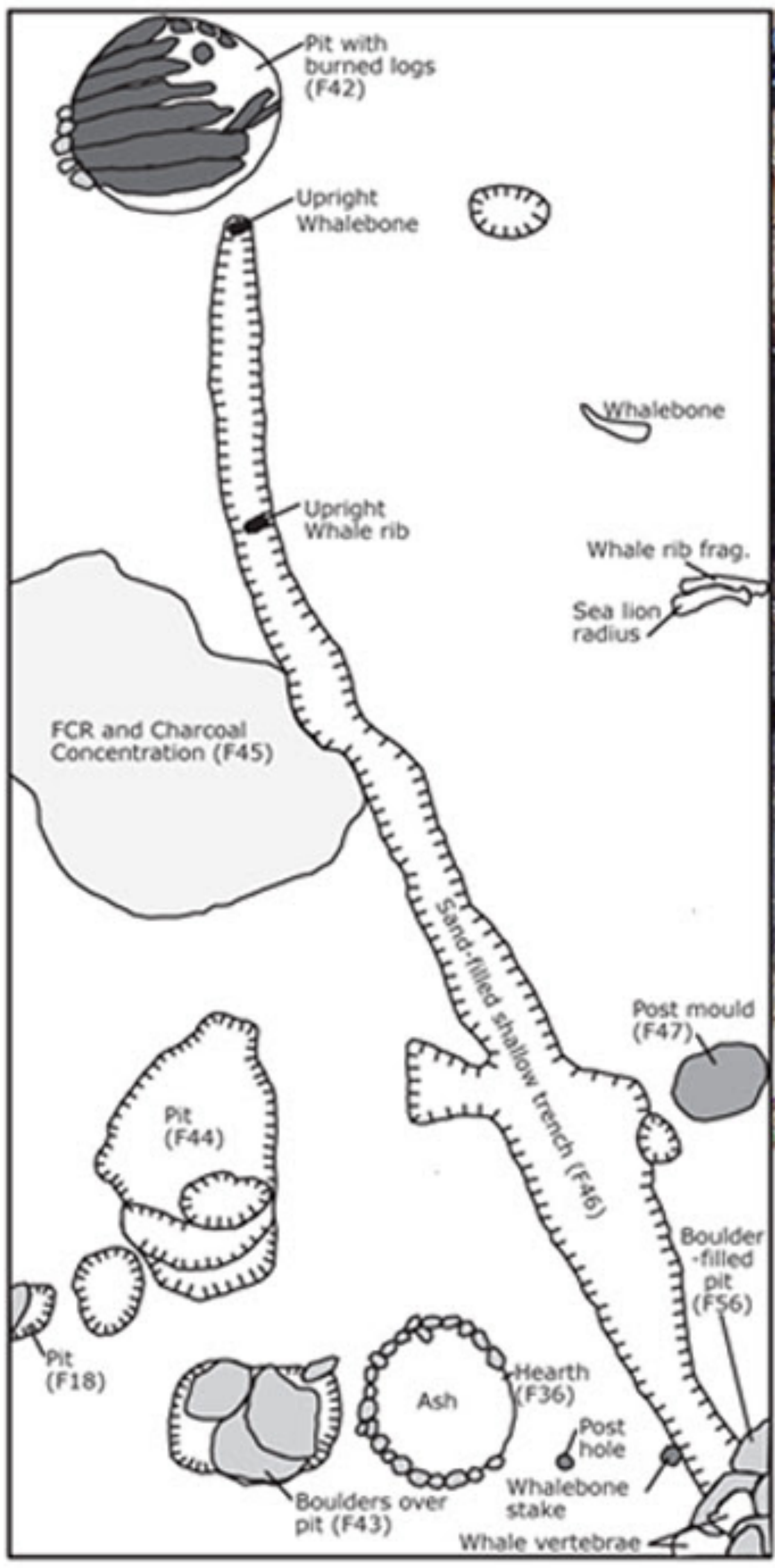
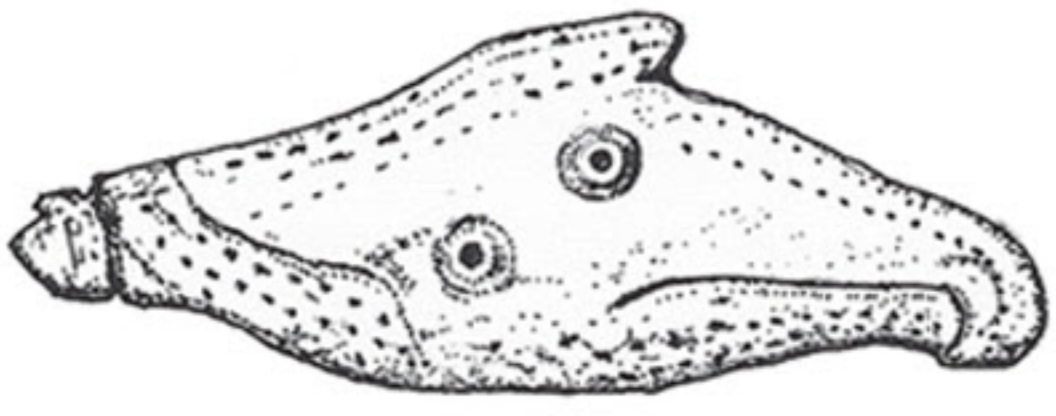
Huu7ii: Household Archaeology at a Nuu-chah-nulth Village Site in Barkley Sound





Alan D. McMillan and Denis E. St. Claire

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Cover design: The salmon design along the top of the cover is by Nuu-chah-nulth artist Patrick Amos (used with his permission). This design served as a logo for the Huu-ay-aht Salmon Festival during the fieldwork reported here.

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Acknowledgements

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The project accomplishments were due to the capable and hard-working crew, particularly the experienced field supervisors who provided guidance to a primarily novice team. In addition to the two project directors (Alan McMillan and Denis St. Claire), the 2004 senior crew consisted of George Kaufmann, Iain McKechnie, Nicole Smith, Darryl Kirsch, and Alex Clark. The 2006 supervisors were George Kaufmann, Iain McKechnie, Darryl Kirsch, Alex Clark, Beth Weathers, and Jon Hall. Darryl Kirsch served a double role, ably handling the demanding job of senior camp cook as well as his excavation duties, as did Alex Clark, who was in charge of carpentry and boat maintenance among other tasks.

The project was designed to include employment and archaeological training for members of the Huu-ay-aht First Nations. Huu-ay-aht field participants in 2004 were Charlene Nookemus, Judy Johnson, Kerri Dennis, Tala Dennis, Henry Williams, Marlene Williams, Duane Nookemus, Shane Nookemus, Vikky Nookemus, and Alexander Frank. In 2006, they were Arthur Peters, Gabriel Williams, and Candice Clappis.

In the second field season, we were fortunate to play host to the University of Victoria archaeological field school, taught by Nicole Smith. Fifteen students participated in the excavation at Huu7ii as part of the field school. We thank Quentin Mackie (Department of Anthropology, University of Victoria) for facilitating the arrangements (and for spending several days on the project to observe the students in action).

A constantly changing roster of volunteers swelled the number of fieldworkers and added greatly to what the project was able to accomplish. In total, 45 individuals contributed their time and labour, some for only a few days whereas others stayed for lengthy periods over the two field seasons. Although they are too numerous to list individually, their efforts are no less appreciated. Ian Sumpter, formerly of Parks Canada, deserves special note as he participated in this project (as well as our other work in Barkley Sound) for both seasons and did the shell analysis for the site. Ted Knowles, our "handyman extraordinaire," should also be singled out for the considerable amount of time he spent on the site over the two seasons and for his contributions to keeping the camp running smoothly.

Al Mackie has been instrumental in this project from the beginning. He initially recorded the site and mapped the house platforms in 1984 (and kindly allowed us to use that map in this report). He accompanied the directors out to the site for an initial discussion of field strategies in 2003. As Project Officer at the Archaeology Branch, he greatly assisted with matters involving the provincial excavation permit. He also managed to visit the site for several days during excavation.

Various other individuals contributed in diverse ways. Iain McKechnie took a major role in the collection of faunal remains in the field, did the analysis of the column sample fauna, and prepared several of the maps and profiles. Other maps and profiles are the work of Brian McMillan. Gay Frederick did the main analysis of the faunal remains from the site, Ian Sumpter did the shell analysis, and Beth Weathers examined the matrix samples for paleoethnobotanical evidence. Marlow Pellatt (Parks Canada) spent several days at the site to collect core samples from a bog and wrote up the pollen results for this report. Ursula Arndt and Dongya Yang (Simon Fraser University) examined the ancient DNA from selected whalebones for species identification. Michael Wilson (Douglas College) kindly examined the stone artifacts from Huu7ii, identifying lithic types and possible sources. Warren Sookocheff and Mike Perdue, students in a "Temperate Rainforest Ecology" course at Bamfield Marine Sciences Centre, spent several days in camp while conducting dendrochronological studies on large trees that had grown on the site. Ann Stewart at the Bamfield Marine Sciences Centre kindly organized the use of several large skiffs and their operators during camp set-up and dismantling. We are indebted to them all.

For their work in the production of this volume, we thank Cheryl Takahashi (Takahashi Design) and Roy Carlson (Archaeology Press, Department of Archaeology, Simon Fraser University).

Transcription of Nuu-chah-nulth Terms

Throughout this report, but particularly in the ethnographic section (Chapter 2), an effort was made to include the Nuu-chah-nulth names for places and social groups, as well as other Nuu-chah-nulth terms. Nuu-chah-nulth words are generally shown in italics throughout (although the two major sites dealt with in this report, Huu7ii and Kiix7in, are exceptions). They are rendered in the practical orthography developed by Randy Bouchard of the B.C. Indian Language Project, Victoria (see Bouchard 1982). A major advantage of this writing system is that all symbols are available on a standard keyboard. The symbol "7" represents a glottal stop (or "catch in the throat"). An apostrophe indicates that the preceding sound is "strongly exploded" (glottalized). Underlining indicates that the sound is produced toward the back of the mouth. Doubling of vowels lengthens the sound. This orthography differs from the system used earlier by Edward Sapir (e.g., Sapir and Swadesh 1955) and that used by Eugene Arima in preparing the narratives collected by Sapir (e.g., Sapir et al. 2004, 2009). For consistency, where such terms occur here in quotations, the present spelling is substituted.

Names for Nuu-chah-nulth political and residential units generally end in "–7ath," meaning "people of." The Huu-ay-aht (*Huu7ii7ath*) are literally "the people of Huu7ii." The phonetic rendering of *Huu7ii7ath* is used throughout this report to refer to the pre-amalgamation local group that was based at Huu7ii. Huu-ay-aht, the spelling in common use today, is applied to the later amalgamated political unit and the modern First Nation.

Chapter One:
INTRODUCTION: THE SITE AND THE PROJECT

Huu7ii (DfSh-7)

The major village site of Huu7ii is the centre of the traditional territory of the *Huu7ii7ath* local group, one of the formerly independent political units that amalgamated to form the modern Huu-ay-aht First Nations (St. Claire 1991; Chapter 2). It is located on the northeast shore of Diana Island, a short distance from the modern community of Bamfield (Fig. 1-1). Diana is one of a chain of islands known as the Deer Group, which extends along the eastern edge of Barkley Sound (Fig. 1-2). The Deer Group islands and the adjacent eastern shoreline of Barkley Sound fall within the asserted traditional territory of the Huu-ay-aht First Nations today.

The archaeological site evident at this former village location extends for about 300 m in an east-west direction, from just past a small stream at the western end to a high rock ridge that marks the eastern edge. The area is largely open today, covered by ferns, hemlock seedlings, and scattered large trees. Evidence of recent camping is evident at various points on the site surface. Shell midden deposits marking the earlier village were discerned by probing across this area during the initial site recording in 1984. Toward the back, a row of fairly distinct house platforms extends across most of the site. At least ten, and perhaps 12, houses once stood in this area (Fig. 1-3; Mackie and Williamson 2003). A substantial back midden ridge, ranging up to two metres in height, extends the length of the site along the rear of the houses. Toward the eastern end of the site, a segment of another, presumably older, back ridge stands behind the first. Several of the house locations are quite well demarcated by narrow side midden ridges extending out at right angles from the back ridge, gradually ta-

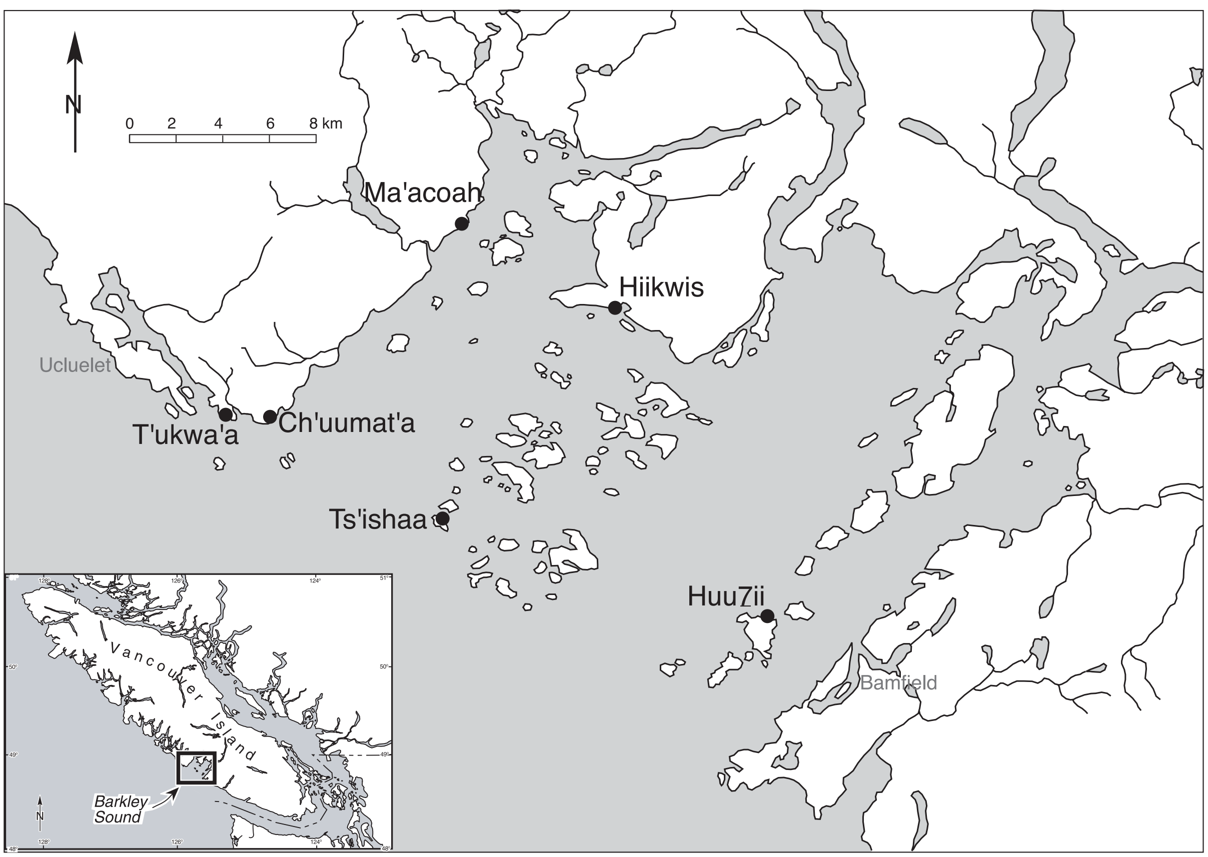

Figure 1-1. Map of Barkley Sound, showing location of Huu7ii on Diana Island and other major excavated sites discussed in the text.

Figure 1-2. In Huu-ay-aht territory (east side of Barkley Sound south of the entrance to Bamfield Inlet, looking across to Diana Island on left).

