:93-94). In particular, the flaked stone tools, ground stone points, knives, and quartz crystal microblades link Shoemaker Bay I to the Locarno Beach time period in the Gulf of Georgia (McMillan and St. Claire 1982:127), similar to many of the artifacts uncovered at Hiikwis.

Little Beach (DfSj 100) is a large shell midden in Ucluelet, at the Western edge of Barkley Sound (Stryd et al. 1991:5). Similarly to Shoemaker Bay I and Hiikwis, Little Beach has contracting stem projectile points, and thick ground stone points, linking the sites to each other, as well as to the Locarno Beach culture type (McMillan 1999:78). The earliest cultural deposits have been radiocarbon dated to ca. 4000 BP while the most recent cultural deposits date to ca. 2510 BP, making the site contemporaneous with the lower levels of Shoemaker Bay I and the Locarno Beach culture type.

The Grappler Inlet site (DeSg 10) is located in southeastern Barkley Sound (Mackie and Williamson 1984:1). Flaked basalt and chalcedony stemmed and leaf shaped points and retouched obsidian flakes have been uncovered, making this small assemblage another notable site in Barkley Sound as it relates to Hiikwis, Shoemaker Bay I, and Little Beach, and sites of equivalent age in the Gulf of Georgia (Mackie and Williamson 1984:2). Unfortunately, we lack dates for this site, but it is located at the present shoreline meaning that it was likely occupied during a sea level similar to the present, similarly to the recent component of Hiikwis.

Similarly to Shoemaker Bay, Ch’uumat’a is divided into an early and a late component. The early component is from approximately 4000 to 2000 BP and includes two bifacially flaked projectile points (one leaf-shaped and one stemmed), two pebbles with bipolar flaking, several flaked schist tools including a roughly circular knife, as well as various flaking debitage (McMillan 1999:114). McMillan (1999:115-116) states that these artifacts are similar to Shoemaker Bay I and Little Beach, and are characteristic of the Locarno Beach culture type in the Strait of Georgia. They are also similar to those found in Grappler Inlet and at Hiikwis, resulting in an unexpected presence of flaked stone materials in the Barkley Sound region.

The early component of Ts'ishaa is the earliest radiocarbon dated site in Barkley Sound with flaked stone materials. The earliest cultural materials were dated to 5900-4500 cal. BP spanning until 3360-2950 cal. BP when sea levels changed. Ts'ishaa has several flaked stone artifact types including an obsidian biface, an obsidian microblade core ridge flake, schist knives, choppers, cores, bipolar pebbles and cores, split pebbles, retouched and utilized flakes, spalls, and other flakes (McMillan and St. Claire 2005:78; Magne 2005). In considering regional relationships, the obsidian biface is of particular interest; it is made of Glass Buttes obsidian from central Oregon, which was also the source of a flake found at Shoemaker Bay as well as many artifacts found from various sites in the Gulf of Georgia.

The importance of the Hiikwis assemblage is not just the presence of flaked stone but that it continues into much later times than at the other Barkley Sound sites. Previously to the Hiikwis excavation, the most recent flaked stone in substantial numbers was found at approximately 2000 BP. The earliest flaked stone at Hiikwis has been dated to 2870 to 2750 cal BP, while the large flaked chert concentration in Unit 2 dated to approximately 1100 BP. Flaked technology continues even further into historic times with the presence of flaked glass materials (particularly from Unit 1).

6.6.2 Sites Outside the Barkley Sound Region

The general area under consideration for comparison is the Strait of Georgia area, on the east coast of Vancouver Island as well as on the adjacent mainland. This area has four accepted late Holocene culture types: Charles (6450-3150 BP), Locarno Beach (3150-2350 BP), Marpole (2350-1550 BP), and Strait of Georgia (1550-150 BP) (Mitchell 1990:340). The two that are most relevant to the Hiikwis site complex based on their characteristic artifact types are Locarno Beach (3150-2350 BP) and Marpole (2350-1550 BP). Some of the prominent Locarno Beach culture type flaked stone artifacts are flaked basalt points (many with contracting stems), microblades and microcores (often made of quartz crystals), flaked slate and sandstone tools, and "microflakes of cryptocrystalline and fine-grained rock, produced mainly by bipolar flaking techniques" (Mitchell 1990:341). Flaked stone artifacts characteristic of the Marpole Culture Type include contracting and expanding stemmed or unstemmed flaked stone points, leaf-shaped points, and microblades and microcores (Mitchell 1990:345). Several of the stemmed points from Units 2 and 3 (DfSh-15:150, DfSh-15:241, and DfSh-15:270) most closely match Marpole examples based on those shown by Carlson, who classifies them as Type IV Stemmed and Barbed, which is associated most commonly with Marpole (Carlson 2008:135, 141). The radiocarbon dates from Unit 3 are contemporaneous with the Marpole culture type in the Gulf of Georgia.

Each of these artifact categories is represented in the Hiikwis assemblage, although some in greater quantities than others. Of particular interest are the bipolar microflakes characteristic of the Locarno Beach culture type that are so prevalent at Hiikwis, but are not characteristic of the Marpole culture type. The majority of the Hiikwis examples are from Unit 4 and therefore those from the base are roughly contemporaneous with late Locarno Beach culture type. Based on the flaked stone artifact types present and the time period under consideration, the Hiikwis flaked stone assemblage is most similar to the Locarno Beach culture type in the early component (Unit 4) and Marpole in the more recent component (Unit 2).

The Locarno Beach culture type was also recognized at the Hoko River ‘wet/dry’ fishing campsite (45CA213), dating to 3000 to 2200 BP (Croes 1989:101). Similarly to the Hiikwis site complex, Hoko River is not technically within the Gulf of Georgia region, but has cultural connections to that area. While the lithic component has been identified as Locarno Beach, the basketry and cordage artifacts from the wet site component are stylistically “most similar to outer West Coast types,” which are markedly different from Gulf of Georgia and Puget Sound styles (Croes 1989:102). Croes’ recognition of two culture types operating at the site simultaneously is similar to the preliminary findings at Hiikwis, where the flaked stone assemblage most closely resembles the Locarno Beach and Marpole culture types, while the bone assemblage appears to fit comfortably within the West Coast culture type (based on initial field observations) (McMillan, pers. comm. 2012).

In considering the Gulf of Georgia culture types, Croes and Hackenberger conclude that they would be better termed economic stages or plateaus (1988:79). The authors theorize that the changes represented by the ‘culture types’ were influenced by a combination of “early exponential growth, eventual territorial circumscription (about 4,000 BP), and critical resource stresses” (Croes and Hackenberger 1988:79). Rather than seeing culture types as the result of changing cultural styles or population migrations, Croes and Hackenberger argue that the changes noted in the archaeological record are probably linked to shifts in subsistence adaptation (1988; Croes 2005:231).

However, it is important to revisit what the term ‘culture type’ actually implies. A culture type is “a group of components distinguishable by the common possession of a group of traits” (Spaulding 1955:12). The definition purposely does not define the nature of the traits used in determining similarity, nor does it infer a specific meaning to the observed traits. Croes and Hackenberger (1988), along with many other researchers, have taken the term ‘culture type’ to connote a specific cultural style and therefore used the term and observed sequences to describe population migrations. However, when returning to the original definition put forth by Spaulding (1955), Croes and Hackenberger’s (1988) economic stages can be encompassed within the definition of a ‘culture type’. That being said, Croes and Hackenberger (1988) remind us of the importance of not assigning specific cultural or ethnic meaning to these created categories, and that these observed patterns are likely the result of broad subsistence and/or economic patterns.

Although not within Barkley Sound or the Strait of Georgia, Namu makes for an interesting comparison as it is just north of Vancouver Island, and on the suggested territorial border featured in the Wakashan Migration Hypothesis for the expansion of the northern branch of the Wakashan language family. Namu (ElSx 1), located on a large bay just south of Burke Channel and Fitz Hugh Sound, and just north of Vancouver Island, is one of the earliest occupation sites on the British Columbia coast, dating to 9720 +/- 140 (Borden 1975:28; Carlson 1996:84). Namu is comprised of both a macrolithic and microlithic assemblage. The microlithic industry includes microcores, microflakes, burin spalls, shatter, bipolar cores and bipolar flakes, which are made of obsidian, quartz, quartz crystal, and andesite (Carlson 1996:92). Although the specific measurements are not given, the microflakes are defined as being less than 1.5 to 2 cm^2 on the ventral surface, which would include the Uukwatis microliths and the majority of the flakes (Hutchings 1996:172). Of the 231 microblades recovered at Namu, 13 were made of materials other than obsidian; there were also 10 non-obsidian microblade cores (Carlson 1996:91; Hutchings 1996:170). Rather than defining by length, Hutchings defined the microblades as being less than 1 cm wide. Similarly to the microliths, Hutchings' category also encompasses all of the microblades from Uukwatis. Microblades first appeared during the Early Period shortly after 9000 BP and remained until Period 3, which dates from 5000 to 4500 BP (Hutchings 1996:167, 175).

Although the nature of the link between these areas is currently unknown, there are certainly similarities present between the material culture from the two regions, which may possibly be explained through the Wakashan Migration Hypothesis, as is discussed below.

6.6.3 The Wakashan Migration Hypothesis in relation to the Hiikwis Site Complex

As previously discussed in chapter two, Mitchell (1988, 1990) and McMillan (1999, 2003) have suggested that the original Wakashans occupied a northern and north-western Vancouver Island homeland, and spread south and north to the lands they occupied at contact, absorbing or displacing Salishan peoples. This theory is supported in the Barkley Sound region by the Ch'uumat'a, Shoemaker Bay, and Ts'ishaa sites (see Chapter 2) through the presence of a pre-2000 BP component characterized by artifact types most closely resembling those of equivalent age in the Strait of Georgia, namely the

Locarno Beach culture type, followed by a more recent component most similar to the West Coast culture type. Although aspects of both these culture types are present at the Hiikwis site complex, they are not present in clearly defined and differentiated components, as is seen at Ch'uumat'a, Shoemaker Bay, and Ts'ishaa. Although the flaked stone assemblage is most similar to the Locarno Beach and Marpole culture types, the bone assemblage (based on initial field observations) isn't particularly diagnostic, but fits comfortably within the West Coast culture type (McMillan pers. comm. 2012). Therefore, the artifact assemblage from this site does not fit unequivocally within either culture type, and must be situated within our knowledge of other archaeological sites, similarly to Croes' (1989) analysis of the basketry and lithics at the Hoko River 'wet/dry' site. For the purposes of this thesis, this process will be termed a *cultural fusion*.

In relation to the Wakashan Migration Hypothesis, the Hiikwis site complex does not have the marked technological change over time that is seen at Ts'ishaa, Ch'uumat'a and Shoemaker Bay. Instead, it has flaked stone artifacts beginning at approximately 2800 BP and persisting into the historic period through the transfer of flaking technology to a new material: glass. Although flaked stone carries through the entire 2800 year sequence, there are considerable changes over time in this technology, as discussed above. Previous arguments for the West Coast culture type stressed a cultural break in the stone tools, with flaked stone technology overwhelmingly restricted to an earlier period. The Hiikwis site complex challenges that argument in that flaked stone technology carries through the entire site occupation, into very late times.

6.7 Conclusion

This chapter utilized the *chaîne opératoire* and design theory to collectively discuss the relation of raw materials, reduction methods employed, design choices, and the larger regional setting. By uniting these topics into a single discussion, the information gained from the technological analysis can inform us about broader behavioural decisions, and environmental and social conditions. The exotic projectile points imply a relationship with the Strait of Georgia region based on both the raw materials used and the morphological styles. The bifacially flaked schist/phyllite knives, microlithic tools, and microblades are stylistically similar to those found at the Hoko River site, and although it cannot be proven, it is likely that they were hafted into composite tools and used similarly. Bipolar technology is prevalent at this site, indicating a shortage of flakeable raw material, as well as drawing further ties to Hoko River and Wa'atch River. At Hoko River, the products of bipolar reduction were hafted and used as knives, which is likely how they were used at the Hiikwis site complex, although this cannot be proven due to a lack of perishable technology.

In terms of behaviour, it seems clear that due to the limited availability of raw materials, people were using the stone that they had as much as possible. The largest flakes removed from a core were opportunistically used to make other tools. Many of these flakes were small because the cores were small, which therefore led to the creation of a microlithic tool assemblage. In addition, the development of techniques facilitating the creation of microlithic tools "tends to increase the efficiency of flintknapping, since more usable edge can be obtained for a given amount of flint" (Bordaz 1970:56). The complete lack of heavily curated large flake tools suggests that the site occupants did not readily have access to cores large enough to make such tools, substantiating this explanation for microlithic tool production.