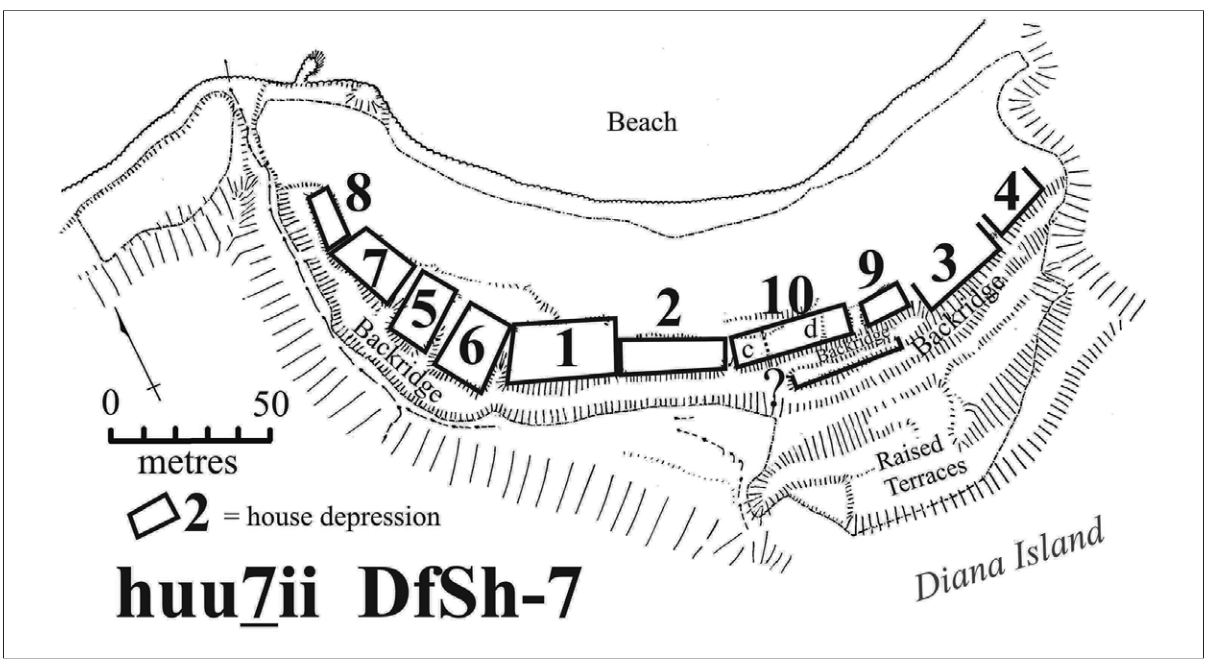

Figure 1-3. Map of Huu7ii showing house platforms visible on the surface, the back midden ridge behind the houses, and the raised terrace at the back of the site (as recorded by Al Mackie and Laurie Williamson in 1984; map courtesy of Al Mackie).

pering off toward the beach. Between these ridges are the level house floors. The fronts of the houses are more difficult to discern, although some have a clear front edge where the floor has been built up (Mackie and Williamson 2003:110). The largest of these houses, designated House I by Mackie and Williamson (2003), was about 35 m in length and 17 m in width, as indicated by the surface evidence. No posts or other structural traces remain. The back ridge behind this house location marks the inland limit of the site, beyond which the land drops off to a low swampy area, with a seasonal freshwater creek running behind the midden ridge to the beach near the western end of the site (Fig. 1-3).

The house platforms are located a considerable distance back from the modern beach, behind a lower area of discontinuous deposits. This differs from most recent village sites, at which houses tend to be located in immediate proximity to the beach. From the initial recording of this site, it was suspected that when the village was occupied the houses were closer to the beach and the low-lying area in front of the house platforms today had formed as a result of gradual uplift of the land due to on-going tectonic forces (Hutchinson 1992). The presence of two back midden ridges, and possible locations of several earlier structures behind the main row, may indicate at least one period of rebuilding the houses closer to the beach as a result of this process (Mackie and Williamson 2003). This evidence of geological uplift, plus the presence of large mature trees on some house platforms, indicated that the site had not been occupied in recent times, even before radiocarbon dates became available through excavation.

Evidence for an even earlier occupation came from an elevated terrace at the back of the site, toward the eastern end, separated from the rest of the site by a drop-off behind the rear midden ridge (Fig. 1-3). Shell midden deposits extend out over this terrace, which has several flat areas and measures roughly 90 m by 40 m. It is about 3 m above the level of the house platforms and about 9 m above modern mean sea level (marked by the barnacle line on the beach). This portion of the site appears to have been occupied at a time of higher relative sea levels. A low swampy area behind this terrace appears to have been a former marine channel extending to the east. When occupied, this portion of the site may have faced onto this marine channel, rather than the present beach to the north. Evidence of an earlier (mid-Holocene) occupation was confirmed through excavation, as is discussed later in this report (Chapter 5).

Origins of the Project

The Huu-ay-aht Archaeological Project originated in discussions held in the summer of 2002. Stella Peters, a member of the Huu-ay-aht First Nations Council, and Denis St. Claire were both participants in the Kiix7in Village Mapping and Dating Project in August of that year. Kiix7in, a Huu-ay-aht heritage village site that has unique standing house remains (Huu-ay-aht First Nations 2000), was declared a Canadian National Historic Site in 2001. Huu-ay-aht site development plans included trails, educational tours and the construction of an Interpretation Centre. In discussions as to what such a centre could contain, St. Claire suggested that an archaeological excavation to examine the subsurficial deposits would complement the detailed data already accumulated on the visible house structure remnants and would provide visitors a broader understanding of the village and past lifeways of the Huu-ay-aht. However, because of the fragile condition of the posts and beams of the remaining house structures, it would not be appropriate to excavate in the main part of the village site. An alternate Huu-ay-aht heritage village, Huu7ii on Diana Island, was suggested as a suitable substitute for Kiix7in. Huu7ii has clearly visible house platforms and was once a major village at least the size of Kiix7in. Its former importance is demonstrated in the name Huu7ii, from which the *Huu7ii7ath* (Huu-ay-aht) take their name. An excavation at Huu7ii could be focused in one of the house areas to recover data that might be comparable to what could be found in the Kiix7in deposits. The recovered materials could then become an important part of any future Huu-ay-aht Interpretation Centre displays.

Stella Peters presented a project proposal prepared by St. Claire to her fellow Huu-ay-aht Council members in the winter of 2002–2003. In March of 2003 further discussions were held between Robert Dennis, then Chief Councillor of the Huu-ay-aht First Nations, and St. Claire to finalize a budget and refine the project parameters. All research was entirely funded by the Huu-ay-aht First Nations. The project was designed to provide employment and training in archaeological fieldwork for members of the Huu-ay-aht community (Figs. 1-4, 1-5, 1-6). In April of 2003, senior researchers associated with the project (Denis St. Claire, Alan McMillan, Gay Frederick, Ian Sumpter, and Al Mackie) travelled to Huu7ii to plan strategies for excavation at the site and analysis of the recovered data.

Figure 1-4. Huu-ay-aht crew members, 2004 (from left: Marlene Williams, Charlene Nookemus, Judy Johnson, Henry Williams, Tala Dennis, Kerri Dennis, Duane Nookemus; Holly Johnson (volunteer) in front).

Figure 1-5. Huu-ay-aht crew members, 2006 (from left: Arthur Peters, Candice Clappis, Gabriel [Hip] Williams).

Figure 1-6. George Kaufmann, one of the senior supervisory crew, provides instruction on excavation and recording to Marlene Williams (left) and Tala Dennis (right), 2004.

Fieldwork for the Huu-ay-aht Archaeological Project began in late June of 2004, when the project co-directors (Alan McMillan and Denis St. Claire) and senior crew arrived on site to set up the excavation grid and prepare camp. Excavation with the full crew began in early July and extended for seven weeks. A considerable number of volunteers joined the professional staff and Huu-ay-aht employees throughout that time, greatly adding to what the project was able to achieve. Crew size ranged up to 24 people and a total of 40 individuals took part at some point during the project. Excavation that season was restricted to the southwest corner of House 1, plus one unit on the elevated terrace behind the main site.

Continued Huu-ay-aht interest in the project and provision of additional funding led to another field season in the summer of 2006. Negotiations with the University of Victoria resulted in that institution holding its six-week field school (taught by Nicole Smith) on the site. In all, the project ran for eight weeks in that summer, with a fluctuating but often large crew consisting of professional staff, Huu-ay-aht employees, field school students, and volunteers. At the height of the project, crew size reached 36 people, and a total of 54 people participated at various points in the excavation. With this large crew, a substantial portion of the House 1 floor could be exposed and an additional unit could be dug on the elevated terrace behind the house platforms. This report presents the results of that work over the two field seasons.

The Natural Setting

The islands and shoreline of Barkley Sound fall within the Estevan Coastal Plain, a comparatively low-lying strip of outer coast immediately backed by the rugged topography of the Vancouver Island Range (Holland 1964). The sound itself has been glacially scoured, as Pleistocene ice sheets advanced down the major inlets (such as Alberni and Effingham) and out onto the continental shelf. Holland (1964:20) characterizes the geology of this area as "folded and faulted sedimentary and volcanic rocks." Volcanic rocks such as andesites and basalts predominate, with Tertiary sandstones along the coastal plain overlain with unconsolidated Pleistocene glacial deposits (Carter 1973; Wilson 2005). The land is thickly covered with the predominantly coniferous forests of the Coastal Western Hemlock biogeoclimatic zone (Krajina 1969; Meidinger and Pojar 1991; British Columbia Ministry of Forests 1999), with the principal species being Western hemlock (*Tsuga heterophylla*), Western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), and Sitka spruce (*Picea sitchensis*).

The lush forest cover is sustained by the rainy climate, with an average annual precipitation of about 300 cm. Winters are relatively warm and wet, with much of the annual rainfall occurring during that time. Snowfall occurs only about seven or eight days a year. Table 1-1 summarizes recent climatic data for Huu-ay-aht territory, based on stations at Bamfield East (in Bamfield Inlet at the eastern edge of Barkley Sound) and Pachena Point (on the outer coast southeast of Cape Beale, which marks the entrance to the sound).

Two major clusters of islands lie within Barkley Sound. The numerous islands of the Broken Group occupy the central portion of the sound, while those of the Deer Group are located near the eastern shore. The Deer Group consists of about 15 islands, varying greatly in size, with additional small islets and exposed rocks. This island cluster provided protected village locations and diversified habitats that supported a range of fauna. Huu7ii is on Diana Island, toward the southern end of the Deer Group and near the entrance to Bamfield Inlet (Figs. 1-1, 1-2). Diana is a relatively small island, roughly triangular in shape, extending just over 2 km north to south and about 1.8 km across its northern end. Much of the southern portion of the island, as well as the northwest corner, is held by the Huu-ay-aht as reserve land, but the northeastern portion of the island, where Huu7ii is located, is not.

Offshore from Barkley Sound lies the La Perouse Bank, with its abundance of marine life. Coastal upwelling across the bank brings deep nutrient-rich water upward to the surface layer, supporting a great concentration of plankton (Thomson 1981:83; Allen et al. 2001). This provides food for large numbers of fish and sea mammals. The resultant high biomass made this area highly productive for Nuu-chah-nulth fishing, sealing, and whaling. When the reserve commissioner laid out reserves for the Huu-ay-aht in the late 19th century, he included several outer coast seasonal villages that were highly valued for their access to the offshore fishing grounds, particularly for halibut (O'Reilly 1883).

Numerous species of fish, bird, sea mammal, and shellfish would have been available within a short distance of major villages in Barkley Sound. A survey of the birds found in Pacific Rim National Park, including both seasonal visitors and permanent residents, lists 247 species (Hatler, Campbell, and Dorst 1978). Economically important bird species include a variety of ducks, geese, grebes, mergansers, cormorants, and gulls. The waters of Barkley Sound and the offshore banks provided an abundant and varied supply of fish, including halibut (*Hippoglossus stenolepis*), cod (*Gadus macrocephalus*), lingcod (*Ophiodon elongatus*), rockfish (*Sebastes* spp.), herring (*Clupea harengus pallasi*), dogfish (*Squalus acanthius*), and salmon (*Oncorhynchus* spp.). The waters also provided access to a variety of sea mammals, including Stellar or northern sea lion (*Eumetopias jubata*), California sea lion (*Zalophus californianus*), northern fur seal (*Callorhinus ursinus*), harbour seal (*Phoca vitulina*), sea otter (*Enhydra lutris*), and a number of cetaceans, the most important of which were the humpback whale (*Megaptera novaeangliae*), grey whale (*Eschrichtius robustus*), and Pacific harbour porpoise (*Phocoena phocoena*).

Table 1-1. Modern climatic data, Huu-ay-aht Territory (Source: Environment Canada 1993). (Figures refer to the averages from 1961 to 1990.)

	Bamfield East	Pachena Point
mean January temperature	4.4°C	4.7°C
mean August temperature	14.5°C	13.7°C
mean annual temperature	9.1°C	9.0°C
minimum recorded temperature	–10.6°C	–15.6°C
maximum recorded temperature	32.8°C	31.7°C
mean annual precipitation	287.6 cm	310.2 cm
days per year with precipitation	193	210
days per year with snowfall	7	8

Land mammals, on the other hand, were uncommon in this island environment, with only the coast deer (*Odocoileus hemionus columbianus*) being important in the diet, although bear (*Ursus americanus vancouveri*) and elk (*Cervus elaphus roosevelti*) could have been obtained from the nearby shores of Barkley Sound. Plant food resources were also limited in this island setting, although a wide range of berries and other edible plants would have been available in the broader Barkley Sound region. A range of intertidal invertebrates, including several species of clams, mussels, scallops, barnacles, chitons, and sea urchins, also played a vital role in the local economy (Sumpter 2005).

Previous Archaeological Work

Relatively few large-scale archaeological projects, involving extensive excavation, have taken place in Nuu-chah-nulth territory along western Vancouver Island (see McMillan 1999 for review). Until recently, our understanding of the ancient Nuu-chah-nulth past came primarily from Yuquot, the major village of the Mowachaht people of Nootka Sound, and several sites in Hesquiaht territory, in Hesquiat Harbour. A large excavation unit dug at Yuquot (DjSp-1) revealed deep and continuous deposits, documenting the evolution of Nuu-chah-nulth culture from about 4700 cal BP into modern times (Dewhirst 1978, 1980). The Hesquiaht sites are more recent, spanning the past 1,200 years. Frederick (Calvert 1980) provided a detailed study of the faunal remains from three major Hesquiaht sites, while Haggarty (1982) examined the artifacts.

At the same time as these projects, a major long-term excavation was occurring at Ozette, the southernmost Makah village on the outer shore of the Olympic Peninsula. At that location, waterlogged deposits sealed under the mud of an ancient slide had preserved the crushed but intact remains of houses and their contents, providing an unparalleled glimpse into Northwest Coast village life just prior to contact with Europeans. The numerous small bone and stone objects recovered from midden sites elsewhere were found here as parts of composite tools, intact with the wooden and bark components. As the Makah are closely related to the Nuu-chah-nulth socially and culturally, the Ozette discoveries provided extremely valuable insights for interpreting archaeological remains from western Vancouver Island.

Mitchell's (1990) important synthesis of archaeological knowledge for Nuu-chah-nulth territory was based mainly on excavated data from Yuquot and Hesquiat Village, at that time the only major archaeological projects on the west coast of Vancouver Island. Mitchell defined the West Coast culture type, viewing it as the archaeological traces of evolving Nuu-chah-nulth culture (see also McMillan 1998a). Claims for lengthy continuity at Yuquot led Mitchell to propose that Nuu-chah-nulth precontact history could be encompassed within a single culture type. Distinguishing features of this culture type, defined almost entirely in terms of artifacts, consist of bone points and bipoints, barbed bone points and harpoon heads, large and small composite toggling harpoon valves of bone or antler, bone splinter awls, stone and bone fishhook shanks, bark beaters and shredders of whalebone, and mussel shell celts and knives (Mitchell 1990:356). The rarity or absence of flaked stone tools and flaking detritus is also seen as an identifying trait. In fact, stone implements in general are rare, with the exception of the numerous abrasive stones that played an important role in shaping tools of other materials. According to Mitchell (1990:357),

> the archaeological assemblages are so like described Nootkan [Nuu-chah-nulth] material culture that a lengthy reconstruction of the technology is not necessary. There are artifacts interpretable as whale, small sea mammal, and salmon harpoons; parts of composite fishhooks; knives suitable for butchering salmon or herring or for preparing other fish and foods; woodworking tools; and tools for shaping the numerous bone implements … These tools are represented even in the [earliest] levels at Yuquot Village.

Barkley Sound received little detailed archaeological attention until relatively recently. An early, but very small, excavation took place in Huu-ay-aht territory, at Aguilar Point, in 1968 (Buxton 1969). Aguilar Point (DfSg-3) is a defensive earthwork atop a rocky promontory at the entrance to Bamfield Inlet. Although few items of material culture were recovered during the limited excavation, two radiocarbon dates suggest that people were living there about 1,200 years ago and that the defensive ditch was dug through earlier midden deposits about 700 years ago (Buxton 1969:29).

Much more extensive excavation was carried out in 1973 and 1974 at the Shoemaker Bay site (DhSe-2), at the head of the long Alberni Inlet that extends north from Barkley Sound (McMillan and St. Claire 1982). Although a large assemblage of artifacts and faunal remains was recovered and analyzed, this all appears to predate the late Nuu-chah-nulth occupation of the Alberni Valley (Drucker 1951:5; McMillan and St. Claire 1982; St. Claire 1991:79-81). Following that fieldwork, the directors turned in 1975 to a survey of archaeological sites from the Alberni Valley to Barkley Sound (St. Claire 1975; McMillan and St. Claire 1977, 1982). Given the huge area covered, small crew, and short time, the survey concentrated on the most visible archaeological sites.

Two detailed, intensive survey and mapping programs were conducted in portions of Barkley Sound in the 1980s. The Pacific Rim Project involved systematic site survey throughout Pacific Rim National Park Reserve between 1982 and 1984. This survey covered the three units of the Park: the Long Beach area, the islands of the Broken Group, and the West Coast trail, the latter including the outer coast portion of Huu-ay-aht territory (Haggarty and Inglis 1985; Inglis and Haggarty 1986). These surveys substantially increased the number of known Nuu-chah-nulth heritage sites in the Barkley Sound area. For example, 163 sites were recorded in the Broken Group islands alone, of which shell middens, marking the locations of former villages or camps, comprise almost half. In 1984, the Ohiaht (the former spelling of Huu-ay-aht) Ethnoarchaeological Project involved a detailed inventory of a portion of Huu-ay-aht territory, including Bamfield Inlet and the adjacent eastern coastline of the sound, along with the closest Deer Group islands, including Diana (Mackie and Williamson 2003). The village of Huu7ii was recorded and sketch mapped, and the house features plotted and described, as part of that project.

A number of archaeological excavation projects occurred in Barkley Sound in the 1990s. In Huu-ay-aht territory, the ethnographic village of *7uuts'uu7a* (DfSg-2), located below the defensive earthwork at Aguilar Point, received minor testing (Coates and Eldridge 1992). The few artifacts consist primarily of bone points and bipoints; among the relatively abundant faunal remains, fur seals and sea lions dominate the mammals and salmon comprise most of the fish. In the territory of the Ucluelet First Nation, a small excavation at the Little Beach site (DfSj-100) near Ucluelet exposed a burial location that had been used between about 4500 and 2500 cal BP (Arcas Consulting Archeologists 1991). Distinctive stone tools from this site show closest resemblance to the earliest occupation at Shoemaker Bay, which is at least partially contemporaneous. Across Ucluelet Inlet, on the Ucluelet reserve, a small excavation into a deep shell midden deposit at Ittatsoo North (DfSj-40) demonstrated human occupation for at least 2,300 years (Arcas Consulting Archeologists 1998). At that site, the primarily bone artifacts resemble implements of the later West Coast culture type. Fish, particularly lingcod and rockfish, dominate the faunal assemblage, along with sea mammals, particularly fur seal.

Large-scale excavation in Barkley Sound began with the Toquaht Archaeological Project, involving fieldwork between 1991 and 1996. Intensive survey and mapping of sites in Toquaht traditional territory in the western sound was accompanied by excavation at three major villages and two smaller sites, revealing a lengthy period of occupation (McMillan and St. Claire 1992, 1996; McMillan 1999). The largest of the excavated sites is T'ukw'aa (DfSj-23), the major traditional village of the Toquaht (*T'ukw'aa7at<u>h</u>*) people and the place from which they derive their name. Extensive excavation, at both the main village and on top of an adjacent headland that served as a defensive location, uncovered almost 1,500 artifacts and a large quantity of faunal remains. A series of radiocarbon dates indicates that this site was first occupied about 1,200 years ago and continued in use until the early twentieth century. A nearby site, Ch'uumat'a (DfSi-4), with even deeper deposits (slightly over four metres at the back of the site), was excavated in an attempt to extend this sequence further back in time. Deposits at this site spanned the period from about 4600 cal BP to early historic times. About 750 artifacts, plus a large quantity of faunal remains, were recovered. Chipped stone tools and several other distinctive artifact types were found only in the older deposits, leading to the suggestion of a possible cultural break just over 2,000 years ago (McMillan 1998b). Less extensive excavations took place at Ma'acoah (*Ma7a<u>k</u>wuu7a;* DfSi-5), the ethnographic winter village of the Toquaht. A date of 1800 BP was obtained from the base of the site, but most of the cultural remains recovered are associated with a later date of about 600 BP (McMillan 1999:74; Monks 2006). Monks (2006) has recently reported on the faunal remains from Ma'acoah. Two elevated lookout or defensive sites (DfSj-29 and -30) on rocky islets in the George Fraser Islands, at the entrance to Ucluelet Inlet, have also received minor testing. The three Toquaht village locations are shown on Figure 1-1.

Major archaeological research in Barkley Sound continued with the Tseshaht Archaeological Project, from 1999 to 2001 (McMillan and St. Claire 2005). Excavation was centred on the major village of Ts'ishaa (DfSi-16; Fig. 1-1) and the neighbouring site of Himayis (DfSi-17). Ts'ishaa was the principal village of the Tseshaht (*Ts'ishaa7ath̲*) people in their oral histories and the site from which they take their name. Creation stories specify this as the location where the Tseshaht came into being (Sapir and Swadesh 1955:52–53). Excavation at the main village site yielded a total of 736 artifacts and a great quantity of faunal remains, a large sample of which has been analyzed to reveal a picture of past lifeways (Frederick and Crockford 2005; McKechnie 2005a, 2005b; McMillan et al. 2008; Sumpter 2005). The people who lived at Ts'ishaa exploited a wide range of resources in the immediate vicinity of their outer island home. California mussel was a major part of their diet, as is evident in the huge shell midden that accumulated at the village. Fishing was clearly a paramount activity, with the faunal assemblage dominated by rockfish and other fish species that were readily available off the rocky shores. The artifacts confirm this reliance on fishing in the culture, as the most numerous implements are small bone points and bipoints, almost all of which were parts of composite fishing gear. Oral histories tell of the great whalers who once lived at Ts'ishaa, and the archaeological evidence confirms the importance of whaling. Not only was whalebone abundant in the midden, but the presence of a still-embedded mussel shell harpoon cutting blade in the back of a humpback whale skull demonstrates that active whaling was taking place in Barkley Sound over 500 years ago. The maritime lifeways of the people of Ts'ishaa are also affirmed by the abundance of other sea mammal remains. Fur seals were a major part of the diet, as is the case at almost all excavated Nuu-chah-nulth village sites (McMillan 1999:140; Crockford et al. 2002), and abundant remains of several species of porpoise and dolphin indicate that the people of Ts'ishaa had well-developed maritime hunting skills and technology. Radiocarbon dates show that the main village deposits span the last two millennia.

Earlier deposits were identified on a back terrace behind the main village at Ts'ishaa. Like the back terrace at Huu7̲ii, this was an area that had been occupied at a time of higher sea levels, when the main village area was an active inter-tidal zone. A series of radiocarbon dates places this occupation from roughly 3000 to 5000 cal BP. Stone tools, many of which were chipped to shape, dominate the artifact assemblage. This is in marked contrast to the later village site, as well as the more general West Coast culture type. Closest parallels are with Little Beach and the lower levels at Ch'uumat'a, as well as with Shoemaker Bay I, at the head of Alberni Inlet (McMillan and St. Claire 1982). Cultural differences between these earlier components and the later village sites are unexplained, but the arrival of a new population in Barkley Sound just over 2,000 years ago is one possibility (McMillan 1998b, 2003a).

More recent work (2008 to 2010) in Tseshaht territory involves excavation at the two adjacent sites of Ukwatis (DfSh-15) and Hiikwis (DfSh-16) along Sechart Channel in the upper sound (Fig. 1-1). Large traditional plank houses once stood at both sites, as is evidenced by flat platforms and a back midden ridge at Ukwatis, and flat platforms, post remnants and a fallen beam at Hiikwis. Abundant recent historic materials document use of both sites well into the 20th century. Radiocarbon dates from the base of the front platform at Hiikwis show initial use by at least 800 years ago, while a date from the base of a rear platform indicates human occupation by about 1,200 years ago. Similar dates came from Ukwatis, where the front platform was in use by about 1,300 years ago. However, additional archaeological deposits were located well back into the modern forest behind the main site at Ukwatis, corresponding to times of higher sea level. Dates from the bottom of this deposit show human presence by at least 2,800 years ago, while a date of about 2,000 years from the upper layers indicates when this portion of the site was no longer occupied as people followed the retreating sea levels to their present position.

In Huu-ay-aht territory, the ethnographic village of Kiix7in (DeSh-1) and its associated bluff-top fortress (DeSh-2), on the eastern Barkley Sound shoreline near the entrance to Bamfield Inlet, have been the focus of recent archaeological attention. The location's nomination as a National Historic Site led to detailed examination and mapping of surface remains, including standing structural elements (Huu-ay-aht First Nations 2000; Mackie and Williamson 2003). Remains of at least ten houses are evident at the site, of which eight are traditional longhouses with standing frames or architectural elements visible on the surface (Fig. 1-7). Dendroarchaeological analysis of surviving posts and beams dates the visible house remains to the early and mid-19th century (Smith et al. 2005). Coring of the archaeological deposits around the standing structures revealed

Figure 1-7. Standing wooden architectural remains at Kiix7in. This entrance framework at the front of a large house once supported a central gable beam.

evidence of earlier, pre-European occupation. Charcoal obtained from a house location at one end of the site provided an age estimate of 540 to 480 cal BP, while two more recent dates came from the central portion of the village (Sumpter 2003:18). An older date of 960 to 670 cal BP comes from atop the fortress, suggesting that the village would also have been in use at that time. At the end of the village closest to the fortress, a sample taken from the base of a deep midden deposit on an apparent raised landform yielded a date of 5320 to 5050 cal BP (Sumpter et al. 2002; Sumpter 2003:18). This early date is contemporaneous with the oldest excavated materials from the back terrace at Ts'ishaa, and is only slightly earlier than the dates from the Huu7ii back terrace. As is discussed earlier in this chapter, the Huu-ay-aht desire to see further research into their heritage following the investigations at Kiix7in led directly to the work of the Huu-ay-aht Archaeological Project at Huu7ii, the results of which are reported here.

Chapter Two:
HUU-AY-AHT ETHNOGRAPHY AND HISTORY

Nuu-chah-nulth Political and Social Units

The basic social, political, and economic unit in Nuu-chah-nulth culture was the local group. As Drucker (1951:220) described it: "The fundamental Nootkan political unit was a local group centering in a family of chiefs who owned territorial rights, houses, and various other privileges. Such a group bore a name, usually that of their "place"…or sometimes that of a chief; and had a tradition, firmly believed, of descent from a common ancestor." Similarly, Kenyon (1980:84) stated: "The Nootka local group was conceived of as an idealized family, expanded over time, which owned a distinct territory and shared common ceremonial and ritual property." Each local group was composed of a number of subgroups known as *ushtaḵimilh*, representing different descent lines from the original founding ancestor. Each *ushtaḵimilh* had its own chief and its own house or houses within the local group village. The senior line of descent held the highest status and its hereditary leader was the *taayi ẖawilh* (head chief) of the entire local group (St. Claire 1991:22; McMillan and St. Claire 2005:9).

Head chiefs, who often held high-status titles that stemmed from the original ancestor, were the owners and custodians of all group property, including its territorial holdings (*ẖaẖuulhi*). Nuu-chah-nulth chief Richard Atleo (2004:80–81) described the concept of *ẖaẖuulhi* as extending to "the traditional territories, mountains, lakes, streams, rivers, and foreshore and offshore fishing grounds owned by *hawilh* (chiefs)." Chiefs also held various *tupaati*, hereditary privileges, that were essential to chiefly status (Huu-ay-aht First Nations 2000:50). These had to be established and maintained through public presentation. Songs, carvings, painted screens, or any other hereditary rights could signify chiefly status during ceremonies (Sapir and Swadesh 1955:3).

Ethnographers have described Nuu-chah-nulth social structure, residence patterns, and seasonal movement in considerable detail. Drucker's major study, which focuses on the more northerly Nuu-chah-nulth, describes the union of local groups to form tribal units sharing a common winter village, and the joining of several such tribes to form confederacies, which came together at a summer village (Drucker 1951:220). Such a hierarchical structure, with group composition changing with seasonal moves, was lacking in southern areas, such as Barkley Sound. However, ethnographic studies throughout the Nuu-chah-nulth area describe local group territories of considerable size. These ideally encompassed both "outside" areas, with good access to open coast resources such as sea mammals and halibut, and sheltered "inside" locations near productive salmon rivers (Arima 1983:1; Arima and Dewhirst 1990:394–397; Dewhirst 1978:1–7, 1980:11–15). A fixed pattern of seasonal movement through the group's *ẖaẖuulhi* was necessary to exploit its varied resources. Drucker (1951:59) even expressed doubt that residence in one location could support a Nuu-chah-nulth group.

These ethnographic studies, however, describe a way of life that had been greatly altered through contact with Europeans, beginning in the late 18th century (Inglis and Haggarty 1986; McMillan 1999, 2009; St. Claire 1991, 1998). Archaeological research in Barkley Sound suggests a considerably different pattern for earlier times. An intensive archaeological reconnaissance of the Broken Group Islands in the central sound revealed 15 major village sites, each with deep shell midden deposits (Haggarty and Inglis 1985; Inglis and Haggarty 1986). Such a concentration of major villages in this relatively restricted island cluster is inconsistent with the ethnographic picture of a single political unit following a pattern of seasonal movement. Instead, it suggests that a significant number of independent groups once occupied this archipelago, each holding a relatively small well-defined territory that it managed from a permanent base. The presence of 15 large village locations provides a maximum number of local groups (Haggarty and Inglis 1985:97), although several sites in close proximity can be clustered to give an estimate of perhaps ten such units. Sapir's extensive ethnographic notes (1910–1914), collected early in the 20th century, provide names and historical details of at least five independent local groups holding territories in these islands, prior to the amalgamations that gave rise to the modern Tseshaht First Nation (Inglis and Haggarty 1986; McMillan 1999; McMillan and St. Claire 2005; St. Claire 1991, 1998). At least one additional group, whose name has not survived, also appears to have once occupied these islands (McMillan and St. Claire 2005:15–16; St. Claire 1998:31). A similar pattern existed at the western edge of Barkley Sound, particularly along the Ucluth Peninsula and within Ucluelet Inlet (St. Claire 1991:56–61).

The eastern shore of Barkley Sound, the traditional territory (*h̲ah̲uulhi*) of the Huu-ay-aht First Nations, has been only partially surveyed for archaeological sites (see Chapter 1). However, when the physical evidence of the cultural landscape is added to the surviving ethnographic data, there are strong indications of a similar pattern of independent local groups residing year-round in a principal village from which they took their name. Their territories were relatively small and constrained by the presence of neighbouring groups, requiring only limited movement from each group's major village to exploit the resources of their *h̲ah̲uulhi*. The amalgamation of these local groups, discussed below, gave rise to the modern Huu-ay-aht First Nations and provided a much larger *h̲ah̲uulhi* than was characteristic of the pre-amalgamation groups.

Huu-ay-aht Component Groups and Territories

Modern Huu-ay-aht traditional territory spans the considerable distance from Coleman Creek (*Yashitkuu7a*) on lower Alberni Inlet to their boundary with the Ditidaht on the open coastline of Vancouver Island's west coast. (In the following discussion, the spelling of Huu-ay-aht is used for the amalgamated unit and modern First Nation, whereas the phonetic rendering of *Huu7̲ii7ath̲* is used for the pre-amalgamation local group.) This large territory encompasses what was once land belonging to at least seven autonomous local groups. In 1913, "William," a cultural advisor to Sapir, gave the names of the seven groups and provided details on their original territories (Huu-ay-aht First Nations 2000:60; Inglis and Haggarty 1986:177–179; Sapir 1910–1914, notebook XXIV:7, 7a). Four of these—the *Huu7̲ii7ath̲*, *Kiix7in7ath̲*, *Ch'imaatak̲su7ath̲*, and *7̲Aanak̲tl'a7ath*—gave rise to the modern Huu-ay-aht through amalgamation, whereas the remaining three went extinct and the Huu-ay-aht acquired their lands. The latter groups, all located in the northern portion of Huu-ay-aht territory, consist of the *Yashitkuu7a7ath̲* on the lower eastern shore of Alberni Inlet, the *P'up'uma7̲aa7ath̲* around San Mateo Bay at the eastern entrance to Alberni Inlet, and the *Anak̲shitl7ath̲* at the Sarita River. The four local groups that joined to form the Huu-ay-aht are discussed separately below (Fig. 2-1).