The Uukwatis site has two basic components, which are both spatially and temporally separated. The later component is located at the front of the site near the modern shoreline and the level with the flaked materials dates to 1140 to 940 cal BP. This component has the majority of the flaked stone materials, most of which are made of green chert through percussion flaking. The older component came from a unit located on the back terrace with the earliest flaked stone artifacts dated to 2870 to 2750 cal BP. The majority of the artifacts were produced through bipolar reduction and were made from beach rolled quartz nodules.

The flaked stone artifacts found from both components are most similar to contemporaneous stages in the Strait of Georgia region. Other sites in the region, such as Shoemaker Bay, Ch’uumat’a, and Ts’ishaa have a clear divide between their components at approximately 2000 BP; the older component has similarities to the Locarno Beach culture type while the more recent component is West Coast culture type. The Hiikwis site complex also has two components, with the cultural break at approximately 2000 BP. However, both components have significant quantities of flaked stone materials, differentiating them from the West Coast culture type. Although the Wakashan Migration Hypothesis discusses the relationship between Nuu-chah-nulth and Salishan populations, the timing and manner of these events at this site are still uncertain.

Chapter 7: Conclusion

This thesis analyzed a small, anomalous, flaked stone assemblage from the Hiikwis site complex in Barkley Sound. Several tool types were identified, including projectile points, bifacial knives, a bifacial chopper, bifacial scrapers, a spokeshave, various microliths, microblades, cores, flakes, and shatter (see Chapter 5). Different technological typologies were also recognized, including bipolar reduction, hard and soft hammer percussion, and pressure flaking. In addition, comparisons were made to other sites and archaeological regions.

The Hiikwis site complex includes two sites, Uukwatis (DfSh-15) and Hiikwis proper (DfSh-16). The beginning of the Uukwatis occupation has been radiocarbon dated to 2870 to 2750 cal BP, lasting into historic times. The majority of the flaked stone materials were found at Uukwatis, and came from two units. Unit 2 at the front of the site included an assemblage of flaked green chert, while Unit 4, on a low back terrace, had an assemblage of bipolar reduced quartz pebbles (discussed further in Chapter 4). The Hiikwis proper occupation began in 1290 to 1160 cal BP and the most recent dates are 520 to 310 cal BP, although there are many historic artifacts in the upper layers, and it is known ethnographically to have been occupied into the 20th century (as noted in Chapter 3).

The flaked stone assemblage from the Hiikwis site complex is regionally unique, as is discussed in Chapter 2, and unlike other sites with flaked stone in Barkley Sound, the Hiikwis lithics challenge the Wakashan Migration Hypothesis. The pre-2000 BP lithics from the back unit fit well with the findings at Ch'uumat'a and Ts'ishaa, and therefore support the hypothesis. However, the Hiikwis site complex makes a unique contribution due to the presence of flaking technology continuing into much later times with the large assemblage of chert from Unit 2 as well as the glass from Unit 1 dating to the historic period. The Hiikwis assemblage suggests the possibility of a longer-lasting influence from proto-Salishan populations than has previously been asserted. Alternatively, it questions whether there is any necessary association between flaked stone and Strait of Georgia cultures, as assumed by the Wakashan Migration Hypothesis.

7.1 Raw Material Availability

Differences were noted between the majority of the flakes and shatter, and the finished artifacts. The 11 recovered projectile points were made of non-local materials, and no flakes or pieces of shatter were found of similar materials. This suggests that the projectile points were possibly imported from another area. Due to their similarity of form and raw material to projectile points at several sites in the Gulf of Georgia region, it is possible that they were imported from there.

Although chert is typically a suitable material for knapping, the chert used at Uukwatis is very low quality and highly fragmented, meaning that it would have been extremely hard to knap. In addition, the quartz was obtained from beach rolled nodules and split by bipolar percussion. Although this creates an effective cutting edge, it is difficult to make precise flake removals.

As discussed in chapter 6, the microliths, microblades, flakes, and shatter are all extremely small and appear to have been reduced as much as possible. Although flaked stone tools in general are uncommon in the Barkley Sound region, microliths have not been identified previous to this study. The use of microliths at this site potentially points to a lack of available usable stone. In addition, bipolar technology is a method used to obtain the largest usable pieces possible from small nodules. The combination of these factors suggests that there was a lack of flakeable raw materials available at the site or surrounding area.

7.2 Design Variables and Technological Strategies present at the Hiikwis Site Complex

Following Nelson's design theory, several different design strategies were noted in the tool assemblage (see Chapter 6). The bifacially flaked schist knives are maintainable and versatile tools, as they are maintained in a generalized form allowing them to be useful for a variety of tasks (Nelson 1991:70-71). The classification of the microliths and microblades is tentative, as it is based on the assumption that they were hafted similarly to those found at the Hoko River site. When hafted, they would be considered reliable tools based on their sturdy construction and secure fittings (Nelson 1991:66). The variety of design types noted here complement each other to create a complete toolkit.

In terms of technological strategies, both curation and expediency are observed at this site. As discussed in chapter 6, curation is based on anticipating inadequate conditions, and therefore preparing raw materials prior to the time of use (Nelson 1991:62-63). This is seen at the Hiikwis site complex through the imported projectile points, as well as the microliths and microblades that were probably hafted, and therefore required advanced manufacture. Although at first glance it appears to oppose the previous statement, expediency is also noted at this site, which anticipates the presence of workable materials and sufficient time to produce tools when and where they are needed. This is accomplished through the production of tools that require minimal technological effort (Nelson 1991:64). Expediency is seen at the Hiikwis site complex through the beach-rolled quartz nodules reduced through bipolar technology. This material naturally occurs on the site and is quickly and effectively reduced utilizing bipolar techniques.

The beach-rolled quartz nodules and expediency strategy are from the earlier context, while the technologies representing a curation strategy are from the more recent components. This suggests increasingly depleted resources over time and therefore an increased need to trade for materials and tools not readily available within the study region, such as the imported projectile points, and technologies that efficiently utilize any available stone, as is seen with the microlithic tools and microblades.

7.3 Spatial and Temporal Differences within Uukwatis

As discussed in Chapter 6, there are several important temporal and spatial differences within the Uukwatis site. The majority of the flaked stone materials came from two units that were spatially and temporally separated. Unit 2, located at the front of the site near the present day shoreline contained abundant green chert flakes, shatter, and microliths, as well as five chert microblades. In particular, the five chert microblades from Unit 2 are very recent compared to other assemblages on the B.C. coast, such as Namu and sites in the Strait of Georgia region.

Conversely, Unit 4 located on a raised terrace at the back of the site furthest from the other excavation units, contained all of the bipolar quartz materials. Unit 4 has the earliest appearance of flaked stone, dated to 2870 to 2750 cal BP. All of the schist/phyllite bifacial knives came from Unit 4, and were therefore associated with an older occupation, dating to between approximately 2000 to 2800 cal BP. The two quartz crystal microblades also came from this earlier context.

This demonstrates a marked temporal and spatial change beginning with bipolar technology on quartz nodules and bifacially flaked schist/phyllite knives, being replaced by percussion techniques on chert to produce a variety of microlithic tools.

7.4 Regional Relationship to Barkley Sound and the Strait of Georgia

There are several sites in the Barkley Sound region with relatively abundant flaked stone artifacts: the early component of Shoemaker Bay, Little Beach, and the early components at Ch'uumat'a and Ts'ishaa. These sites temporally overlap with the earliest materials at Uukwatis (Unit 4), but the relatively abundant flaked stone continues into much later times at this site than at any of the others. Each of these sites contains flaked stone artifacts, including flaked projectile points that are stylistically similar to Strait of Georgia examples. Artifact types characteristic of the Locarno Beach culture type include, but are not limited to, flaked basalt points (many with contracting stems), microblades and microcores (often made of quartz crystals), flaked slate and sandstone tools, and "microflakes of cryptocrystalline and fine-grained rock, produced mainly by bipolar flaking techniques" (Mitchell 1990:341). As previously mentioned, there are five flaked points made of various materials and two quartz crystal microblades from Unit 4. In addition, bipolar technology was used to produce many of the flaked stone artifacts from Unit 4. Flaked stone artifacts characteristic of the Marpole culture type include contracting and expanding stemmed or unstemmed flaked stone points, leaf-shaped points, and microblades and microcores (Mitchell 1990:345). As mentioned previously, several of the stemmed points from Units 2 and 3 (DfSh-15:150, DfSh-15:241, and DfSh-15:270) most closely match Marpole examples based on those shown by Carlson (2008:135,141).

The similarities noted in the material culture from these different areas create a link between these areas that cannot be conclusively explained. Analysis of the bone assemblage will further contribute to our understanding of the Hiikwis site complex, and how it relates to the West Coast culture type and Strait of Georgia sites. However, prior to any analysis at this site, historical linguists and archaeologists alike have previously theorized about the relationship between these regions and the people who resided there.

A connection to Gulf of Georgia populations has been theorized by means of the Wakashan Migration Hypothesis, which is furthered based on these results. As noted in Chapter 2, the Wakashan Migration Hypothesis asserts that prior to contact, Salishan peoples lived along the coast in portions of what is now recognized as Nuu-chah-nulth territory. From an original Wakashan homeland on northern Vancouver Island (McMillan 1999, 2003), it is theorized that the northern branch of the Wakashans spread to the adjacent mainland coast, while the southern Wakashans (including the Nuu-chah-nulth) expanded southward along Vancouver Island's west coast, either displacing or absorbing Salishan populations (McMillan 1999, 2003). The Hiikwis site complex reaffirms the idea of Nuu-chah-nulth populations absorbing Salishan populations and ideas with the presence of flaked stone artifacts at a known Nuu-chah-nulth site beginning at approximately 2800 cal BP and persisting into the historic period.

Despite these connections to stages in the Strait of Georgia, the Hiikwis site complex assemblage, based on initial field observations of the bone assemblage, appears to fall primarily within the West Coast culture type. However, it is important to return to Marshall's argument (see chapter 2) that bone points and abraders are relatively non-diagnostic artifacts and therefore unsuitable for constructing culture types as they are stylistically limited (Marshall 1993:39). Due to the lack of stone artifacts on the west coast that are usually used to construct culture types, Mitchell utilized the bone artifacts and multitude of abraders to define the West Coast culture type (Mitchell 1990:356-357). Therefore, although similarities have been noted to both the Locarno Beach culture type and the West Coast culture type, it is not a simple matter of deciding which culture type the Hiikwis site complex most closely resembles. Instead, it is important to recognize that the Hiikwis site complex does not fit indisputably within any preexisting culture type but rather must be situated within our knowledge of other archaeological sites, similarly to Croes' (1989) analysis of the basketry and lithics at the Hoko River 'wet/dry' site. At this site, he recognized that the lithics were Locarno Beach culture type while the basketry and cordage were identified as outer West Coast (Croes 1989:102). This combination of two culture types within a single temporal and spatial site may be occurring at the Hiikwis site complex, but cannot be known absolutely until the bone assemblage is analyzed. The idea of a hybrid culture type or *cultural fusion* doesn't necessarily reduce the possibility of Croes and Hackenberger's (1988) theorized economic plateaus, nor does it necessarily imply hybrid economic stages. Rather, the proposed *cultural fusion* provides a different set of basic units of analysis on which broad subsistence and/or economic patterns could be formulated.

7.5 Final Conclusions

The Hiikwis site complex is a part of a poorly understood lithic tradition in Barkley Sound. Although there have been occasional flaked stone artifacts found within Barkley Sound assemblages, the Hiikwis site complex offers the largest flaked stone assemblage to date. Moreover, the flaked stone tradition at this site covers the entire span of occupation, approximately 2800 years. However, this raises the question of whether this is an anomalous site in Barkley Sound, or is it simply the first to be recognized? The use of ¼" screen size and limited use of water screening, while facing thick, muddy matrices has possibly resulted in very small lithic assemblages being missed. However, all of the lithic components at this site were recognized prior to the use of water screening; water screening was most useful in increasing the rate of recovery, rather than in recognizing the presence of small lithics. Further excavation in this region with an increased use of water screening could potentially uncover a similar site. Whether a similar site exists or not, it is clear that the West Coast culture type has a very small quantity of flaked stone technology. However, Nuu-chah-nulth peoples were potentially using more flaked stone than is characterized by the West Coast culture type. In addition, the West Coast culture type may have had more regional variability than has generally been recognized.