Huu7̲ii7ath̲

The *Huu7̲ii7ath̲* occupied much of the Deer Group islands as their core territory. Their principal village, from which they derived their name, was Huu7̲ii on Diana Island

According to William, their boundary with the *Kiix7in7ath̲* began at *Ts'axts'aa7a*, a point just north of the entrance to Bamfield and Grappler Inlets (Figs. 2-1, 2-2) and extended "out to sea," presumably meaning down Trevor Channel to the open ocean as *Huu7̲ii7ath̲* territory included the southern Deer Group Islands. At some time prior to amalgamation, the *Huu7̲ii7ath̲* local group expanded to the north at the expense of the *Anak̲shitl7ath̲*, whose territory included Sarita River, perhaps the most productive salmon river in Barkley Sound. The *Huu7̲ii7ath̲* wiped out the *Anak̲shitl7ath̲* and seized the land and rich fishery by *his7ukwt* ("obtained by striking"; Sapir 1910–1914, notebook XIII:27a). At that point, *Huu7̲ii7ath̲* territory extended north along the coast to border on the *P'up'uma7aa7ath̲*. As Sapir's notes indicate that the southern extent of *P'up'uma7aa7ath̲* territory was *Cha7aktlim* (Assits Island), the pre-amalgamation *Huu7̲ii7ath̲* lands presumably extended north to that point (Sapir 1910–1914, notebook XXIV:7). To the west, the *Huu7̲ii7ath̲* held the eastern half of Tzartus and Fleming Islands, where they bordered on the *Hikwuulh7ath̲*, a group that joined the Tseshaht early in the 19th century (Blenkinsop 1874; St. Claire 1981, 1991:65; Sapir 1910–1914 notebook XVIII:2a).

Kiix7in7ath̲

As noted above, William indicated to Sapir that the territorial boundary between the *Huu7̲ii7ath̲* and *Kiix7in7ath̲* was at *Ts'axts'aa7a* Point. However, there are problems with that name. In 1817, Roquefeuil (1823:38) indicated that Grappler Inlet was known by that term. O'Reilly (1883) and Blenkinsop (1874), as well as elders interviewed during the past thirty years, specifically assign that name to the head of Grappler Inlet at Sugsaw Creek (St. Claire 1991:97). Additionally, Sapir recorded that the people of Sugsaw Creek were known as the *Ts'axts'aa7ath̲*, again tying that name to Grappler Inlet. These people were also known as the *Tl'uutl'uulhswi7ashtak̲imilh*, the senior *ushtak̲imilh* (descent group) of the *Kiix7in7ath̲* (Sapir 1910–1914, notebook XXIV:4a). Thus it is likely that both Bamfield and Grappler Inlets were within *Kiix7in7ath̲* territory and that William mis-

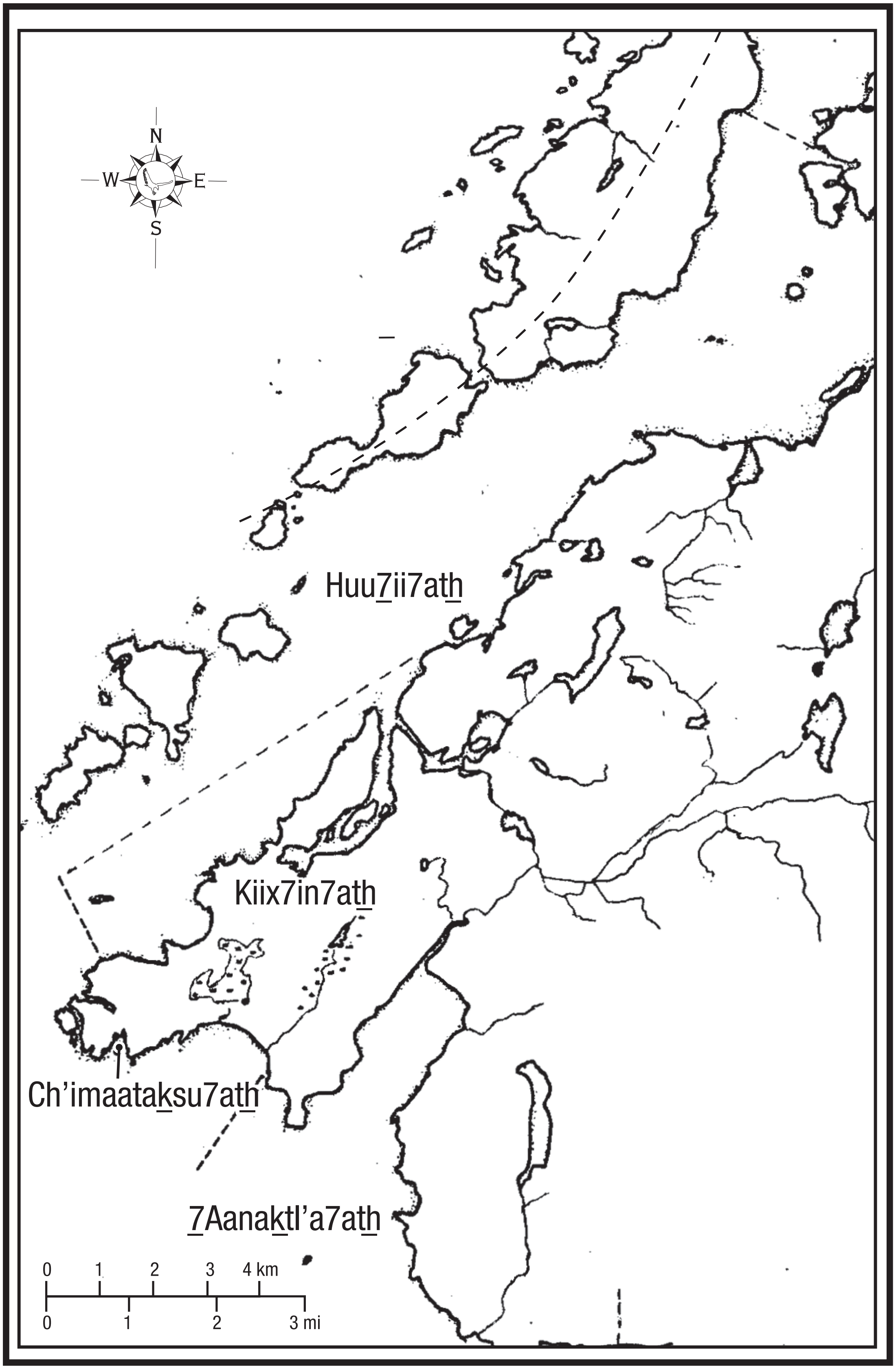

Figure 2-1. Original Huu-ay-aht local group territories.

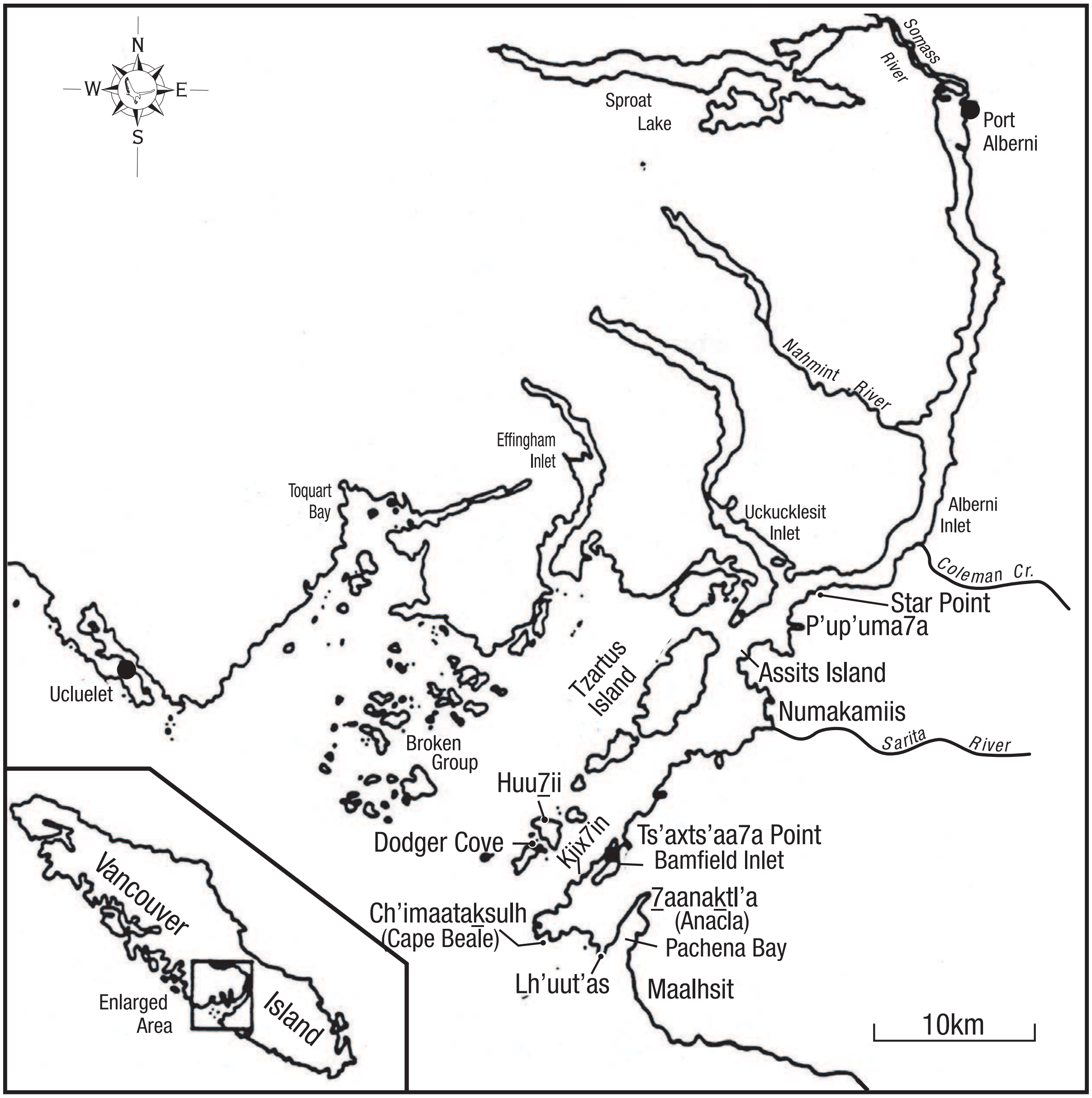

Figure 2-2. Barkley Sound and Alberni Inlet, showing place names mentioned in the text.

named the point just outside the eastern entrance to the two inlets that served as the *Huu7ii7ath–Kiix7in7ath* boundary. His description of the *Huu7ii7ath* boundary extending from the point "out to sea" only makes sense in this context. To the south, William stated that *Kiix7in7ath* territory extended along the eastern shore of Barkley Sound to a point called *Tlatstlakishhsaa7a*, where they bordered the *Ch'imaataksu7ath* (Fig. 2-1).

The *Kiix7in7ath* "name" village and principal residence was Kiix7in, along the Barkley Sound shoreline to the south of Bamfield Inlet. The importance of this major village site, with its still-standing architectural remains, is discussed at several points elsewhere in this volume. Immediately adjacent to the village is a steep-sided rocky bluff that served as their "fortress" or refuge site. This location features prominently in several war narratives (Arima et al. 1991:209. 224–225; Huu-ay-aht First Nations 2000:51–53; Sapir and Swadesh 1955:339–341; Sapir et al 2009:325). Accounts indicate that a large log was placed at the top in preparation for rolling down on attackers (Arima et al. 1991:225; Scott 1972:255; Sapir et al. 2009:325). At least three such elevated fortresses existed along the short stretch of shoreline between

Kiix7in and Bamfield Inlet: at Aguilar Point (adjacent to the village of *7̲uuts'uu7a*) at the southern entrance to the inlet, at Brady's Beach (a short distance to the south), and at Kiix7in (Arima et al. 1991:224–225; St. Claire 1991:100; Sapir et al. 2009:325).

Ch'imaatak̲su7ath̲

The *Ch'imaatak̲su7ath̲* were the people of Cape Beale, at the eastern entrance to Barkley Sound. Sapir consultant "William," who was half Huu-ay-aht, described this group as "a large tribe" that was wealthy as they "always got many whales." Whaling appears to have been central to their economy, as he added that this "was their only occupation" (Sapir et al. 2004:189). The *Ch'imaatak̲su7ath̲* were well placed for such an activity, as Frank Williams told Sapir that the grey whales, in their annual movement along the coast, hugged the shore until they rounded Cape Beale, then went up to Kiix7in and through the outer islands of the Deer Group into Barkley Sound (Sapir 1910–1914, notebook XVIII:11).

Ch'imaatak̲su7ath̲ territory extended from *Tlatstlakishh̲saa7a*, a rocky point just into Barkley Sound from Cape Beale, to a point on the outer coast called *Kwisiiyis7ikixaa*, probably at the eastern end of Keeha (*Kixaa*) Beach, as its name means "the other end of the beach" from *Kixaa* (Fig. 2-1). The summer village of *Kixaa* was occupied while fishing for halibut and hunting seals and whales (St. Claire 1991:105; Sapir 1910–1914, notebook XVII:5). Their main village and "name" site was *Ch'imaatak̲sulh* at Cape Beale.

7̲Aanak̲tl'a7ath̲

From *Kwisiiyis7ikixaa*, *7̲Aanak̲tl'a7ath̲* territory extended eastward along the outer coast around Clutus Point to include all of Pachena Bay. The Pachena River, which flows into the bay, provided a major salmon fishery. *7̲Aanak̲tl'a*, their "name" village and the location where most on-reserve Huu-ay-aht members live today, is at the head of Pachena Bay. Their major village during the spring and summer months was *Lhuut'as* ("Clutus"), at the western entrance to the bay, which was well situated for whaling and halibut fishing (St. Claire 1991:106).

According to William, *7̲Aanak̲tl'a7ath̲* territory extended to Pachena Point, on the outer coast east of Pachena Bay. This location was called *Satsnit*, the "place of many tyee salmon," according to Huu-ay-aht Chief Louie Nookmiis (St. Claire 1991:107). This is also the boundary accepted by modern Ditidaht elders. However, Huu-ay-aht elder Robert Sport in a 1981 interview placed the *7̲Aanak̲tl'a7ath̲* –Ditidaht boundary further east, at the Darling River (St. Claire 1981). Blenkinsop in 1874 placed this boundary even further east, at the Tsusiat River *(Tsusyii7at)*. Chief Louie Nookmiis also indicated that his ancestors' lands stretched to the waterfall at Tsusiat River (Arima et al. 1991:208, 231; Sapir et al. 2009:291, 355). These differing boundaries may simply reflect relatively minor territorial shifts over time.

Amalgamation

The relatively precise information on individual territories clearly demonstrates the former existence of several autonomous local groups. The extant ethnographic data and oral traditions are less clear on when and why these groups amalgamated to form the present-day Huu-ay-aht First Nations.

The process of peaceful mergers or at times forcible absorption of neighboring local groups is well documented throughout Nuu-chah-nulth territory. Such amalgamations particularly characterize the decades immediately following contact with Europeans in the late 18th century. Dramatically declining populations, generally a result of introduced diseases and intensified warfare following contact, were the primary factors driving such political unions. William indicated to Sapir that the amalgamations to form the modern Huu-ay-aht came about because all four groups were "reduced in number" (Huu-ay-aht First Nations 2000:52; Inglis and Haggarty 1986:179; Sapir 1910–1914, notebook XXIV:7a). However, he also indicated that this occurred "long before white people came." In the Huu-ay-aht case, oral traditions indicate that population loss occurred through both warfare and a natural disaster dating well prior to European arrival, as is discussed below.

Because of their close proximity, the four groups that joined to become the Huu-ay-aht undoubtedly had close social, economic, and perhaps military ties. Some preliminary forms of integration may have occurred at earlier stages. Referring to the *Ch'imaatak̲su7ath̲*, Chief Louie Nookmiis stated:

> …Cape Beale was their real home, though they and the Huu7̲ii7ath̲ would get together at times. They had between them one river and that was the Sarita River. They would

> also at times move there, halfway up the river, to a place called Chitlmakis, 'Ferns-on-Beach.' At that place the Ch'imaataksu7ath would dry salmon for food. (Arima et al. 1991:218)

Since the original territories of both the *Huu7ii7ath* and the *Ch'imaataksu7ath* were without salmon rivers, perhaps the forcible takeover of the Sarita River from the *Anakshitl7ath*, mentioned previously, was a cooperative effort. Alternatively, the *Ch'imaataksu7ath* may have acquired rights to the use of the river at a later date through marriage or by some other social or military arrangement, prior to full amalgamation.