It is possible that Gulf of Georgia traditions had a more widespread influence than initially suspected, affecting parts of the Barkley Sound area, and possibly being ancestral to this region. The use of the vaguely defined term 'culture type' allows flexibility in the creation and definition of these categorical groups (Spaulding 1955:12-13). As noted in chapter 2, there are sites in the Barkley Sound region that exhibit Locarno Beach culture type traits, but do not exhibit all of the characteristics included in the culture type. However, the flexibility allowed by the definition of a 'culture type' makes these differences permissible. Even within the Gulf of Georgia sequence, there are regional differences between the Fraser Delta and Gulf Islands, and Southern Vancouver Island

(Clark 2000:139-140). If the Locarno Beach culture type was ancestral to the Barkley Sound region, the mixed assemblage at Hiikwis could possibly be the result of the Locarno Beach culture type being isolated and developing differently than it did in the Gulf of Georgia, which would explain the continuation of microblades into the later period. With this isolation, this could have led to the West Coast culture type coming to the Hiikwis site complex in the form of adoption of ideas rather than full acceptance of the culture type. Regardless, this could all be better understood through examination of the entire assemblage.

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Appendix A

Column A – Site Designation (DfSh)
Column B – Site Designation number
Column C – Artifact Number
Column D – Artifact Subnumber
Column E – Excavation Unit
Column F – Length (mm)
Column G – Width perpendicular to Length (mm)
Column H – Maximum Thickness (mm)
Column I – Weight (g)
Column J – Complete (Yes/No)
Column K – Type of Artifact
- Flakes (1)
- Shatter (2)
- Core (3)
- Microblade (4)
- Projectile Point (5)
- Microlith (6)
- Spokeshave (7)
- Scraper (8)
- Knife (9)
- Flaked Tool (10)
- Pebble Chopper (11)
- Potlid (12)
- Burin (13)

Column L – Technological Typology
- Undetermined (1)
- Bipolar (2)
- Percussion (3)
- Pressure (4)

Column M – Platform Type
- Simple (1)
- Complex (2)
- None Visible (3)

Column N – Raw Material Type
- Chert (1)
- Quartz (7)
- Quartz Crystal (8)
- Schist/Phyllite (9)
- Glass (11)
- Quartzite (13)
- Andesite (15)
- Dacite (16)

Basalt (18)
Argillite (20)
Unidentified (30)

Column O – Cortex Percentage

0% (1)
1-10% (2)
10-40% (3)
40-60% (4)
60-90% (5)
90-100% (6)
100% (7)
Not Applicable (8)

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	16		1	8.08	10.29	1.67	0.10	N	1	1	2	11	1
DfSh	15	19		1	10.73	7.54	0.81	0.01	N	1	1	3	11	1
DfSh	15	8		3	15.68	11.63	2.74	0.43	Y	1	2	3	7	1
DfSh	15	235A	2	2	4.86	4.06	1.23	0.02	Y	1	1	1	7	1
DfSh	15	235A	11	2	13.62	5.59	2.94	0.20	Y	1	1	1	13	1
DfSh	15	235A	6	2	5.07	3.11	0.90	0.02	N	1	1	3	1	1
DfSh	15	184		2	11.59	13.17	2.27	0.29	Y	1	3	2	1	2
DfSh	15	197	66	2	6.15	3.95	0.69	0.01	Y	1	3	1	1	1
DfSh	15	197	68	2	6.95	6.52	1.67	0.06	Y	1	3	1	1	1
DfSh	15	197	75	2	7.81	4.10	1.19	0.03	Y	1	3	1	1	1
DfSh	15	197	112	2	5.50	4.13	1.01	0.02	Y	1	3	1	1	1
DfSh	15	197	139	2	8.96	4.62	1.90	0.03	Y	1	3	3	1	1
DfSh	15	197	99	2	5.80	4.76	2.52	0.08	Y	1	3	3	30	1
DfSh	15	248	1	2	5.21	3.82	2.17	0.04	Y	1	3	1	1	1
DfSh	15	248	2	2	7.27	5.37	1.46	0.05	Y	1	3	1	1	1
DfSh	15	283	3	2	11.36	9.31	1.94	0.15	Y	1	3	3	1	1
DfSh	15	285	16	2	8.80	7.19	1.75	0.07	Y	1	3	1	1	1
DfSh	15	197	93	2	2.66	5.10	1.20	0.01	N	1	3	1	1	1
DfSh	15	161		2	9.22	5.33	0.86	0.05	Y	1	4	1	1	1
DfSh	15	197	52	2	4.21	4.92	0.56	0.01	Y	1	4	1	1	1
DfSh	15	138		2	9.83	8.53	3.73	0.28	Y	1	5	1	1	1
DfSh	15	197	7	2	6.25	12.01	2.40	0.11	Y	1	5	1	1	1
DfSh	15	197	106	2	8.26	5.11	1.00	0.04	Y	1	5	1	1	1
DfSh	15	275	4	2	11.57	12.44	1.99	0.17	Y	1	5	1	1	3
DfSh	15	284	6	2	3.91	4.72	0.71	0.01	Y	1	5	1	1	1
DfSh	15	284	11	2	9.43	5.49	2.14	0.09	Y	1	5	2	1	1
DfSh	15	284	18	2	8.26	4.69	1.13	0.03	Y	1	5	1	1	1
DfSh	15	285	8	2	6.53	3.95	1.20	0.02	Y	1	5	1	1	1
DfSh	15	285	31	2	14.40	9.02	3.00	0.27	Y	1	5	1	1	1
DfSh	15	291	5	2	8.51	6.63	1.37	0.06	Y	1	5	1	1	1
DfSh	15	291	15	2	7.54	6.26	2.21	0.07	Y	1	5	3	13	1
DfSh	15	197	109	2	8.12	5.28	0.90	0.01	N	1	5	3	1	1
DfSh	15	199	4	2	7.07	3.91	0.87	0.02	Y	1	6	1	1	1
DfSh	15	250	27	2	4.54	3.54	0.54	0.01	Y	1	6	1	1	1
DfSh	15	284	3	2	5.12	6.62	0.79	0.02	Y	1	6	1	1	1
DfSh	15	312	4	2	9.34	5.32	1.30	0.02	Y	1	6	3	1	1
DfSh	15	201		4	12.71	6.26	1.81	0.13	Y	1	2	3	7	1
DfSh	15	599		4	10.25	9.24	2.72	0.25	Y	1	2	3	7	2
DfSh	15	133		2	7.20	3.33	0.85	0.01	Y	1	3	1	1	2
DfSh	15	143		2	14.90	5.70	3.13	0.26	Y	1	3	1	1	1
DfSh	15	105		4	17.68	11.87	4.64	1.03	Y	1	2	3	7	1
DfSh	15	227		4	11.69	10.00	2.57	0.19	Y	1	2	3	7	1
DfSh	15	257		4	24.60	11.72	4.59	1.04	Y	1	2	3	7	1
DfSh	15	260		4	9.29	7.85	1.67	0.15	Y	1	2	3	7	1
DfSh	15	301		4	13.61	6.94	3.19	0.29	Y	1	2	3	7	3
DfSh	15	341		4	16.61	14.01	7.43	0.99	Y	1	2	3	7	1
DfSh	15	343		4	15.78	6.19	2.35	0.19	Y	1	2	2	7	1
DfSh	15	359		4	18.69	8.97	5.77	0.94	Y	1	2	3	7	4
DfSh	15	369		4	10.85	9.92	1.82	0.14	Y	1	2	1	7	1
DfSh	15	391		4	16.76	10.94	3.35	0.58	Y	1	2	3	7	1
DfSh	15	393		4	13.77	8.16	2.54	0.24	Y	1	2	1	7	4
DfSh	15	394		4	9.57	8.15	2.38	0.13	Y	1	2	3	7	1
DfSh	15	396		4	8.51	6.30	2.09	0.12	Y	1	2	3	7	1
DfSh	15	397		4	7.79	9.46	1.98	0.11	Y	1	2	1	8	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	398		4	10.16	7.47	4.09	0.22	Y	1	2	3	7	1
DfSh	15	400		4	15.87	5.90	2.77	0.21	Y	1	2	1	7	3
DfSh	15	405		4	25.45	11.23	5.72	1.50	Y	1	2	3	7	1
DfSh	15	408		4	17.59	4.44	2.66	0.24	Y	1	2	3	7	1
DfSh	15	418		4	15.38	9.31	2.47	0.31	Y	1	2	1	7	2
DfSh	15	419		4	11.84	6.40	1.81	0.13	Y	1	2	3	7	1
DfSh	15	422		4	15.77	5.51	2.92	0.19	Y	1	2	1	7	2
DfSh	15	423		4	11.76	10.02	2.11	0.22	Y	1	2	1	7	1
DfSh	15	425		4	9.82	7.38	2.06	0.14	Y	1	2	3	7	1
DfSh	15	426		4	11.36	7.37	2.36	0.15	Y	1	2	3	7	1
DfSh	15	430		4	13.35	9.96	3.37	0.41	Y	1	2	3	7	1
DfSh	15	432		4	15.73	13.11	4.30	0.94	Y	1	2	3	7	2
DfSh	15	446		4	17.89	13.38	3.20	0.51	Y	1	2	3	7	1
DfSh	15	447		4	11.04	9.43	2.37	0.18	Y	1	2	3	7	1
DfSh	15	448		4	27.21	9.58	6.57	1.38	Y	1	2	3	7	4
DfSh	15	449		4	16.14	6.29	4.18	0.33	Y	1	2	3	7	2
DfSh	15	450		4	7.56	7.07	2.59	0.08	Y	1	2	3	7	1
DfSh	15	451		4	12.22	5.46	3.63	0.26	Y	1	2	3	7	1
DfSh	15	517		4A	19.18	14.13	4.77	1.11	Y	1	2	3	7	2
DfSh	15	519		4B	10.25	9.39	3.08	0.18	Y	1	2	3	7	1
DfSh	15	532		4	18.39	10.17	3.83	0.53	Y	1	2	3	7	1
DfSh	15	548		4	20.37	7.36	4.45	0.52	Y	1	2	3	7	1
DfSh	15	550		4A	19.05	14.35	5.10	0.99	Y	1	2	3	7	1
DfSh	15	551		4B	9.96	9.59	2.54	0.23	Y	1	2	3	7	1
DfSh	15	565		4	25.57	8.43	3.78	0.53	Y	1	2	3	7	1
DfSh	15	633		4A	21.28	16.57	6.37	2.19	Y	1	2	3	7	2
DfSh	15	669	1	4A	15.42	10.20	4.47	0.55	Y	1	2	3	7	1
DfSh	15	121		2	11.76	6.45	2.18	0.09	Y	1	3	3	1	1
DfSh	15	122		2	7.42	7.75	1.23	0.07	Y	1	3	1	1	1
DfSh	15	123		2	7.91	11.38	1.71	0.13	Y	1	3	2	1	1
DfSh	15	126		2	5.52	11.85	1.36	0.11	Y	1	3	1	1	1
DfSh	15	159		2	9.52	6.48	2.76	0.13	Y	1	3	1	1	1
DfSh	15	193		2	11.97	6.40	1.93	0.10	Y	1	3	1	1	1
DfSh	15	199	6	2	7.65	7.29	1.00	0.05	Y	1	3	1	1	1
DfSh	15	197	14	2	3.84	7.65	0.62	0.02	N	1	3	1	1	1
DfSh	15	197	30	2	4.24	4.97	0.92	0.01	Y	1	4	1	1	1
DfSh	15	6		2	9.05	7.05	1.73	0.10	Y	1	5	2	1	1
DfSh	15	145		2	12.14	7.16	2.47	0.19	Y	1	5	2	1	1
DfSh	15	249	3	2	9.91	10.11	1.91	0.13	Y	1	5	1	1	2
DfSh	15	197	36	2	7.95	3.83	1.27	0.03	Y	1	6	2	1	1
DfSh	15	197	134	2	3.97	6.62	0.81	0.03	Y	1	6	1	1	1
DfSh	15	17		1	16.15	9.76	4.35	0.80	Y	1	3	3	11	1
DfSh	15	21		1	23.33	13.81	4.55	0.40	Y	1	3	2	11	1
DfSh	15	295	7	2	4.99	6.81	1.28	0.03	N	1	5	2	1	1
DfSh	15	285	5	2	7.61	8.44	1.81	0.07	Y	1	3	1	1	1
DfSh	15	285	29	2	11.81	6.62	2.58	0.14	Y	1	5	3	1	1
DfSh	15	295	3	2	6.16	4.47	0.86	0.02	Y	1	3	1	1	1
DfSh	15	144		2	12.87	6.42	1.10	0.06	Y	1	3	2	1	1
DfSh	15	250	22	2	9.29	6.86	1.97	0.09	Y	1	3	1	1	1
DfSh	15	275	3	2	12.68	10.87	3.20	0.32	Y	1	3	3	1	1
DfSh	15	321	4	2	12.09	8.51	2.36	0.19	Y	1	5	1	1	1
DfSh	15	197	59	2	7.34	5.99	0.88	0.04	N	1	5	3	1	1
DfSh	15	338		4	27.14	23.10	2.22	0.86	Y	1	3	3	13	1
DfSh	15	197	11	2	5.33	4.17	0.74	0.01	N	1	1	3	1	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	166		2	11.51	10.01	2.05	0.17	N	1	3	1	1	1
DfSh	15	221	1	2	7.27	4.98	1.33	0.04	N	1	3	3	1	1
DfSh	15	197	117	2	4.55	5.28	0.40	0.01	N	1	5	3	1	1
DfSh	15	197	120	2	8.42	4.95	1.95	0.06	N	1	5	3	1	1
DfSh	15	285	30	2	8.75	11.07	1.75	0.20	N	1	5	3	1	1
DfSh	15	235B	1	2	11.17	9.59	2.96	0.20	N	1	5	3	1	1
DfSh	15	322	1	2	6.75	4.28	0.86	0.01	N	1	6	3	1	1
DfSh	15	107		2	16.07	16.83	2.35	0.54	Y	1	3	2	1	4
DfSh	15	197	110	2	4.37	4.08	0.37	0.01	Y	1	5	1	1	1
DfSh	16	21		E0-2 N4-6	23.76	13.13	4.63	1.30	N	1	5	2	1	1
DfSh	15	127		2	15.55	13.11	1.43	0.23	N	1	1	3	1	1
DfSh	15	135		2	4.67	9.79	1.12	0.05	N	1	3	3	1	1
DfSh	15	197	25	2	4.94	4.41	1.74	0.02	N	1	3	3	1	3
DfSh	15	197	28	2	5.05	3.47	0.64	0.02	N	1	3	3	1	1
DfSh	15	197	38	2	7.86	4.42	1.02	0.03	N	1	3	3	1	1
DfSh	15	197	77	2	5.89	7.50	1.59	0.07	N	1	3	1	1	1
DfSh	15	197	131	2	5.72	3.49	0.87	0.01	N	1	3	3	1	1
DfSh	15	274	12	2	6.82	4.35	1.23	0.02	N	1	3	1	1	1
DfSh	15	282	4	2	11.56	9.56	2.53	0.28	N	1	3	3	1	1
DfSh	15	291	4	2	7.69	6.11	1.33	0.05	N	1	3	3	1	1
DfSh	15	317	1	2	7.38	3.13	1.01	0.02	N	1	3	2	1	1
DfSh	15	233A	1	2	3.69	3.64	0.71	0.01	N	1	3	3	1	1
DfSh	15	136		2	17.14	7.46	4.46	0.44	N	1	5	3	1	3
DfSh	15	197	2	2	6.14	4.82	1.31	0.03	N	1	5	3	1	1
DfSh	15	197	118	2	6.25	4.73	1.17	0.05	N	1	5	3	1	1
DfSh	15	199	1	2	7.06	8.59	2.06	0.08	N	1	5	3	1	1
DfSh	15	250	21	2	9.22	3.70	1.49	0.04	N	1	5	3	1	1
DfSh	15	264		2	8.55	7.84	1.93	0.09	N	1	5	3	1	1
DfSh	15	285	7	2	4.70	3.74	1.61	0.01	N	1	5	3	1	1
DfSh	15	294		2	7.34	5.01	0.76	0.02	N	1	5	3	1	1
DfSh	15	630		4B	12.84	12.52	3.88	0.84	N	1	3	1	1	4
DfSh	15	285	25	2	7.57	4.34	1.56	0.05	N	1	5	3	1	1
DfSh	15	197	122	2	6.43	9.11	1.32	0.06	N	1	3	3	1	1
DfSh	15	197	58	2	6.66	2.63	1.32	0.01	Y	1	3	1	1	2
DfSh	15	197	61	2	7.84	4.65	2.12	0.08	Y	1	3	2	1	1
DfSh	15	285	19	2	5.59	2.93	1.07	0.01	Y	1	4	1	1	1
DfSh	15	285	21	2	5.72	3.65	0.93	0.01	N	1	3	3	1	1
DfSh	15	248	9	2	4.86	4.78	1.16	0.02	N	1	3	2	1	1
DfSh	15	250	32	2	5.80	4.16	1.59	0.04	N	1	3	3	1	1
DfSh	15	273	10	2	7.31	6.11	1.48	0.06	N	1	5	3	1	1
DfSh	15	281	8	2	6.71	5.14	1.12	0.02	N	1	5	1	1	1
DfSh	15	285	15	2	10.57	8.79	2.95	0.23	N	1	5	2	1	1
DfSh	15	233A	15	2	8.95	6.31	1.97	0.11	N	1	5	2	1	1
DfSh	15	281	6	2	10.21	4.28	1.28	0.04	Y	1	2	3	1	1
DfSh	15	291	3	2	6.07	3.93	1.77	0.02	Y	1	2	1	1	2
DfSh	16	341		N4-6 W4-6	20.91	8.63	3.99	0.40	Y	2	1	3	11	1
DfSh	15	120		2	8.50	5.33	3.46	0.18	Y	2	1	3	1	1
DfSh	15	128		2	10.46	6.41	3.46	0.17	Y	2	1	3	1	1
DfSh	15	130		2	6.28	6.46	1.63	0.05	Y	2	1	1	1	1
DfSh	15	131		2	6.09	5.18	3.27	0.07	Y	2	1	3	1	1
DfSh	15	134		2	9.45	5.34	1.33	0.05	Y	2	1	3	1	1
DfSh	15	140		2	3.96	3.36	0.80	0.01	Y	2	1	3	1	1
DfSh	15	156		2	9.67	5.08	3.68	0.19	Y	2	1	3	1	1
DfSh	15	160		2	8.11	5.11	1.95	0.10	Y	2	1	3	1	1
DfSh	15	167		2	15.97	8.41	5.01	0.45	Y	2	1	3	1	4