Earthquakes and the destructive tsunamis they generate occasionally impacted populations along the coast, resulting in great losses of life that forced political changes. Such catastrophic events affected the people of Barkley Sound, as is reflected in oral narratives of the ground shaking or rapid rushes of water (McMillan and Hutchinson 2002; Sapir 1919; Sapir et al. 2009:305). In 1964, Chief Louie Nookmiis recounted the story of a major earthquake and a subsequent landslide that caused the death of most of the *Ch'imaataksu7ath*, leaving only a small group of survivors (Arima et al. 1991:220; Sapir et al. 2009:318–320). He also described how a tsunami produced by the earthquake destroyed the *7Aanaktl'a7ath*, who were living on the outer coast at *Lhuut'as* (Arima et al. 1991:230–231; Sapir et al. 2009:330). Although some *7Aanaktl'a7ath* survived in their outer-coast settlements of *Maalhsit* and *Maalhts'aas*, due to their higher elevation, those living at the principal village of *Lhuut'as* were wiped out in this disaster.

> There is now no one left alive due to what this land does at times. They had practically no way or time to try to save themselves…and they simply had no time to get hold of canoes, no time to get awake. They sank at once, were all drowned; not one survived…I think a big wave smashed into the beach. The Pachena Bay people were lost…Everything then drifted away; everything was lost and gone. (Arima et al. 1991:231)

The only member of the *7Aanaktl'a7ath* Chief's family to survive was his elder daughter, who had married the son of the *Kiix7in7ath* Chief and was residing at Kiix7in (Arima et al. 1991:231; Sapir et al. 2009:330). The leadership of the surviving *7Aanaktl'a7ath* and the possession of their *hahuulhi* seems to have transferred to the *Kiix7in7ath* through this marriage alliance. Chief Nookmiis stated:

> …it is said that my grandfather's domain reached Tsusyii7at [Tsusiat River]. This was brought about by the Pachena Bay Chief, brought as dowry for his elder daughter to my grandfather's ancestor before the big earthquake, before the big flood. By that my grandfather's land reached Tsusyiiat, along with all chiefly rights, songs, tupaatis. (Arima et al. 1991:231)

Sapir's notes also suggest that the *Kiix7in7ath* Chief assumed the *7Aanaktl'a7ath* leadership and lands. Sapir recorded that the *Lhuut'as7ath* were a junior line of the senior *Kiix7in7ath ushtakimilh* (descent group) called the *Tl'utl'ulhswi7ashtakimilh* (Sapir 1910–1914, notebook XVII:4a). A *Kiix7in7ath* subgroup in the process of "budding off" from its senior line and residing at the principal *7Aanaktl'a7ath* village makes sense in the context of the tsunami catastrophe. Given his claim to the *7Aanaktl'a7ath* territory through his daughter-in-law, the *Kiix7in7ath* Chief presumably sent part of his family to reside with and lead the *7Aanaktl'a7ath* survivors to consolidate his control over his new territories.

Warfare also played a major role in population loss among the four groups and presumably contributed to the amalgamations. Tom Sayaach'apis, one of Sapir's principal informants, described a series of deadly raids and counter raids between the *Kiix7in7ath* and the Uchucklesaht (*Huuchukwtlis7ath*), resulting in the defeat and near-extermination of the *Kiix7in7ath* (Sapir and Swadesh 1955:339-341). Although the date of this conflict is uncertain, it was pre-amalgamation as the conflict was specifically with the *Kiix7in7ath*; the other groups do not appear in this war narrative. However, there may have been an earlier stage in the hostilities during which the *Huu7ii7ath* were displaced. At the beginning of the narrative the Uchuckesaht were living at a village on northwestern Diana Island (*Husmatkts'us*, "Kelp-in-Bay"; Sapir and Swadesh 1955:339), in what clearly had been *Huu7ii7ath* territory. As this was in close proximity to Huu7ii, the major *Huu7ii7ath* village, this area must have been unoccupied at that time. Although only the *Kiix7in7ath* feature in this narrative, William specifically indicated to Sapir that all four local groups became subject to the Uchucklesaht (Haggarty and Inglis 1985:186; St. Claire 1991:75; Sapir 1919-1914, notebook XXIV:7). For a time, the Uchucklesaht held a position of dominance throughout eastern Barkley Sound and the adjacent outer coast, extending as far as *Tsusyii7at* (Sapir and Swadesh 1955:341).

Estimating the time at which the amalgamations took place to produce the modern Huu-ay-aht First Nations is difficult. This was likely a prolonged process, occurring in a number of stages, rather than a single event. Declining populations over time, through warfare and the drastic impact of the earthquake and tsunami described above, created the conditions for gradual unions of neighbouring groups. Some chronological clues, however, are discussed below.

The abandonment of Huu7ii as a major village may have been an early step in eventual group amalgamations. Considerable incentive, such as the war with the Uchucklesaht, would have been required for the *Huu7ii7ath* to move from their principal village and "name" site, the location they had occupied for many centuries. As there are no traditions of a major subsequent "capital" in their original homeland in the Deer Group islands, they may have relocated to the mainland, perhaps to Sarita River or to join others at Kiix7in. This would indicate that the beginning of the amalgamation process began very early, as Huu7ii had ceased to be a residential community by about AD 1600 (see Chapters 3 and 4).

The earthquake and subsequent tsunami that struck this area clearly had a devastating impact, nearly destroying the *Ch'imaataksu7ath* and *7Aanaktl'a7ath* local groups. The last major seismic event known to have affected this area was in AD 1700. Genealogical clues in Chief Nookmiis' oral tradition of the Pachena Bay disaster place this event at about 300 years ago (Ludwin et al. 2005:142–143), strongly indicating that the story refers to the AD 1700 earthquake. Certainly the great loss of life due to this natural disaster would have required political restructuring and joining of survivors from several groups, thus giving a firm date for at least one stage in the Huu-ay-aht amalgamation process.

Other chronological clues come from oral traditions of the war with the Clallam, which is discussed in more detail in the following section. The Huu-ay-aht groups had amalgamated by the time the Clallam launched an attack on Kiix7in, according to Nuu-chah-nulth elders Robert Sport (Huu-ay-aht) and Ernie Lauder (Hupacasath) (St. Claire 1981, 1982). In Chief Louie Nookmiis' narrative of the war (Arima et al. 1991:222–230), the Clallam attacked a number of other villages after Kiix7in, including *Husmakts'us* on Diana Island, in the core territory of the original *Huu7ii-7ath* local group. This suggests that amalgamation had occurred earlier, as otherwise warfare with the residents of Kiix7in would not have led to attacks on *Huu7ii7ath* settlements. In addition, survivors of the Clallam attacks fled to refuge sites up the Sarita River, former *Anakshitl7ath* territory taken by the *Huu7ii7ath* local group through conquest. If amalgamation had not occurred, the *Kiix7in7ath* presumably would have fled into the hinterland of their own territory, as they had no rights to the Sarita River prior to amalgamation. The absence of firearms from this war narrative suggests that the events occurred prior to European arrival. This is consistent with Chief Nookmiis' 1964 estimate that the war had occurred about 200 years earlier, placing it around the mid-1700s. Another clue comes from the appearance of the *Hach'aa7ath* in the narrative, at a time estimated to be about twenty years after the attack on Kiix7in (Arima et al. 1991:209; Sapir et al. 2009:325–327). As the *Hach'aa7ath* disappeared as an independent local group, with the remnants joining the Tseshaht by the end of the 18th century (McMillan and St. Claire 2005:20), this offers additional support to dating the Clallam attack near the middle of the 18th century. As the Huu-ay-aht seem to have been a single group at that time, the amalgamation process may have been completed not long after the devastating earthquake, tsunami, and landslide led to such a loss of life that survivors were forced to join together in a new political unit.

The War with the Clallam

The war with the Clallam, a Salish group from across the Strait of Juan de Fuca, is a pivotal event in Huu-ay-aht history. In 1964, Chief Louie Nookmiis provided a detailed narrative of the hostilities, which spanned several decades (Arima et al. 1991:208-213, 222-230; Sapir et al. 2009:291–294, 324–328). Tliishin, a direct ancestor of Chief Nookmiis, was the Huu-ay-aht *taayi hawilh* at the time of the war; Tliishin was "chief to all the Huu-ay-aht" (Huu-ay-aht First Nations 2000:51). His territory reached the falls at *Tsusyii7at* on the outer coast, and in the other direction extended to Coleman Creek (*Yashitkuu7a*) on lower Alberni Inlet (Arima et al. 1991:208; Sapir et al. 2009:291). This again indicates that amalgamation was complete and that the Huu-ay-aht *ha̲h̲uulhi* had reached its full extent at the time of this war.

The prolonged hostilities with the Clallam began with the slaying of a troublesome young Huu-ay-aht secondary chief, whose mother was a Clallam. Seeking revenge, his Clallam kin organized a large war party and attacked Kiix7in. Chief Tliishin and a few followers escaped this onslaught by hiding in a cavity in the rocks below the Kiix7in fortress, but most of the Huu-ay-aht residing at Kiix7in were killed. The Clallam war party also attacked other Huu-ay-aht villages, such as the defensive locations at *7̲uuts'uu7a* (Aguilar Point) and at Brady's Beach. When they attacked the Huu-ay-aht living at *Husmatkts'us* on Diana Island, the survivors fled into the nearby woods around their former major village of Huu7̲ii, again indicating that this once-important site had fallen into disuse by that time. The Clallam stayed "for a long time going about searching whom to kill here and there" (Sapir et al. 2009:325). The Huu-ay-aht survivors retreated far up the Sarita River to several defensive locations. Those who had been living on Diana Island settled on the South Sarita River, while others established the village of *Wih̲ata* at the head of Sarita Lake (St. Claire 1991:94; Sapir et al. 2009:325). There they resided for a long time, perhaps twenty years according to Chief Nookmiis (Arima et al. 1991:209; Sapir et al. 2009:325, 327). This prolonged inland stay allowed their population to grow until they became a large group once more and could return down the river to reclaim their former territory.

When the Huu-ay-aht reemerged at the mouth of the Sarita River, they found the land occupied by the Tseshaht and the *H̲ach'aa7ath̲*. They attacked the village of the newcomers, allowing those who fled in their canoes to escape unharmed but killing those who resisted (Sapir et al. 2009:327–328). The battle was fought with stone clubs, which presumably indicates that this was prior to European arrival and the availability of firearms. The Huu-ay-aht reclaimed their land and river, eventually spreading throughout their former territory. Kiix7in again became their major village.

At a later time, according to the Chief Nookmiis narrative, the Clallam again attacked Kiix7in (Arima et al. 1991:211; Sapir et al. 2009:293). Relatively few Huu-ay-aht were killed as most were living at Sarita River. The Huu-ay-aht, once again a large and powerful tribe, formed an alliance with the Uchucklesaht and Ditidaht to strike at the Clallam in their home territory. Many Clallam died in the attack by this combined force.

Post-Amalgamation Territorial Expansion

The *Huu7̲ii7ath̲* local group's forcible acquisition of the Sarita River from the *Anak̲shitl7ath̲* has been discussed above. At that point in their history, their territorial boundary with their neighbour to the north, the *P'up'uma7̲aa7ath̲*, was at *Cha7aktlim* (Assits Island), just south of San Mateo Bay. After amalgamation of the four groups to form the Huu-ay-aht, their territory continued to expand to the north.

The *P'up'uma7̲aa7ath̲* took their name from their village of *P'up'uma7a* in San Mateo Bay, at the eastern entrance to Alberni Inlet. Their up-inlet territorial limit was at *Kak̲uu7a* (Star Point) on the lower reaches of Alberni Inlet (Fig. 2-2; Sapir 1910–1914, notebook XXIV:7). Huu-ay-aht elder Robert Sport stated that this little-known local group ceased to exist before the arrival of Europeans (St. Claire 1981). The Huu-ay-aht may not have been involved in a conflict that destroyed the *P'up'uma7̲aa7ath̲*, but the Uchucklesaht (*H̲uuchuk̲wtlis7ath̲*) may have played a role, as Sapir recorded that the latter group assumed control of San Mateo Bay. Later, however, they were in turn replaced by the Huu-ay-aht, who seized the former *P'up'uma7̲aa7ath̲* lands by *his7ukwt* or "spoils of war" (Sapir 1910–1914 notebook XXIV:7). Huu-ay-aht elder Robert Sport and Huu-ay-aht–Uchucklesaht elder Ella Jackson also indicated that the *Hikwuulh7ath̲*, a local group holding territory in northeastern Barkley Sound, shared San Mateo Bay for a period of time with the Huu-ay-aht (St. Claire 1981, 1984a). The *Hikwuulh7ath̲* may have lost their claim to San Mateo when, due to severe reduction in population, they were forced to seek the protection of the Tseshaht and were absorbed by them, losing their independence.

The final expansion of Huu-ay-aht traditional territory came after the Ucluelet destruction of the *Namint7ath̲*, an independent local group in the mid-regions of Alberni Inlet, with villages at Nahmint Bay and Coleman Creek. (The people who lived at Coleman Creek, the *Yashitkuu7ath̲*, were an *ushtak̲imilh* of the *Namint7ath̲* [St. Claire 1991:78; Sapir and Swadesh 1955:365].) *Namint7ath̲* territory encompassed much of the inlet, from the northern limit of the *P'up'uma7̲aa7ath̲* (at Star Point) on the east side and the Uchucklesaht (at Handy Creek) on the west (Sapir and Swadesh 1955:366). Sapir's Ucluelet informant Kwishanishim described a series of deadly raids by which the Ucluelet destroyed the *Namint7ath̲* and seized their territory through *his7ukwt*

(Sapir and Swadesh 1955:362–367). Initially, as is Nuu-chah-nulth custom, the territory of the *Namint7ath̲* Chiefs was carefully and completely partitioned among the Ucluelet leaders (Sapir and Swadesh 1955:366). However, the Ucluelet appear to have dropped their claim over most of it relatively quickly, retaining only Nahmint Bay and the Nahmint River, as their sole reason for the hostilities was to obtain this important salmon fishery. Blenkinsop, referring to the Ucluelet use of Nahmint Bay, wrote: "their right to this place is acknowledged by the other Indians but they have no claim to the surrounding territory" (Blenkinsop 1874:29). Ucluelet abandonment of much of the former *Namint7ath̲* territory allowed both the Huu-ay-aht and Tseshaht to expand into this area. The Huu-ay-aht extended their up-inlet boundary to Coleman Creek (*Yashitkuu7a*), their newly established border with the Tseshaht, who had filled the territorial vacuum by taking control of much of the rest of the inlet.

Post-Amalgamation Huu-ay-aht Social Structure

The process of amalgamation of local groups into new, larger entities, both prior to the arrival of Europeans in the late 18th century and, in an accelerated manner, after that time, caused a certain degree of stress within Nuu-chah-nulth society. Each *ushtak̲imilh* had a clearly understood ranking within its local group and each possessed its own *tupaatis* (hereditary ceremonial and economic rights). However, once several local groups combined, a whole new set of internal rankings and statuses, for both *ushtak̲imilh* and individuals within them, had to be created, not the least being the establishment of relationships between the various *taayii hawiilh* of the formerly separate local groups. There could be only one *taayii hawiilh* in the new political unit and as a result some individuals, and in a sense their entire families, had to accept relegation to secondary status.

The devastating earthquake and tsunami of 1700 caused such loss of life among the *Ch'imaatak̲su7ath̲* and the *7Aanak̲tl'a7ath̲* that they ceased to exist as independent units and were absorbed within the *Kiix7in7ath̲*. This would have required an entirely new composition of component groups, ranking, and status. Entire *ushtak̲imilh* were wiped out or severely depleted. In a situation where the hereditary leadership was destroyed, the survivors of an *ushtak̲imilh* may have lost the "glue" that held them together, that gave them a tradition and a history. They may have dispersed to other *ushtak̲imilh* or to other local groups in which they had kin ties. Alternatively, a dominant group could have imposed new leadership upon the survivors, as when the *Kiix7in7ath̲* Chief sent a member of his immediate family to the village of *Lhuut'as*. This not only formally affirmed his control over his new territory, but also gave the *7Aanak̲tl'a7ath̲* survivors leadership while allowing them to remain at their traditional principal village. If individuals within the Chief's family had survived, the *ushtak̲imilh* could have continued as a named and socially recognized entity within a different local group.