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	168		2	10.74	6.43	3.71	0.18	Y	2	1	3	1	1
DfSh	15	192		2	7.30	6.27	1.69	0.11	Y	2	1	3	1	1
DfSh	15	197	4	2	8.06	2.85	1.62	0.04	Y	2	1	3	1	3
DfSh	15	197	5	2	7.50	5.45	2.90	0.10	Y	2	1	3	1	3
DfSh	15	197	6	2	6.62	3.62	1.38	0.03	Y	2	1	3	1	1
DfSh	15	197	8	2	7.52	3.97	1.70	0.04	Y	2	1	3	1	1
DfSh	15	197	10	2	5.87	4.45	1.34	0.02	Y	2	1	3	1	1
DfSh	15	197	16	2	10.81	5.10	2.08	0.11	Y	2	1	1	1	1
DfSh	15	197	17	2	9.36	3.44	1.65	0.04	Y	2	1	2	1	1
DfSh	15	197	18	2	7.22	4.39	0.87	0.02	Y	2	1	3	1	1
DfSh	15	197	20	2	7.32	4.15	0.88	0.01	Y	2	1	3	1	1
DfSh	15	197	21	2	5.03	3.20	1.06	0.01	Y	2	1	3	1	1
DfSh	15	197	22	2	5.27	2.81	0.72	0.01	Y	2	1	3	1	4
DfSh	15	197	24	2	3.82	4.62	1.84	0.02	Y	2	1	2	1	1
DfSh	15	197	26	2	3.74	3.64	0.78	0.02	Y	2	1	3	1	1
DfSh	15	197	27	2	5.79	3.25	0.97	0.01	Y	2	1	3	1	1
DfSh	15	197	29	2	7.04	4.28	1.35	0.01	Y	2	1	3	1	1
DfSh	15	197	33	2	3.18	2.98	1.49	0.01	Y	2	1	3	1	1
DfSh	15	197	37	2	4.65	3.75	0.65	0.01	Y	2	1	3	1	1
DfSh	15	197	39	2	6.02	3.70	0.89	0.01	Y	2	1	3	1	1
DfSh	15	197	43	2	8.54	5.40	2.55	0.12	Y	2	1	3	1	3
DfSh	15	197	46	2	5.64	3.20	1.43	0.02	Y	2	1	3	1	1
DfSh	15	197	47	2	5.25	4.12	2.08	0.04	Y	2	1	3	1	1
DfSh	15	197	50	2	5.32	4.87	0.85	0.01	Y	2	1	3	1	1
DfSh	15	197	55	2	7.80	4.84	2.52	0.07	Y	2	1	3	1	1
DfSh	15	197	56	2	5.34	3.56	2.49	0.01	Y	2	1	3	1	1
DfSh	15	197	57	2	7.06	6.33	1.31	0.04	Y	2	1	3	1	3
DfSh	15	197	63	2	7.48	3.82	1.66	0.04	Y	2	1	3	1	1
DfSh	15	197	67	2	11.34	6.42	0.96	0.08	Y	2	1	3	1	1
DfSh	15	197	69	2	4.90	3.90	3.73	0.07	Y	2	1	3	1	1
DfSh	15	197	70	2	8.17	6.51	3.38	0.19	Y	2	1	3	1	1
DfSh	15	197	72	2	7.93	4.33	4.19	0.16	Y	2	1	3	1	1
DfSh	15	197	73	2	12.33	4.41	3.45	0.13	Y	2	1	3	1	1
DfSh	15	197	76	2	8.66	6.55	1.54	0.06	Y	2	1	3	1	1
DfSh	15	197	78	2	5.14	4.31	2.49	0.05	Y	2	1	3	1	1
DfSh	15	197	81	2	7.44	3.90	2.43	0.05	Y	2	1	3	1	1
DfSh	15	197	82	2	6.91	4.58	3.60	0.08	Y	2	1	3	1	1
DfSh	15	197	83	2	4.55	3.70	3.13	0.08	Y	2	1	3	1	1
DfSh	15	197	88	2	7.21	3.43	2.18	0.02	Y	2	1	3	1	3
DfSh	15	197	89	2	5.22	4.45	3.31	0.10	Y	2	1	3	1	1
DfSh	15	197	94	2	7.35	2.65	1.82	0.03	Y	2	1	3	1	3
DfSh	15	197	95	2	9.58	5.02	4.64	0.19	Y	2	1	3	1	4
DfSh	15	197	96	2	4.55	3.29	1.50	0.01	Y	2	1	3	1	1
DfSh	15	197	100	2	6.48	5.48	1.37	0.05	Y	2	1	3	1	3
DfSh	15	197	101	2	7.06	4.92	2.14	0.05	Y	2	1	3	1	2
DfSh	15	197	102	2	13.07	5.17	1.81	0.12	Y	2	1	3	1	1
DfSh	15	197	103	2	4.75	3.55	1.14	0.02	Y	2	1	2	1	1
DfSh	15	197	104	2	6.21	4.31	2.56	0.07	Y	2	1	3	1	1
DfSh	15	197	105	2	7.50	6.36	1.84	0.06	Y	2	1	3	1	1
DfSh	15	197	108	2	6.99	3.18	2.44	0.05	Y	2	1	3	1	1
DfSh	15	197	111	2	8.21	5.09	1.28	0.04	Y	2	1	3	1	1
DfSh	15	197	114	2	7.31	5.61	2.85	0.06	Y	2	1	3	1	1
DfSh	15	197	115	2	6.71	4.40	0.89	0.01	Y	2	1	3	1	1
DfSh	15	197	116	2	6.74	3.48	2.45	0.03	Y	2	1	3	1	1
DfSh	15	197	119	2	5.60	5.03	3.73	0.10	Y	2	1	3	1	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	197	124	2	5.50	3.37	3.01	0.06	Y	2	1	3	1	1
DfSh	15	197	125	2	3.99	3.87	0.68	0.02	Y	2	1	3	1	1
DfSh	15	197	128	2	13.00	6.59	4.22	0.31	Y	2	1	3	1	1
DfSh	15	197	130	2	6.63	4.74	3.83	0.15	Y	2	1	3	1	2
DfSh	15	197	132	2	6.50	5.31	3.57	0.07	Y	2	1	2	1	2
DfSh	15	197	135	2	9.84	5.17	2.74	0.07	Y	2	1	3	1	1
DfSh	15	197	136	2	8.02	5.70	4.04	0.07	Y	2	1	3	1	3
DfSh	15	197	137	2	6.63	5.23	1.67	0.05	Y	2	1	3	1	3
DfSh	15	197	138	2	7.54	3.36	3.20	0.12	Y	2	1	3	1	3
DfSh	15	197	140	2	5.86	5.45	2.62	0.06	Y	2	1	3	1	1
DfSh	15	197	141	2	9.24	3.81	2.69	0.07	Y	2	1	3	1	1
DfSh	15	197	142	2	5.49	4.93	1.92	0.04	Y	2	1	3	1	1
DfSh	15	197	144	2	11.34	6.07	1.85	0.11	Y	2	1	1	1	2
DfSh	15	197	145	2	5.53	4.04	1.55	0.02	Y	2	1	3	1	1
DfSh	15	197	146	2	5.92	4.50	2.69	0.08	Y	2	1	3	1	1
DfSh	15	197	147	2	6.87	5.25	3.22	0.09	Y	2	1	3	1	3
DfSh	15	197	23	2	6.59	5.33	2.55	0.09	Y	2	1	3	30	4
DfSh	15	197	133	2	5.68	3.58	2.06	0.05	Y	2	1	3	30	1
DfSh	15	199	2	2	8.54	5.01	1.52	0.07	Y	2	1	3	1	1
DfSh	15	199	9	2	5.84	4.66	3.61	0.13	Y	2	1	3	1	3
DfSh	15	199	11	2	8.12	6.46	1.89	0.08	Y	2	1	3	1	1
DfSh	15	199	12	2	8.02	6.56	1.12	0.05	Y	2	1	3	1	1
DfSh	15	199	13	2	9.44	5.61	3.35	0.10	Y	2	1	3	1	1
DfSh	15	199	14	2	4.81	3.68	1.72	0.02	Y	2	1	3	1	1
DfSh	15	199	15	2	7.78	7.04	3.09	0.11	Y	2	1	3	1	1
DfSh	15	200		2	6.82	5.75	1.64	0.05	Y	2	1	3	1	1
DfSh	15	221	3	2	8.25	4.09	3.32	0.13	Y	2	1	3	1	1
DfSh	15	221	4	2	12.32	12.17	2.61	0.47	Y	2	1	3	1	4
DfSh	15	222	1	2	9.56	7.74	3.42	0.18	Y	2	1	3	1	2
DfSh	15	222	3	2	7.14	3.41	2.11	0.06	Y	2	1	3	1	1
DfSh	15	223	1	2	6.86	6.02	2.10	0.07	Y	2	1	3	1	1
DfSh	15	223	3	2	8.75	6.42	0.80	0.02	Y	2	1	3	1	1
DfSh	15	223	4	2	8.22	4.98	4.85	0.17	Y	2	1	3	1	1
DfSh	15	223	6	2	6.54	5.69	1.09	0.04	Y	2	1	3	1	1
DfSh	15	223	7	2	6.34	5.82	2.49	0.08	Y	2	1	3	1	1
DfSh	15	223	8	2	27.39	22.31	6.65	3.73	Y	2	1	3	1	1
DfSh	15	224		2	5.69	4.80	2.33	0.04	Y	2	1	3	1	1
DfSh	15	225		2	2.78	2.76	0.33	0.01	Y	2	1	3	1	1
DfSh	15	246	2	2	8.71	3.46	2.25	0.03	Y	2	1	3	1	1
DfSh	15	246	3	2	7.57	4.76	1.98	0.04	Y	2	1	3	1	1
DfSh	15	246	4	2	4.42	3.87	2.59	0.04	Y	2	1	3	1	1
DfSh	15	246	6	2	9.91	4.69	2.29	0.08	Y	2	1	3	1	1
DfSh	15	246	7	2	6.76	5.64	3.55	0.07	Y	2	1	3	1	1
DfSh	15	248	4	2	6.82	5.16	2.20	0.08	Y	2	1	3	1	3
DfSh	15	248	5	2	7.52	4.58	1.08	0.02	Y	2	1	3	1	1
DfSh	15	248	7	2	7.36	3.22	2.64	0.04	Y	2	1	3	1	3
DfSh	15	248	8	2	5.15	4.19	2.58	0.04	Y	2	1	3	1	1
DfSh	15	248	12	2	6.36	4.34	0.86	0.01	Y	2	1	3	1	1
DfSh	15	248	10	2	5.94	3.80	1.06	0.01	Y	2	1	3	13	1
DfSh	15	249	1	2	27.41	14.73	5.40	1.75	Y	2	1	3	1	1
DfSh	15	249	6	2	6.91	4.11	1.86	0.04	Y	2	1	2	1	1
DfSh	15	249	9	2	4.63	4.47	3.25	0.07	Y	2	1	3	1	1
DfSh	15	249	5	2	8.52	6.44	0.86	0.04	Y	2	1	3	9	4
DfSh	15	250	2	2	7.31	4.31	3.86	0.06	Y	2	1	3	1	1
DfSh	15	250	3	2	7.19	4.59	2.32	0.08	Y	2	1	3	1	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	250	5	2	11.86	7.07	4.31	0.23	Y	2	1	3	1	1
DfSh	15	250	6	2	6.18	3.42	1.70	0.04	Y	2	1	3	1	1
DfSh	15	250	7	2	8.51	5.38	3.29	0.15	Y	2	1	3	1	1
DfSh	15	250	8	2	6.66	3.49	2.00	0.03	Y	2	1	3	1	1
DfSh	15	250	10	2	4.93	3.72	1.30	0.01	Y	2	1	3	1	1
DfSh	15	250	11	2	5.25	3.82	1.34	0.02	Y	2	1	3	1	1
DfSh	15	250	12	2	5.43	4.25	1.35	0.03	Y	2	1	3	1	1
DfSh	15	250	14	2	5.44	3.68	1.73	0.06	Y	2	1	3	1	1
DfSh	15	250	16	2	9.43	6.44	5.23	0.21	Y	2	1	3	1	1
DfSh	15	250	17	2	7.45	5.61	3.58	0.09	Y	2	1	3	1	1
DfSh	15	250	18	2	8.32	4.59	3.79	0.09	Y	2	1	3	1	1
DfSh	15	250	19	2	7.38	3.88	1.58	0.04	Y	2	1	3	1	1
DfSh	15	250	24	2	6.18	3.91	2.35	0.05	Y	2	1	3	1	1
DfSh	15	250	25	2	6.00	4.02	2.01	0.06	Y	2	1	3	1	1
DfSh	15	250	26	2	7.93	4.16	1.96	0.07	Y	2	1	3	1	1
DfSh	15	250	28	2	6.85	3.16	1.29	0.02	Y	2	1	3	1	1
DfSh	15	250	29	2	6.49	3.54	2.56	0.05	Y	2	1	3	1	1
DfSh	15	250	30	2	5.61	3.12	2.20	0.02	Y	2	1	3	1	1
DfSh	15	250	31	2	7.24	4.29	2.92	0.07	Y	2	1	3	1	1
DfSh	15	250	33	2	4.87	3.62	0.67	0.01	Y	2	1	3	1	1
DfSh	15	250	20	2	6.91	6.04	2.44	0.09	Y	2	1	3	7	1
DfSh	15	250	23	2	15.34	5.97	1.73	0.13	Y	2	1	3	9	3
DfSh	15	250	1	2	5.52	4.12	1.23	0.03	Y	2	1	3	13	1
DfSh	15	273	5	2	6.03	4.10	2.71	0.06	Y	2	1	3	1	1
DfSh	15	273	11	2	6.79	6.05	4.67	0.10	Y	2	1	3	1	1
DfSh	15	273	12	2	10.97	9.08	2.69	0.19	Y	2	1	3	1	2
DfSh	15	273	13	2	8.48	3.02	1.46	0.03	Y	2	1	3	1	3
DfSh	15	273	14	2	7.87	6.84	5.32	0.19	Y	2	1	3	1	1
DfSh	15	273	15	2	13.65	7.65	3.29	0.28	Y	2	1	3	1	1
DfSh	15	273	18	2	6.30	5.48	1.57	0.05	Y	2	1	3	1	1
DfSh	15	273	8	2	9.90	3.19	1.71	0.02	Y	2	1	3	30	1
DfSh	15	274	1	2	7.36	3.85	0.82	0.03	Y	2	1	3	1	1
DfSh	15	274	2	2	8.78	5.54	2.19	0.10	Y	2	1	3	1	1
DfSh	15	274	3	2	7.95	4.91	1.22	0.04	Y	2	1	3	1	1
DfSh	15	274	4	2	7.36	3.28	1.89	0.05	Y	2	1	3	1	1
DfSh	15	274	6	2	7.01	3.72	2.08	0.07	Y	2	1	1	1	1
DfSh	15	274	11	2	9.60	4.73	2.31	0.09	Y	2	1	3	1	1
DfSh	15	274	13	2	6.36	3.84	2.97	0.04	Y	2	1	3	1	1
DfSh	15	274	14	2	7.34	4.69	2.21	0.04	Y	2	1	3	1	3
DfSh	15	274	15	2	8.10	5.60	1.82	0.06	Y	2	1	3	1	1
DfSh	15	274	19	2	5.02	4.72	3.77	0.08	Y	2	1	3	1	1
DfSh	15	274	8	2	10.14	5.14	2.29	0.11	Y	2	1	3	13	1
DfSh	15	274	10	2	5.60	4.74	2.23	0.07	Y	2	1	3	13	1
DfSh	15	281	7	2	7.25	4.32	2.28	0.05	Y	2	1	3	1	1
DfSh	15	281	9	2	8.27	5.30	2.29	0.09	Y	2	1	3	1	2
DfSh	15	281	11	2	5.76	4.62	2.57	0.06	Y	2	1	3	1	1
DfSh	15	282	2	2	10.42	5.15	5.09	0.24	Y	2	1	3	1	3
DfSh	15	282	3	2	11.06	10.44	1.98	0.15	Y	2	1	3	1	1
DfSh	15	283	4	2	9.12	4.50	4.41	0.21	Y	2	1	3	1	1
DfSh	15	284	1	2	5.77	3.71	0.83	0.01	Y	2	1	3	1	1
DfSh	15	284	2	2	4.81	3.20	1.08	0.01	Y	2	1	3	1	1
DfSh	15	284	4	2	8.79	3.61	2.72	0.08	Y	2	1	3	1	1
DfSh	15	284	5	2	12.26	7.32	3.84	0.27	Y	2	1	3	1	1
DfSh	15	284	8	2	9.68	2.73	1.84	0.02	Y	2	1	3	1	1
DfSh	15	284	9	2	4.56	4.44	3.89	0.10	Y	2	1	3	1	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	284	10	2	6.96	5.93	1.20	0.04	Y	2	1	3	1	1
DfSh	15	284	13	2	8.85	5.90	1.84	0.08	Y	2	1	3	1	1
DfSh	15	284	14	2	3.82	3.68	1.91	0.04	Y	2	1	3	1	1
DfSh	15	284	15	2	8.55	5.68	1.58	0.06	Y	2	1	3	1	1
DfSh	15	284	16	2	9.52	3.49	2.51	0.08	Y	2	1	3	1	1
DfSh	15	284	17	2	3.99	3.44	2.70	0.01	Y	2	1	3	1	1
DfSh	15	284	19	2	6.56	4.97	0.99	0.03	Y	2	1	3	1	1
DfSh	15	284	12	2	10.65	3.60	1.40	0.07	Y	2	1	3	9	1
DfSh	15	285	2	2	6.55	4.29	2.19	0.05	Y	2	1	3	1	1
DfSh	15	285	18	2	7.00	4.01	1.51	0.03	Y	2	1	3	1	1
DfSh	15	285	22	2	4.41	4.27	0.89	0.01	Y	2	1	3	1	1
DfSh	15	285	27	2	10.63	6.37	4.31	0.21	Y	2	1	3	1	1
DfSh	15	285	28	2	8.66	7.59	4.60	0.22	Y	2	1	3	1	2
DfSh	15	285	17	2	7.67	4.31	2.57	0.06	Y	2	1	3	7	1
DfSh	15	291	1	2	10.13	7.93	2.76	0.18	Y	2	1	3	1	1
DfSh	15	291	2	2	7.26	3.34	1.36	0.04	Y	2	1	3	1	1
DfSh	15	291	8	2	4.30	3.88	2.04	0.02	Y	2	1	3	1	1
DfSh	15	291	9	2	5.95	2.69	1.67	0.02	Y	2	1	3	1	1
DfSh	15	291	10	2	9.02	3.61	1.48	0.03	Y	2	1	3	1	1
DfSh	15	291	11	2	4.66	4.55	1.34	0.02	Y	2	1	3	1	2
DfSh	15	291	12	2	7.42	4.63	1.60	0.05	Y	2	1	3	1	1
DfSh	15	291	13	2	7.46	5.15	3.04	0.10	Y	2	1	3	1	1
DfSh	15	291	14	2	9.01	6.08	2.25	0.07	Y	2	1	3	1	1
DfSh	15	291	18	2	8.49	5.54	4.58	0.11	Y	2	1	3	1	1
DfSh	15	291	19	2	10.03	5.75	2.92	0.15	Y	2	1	3	1	3
DfSh	15	291	20	2	10.80	6.55	2.47	0.12	Y	2	1	3	1	1
DfSh	15	291	21	2	9.03	5.87	4.65	0.22	Y	2	1	3	1	3
DfSh	15	291	23	2	12.80	5.41	5.36	0.39	Y	2	1	3	1	1
DfSh	15	291	24	2	8.37	4.72	1.43	0.06	Y	2	1	3	1	3
DfSh	15	295	1	2	7.75	4.39	0.73	0.03	Y	2	1	3	1	1
DfSh	15	295	2	2	6.36	4.15	2.11	0.04	Y	2	1	3	1	1
DfSh	15	295	5	2	6.93	4.53	1.23	0.04	Y	2	1	3	1	1
DfSh	15	295	6	2	6.52	4.41	1.10	0.04	Y	2	1	3	1	1
DfSh	15	295	8	2	8.26	4.48	1.68	0.04	Y	2	1	3	1	1
DfSh	15	295	4	2	7.55	5.34	1.31	0.06	Y	2	1	3	13	1
DfSh	15	312	2	2	6.53	4.22	1.49	0.01	Y	2	1	1	1	2
DfSh	15	312	5	2	10.65	6.73	4.02	0.26	Y	2	1	3	1	1
DfSh	15	313	4	2	9.67	4.43	4.67	0.19	Y	2	1	3	1	3
DfSh	15	313	2	2	6.32	5.01	2.56	0.07	Y	2	1	3	13	1
DfSh	15	313	1	2	5.74	3.69	1.57	0.03	Y	2	1	3	30	4
DfSh	15	313	3	2	13.06	7.46	2.53	0.18	Y	2	1	3	30	1
DfSh	15	317	2	2	8.95	5.93	1.89	0.07	Y	2	1	3	1	2
DfSh	15	318	2	2	7.42	3.97	3.18	0.05	Y	2	1	3	1	1
DfSh	15	318	4	2	5.33	3.85	0.89	0.02	Y	2	1	3	1	1
DfSh	15	318	5	2	4.78	4.24	0.55	0.02	Y	2	1	3	1	1
DfSh	15	318	6	2	5.15	2.79	1.37	0.01	Y	2	1	3	1	3
DfSh	15	318	7	2	6.41	4.52	1.85	0.03	Y	2	1	3	1	1
DfSh	15	318	9	2	9.96	3.66	1.42	0.03	Y	2	1	3	1	1
DfSh	15	318	10	2	3.89	3.88	1.30	0.01	Y	2	1	3	1	1
DfSh	15	318	11	2	6.08	3.03	2.75	0.04	Y	2	1	3	1	1
DfSh	15	318	12	2	6.79	4.41	2.16	0.03	Y	2	1	3	1	1
DfSh	15	318	13	2	10.28	4.41	3.45	0.12	Y	2	1	3	1	1
DfSh	15	318	14	2	4.61	4.26	3.13	0.07	Y	2	1	3	1	1
DfSh	15	318	18	2	7.41	5.08	4.48	0.11	Y	2	1	3	1	1
DfSh	15	318	16	2	5.52	4.64	2.28	0.03	Y	2	1	3	9	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	319	2	2	5.54	3.96	1.37	0.02	Y	2	1	3	1	2
DfSh	15	319	3	2	6.97	6.04	2.49	0.06	Y	2	1	3	1	1
DfSh	15	319	5	2	10.25	5.58	3.51	0.13	Y	2	1	3	1	1
DfSh	15	319	6	2	6.80	5.73	1.81	0.05	Y	2	1	3	1	1
DfSh	15	321	6	2	11.74	7.15	5.80	0.35	Y	2	1	3	1	1
DfSh	15	321	1	2	12.49	8.69	1.41	0.14	Y	2	1	3	9	1
DfSh	15	322	2	2	6.80	4.49	1.57	0.01	Y	2	1	3	1	1
DfSh	15	322	3	2	8.42	5.94	1.94	0.06	Y	2	1	3	1	1
DfSh	15	324		2	6.54	6.13	1.25	0.05	Y	2	1	3	1	1
DfSh	15	334	2	2	6.05	4.41	1.43	0.02	Y	2	1	3	1	3
DfSh	15	334	3	2	5.75	5.63	2.85	0.02	Y	2	1	3	1	1
DfSh	15	334	1	2	4.53	3.10	0.59	0.01	Y	2	1	3	13	4
DfSh	15	334	4	2	7.57	6.24	1.21	0.02	Y	2	1	3	13	1
DfSh	15	335	1	2	3.88	3.56	2.41	0.02	Y	2	1	3	1	3
DfSh	15	335	2	2	7.46	6.18	3.77	0.06	Y	2	1	3	1	1
DfSh	15	335	3	2	6.44	5.73	3.80	0.04	Y	2	1	3	1	1
DfSh	15	336	2	2	6.54	5.38	2.42	0.02	Y	2	1	3	7	1
DfSh	15	347		2	4.49	2.97	1.32	0.01	Y	2	1	3	1	1
DfSh	15	348	3	2	30.96	13.60	14.34	3.53	Y	2	1	3	1	4
DfSh	15	348	1	2	11.55	8.30	7.40	0.54	Y	2	1	3	7	4
DfSh	15	348	2	2	18.20	11.70	10.29	1.57	Y	2	1	3	13	3
DfSh	15	354	1	2	6.87	6.07	2.43	0.02	Y	2	1	3	1	1
DfSh	15	354	2	2	9.24	4.02	2.54	0.03	Y	2	1	3	1	1
DfSh	15	355	2	2	6.85	4.61	0.98	0.01	Y	2	1	3	1	1
DfSh	15	356		2	10.50	7.75	7.24	0.49	Y	2	1	3	1	2
DfSh	15	357		2	17.37	13.22	9.82	2.28	Y	2	1	3	1	1
DfSh	15	358		2	7.62	5.32	2.83	0.02	Y	2	1	3	1	1
DfSh	15	232B	1	2	4.46	3.72	0.70	0.01	Y	2	1	3	1	1
DfSh	15	232B	2	2	5.94	3.93	1.01	0.01	Y	2	1	3	1	1
DfSh	15	232B	3	2	6.21	4.46	3.43	0.10	Y	2	1	3	1	1
DfSh	15	232B	4	2	5.63	3.78	2.36	0.04	Y	2	1	3	1	1
DfSh	15	232B	6	2	6.98	4.13	1.74	0.03	Y	2	1	3	1	2
DfSh	15	232B	9	2	4.85	2.76	2.70	0.03	Y	2	1	3	1	1
DfSh	15	232B	10	2	6.21	4.48	2.36	0.05	Y	2	1	3	1	3
DfSh	15	232B	11	2	6.83	5.17	3.46	0.10	Y	2	1	3	1	1
DfSh	15	233A	2	2	6.19	5.23	1.28	0.02	Y	2	1	3	1	1
DfSh	15	233A	3	2	6.52	3.54	1.81	0.02	Y	2	1	3	1	2
DfSh	15	233A	4	2	7.03	2.91	1.52	0.03	Y	2	1	3	1	1
DfSh	15	233A	6	2	5.42	4.19	1.06	0.01	Y	2	1	3	1	1
DfSh	15	233A	7	2	6.64	3.96	0.77	0.03	Y	2	1	3	1	1
DfSh	15	233A	8	2	7.20	3.72	2.17	0.04	Y	2	1	3	1	1
DfSh	15	233A	9	2	5.60	5.43	2.03	0.05	Y	2	1	3	1	1
DfSh	15	233A	12	2	9.75	4.65	2.55	0.06	Y	2	1	3	1	1
DfSh	15	233A	14	2	6.33	4.63	4.42	0.13	Y	2	1	3	1	3
DfSh	15	233A	5	2	8.44	6.67	1.83	0.10	Y	2	1	3	30	1
DfSh	15	235A	1	2	6.14	3.00	2.18	0.02	Y	2	1	3	1	1
DfSh	15	235A	7	2	7.03	5.79	4.00	0.09	Y	2	1	3	1	1
DfSh	15	235A	9	2	6.14	3.73	1.81	0.03	Y	2	1	3	1	1
DfSh	15	235A	10	2	9.19	5.84	3.75	0.11	Y	2	1	3	1	1
DfSh	15	235A	4	2	5.06	4.37	2.12	0.04	Y	2	1	3	7	1
DfSh	15	233A	11	2	8.94	4.79	3.73	0.15	Y	2	2	3	1	1
DfSh	15	108		2	27.56	27.03	8.84	6.18	Y	2	3	3	1	1
DfSh	15	117		2	15.78	6.89	3.34	0.31	Y	2	3	3	1	2
DfSh	15	125		2	10.85	6.96	4.19	0.30	Y	2	3	3	1	1
DfSh	15	137		2	14.65	6.72	3.82	0.27	Y	2	3	3	1	2