If the leadership had been wiped out, what happened to their prerogatives, their *tupaatis*? Their *h̲ah̲uulhi* automatically passed to the dominant group with whom they merged, but the hereditary rights that individual high status people had to specific ceremonial regalia and activities, as well as the use of hunting, fishing, and collecting sites, had to be reassigned. There were traditional Nuu-chah-nulth ways to pass on rights and privileges, but in the case of significant depopulation the requisite high status holders of those *tupaatis* may not have survived, causing societal stress in the disposition and reallocation of these rights.

Regardless of the specific circumstances, which would have varied among the *ushtak̲imilh* of the *Ch'imaatak̲su7ath̲* and *7Aanak̲tl'a7ath̲*, a complex realignment of both their social structures, as well as that of the *Kiix7in7ath̲*, would have resulted. It may have taken some time for the new set of internal rankings for political and ceremonial purposes to become established and provide a uniformly accepted and acknowledged leadership structure.

Little is known of the internal structure of the four original groups. Other than the *Tl'utl'ulhswi7ashtak̲imilh* and latterly the *Lhuut'as7ath̲*, no names of the *ushtak̲imilh* were recorded in Sapir's field notes. However, various lists of names exist for the post-amalgamation Huu-ay-aht, although their exact status remains uncertain. Table 2-1 presents two lists collected by Sapir and his associates early in the 20th century, plus two more recent lists obtained from Huu-ay-aht elders in the 1980s. In total, 33 individual names appear in the four lists.

As might be expected, the greatest correlation among the four lists is between the two earliest. All 15 names given by Dick Thlamaahuus also appear in Sapir's list, although the latter contains three additional names. Fourteen of the 24 names given by Ella Jackson also appear on Sapir's list. Mary Moses' list is the most divergent, with only eight of

Table 2-1. Huu-ay-aht post-amalgamation group names.

Source	Group Names	
Sapir 1910–1914, notebook XVII:4a	1. Kiix7in7ath	10. 7Ap'win7as7ath
	2. Kwi7ikts'ilhu7as7ath	11. Kwintinuxw
	3. Tuxwulh7ath	12. Tuxwiitlakimilh
	4. Chachaahtsii7as7ath	13. 7Aanaktl'a7ath
	5. Ch'u7mat'ath	14. Xaya7ath
	6. Malhts'as7ath	15. Kixaa7ath
	7. 7Ap'win7as7ath	16. Tsaxts'aa7ath
	8. T'ukw'aa7athtakimilh	17. Tl'isnashis7ath
	9. Lhuut'as7ath	18. Tl'ihskaapu7is7ath
Alex Thomas interview with Dick Thlamaahuus 1922 (Thomas 1922; also Sapir et al. 2009:249)	1. 7Ap'win7as7ath	9. 7Aanaktl'a7ath
	2. Chachaahtsii7as7ath	10. Maalhsit7ath
	3. Tuxwulh7ath	11. Lhuut'as7ath
	4. Ch'u7mat'ath	12. Kixaa7ath
	5. T'ukw'aa7athtakimilh	13. Tsaxts'aa7ath
	6. Malhts'as7ath	14. Tl'isnashis7ath
	7. Tuxwiitstakimilh	15. Tl'ihskaapu7is7ath
	8. Xaya7ath	
Ella Jackson interview with D. St. Claire 1984 (St. Claire 1984a)	1. Chachaahtsii7as7ath	13. Huu7ii7ath
	2. Maalhts'aas7ath	14. Tsaxts'aa7ath
	3. Ts'a7akwa7ath	15. Kixaa7ath
	4. Ch'imaataksu7ath	16. 7Uts'uu7a7ath
	5. Hitaaktlas7ath	17. 7Aa7ikis7ath
	6. 7Ap'win7as7ath	18. Tuup'alhsit7ath
	7. Amiihtaa7ath	19. Tuxuulh7ath
	8. Maalhsit7ath	20. Chu'umaat'aa7ath
	9. Lhuut'as7ath	21. 7Ukchii7ath
	10. 7Aanaktl'a7ath	22. T'ukwaa7athtakimilh
	11. Kiix7in7ath	23. Tl'isnach'is7ath
	12. Xaya7ath	24. Hilhstu7as7ath
Mary Moses interview with D. St. Claire 1984 (St. Claire 1984b)	1. Maalhts'a7asath	9. Kwisp'a7as7ath
	2. Ts'a7akwa7ath	10. Hilhstu7as7ath
	3. Ch'uumaata7ath	11. Kiix7in7ath
	4. T'ak'ak'ts7a7ath	12. Kixaa7ath
	5. Ustu7as7ath	13. 7Aanaktl'a7ath
	6. 7Apswin7as7ath	14. Chachaahtsii7as7ath
	7. Chachaahtsii7as7ath	15. Tl'inhapis7ath
	8. 7Apswas7ath	16. Lhuut'as7ath

her 16 names included by Sapir and 11 matching Ella Jackson's. This, however, is probably a function of her focus upon later period names used primarily within the village of *Numakamiis* at the mouth of the Sarita River.

Not all names appearing in the four lists correspond to the traditional Nuu-chah-nulth social units of *ushtakimilh* and local groups. As part of the process of amalgamation due to severe population loss and the consequent blurring of descent lineages, a new nomenclature seems to have developed. In addition to the tradition-based names referring to or derived from descent lines, new names came into use. Many of these names simply indicated specific residence locations within villages or at resource camps. Kin groups might have several names, which changed as they shifted residences. These names did not have the socio-cultural significance embedded in the previous, traditional naming system. The great loss of population and the collapse, possible merger, and disappearance of many *ushtakimilh* of the four original local groups likely led to the development of the new nomenclature.

Mary Moses' list of group names provides an example of this late period usage. She stated that *the 7Ap'win7as7ath* (also rendered as *7Apswin7as7ath)* of *Numakamiis* village were comprised of the *Kiix7in7ath*, *Kixaa7ath* and *7Aanaktl'a7ath*, who went to their "name places"—*Kiix7in*, *Kixaa* and *7Aanak̲tl'a*—during the summer. She also indicated that the *Kwisp'a7as7ath̲* went to *Lhuut'as* in the summer, where they became the *Lhuut'as7ath̲* (St. Claire 1984b). The *Maalhts'a7as7ath̲* moved to Dodger Cove (the adjacent villages of *7Aa7at'suw7is* and *Chap7is*) on Diana Island (St. Claire 1984b). The *Chachaahtsi7as7ath̲* (also transcribed as *Ch'ich'ahchi7as7ath̲)* took their name from and had a house at *Chachaah̲si7as*, at Carnation Creek (just north of Sarita River), where they resided for a portion of the year (St. Claire 1991:91).

Three of the names on Sapir's list are of particular interest as they indicate close relations with the Toquaht (*T'ukw'aa7ath̲*) First Nation of western Barkley Sound. Tom Sayaach'apis told Sapir that the *Kwi7ik̲ts'ilhu7as7ath̲, Ch'umaat'aa7ath̲* and *T'ukw'aa7ath̲takimilh* groups all acquired their names from the Toquaht through high status marriages (Sapir 1910–1914, notebook XVII:4a–5). The dates for these unions are uncertain but may have occurred around the 1840s during the "Long War" among the Barkley Sound groups, when a number of such alliances were made.

Each of the four original local groups had one principal village. Territories were sufficiently compact to enable people to harvest resources from various locations in the *h̲ah̲uulhi* and return to the village within a single day. Undoubtedly, some short-duration resource encampments existed but the primary focus of everyday life was on one year-round village. After amalgamation, four major villages were no longer required and the remnants of the former local groups could congregate at a single location. The abandonment of Huu7̲ii, *Ch'imaatak̲sulh* and *Lhuut'as* as major villages probably resulted from this amalgamation process. Kiix7in emerged as the dominant post-amalgamation centre.

The merger of the four local group territories, plus the acquisition of additional lands described earlier, meant that the amalgamated Huu-ay-aht had access to a much larger *h̲ah̲uulhi*. A far wider choice of residence and resource locations became available. To efficiently exploit their extensive territory and the broad array of resources it contained, the Huu-ay-aht developed a seasonal pattern of movement throughout their lands. Kiix7in was occupied mainly during the spring and summer, while *Numak̲amiis* at the Sartia River became the primary fall and winter residence. In addition, smaller social groups would disperse to live at various resource locations for shorter periods throughout the year.

The European Contact Period

The first significant contact between Europeans and Nuu-chah-nulth peoples began with the Cook expedition of 1778. Within a few years of Cook's favorable report upon the trading opportunities existing along the west coast of what later became known as Vancouver Island, a thriving maritime fur trade was established with the annual arrival of trading vessels of mainly English and American origin. These traders focused initially upon Nootka Sound and soon after Clayoquot Sound to the south. The dominant groups in these areas not only quickly established control over their neighbours, but also spread their hegemony over others in more distant portions of the coast. Barkley Sound soon became part of the Tla-o-qui-aht (*Tla7uukwi7ath̲*) sphere of influence, and Chief Wickaninish of that group controlled much of the trade that far to the south. Wickaninish's greater access to firearms through the American traders in Clayoquot Sound enabled his military domination of this wider region.

The earliest historic accounts from Barkley Sound provide little specific information on the Huu-ay-aht and their territory. Captain William Barkley sailed into the sound in 1787, naming the sound after himself and prominent landmarks such as Cape Beale after members of his ship's company (Hill 1978:37). John Meares arrived the following year and noted the "large and populous villages" in the sound (Meares 1790:172), but gave no details on their location. In 1789, the American traders aboard the *Columbia* briefly entered the sound to trade but found that Wickaninish had recently arrived from Clayoquot Sound and few furs were available (Howay 1990:79). Spanish expeditions also reached Barkley Sound, reporting in 1791 that the population of this area "contained more Indians than Nuca [Nootka] and Clayocuat [Clayoquot]" (Wagner 1933:149). When the crew of the *Jefferson* explored Barkley Sound in 1793, they specifically noted the "large and very populous villages" on the eastern shore, presumably referring to Huu-ay-aht territory (Magee 1794). Bishop, trading in western Barkley Sound in 1795, stated that his ship was "visited by two Chiefs from the East shore," quite possibly referring to the arrival of Huu-ay-aht leaders. He noted that these Chiefs, whom he named as "Yapasuet" and "Annathat," were independent of Wickaninish, unlike their neighbours of the western sound (Roe 1967:108).

The first specific European account of Huu-ay-aht territory comes from Camille de Roquefeuil, Captain of *Le Bordelais*, in 1817. Roquefeuil's ship traversed Trevor Channel and entered Bamfield and Grappler Inlets ("two arms of the sea near each other"), where the local people told him that his was the first ship to enter these protected waters (Roquefeuil 1823:36–38). He records the name for the "grand chief" as "Nanat" (Roquefeuil 1823:37). He also provides the names "Anachtchitl" (*7Anaks-hitl*; the Sarita River area) and "Oheia" (*Huu7ii*) for the surrounding district, as well as "Tchatacktza" (*Ts'axts'aa7a*) for Grappler Inlet, where he anchored during his relatively short stay (Roquefeuil 1823:38). He also mentioned a "steep hillock" with what appeared to be a "ruined fortification," presumably the defensive site at Aguilar Point, at the entrance to Bamfield and Grappler Inlets, or perhaps Kiix7in. By this time, over-hunting in the maritime trade had almost eliminated the sea otters from Barkley Sound. Finding that there were few or no furs available, Roquefeuil set sail, continuing his round-the-world voyage. Throughout Nuu-chah-nulth territory, sea otter populations were so seriously depleted by the second decade of the 19th century that the annual arrival of trading ships ceased and for several decades there was little, if any, contact with outsiders.

The next phase of Nuu-chah-nulth contact with Euro-Americans began with the establishment of Fort Victoria in 1843. Intended as a trading centre, the fort gave local First Nations, as well as those more distant on the coast, an opportunity to access manufactured goods, but differed from the former period in that the Native traders had to travel to a European settlement. In the following decades trading schooners and eventually small stores began to appear along the western coast of Vancouver Island. The first such occurrence in Huu-ay-aht territory came with the arrival of William Banfield in 1858. Banfield was a partner in a trading company that had three stores along the length of Nuu-chah-nulth territory. In a letter to Governor Douglas in 1855, he described the Huu-ay-aht as a tribe of 500 people, the largest group in Barkley Sound (Banfield and Francis 1855). In 1858 Banfield chose Huu-ay-aht territory, specifically what is now Bamfield Inlet, as his centre of operations. He purchased an island in the inlet, which he identified as "Osmetticey," from the Huu-ay-aht chief "Cleeshin" (*Tliishin*) and resided there until his death several years later (Inglis and Haggarty 1986:61). He was appointed government agent in 1859 and began sending a series of reports to Victoria regarding the Nuu-chah-nulth and the prospects for economic development along the west coast of Vancouver Island.

Banfield's choice of the heart of Huu-ay-aht territory as the base of his private and public activities, along with the construction of a saw mill at the head of Alberni Inlet in 1860 and the subsequent establishment of a mission there, began a new period that would see profound changes for the Barkley Sound Nuu-chah-nulth. Although some of these events did not particularly affect the Huu-ay-aht, they ushered in a new era of frequent contact with Euro-Canadians. This period differed from the previous in that it entailed more or less permanent Euro-Canadian settlement, encroaching on traditional Nuu-chah-nulth lands, as opposed to the short-term seasonal contact that characterized the maritime fur trade.

By the 1860s, a number of small trading stores were established within Barkley Sound. Banfield's former quarters in Bamfield Inlet were taken over by Captain Stamp in 1861 for a temporary trading post (Inglis and Haggarty 1986:63). Around 1868, the Spring and Company store was established in Dodger Cove (*Aa7atsuw7is*), at the southern end of Diana Island (Inglis and Haggarty 1986:97). The Huu-ay-aht also had easy access to goods from the store at Ecoole (*Hiikwuulh*), in northwestern Barkley Sound. In 1878, a Catholic church was constructed at Dodger Cove, which, along with the store, brought about a change in the seasonal residence pattern of the Huu-ay-aht.

Despite slow and gradual increments in the frequency of contact between the Nuu-chah-nulth and Euro-Canadians, for much of the 19th century the Huu-ay-aht and other Barkley Sound groups continued to carry on much of their traditional lifeways, as they had for countless generations. However, with the entry of British Columbia into Canadian confederation in 1871, resulting in the establishment of federal jurisdiction over Native issues, mounting regulations, particularly concerning fishing and hunting, began to encroach upon Nuu-chah-nulth culture and independence.

In 1874, George Blenkinsop was sent by federal Indian Commissioner I.R. Powell to contact the Barkley Sound First Nations, to ascertain their populations, territories, and culture, and to assess their needs. This information was intended to prepare for the establishment of reserves, which would have a dramatic impact on the relationship of the Nuu-chah-nulth people with their traditional territories. The Huu-ay-aht chief "Haht.sik" (*Hat7sik*) particularly sought to ensure that land was allotted at each of the "two permanent villages," "Keh.ahk.

in" (Kiix7in) and "Noo.muk.em.e.is" (*Numakamiis,* at the mouth of the Sarita River) (Blenkinsop 1874:48). Swadesh (1949), whose field notes describe approximately the same time as Blenkinsop, drew a map showing the positions of 19 houses at *Numakamiis*; he also listed 14 houses for Kiix7in. Not all the Huu-ay-aht would have lived at these two sites, which served as "headquarters" for the scattered smaller villages and camps where some people seasonally resided. Blenkinsop (1874:51) also commented on the "numerous old village sites" throughout Huu-ay-aht territory. The Huu-ay-aht population at this time, Blenkinsop reports, was 262 people.

At the time of Blenkinsop's visit, the Huu-ay-aht were moving seasonally between their two major villages and a number of smaller short-term resource locations. Chief *Hat7sik* stated that *Numakamiis* was occupied from September to January (Blenkinsop 1874:49). Swadesh (1949) listed the following as the principal economic activities at *Numakamiis:* fishing for salmon, dogfish, and rock cod; collecting little neck clams, butter clams, cinquefoil root, and huckleberries; and hunting seals, sea lions, harbour porpoises, and whales. During February and March people moved to various encampments in the Deer Group islands to fish for dogfish and extract the valuable oil (Blenkinsop 1874:49). *Hat7sik* indicated that Kiix7in was occupied from April to September, making it the main summer residence. Blenkinsop (1874:49) described the major resource activities during that period, including offshore commercial fur sealing, collecting and drying herring spawn, and fishing for salmon, halibut, and cod. Swadesh's (1949) informants listed the following as important economic resources while at Kiix7in: halibut, red snapper, lingcod, sablefish, kelp greenling, perch, dogfish, various rockfish, octopus, several species of chitons, and licorice rhizomes and leather ferns.