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	139		2	12.30	4.09	1.85	0.08	Y	2	3	1	1	1
DfSh	15	157		2	12.33	5.30	2.68	0.14	Y	2	3	3	1	3
DfSh	15	158		2	7.58	5.08	2.55	0.12	Y	2	3	3	1	1
DfSh	15	164		2	25.62	14.09	11.89	3.72	Y	2	3	3	1	3
DfSh	15	165		2	10.84	9.22	3.89	0.22	Y	2	3	3	1	1
DfSh	15	169		2	19.87	7.50	3.86	0.47	Y	2	3	3	1	3
DfSh	15	186		2	11.08	8.11	2.12	0.14	Y	2	3	3	1	1
DfSh	15	191		2	6.57	3.05	2.07	0.05	Y	2	3	3	1	1
DfSh	15	194		2	10.10	10.94	2.18	0.17	Y	2	3	3	1	1
DfSh	15	195		2	11.13	8.26	2.50	0.21	Y	2	3	3	1	3
DfSh	15	196		2	10.03	9.04	3.98	0.26	Y	2	3	3	1	2
DfSh	15	197	3	2	10.00	4.60	1.88	0.04	Y	2	3	3	1	1
DfSh	15	197	9	2	6.45	4.19	2.15	0.05	Y	2	3	3	1	1
DfSh	15	197	15	2	7.48	5.70	3.60	0.22	Y	2	3	3	1	1
DfSh	15	197	19	2	5.29	4.81	1.64	0.03	Y	2	3	2	1	1
DfSh	15	197	31	2	6.47	2.51	1.25	0.01	Y	2	3	3	1	1
DfSh	15	197	32	2	8.26	2.74	1.55	0.05	Y	2	3	3	1	1
DfSh	15	197	34	2	6.66	3.30	2.42	0.06	Y	2	3	3	1	1
DfSh	15	197	40	2	5.87	4.91	0.84	0.01	Y	2	3	3	1	1
DfSh	15	197	41	2	7.09	7.02	1.05	0.01	Y	2	3	3	1	1
DfSh	15	197	42	2	8.02	5.57	1.02	0.03	Y	2	3	3	1	1
DfSh	15	197	48	2	7.14	5.81	3.43	0.13	Y	2	3	3	1	2
DfSh	15	197	51	2	8.02	7.04	1.22	0.05	Y	2	3	3	1	1
DfSh	15	197	71	2	8.74	4.24	3.48	0.11	Y	2	3	3	1	1
DfSh	15	197	74	2	9.92	7.55	2.55	0.19	Y	2	3	1	1	4
DfSh	15	197	79	2	8.26	6.35	2.94	0.11	Y	2	3	3	1	1
DfSh	15	197	80	2	7.98	3.20	2.62	0.05	Y	2	3	3	1	1
DfSh	15	197	84	2	5.27	4.71	0.62	0.01	Y	2	3	3	1	3
DfSh	15	197	85	2	10.83	6.71	3.67	0.23	Y	2	3	3	1	1
DfSh	15	197	86	2	12.13	5.14	3.63	0.20	Y	2	3	3	1	1
DfSh	15	197	87	2	14.06	6.93	2.81	0.15	Y	2	3	3	1	3
DfSh	15	197	91	2	5.29	4.40	1.43	0.02	Y	2	3	3	1	2
DfSh	15	197	92	2	5.87	3.29	0.92	0.01	Y	2	3	3	1	4
DfSh	15	197	97	2	8.85	4.73	3.70	0.12	Y	2	3	3	1	1
DfSh	15	197	98	2	6.85	4.12	1.90	0.05	Y	2	3	3	1	1
DfSh	15	197	107	2	7.62	4.78	1.19	0.03	Y	2	3	3	1	1
DfSh	15	197	113	2	8.35	4.13	1.77	0.02	Y	2	3	3	1	1
DfSh	15	197	121	2	8.66	5.03	2.18	0.07	Y	2	3	3	1	1
DfSh	15	197	123	2	11.02	6.84	1.01	0.06	Y	2	3	3	1	1
DfSh	15	197	126	2	7.49	5.47	2.58	0.07	Y	2	3	3	1	1
DfSh	15	197	127	2	9.50	6.18	3.22	0.20	Y	2	3	3	1	1
DfSh	15	197	143	2	7.95	7.15	3.05	0.16	Y	2	3	3	1	1
DfSh	15	197	54	2	6.55	6.06	1.08	0.03	Y	2	3	3	13	1
DfSh	15	199	3	2	4.77	8.37	1.85	0.07	Y	2	3	2	1	1
DfSh	15	199	10	2	7.20	8.67	2.05	0.12	Y	2	3	3	1	1
DfSh	15	199	16	2	7.52	3.07	1.62	0.01	Y	2	3	3	1	3
DfSh	15	221	2	2	10.04	5.20	1.65	0.08	Y	2	3	3	1	1
DfSh	15	223	2	2	5.61	5.52	2.46	0.10	Y	2	3	3	1	1
DfSh	15	223	5	2	7.92	3.83	1.47	0.04	Y	2	3	3	1	1
DfSh	15	246	1	2	4.93	4.02	0.96	0.02	Y	2	3	3	1	1
DfSh	15	246	5	2	10.28	5.02	1.92	0.08	Y	2	3	3	1	1
DfSh	15	246	8	2	8.05	4.87	3.94	0.17	Y	2	3	3	1	1
DfSh	15	248	3	2	6.01	3.32	1.52	0.02	Y	2	3	3	1	1
DfSh	15	248	11	2	6.26	4.96	1.80	0.05	Y	2	3	3	1	1
DfSh	15	249	4	2	10.45	6.73	1.46	0.07	Y	2	3	3	1	3