In 1882, Peter O'Reilly, the federal Reserve Commissioner, arrived at Dodger Cove and established 13 reserves for the Huu-ay-aht. In all, 2,250 acres were set aside for their use, comprising a very small portion of their widespread traditional territory (*hahuulhi*). *Numakamiis* (Reserve #1) was by far the largest of those allocated, followed by Kiix7in (Reserve #9). O'Reilly (1883:94-96) briefly commented on the nature of each reserve and the major economic activities that took place there (Table 2-2). In addition to Kiix7in and *Numakamiis*, three reserves are located along the eastern shoreline of Barkley Sound, including a salmon fishing station at the head of Grappler Inlet (#4). Five reserves are in the Deer Group islands, including two on Diana Island. *7Aa7at'suw7is* (#7), at the southern end of the island, along with *Chap7is* (#8) on adjacent Haines Island, together formed the community of Dodger Cove. Huu7ii, which had fallen into disuse centuries earlier, was not included in O'Reilly's list. The remaining four reserves are on the outer coast, at Keeha Bay and around Pachena Bay. Three, according to O'Reilly, were occupied while halibut fishing, while Anacla (*7Aanaktl'a*; #12), at the head of Pachena Bay, was prized for its major salmon fishery at the Pachena River.

O'Reilly (1883:95) noted that Kiix7in "was the principal summer residence of the Ohiet [Huu-ay-aht] tribe." At that time, Dodger Cove contained only the Catholic church and a small cluster of houses that were inhabited "during the sealing season." That location, however, provided "a small harbor frequented by the sealing schooners" (O'Reilly 1883:95), while Kiix7in's linear shoreline, exposed to prevailing winds and storms, was a hazard for ship's captains to avoid. The growing importance of the commercial fur seal industry, plus the presence of a trading store, led many Huu-ay-aht to relocate to Dodger Cove. Before the end of the

Table 2-2. Huu-ay-aht reserves established by O'Reilly in 1882.

Reserve no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Major village	X								X				
Size (acres)	1,275	30	22	12	11	38	80	35	375	12	80	200	80
Salmon	X		X	X	X	X						X	
Halibut										X	X		X
Sealing							X	X					
Dogfish	X	X			X								
No. of houses*	6	4	1	1	3	1	2	4	6	3	4	0	2

*as shown on maps of reserves created by O'Reilly.

19th century, Kiix7in, the Huu-ay-aht "capital" for centuries, was unoccupied. People returned to this location to plant their vegetable gardens (Huu-ay-aht First Nations 2000:53), but the forest began to grow over what remained of the large traditional wooden houses.

Despite the growth of the Dodger Cove community, many Huu-ay-aht continued to reside at the Sarita River, in Bamfield and Grappler Inlets, and elsewhere. It was not until the 1960s that the Huu-ay-aht coalesced at Anacla on Pachena Bay, which is today their primary residential community (Huu-ay-aht First Nations 2000:34).

Effects of the Contact Era on the Huu-ay-aht First Nations

Initial contact with Euro-Americans during the maritime fur trade introduced many new items and raw materials into Nuu-chah-nulth life. These were easily integrated within traditional socio-economic structures, which continued without major disruption. Although more power seems to have been concentrated in the hands of the Chiefs than previously, allowing some to extend their power and influence far beyond their traditional territories, the essential relationship between Chiefs and members of their local groups remained largely unchanged. Trading goods, such as food and furs, were gathered by members of the community and turned over to their Chiefs, who then conducted the actual trade with Euro-Americans. This retained the traditional pattern of descent lineages working cooperatively for group benefit and the enhancement of the Chief's status.

Epidemic diseases, intensified warfare, and the consequent amalgamations of local groups as populations dropped, forced major changes in the social structure and general lifeways of the Barkley Sound Nuu-chah-nulth. The new devastating diseases, particularly smallpox, arrived with the ships of the maritime fur traders. As early as 1791, the American traders on the *Columbia* reported smallpox among the Ditidaht, the neighbours of the Huu-ay-aht to the east (Howay 1990:371). Competition over access to furs and control of the trade also stimulated warfare and led to population decline. The late-18th century Euro-American explorers and traders in Barkley Sound frequently remarked on the "large and populous" villages. Yet, by the time Banfield arrived in the 1850s, the population of the sound had been greatly reduced and the Huu-ay-aht numbered only about 500 people. Renewed outbreaks of contagious diseases throughout the latter half of the 19th century continued to affect the Nuu-chah-nulth, placing great stress on their cultural, economic, and spiritual practices. Henry Guillod, catechist at the Alberni Mission and later the regional Indian Agent, reported a deadly outbreak of smallpox among the Huu-ay-aht in 1868: "40 Ohy-ahts had died of the disease, which was fast spreading . . . Those who were affected by it were so terrified that they were neglecting to lay in their winter's stores of salmon, so that starvation would probably ensue" (Guillod 1870:51). In addition to smallpox, diseases such as measles, influenza, and tuberculosis took a dreadful toll in this later stage. By 1914, when the Royal Commission on Indian Affairs met with the Barkley Sound groups, the Huu-ay-aht population was a mere 129 people (British Columbia 1916:877).

The establishment of reserves in 1882 was a major intrusion into Huu-ay-aht control over their daily lives. It officially limited where they could reside and where they could harvest their resources. As long as Euro-Canadian settlement remained low, the establishment of the reserves probably little affected Huu-ay-aht movement throughout their *h̲ah̲uulhi* or the use of its many resources. But as more settlers arrived and more Crown land was alienated into private hands, limitations on traditional use became more evident and restrictive. Various aspects of provincial and federal legislation also affected their ability to continue with traditional economic and social activities and progressively limited use of their *h̲ah̲uulhi.*

As the influence of the church and government officials grew, these individuals were able to effect major changes in Nuu-chah-nulth culture. Aided by the social disruption created by deadly epidemics and the resultant population decline, these institutions used their authority to make changes that altered residence patterns and aspects of the traditional relationship between Chiefs and their kinsmen, as well as to suppress Nuu-chah-nulth language and culture in the newly created schools. Increasingly, the traditional "big house" occupied by an extended family, often comprising a distinct descent lineage (*ushtak̲imilh*), was abandoned in favour of European-style dwellings, each housing a nuclear family. As involvement in the Euro-Canadian cash economy grew, it was no longer essential for groups of related people to work cooperatively under the leadership of their Chief. The traditional pattern of joint residence and economic effort increasingly broke down as more individuals, both male and female, acquired employment, even if only seasonally, in the Canadian economy. As a result, the traditional position of the *hawilh* as the leader of a distinct, well-defined group and his role as the director or coordinator of their economic activities began to diminish.

Initially, Huu-ay-aht participation in the new commercial and industrial ventures involved primarily the production of dogfish oil and work on the sealing schooners. Later, employment in canneries, some at a considerable distance from Huu-ay-aht territory, as well as picking hops on the mainland, became common. By the early 20th century, the commercial fishing and logging industries offered employment for many. Individuals were able to support themselves by earning wages to buy the commodities they could no longer obtain through traditional activities. Because their wages were earned outside the limits of their tribal *ha<u>h</u>uulhi*, they were under no obligation to share with their Chief or *ushta<u>k</u>imilh*. This accelerated the disappearance, already occurring as a result of severe population decline, of numerous *ushta<u>k</u>imlh* and the traditional social structure based on ranked lineages. Although Chiefs retained an important role in ceremonial activities, some political influence, and the respect of their community members for their connection to an honoured and cherished past, the events and resultant changes of this later historic period significantly altered traditional roles developed over millennia of Nuu-chah-nulth culture.

Chapter Three:
EXCAVATION AT HOUSE 1

Excavation Methods and Extent

With the exception of two excavation units on the elevated terrace behind the main village area, excavation at Huu7ii was limited to within the outline of House 1, as visible on the site surface. House 1, the largest of the house platforms mapped by Mackie and Williamson (2003) in 1984, was located near the centre of the village (Fig. 1-3). The rear of the house is clearly demarked by the back ridge that extends across the site. Quite pronounced side ridges extend for short distances from the back ridge, marking the rear corners of the house. Much fainter evidence, in the form of a slight drop-off from the flat platform, indicates the position of the house front. This location was confirmed in the field through auger testing. Dimensions of the house, as initially recorded by Mackie and Williamson, are about 35 m in length (parallel to the beach) and 17.5 m in width.

A 0-0 point for the horizontal grid was placed at the rear of the back ridge, just before it drops off to the swampy area behind the site, immediately above where the ridge marking the west wall of the house joins the back ridge. This side ridge is quite substantial where it joins the back ridge, but drops off rapidly as it extends to the north, disappearing after about 8.5 m. Grid north was established as an arbitrary line running down the centre of this side ridge, approximately 26° east of magnetic north. All measurements into the house were then north and east. For the vertical datum, a large spike was driven into a large tree on the back ridge, immediately behind the excavation area. Secondary datum points consisted of wooden posts driven in beside each unit, with the top surveyed to a known depth below the primary datum. All unit depth measurements were taken using string and line levels from the tops of these posts. A contour map prepared in the second field season shows the location of all excavation units, the 0-0 grid point, and the primary vertical datum (Fig. 3-1). The mapping, using compass, tape, and hand level, was done by DRH Consulting, Port Alberni, under contract to the Huu-ay-aht First Nations.

The 2004 excavation was focused on one back corner (the southwestern) and the western wall of the house. In Nuu-chah-nulth households, the corner areas were occupied by higher status individuals, with the house chief and his family residing in the corner at the rear left when entering through the door (Drucker 1951:71; Marshall 1989:19; Sproat 1987:33–34). Without knowing the location of the door, the most highly-ranked area cannot be determined with certainty, but the corner investigated would have been one of the highest-status areas in the house (see Chapter 4). The position of the six 2 x 2 m units was also partially determined by the presence of a few large trees and stumps on the site surface (Fig. 3-2). Two adjacent units at the south of the excavated area (N10-12 E2-4 and E4-6) were laid out so that they cut into the back and side ridge midden deposits as well as extending out onto the house floor, in the hope of exposing the transition from the outside to inside of the house and possibly detecting architectural features. Two additional adjacent units extended to the north (N12-14 E6-8 and N14-16 E6-8). Two separate units to the north (N18-20 E2-4 and N18-20 E6-8) extended past the mid-point of the house, with one along what would have been the west wall. Only the latter unit (N18-20 E2-4) reached the original beach gravel at its base, at a depth of just over 2 m, although all six units were excavated to cultural strata that lay below the house floor. In total, the 2004 House 1 excavation involved about 35.8 m^3 of deposit.

During excavation, all cultural deposits were removed by trowelling in 5 cm levels, taking care to separate materials from differing natural layers. Levels were numbered while natural layers were given alphabetical designations; both were recorded on all bags and forms. Artifacts were recorded in three-dimensional provenience, and faunal remains were placed in bags by quadrant, level, and layer. Standardized forms (based on ones obtained from the Royal B.C. Museum in Victoria) were used to record data concerning artifacts, features, and radiocarbon samples, as well as the notes for each excavated level. All trowelled matrix was screened through ⅛" mesh to recover even small faunal remains. In cases where small fish bones were abundant, or where relatively little went through the screen, the remaining deposit was put back into a bucket and taken to a sorting table, where it could be carefully picked through to recover small remains. Shell was not collected from the trowelled deposits; instead column samples (20 x 10 x 5 cm)

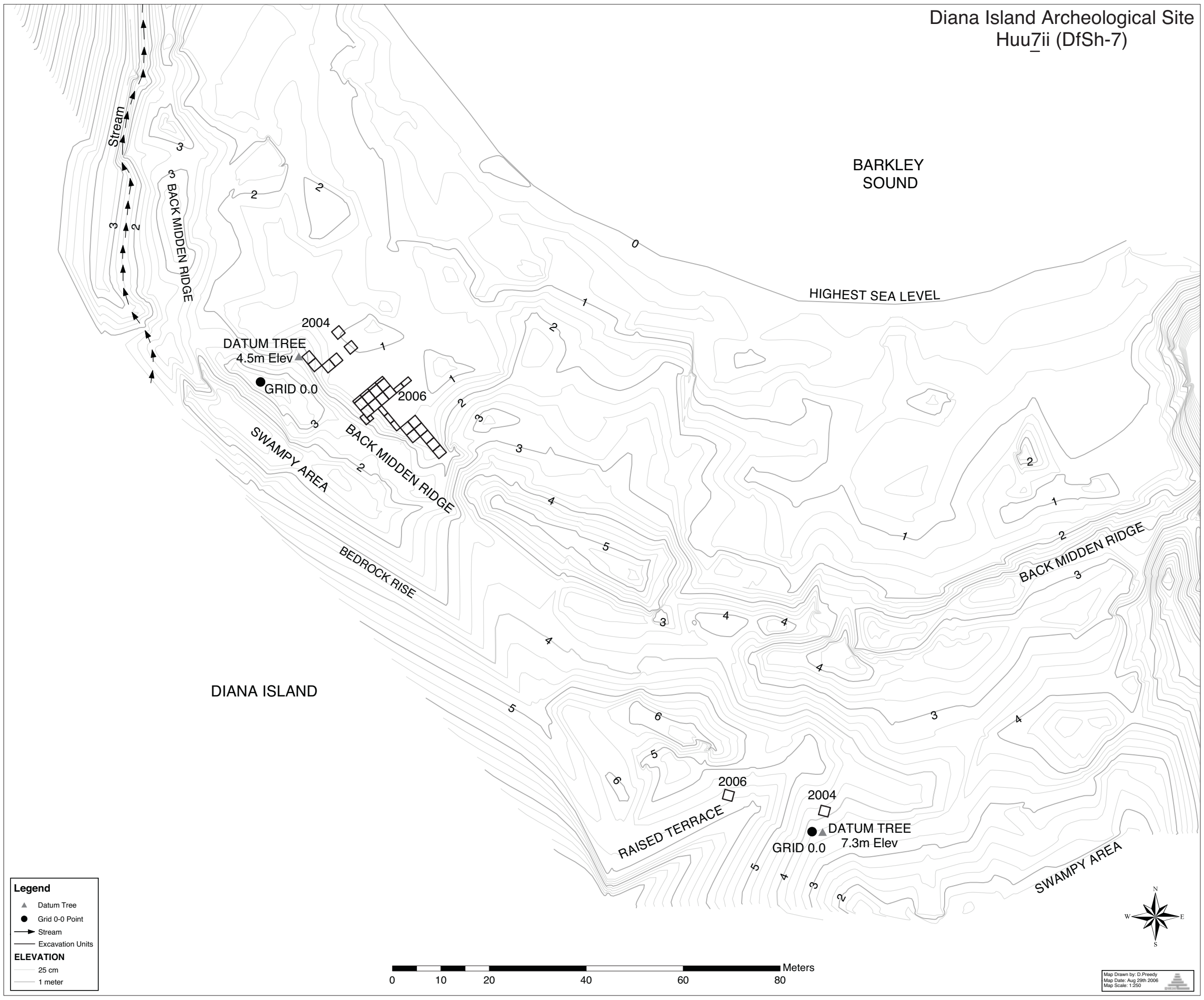

Figure 3-1. Contour map of Huu7ii (DfSh-7), showing locations of excavation units within the House 1 platform, the back midden ridge, and two excavation units on the raised terrace behind the main village, as well as the datum points for the two excavation areas.

were taken from one wall of each unit for later shell and microfaunal analysis. Bulk matrix samples were taken from each hearth or ash deposit for later flotation and archaeobotanical analysis. Any concentrations of charcoal encountered were recorded and collected for possible radiocarbon dating. Profile drawings were made of the stratigraphy from at least two walls of each unit. All units were backfilled at the end of the field season.

The field strategy changed somewhat when excavation resumed in 2006. Instead of excavating in dispersed units and attempting to reach the base of deposits, a horizontal excavation plan was employed, involving exposing a large area of house floor deposits. An initial stratigraphic control trench, 50 cm in width, was laid out at about the middle of the back wall as indicated by the back midden ridge, extending 8 m into the centre of the house. Subsequently, a 4 x 8 m block, with coordinates N12-20 E16-20, was laid out immediately to the east. The eight 2 x 2 m units that made up the block were excavated and recorded as separate units, but were coordinated so that the same level extended across the entire area (Fig. 3-3). After removing the thick layer of humus and rotting wood, the black silt of the house floor (Layer B) was exposed. Most attention focused on recording features and other information within this floor deposit, which was about 50 to 70 cm deep across the central excavation block. When the underlying midden deposit with greater shell content (Layer C) was encountered excavation ceased and all features on the lowest house floor were mapped and photographed.