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	250	4	2	9.40	4.94	2.46	0.11	Y	2	3	3	1	1
DfSh	15	273	1	2	4.42	3.05	0.78	0.01	Y	2	3	3	1	1
DfSh	15	273	2	2	5.66	5.09	0.89	0.02	Y	2	3	3	1	1
DfSh	15	273	3	2	4.24	3.85	0.67	0.01	Y	2	3	3	1	1
DfSh	15	273	4	2	4.40	3.37	2.05	0.04	Y	2	3	3	1	1
DfSh	15	273	6	2	6.44	4.73	1.38	0.04	Y	2	3	3	1	1
DfSh	15	273	7	2	6.17	5.17	1.13	0.01	Y	2	3	3	1	1
DfSh	15	273	9	2	6.74	5.36	1.45	0.04	Y	2	3	3	1	1
DfSh	15	273	16	2	10.97	8.21	2.99	0.21	Y	2	3	3	1	1
DfSh	15	273	19	2	11.07	8.44	9.95	0.65	Y	2	3	3	1	3
DfSh	15	274	7	2	6.61	3.95	3.22	0.07	Y	2	3	3	1	1
DfSh	15	274	9	2	5.58	3.55	1.72	0.02	Y	2	3	3	1	1
DfSh	15	274	17	2	10.31	5.55	4.24	0.27	Y	2	3	3	1	1
DfSh	15	274	18	2	11.41	5.10	4.37	0.24	Y	2	3	3	1	1
DfSh	15	281	1	2	5.29	4.20	1.05	0.01	Y	2	3	3	1	2
DfSh	15	281	2	2	5.46	3.65	1.14	0.01	Y	2	3	3	1	1
DfSh	15	281	3	2	6.77	4.45	2.30	0.04	Y	2	3	3	1	3
DfSh	15	281	4	2	5.59	2.98	1.96	0.03	Y	2	3	3	1	1
DfSh	15	281	5	2	4.72	3.64	2.18	0.04	Y	2	3	3	1	1
DfSh	15	281	10	2	6.57	6.24	1.66	0.04	Y	2	3	3	1	1
DfSh	15	284	7	2	4.09	3.09	0.99	0.01	Y	2	3	3	1	1
DfSh	15	285	1	2	6.80	4.00	3.03	0.08	Y	2	3	3	1	1
DfSh	15	285	3	2	8.83	7.08	1.56	0.09	Y	2	3	3	1	1
DfSh	15	285	6	2	4.85	3.70	0.81	0.02	Y	2	3	3	1	1
DfSh	15	285	10	2	6.64	4.40	2.93	0.08	Y	2	3	3	1	1
DfSh	15	285	20	2	6.29	4.67	1.27	0.04	Y	2	3	3	1	1
DfSh	15	285	23	2	6.11	3.76	1.11	0.01	Y	2	3	3	1	1
DfSh	15	291	6	2	6.52	5.51	1.75	0.05	Y	2	3	3	1	1
DfSh	15	291	7	2	6.70	5.25	1.25	0.04	Y	2	3	3	1	1
DfSh	15	291	16	2	9.26	7.28	2.13	0.10	Y	2	3	3	1	1
DfSh	15	291	17	2	9.58	4.78	1.42	0.04	Y	2	3	3	1	1
DfSh	15	291	22	2	12.73	8.59	3.36	0.26	Y	2	3	3	1	1
DfSh	15	306		2	7.14	6.67	2.97	0.11	Y	2	3	3	1	1
DfSh	15	308		2	9.86	6.03	5.57	0.25	Y	2	3	3	1	2
DfSh	15	312	1	2	5.30	4.49	1.56	0.01	Y	2	3	3	1	1
DfSh	15	314		2	9.83	6.41	4.18	0.20	Y	2	3	3	1	1
DfSh	15	318	3	2	7.29	3.26	2.53	0.03	Y	2	3	3	1	1
DfSh	15	318	8	2	8.75	3.89	3.83	0.14	Y	2	3	3	1	1
DfSh	15	318	15	2	6.90	5.32	2.54	0.08	Y	2	3	3	1	1
DfSh	15	318	17	2	8.32	5.01	2.95	0.13	Y	2	3	3	1	1
DfSh	15	318	20	2	5.74	4.92	2.27	0.04	Y	2	3	3	1	1
DfSh	15	318	21	2	9.44	3.48	3.50	0.12	Y	2	3	3	1	1
DfSh	15	319	1	2	7.45	5.23	1.65	0.04	Y	2	3	3	1	1
DfSh	15	319	7	2	6.95	5.64	1.82	0.06	Y	2	3	3	1	1
DfSh	15	321	3	2	11.59	5.76	3.29	0.19	Y	2	3	3	1	3
DfSh	15	334	5	2	6.03	4.10	1.87	0.02	Y	2	3	3	1	1
DfSh	15	336	1	2	6.20	4.76	3.10	0.02	Y	2	3	3	1	1
DfSh	15	355	1	2	9.72	6.05	4.19	0.18	Y	2	3	3	1	1
DfSh	15	390		2	7.59	4.56	2.00	0.02	Y	2	3	3	1	2
DfSh	15	232B	5	2	5.53	3.88	2.92	0.06	Y	2	3	3	1	1
DfSh	15	232B	12	2	12.50	7.69	1.71	0.16	Y	2	3	3	1	1
DfSh	15	233A	10	2	8.03	5.84	2.98	0.12	Y	2	3	3	1	1
DfSh	15	233A	13	2	10.78	5.05	2.80	0.16	Y	2	3	3	1	1
DfSh	15	233B		2	16.38	14.14	6.14	1.08	Y	2	3	3	1	3
DfSh	15	235A	5	2	8.71	6.79	3.67	0.20	Y	2	3	3	1	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	235A	8	2	6.91	3.75	3.27	0.06	Y	2	3	3	1	1
DfSh	15	119		2	10.26	6.73	4.32	0.29	Y	2	5	3	1	1
DfSh	15	181		2	15.33	10.20	6.75	0.65	Y	2	5	3	1	1
DfSh	15	187		2	11.09	9.73	4.15	0.25	Y	2	5	3	1	1
DfSh	15	189		2	11.14	7.53	3.43	0.27	Y	2	5	2	1	1
DfSh	15	197	35	2	7.29	2.87	1.89	0.03	Y	2	5	3	1	1
DfSh	15	199	5	2	6.45	6.90	2.69	0.11	Y	2	5	3	1	1
DfSh	15	222	2	2	7.46	4.97	3.23	0.08	Y	2	5	3	1	1
DfSh	15	249	2	2	15.14	6.23	4.37	0.35	Y	2	5	3	1	1
DfSh	15	249	7	2	8.92	4.04	2.80	0.12	Y	2	5	3	1	1
DfSh	15	250	9	2	7.31	4.67	1.78	0.03	Y	2	5	3	1	3
DfSh	15	250	15	2	7.19	4.62	2.91	0.09	Y	2	5	3	1	1
DfSh	15	274	5	2	5.59	3.87	0.92	0.01	Y	2	5	3	1	1
DfSh	15	285	4	2	9.20	3.33	2.41	0.05	Y	2	5	3	1	1
DfSh	15	285	12	2	7.88	4.47	3.71	0.08	Y	2	5	3	1	1
DfSh	15	285	14	2	9.10	4.04	2.78	0.06	Y	2	5	3	1	1
DfSh	15	285	24	2	7.04	4.78	1.54	0.05	Y	2	5	3	1	1
DfSh	15	315		2	8.17	7.13	1.34	0.05	Y	2	5	3	1	1
DfSh	15	318	1	2	8.94	6.86	2.21	0.11	Y	2	5	3	1	1
DfSh	15	232A		2	12.31	10.32	3.24	0.27	Y	2	5	3	1	1
DfSh	15	232B	7	2	7.46	4.60	2.10	0.05	Y	2	5	3	1	1
DfSh	15	232B	8	2	5.98	5.56	1.37	0.03	Y	2	5	3	1	1
DfSh	15	255		4	30.31	15.49	4.19	1.69	Y	2	1	3	15	1
DfSh	15	403		4	11.52	7.68	4.78	0.43	Y	2	1	3	1	3
DfSh	15	598		4	13.47	7.85	2.82	0.27	Y	2	1	3	1	1
DfSh	15	344		4	23.41	14.41	3.50	0.86	Y	2	3	3	15	1
DfSh	15	631		4B	19.37	13.13	6.99	1.09	Y	2	3	3	1	3
DfSh	15	45		2	19.02	16.49	7.72	2.62	Y	2	2	3	7	3
DfSh	15	63		2	17.50	14.28	6.55	1.51	Y	2	2	3	7	3
DfSh	15	118		2	8.60	7.16	2.53	0.16	Y	2	2	3	7	2
DfSh	15	282	1	2	14.69	13.07	4.09	0.58	Y	2	2	3	1	3
DfSh	15	129		2	20.22	14.27	3.42	1.01	Y	2	3	3	1	1
DfSh	15	197	90	2	9.30	5.80	2.55	0.13	Y	2	3	3	1	1
DfSh	15	283	5	2	28.58	19.54	11.34	5.77	Y	2	3	3	1	4
DfSh	15	104		4	15.35	8.67	4.86	0.49	Y	2	2	3	7	2
DfSh	15	373		4	11.09	10.04	4.41	0.40	Y	2	2	3	7	4
DfSh	15	420		4	21.25	16.81	9.81	2.83	Y	2	2	3	7	3
DfSh	15	424		4	12.91	6.80	2.79	0.13	Y	2	2	3	7	3
DfSh	15	437		4	26.45	17.35	12.11	4.31	Y	2	2	3	7	3
DfSh	15	523		4	25.27	13.98	8.22	2.93	Y	2	2	3	7	2
DfSh	15	533		4B	15.85	11.50	6.65	1.03	Y	2	2	3	7	1
DfSh	15	534		4B	18.35	11.92	6.52	1.35	Y	2	2	3	7	1
DfSh	15	536		4	19.26	8.50	7.74	1.12	Y	2	2	3	7	3
DfSh	15	553		4B	12.22	5.93	3.71	0.21	Y	2	2	3	7	3
DfSh	15	567		4	29.31	17.66	9.83	4.01	Y	2	2	3	7	2
DfSh	15	572		4A	33.18	20.38	9.18	6.07	Y	2	2	3	7	3
DfSh	15	576		4	12.93	8.41	4.78	0.44	Y	2	2	3	7	2
DfSh	15	583		4	20.36	9.66	7.24	1.64	Y	2	2	3	7	4
DfSh	15	585		4A	13.04	10.81	6.33	0.70	Y	2	2	3	7	1
DfSh	15	588		4	16.16	8.01	4.37	0.56	Y	2	2	3	7	3
DfSh	15	597		4	13.72	5.63	3.06	0.15	Y	2	2	3	7	3
DfSh	15	618		4	20.75	20.41	10.81	4.67	Y	2	2	3	7	3
DfSh	15	626		4B	46.43	12.47	7.92	6.34	Y	2	2	3	7	3
DfSh	15	669	2	4A	25.76	16.01	13.92	4.29	Y	2	2	3	7	3
DfSh	16	17		E0-2 N4-6	9.48	6.36	5.22	0.18	Y	2	5	3	7	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	162		2	5.46	4.52	1.39	0.03	Y	2	3	3	1	1
DfSh	15	197	1	2	8.31	3.24	2.19	0.04	Y	2	3	1	1	1
DfSh	15	197	53	2	10.10	4.52	2.12	0.10	Y	2	3	3	1	3
DfSh	15	197	62	2	8.05	8.40	1.06	0.05	Y	2	3	1	1	1
DfSh	15	235B	2	2	12.72	8.59	5.23	0.39	Y	2	3	3	1	3
DfSh	15	319	8	2	14.06	7.98	2.99	0.22	Y	2	2	3	1	1
DfSh	15	197	12	2	6.71	5.13	1.69	0.05	Y	2	2	3	1	1
DfSh	15	197	49	2	5.71	6.91	2.51	0.09	Y	2	2	3	1	1
DfSh	15	197	45	2	6.95	6.15	2.69	0.09	Y	2	2	3	13	1
DfSh	15	250	13	2	6.23	4.40	2.24	0.04	Y	2	2	3	1	3
DfSh	15	275	1	2	14.87	5.53	3.90	0.33	Y	2	2	3	1	3
DfSh	15	235A	3	2	5.88	7.78	2.42	0.07	Y	2	2	3	1	1
DfSh	15	7		3	27.78	18.38	7.17	4.30	Y	2	3	3	11	1
DfSh	16	9		E0-2 N4-6	42.08	33.96	12.74	22.00	Y	2	3	3	11	1
DfSh	15	20		1	11.67	9.63	2.23	0.20	Y	2	3	3	11	1
DfSh	15	273	17	2	9.31	7.87	2.76	0.20	Y	2	3	3	1	1
DfSh	15	285	11	2	9.61	4.51	2.55	0.11	Y	2	3	3	1	1
DfSh	15	318	19	2	7.99	6.96	4.95	0.28	Y	3	2	3	1	1
DfSh	15	258		4	35.06	20.25	19.98	15.69	Y	3	2	3	7	2
DfSh	15	339		4	43.66	30.67	13.98	19.09	Y	3	2	3	9	3
DfSh	15	370		4	24.42	17.44	10.90	3.83	Y	3	2	3	7	3
DfSh	15	395		4	27.97	24.49	6.96	4.72	Y	3	2	3	7	1
DfSh	15	522		4B	32.77	21.73	12.86	10.16	Y	3	2	3	7	4
DfSh	15	525		4	30.27	25.79	13.25	12.71	Y	3	2	3	7	5
DfSh	15	571		4A	37.46	36.74	21.49	31.61	Y	3	2	3	7	3
DfSh	15	593		4	30.57	20.63	11.23	5.46	Y	3	2	3	7	3
DfSh	15	595		4A	19.59	15.47	12.07	6.14	Y	3	2	3	7	3
DfSh	15	620		4A	45.63	43.80	26.39	49.63	Y	3	2	3	7	4
DfSh	15	384		2	35.95	22.98	16.80	10.57	Y	3	3	3	1	3
DfSh	15	380		2	34.21	17.07	9.52	4.88	Y	3	5	3	1	1
DfSh	15	383		2	84.66	42.86	34.85	94.37	Y	3	5	3	1	4
DfSh	15	188		2	9.84	3.88	1.13	0.04	Y	4	4	1	1	1
DfSh	15	197	60	2	13.46	4.34	1.62	0.09	Y	4	4	3	1	1
DfSh	15	197	65	2	11.49	4.95	2.18	0.09	Y	4	4	1	1	1
DfSh	15	199	8	2	9.43	3.96	1.65	0.07	Y	4	4	1	1	1
DfSh	15	337		4	18.18	4.11	1.85	0.12	Y	4	4	1	8	1
DfSh	15	345		4	27.48	7.56	2.00	0.36	Y	4	4	1	8	1
DfSh	15	43		2	16.33	6.18	2.75	0.16	Y	4	4	2	1	1
DfSh	15	241		3	48.37	33.57	6.32	6.75	Y	5	3	3	15	3
DfSh	15	364		2	32.45	13.16	4.61	1.63	Y	5	3	3	15	1
DfSh	15	349		2	50.34	16.55	5.42	3.54	Y	5	5	3	15	1
DfSh	15	320		2	39.85	18.88	6.32	3.27	N	5	5	3	15	1
DfSh	15	537		4	99.67	29.67	7.74	22.15	Y	5	3	3	20	1
DfSh	15	613		4	29.37	24.32	9.45	7.24	N	5	5	3	18	1
DfSh	15	535		4	50.32	17.85	5.87	4.82	Y	5	5,4	3	18	1
DfSh	15	529		4	22.02	25.81	6.83	4.41	N	5	3	3	30	1
DfSh	15	150		3	46.02	25.19	6.09	4.81	Y	5	5,4	3	1	1
DfSh	15	270		4	49.10	40.00	7.35	10.66	N	5	5,4	3	18	1
DfSh	15	615		4	43.29	22.71	6.60	5.63	N	5	5,4	3	1	1
DfSh	15	132		2	15.04	7.48	4.74	0.55	Y	6	5	3	1	1
DfSh	15	285	9	2	10.25	5.52	2.36	0.12	N	6	5	3	1	1
DfSh	15	275	2	2	15.44	9.35	3.22	0.23	Y	6	5	3	1	1
DfSh	15	124		2	17.58	7.28	6.03	0.71	Y	6	5	3	1	1
DfSh	15	285	13	2	9.85	3.45	1.83	0.03	Y	6	5	3	30	1

Site	Number	Artifact Number	Subnumber	Excavation Unit	Length	Width	Thickness	Weight	Complete (Y/N)	Artifact Type	Technological Typology	Platform	Raw Material	Cortex
DfSh	15	321	5	2	18.12	6.61	5.63	0.57	Y	6	5	3	1	3
DfSh	15	285	26	2	11.23	6.46	4.83	0.33	Y	6	3	3	1	1
DfSh	15	283	2	2	11.53	9.71	2.63	0.19	Y	6	1	3	1	1
DfSh	15	185		2	17.79	5.10	2.67	0.23	Y	6	3,4	3	1	1
DfSh	15	248	6	2	8.77	3.87	2.16	0.09	Y	6	3	3	1	1
DfSh	15	247		2	10.55	6.55	3.79	0.15	Y	6	3	3	1	1
DfSh	15	64		2	21.83	9.90	5.75	1.16	Y	6	5	3	1	1
DfSh	15	316		2	12.13	5.89	3.65	0.28	Y	6	5	3	1	2
DfSh	15	321	2	2	18.04	6.10	4.35	0.49	Y	6	5	3	1	2
DfSh	15	199	7	2	9.90	4.81	3.15	0.15	Y	6	5	3	1	1
DfSh	15	197	64	2	7.92	5.38	2.46	0.08	Y	6	3,4	3	1	1
DfSh	15	274	16	2	7.94	3.61	3.23	0.11	Y	6	3	3	1	1
DfSh	15	293		2	15.69	7.35	3.55	0.28	Y	6	5	1	1	1
DfSh	15	110		2	19.22	13.44	6.83	1.58	Y	6	3,4	3	1	2
DfSh	15	520		4A	20.81	8.35	5.65	0.83	Y	6	2	3	30	3
DfSh	15	319	4	2	10.20	5.78	3.83	0.13	Y	6	3	3	1	1
DfSh	15	190		2	8.05	4.98	1.47	0.02	N	6	3	3	1	1
DfSh	15	197	129	2	6.49	3.36	3.08	0.06	N	6	3	3	1	1
DfSh	15	231		2	5.41	5.41	3.58	0.10	N	6	3	3	1	1
DfSh	15	197	13	2	5.76	3.50	1.66	0.04	Y	6	3	3	1	1
DfSh	15	18		1	14.03	12.67	1.51	0.20	N	6	3	2	11	1
DfSh	15	197	44	2	9.53	3.73	3.92	0.17	Y	6	2	3	1	1
DfSh	15	312	3	2	12.78	5.39	2.96	0.11	Y	6	3	3	1	1
DfSh	15	116		2	14.30	8.72	2.71	0.31	Y	6	3	1	1	1
DfSh	15	249	8	2	9.43	7.19	1.49	0.05	N	6	3	3	1	1
DfSh	15	292		2	39.79	28.78	17.36	19.84	Y	7	3	3	1	3
DfSh	15	271		2	45.95	35.12	14.87	17.88	Y	8	3	3	16	1
DfSh	15	557		4	26.89	24.02	7.93	5.68	N	8	5	3	18	1
DfSh	15	340		4	41.99	30.24	6.67	10.32	Y	9	3	3	9	1
DfSh	15	253		4	35.59	12.19	2.86	1.21	Y	9	3	3	9	1
DfSh	15	305		4	33.74	28.62	3.37	2.79	Y	9	3	3	9	1
DfSh	15	360		4	66.72	38.83	5.73	16.78	Y	9	3	3	9	1
DfSh	15	371		4	51.72	30.21	2.23	4.39	Y	9	3	3	9	1
DfSh	15	372		4	42.98	31.56	2.17	4.02	Y	9	3	3	9	1
DfSh	15	399		4	67.01	28.11	2.89	6.44	Y	9	3	3	9	1
DfSh	15	401		4	67.11	56.40	10.92	46.80	Y	9	3	3	9	1
DfSh	15	404		4	67.27	55.42	9.13	30.31	Y	9	3	3	9	1
DfSh	15	406		4	39.68	20.51	1.96	1.66	Y	9	3	3	9	1
DfSh	15	414		4	74.07	35.77	6.24	17.22	Y	9	3	3	9	1
DfSh	15	415		4	59.55	32.51	4.63	11.23	Y	9	3	3	9	1
DfSh	15	427		4	42.48	34.66	2.33	5.71	Y	9	3	3	9	1
DfSh	15	530		4	78.79	45.73	8.05	25.35	Y	9	3	3	9	1
DfSh	15	608		4	79.37	64.57	4.32	26.84	Y	9	3	3	9	1
DfSh	15	298		4	51.29	33.31	6.80	16.85	N	9	3	3	9	3
DfSh	15	378		3	79.94	56.02	23.31	149.13	Y	11	5	3	15	5
DfSh	15	283	1	2	12.19	9.94	1.47	0.11	Y	12	1	3	1	4