Excavation methodology in 2006 was much the same as in the previous field season. However,

Figure 3-2. View of the 2004 excavation units, in the southwest corner of the House 1 platform. This photo, looking from the back of the house toward the beach, is taken from atop the back midden ridge, near where it is intersected by a short western side ridge. Five of the six excavation units are visible. The flat platform of House 1 extends across the centre of this picture.

use of ⅛" screen was discontinued on the advice of our faunal analysts. Little additional information had been gained for the extra time invested in fine screening, and in addition we were damaging faunal elements in trying to get sediments through the smaller mesh. As a result, screening in the second season was through ¼" mesh. For the record of small fauna that might be lost through this mesh size, column samples taken from the side walls of completed excavation units and samples taken from each level during excavation were subjected to fine screening. Many of the samples were washed (in a split barrel set up at the top of the beach), dried (on racks set up in a small shed) and sorted in the field. As previously, at the end of the field season all units were backfilled and the site was returned as closely as possible to its appearance prior to excavation.

While the central block was being excavated, other units were established to the east. A unit near the southeastern corner (N18-20 E34-36), as indicated by the intersection of the back ridge and an apparent partial side ridge, was excavated to the sterile gravel at its base, at a depth of just over 2 m. Other units were then laid out between this corner unit and the central block, providing a continuous record of site stratigraphy across the excavation (Fig. 3-1). The eastern units were excavated varying distances into the midden layer below the house floor, but only the corner unit was taken to the bottom of cultural deposits. At the end of the project two small excavation extensions were dug into the shell of the back midden ridge to further expose a rock-filled pit feature at the back of the house. In all, the 2006 excavation area covered 77 m^2. The total volume of matrix excavated in 2006 is approximately 70.3 m^3. With the 35.8 m^3 excavated in 2004, the total amount of matrix examined from within the outline of House 1 is approximately 106.1 m^3.

Figure 3-3. Excavation in progress on the central block of the 2006 excavation. Note the 50 cm test trench to the left of the 4 x 8 m block. Numerous ash patches and FCR concentrations occurred throughout the house floor deposits, as can be seen around the centre of this picture. The photo was taken from standing on the back midden ridge, looking north.

Stratigraphy and Chronology

The upper layer (A) was a thick recent organic deposit of forest debris, roots, and decayed wood. This layer was particularly thick in several places where large trees had fallen onto the house platform, requiring removal of rotten wood to a considerable depth. The impact of fallen trees depressed the underlying deposit, so that the upper surface of Layer B was markedly convoluted in these locations, and the limbs of these fallen trees left deep holes into the house deposit.

Layer B is the house floor deposit, consisting of black silt (Munsell 7.5YR 2/0) with a high organic content. In most areas, shell was absent or occurred only as a trace, particularly toward the bottom of the layer. However, along the southern portion of the platform, thin deposits of concentrated highly crushed shell entered the house from the back ridge. Most hearths and other features that marked household activities were found in this layer, particularly at its base. In the excavated block at the centre of the house platform, Layer B was approximately 50 to 70 cm in depth (Fig. 3-4).

Layer C consists of concentrated crushed shell, particularly mussel, in black silt, with occasional patches of charcoal or fire-cracked rock (FCR). Although the central excavation block was excavated only to the top of this layer, a number of units to the east and west continued into or through this layer.

In the southwest corner of the house, in four units excavated in 2004, the shell deposit was underlain by a thick layer of dusky-red silty clay (Munsell 10R 2.5/2) (Figs. 3-5, 3-6). Upper portions of this layer appeared fibrous and a sample taken for later examination under a microscope exhibited a directional layering, indicating that this stratum consists in part of decayed wood. It may represent a hiatus in occupation, or a period of limited activity. Shell was absent in this matrix, and no artifacts were recorded. Faunal remains were rare but did occur, most notably as a largely complete but poorly preserved dog skeleton in one unit and a large whale vertebra in another. Excavation was terminated in this stratum in all four units in which it occurred. This distinctive layer was absent from the two more northerly 2004 units, which continued to greater depths through layers of black silt and sand.

Only two units, at opposite ends of the house as visible on the surface, were excavated to the base

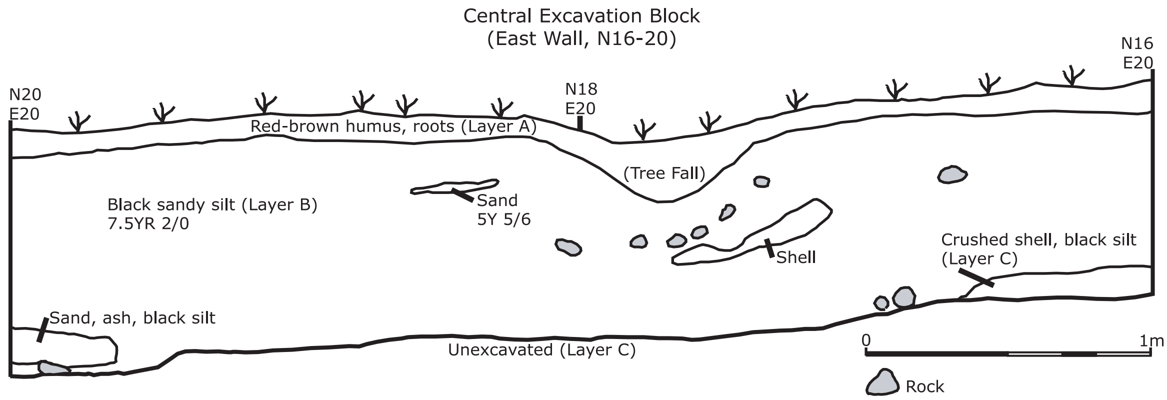

Figure 3-4. Central excavation block profile, showing the house floor deposits (the black silt of Layer B).

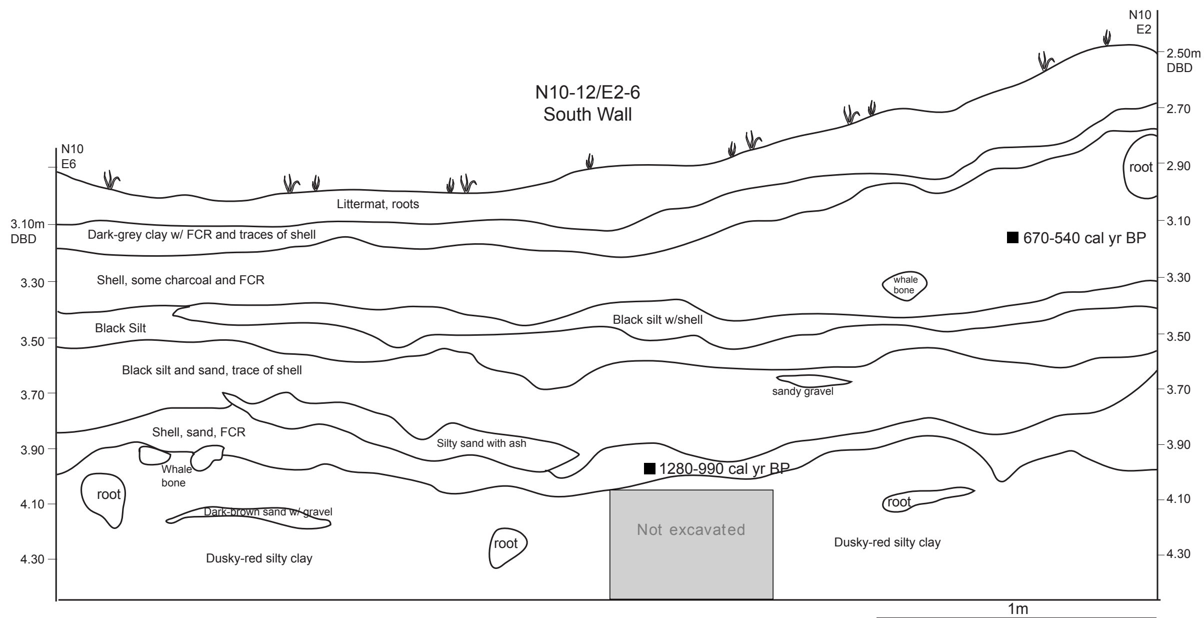

Figure 3-5. Stratigraphic profile of N10-12 E2-6, South Wall, near the southwest corner of House 1, showing location of radiocarbon dates.

of cultural deposits. In the unit along the west wall, the black silt and crushed shell layers were underlain by reddish-brown clay with FCR. This matrix contained abundant faunal remains, including whalebones. Below that was black silt with charcoal and sand lenses. At the base of the deposit, at just over two metres depth, was beach gravel, stained a dark brown (Munsell 10YR 2/1), with clay patches (Fig. 3-7). The unit in the southeast corner also reached a depth of just over two metres. Below the black silt and crushed shell layers was a layer of black silty clay with FCR and charcoal. This was underlain by a thick layer of crushed and burned shell, with some silt, ash, and FCR, then crushed and burned shell with gravel. Below that was a layer of reddish brown stained sand and gravel (Munsell 2.5YR 4/6), before reaching sterile beach sand at the base (Fig. 3-8).

Radiocarbon dates throughout this report are generally given as calibrated age ranges before the present (cal BP), showing the maximum and minimum age estimates at two-sigma standard deviation (95% probability). Nineteen radiocarbon determinations are available from this portion of the site, 18 from within the house outline and one from the base of an auger test toward the beach (north) of House 1 (Table 3-1; see also Fig. 4-4). Of these, twelve date the house deposit while seven are from underlying strata. The earliest date was obtained from the brown sand at the base of a unit

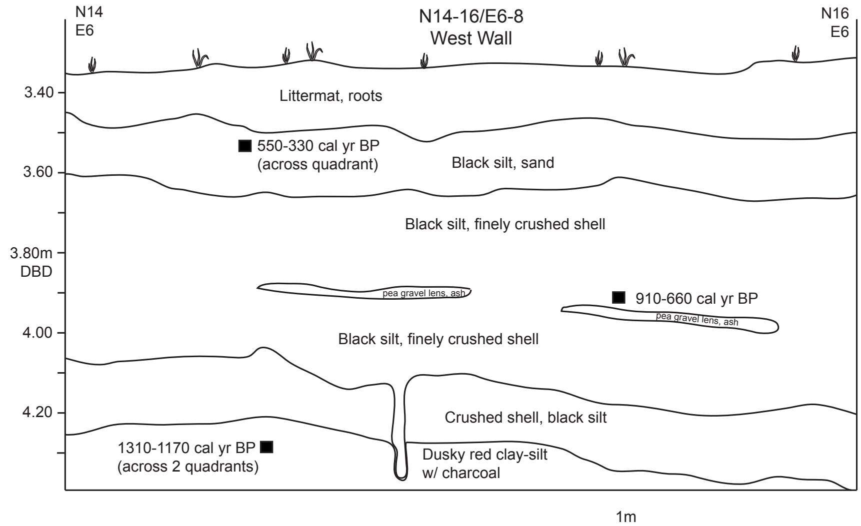

Figure 3-6. Stratigraphic profile of N14-16 E6-8, West wall, showing location of radiocarbon dates.

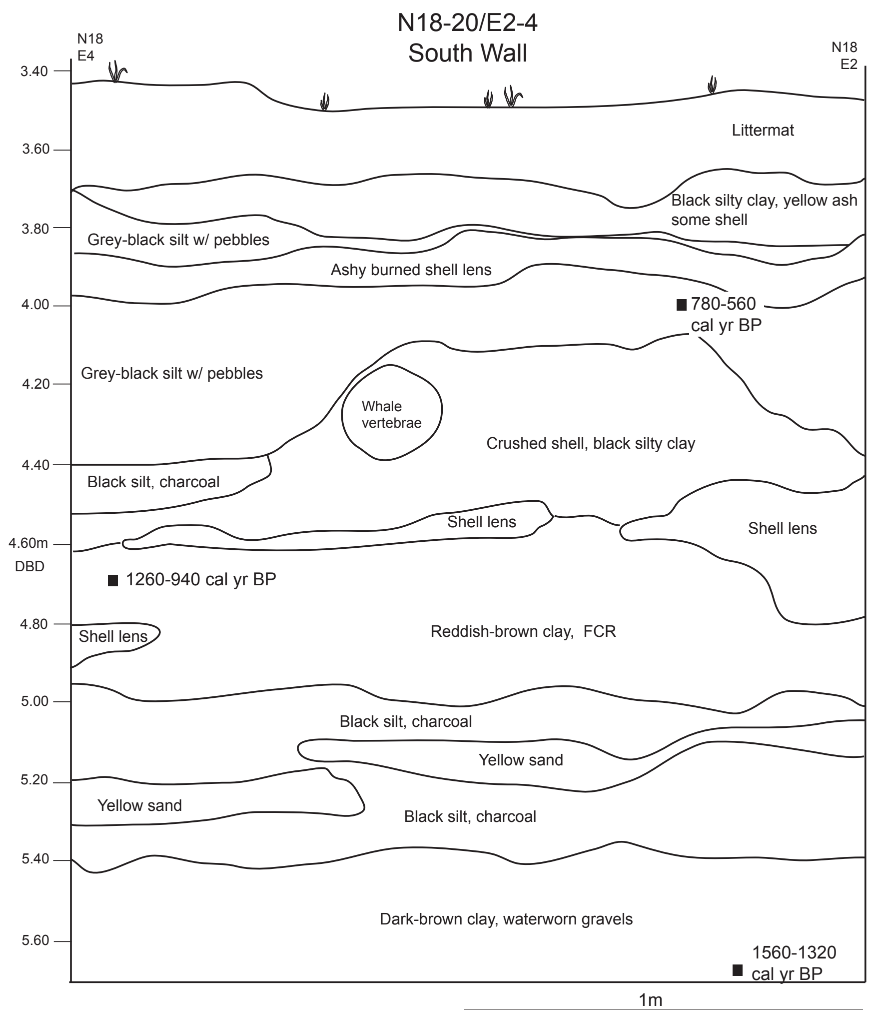

Figure 3-7. Stratigraphic profile of N18-20 E2-4, at the western edge of House 1, showing location of radiocarbon dates.

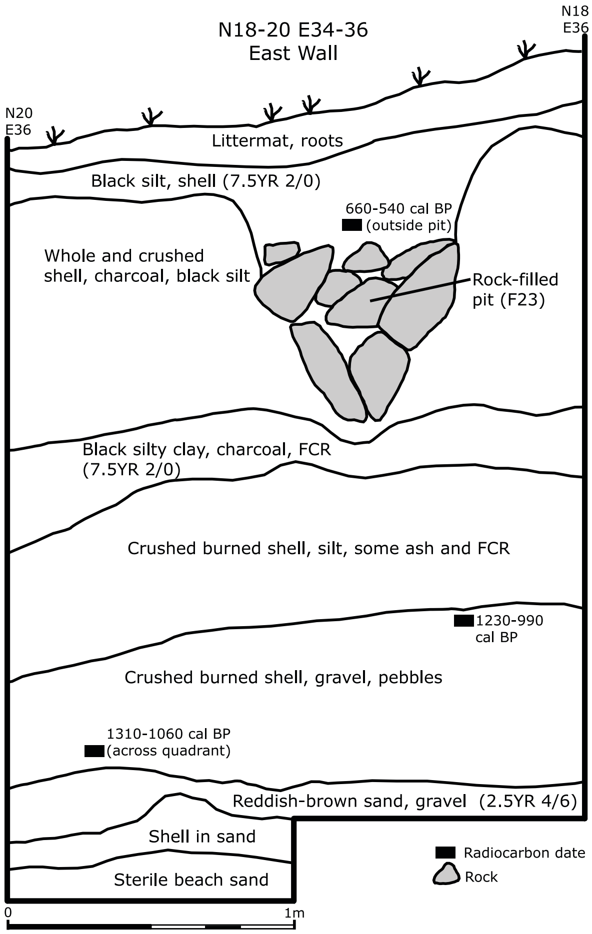

Figure 3-8. Stratigraphic profile of N18-20 E34-36, at the eastern edge of House 1, showing location of radiocarbon dates.

along the west wall (N18-20 E2-4), one of only two units in which the original sterile beach deposits were reached. Calibration of this date provides an estimated age range of 1560 to 1320 cal BP, giving a basal date for this part of the site. The only other date from the underlying beach sands came from the unit in the southeastern corner of the house outline (N18-20 E34-36). Its calibrated age range is slightly later at 1310 to 1060 cal BP. A similar age range, 1310 to 1170 cal BP, came from the dusky-red silty clay matrix found only in units in the southwest portion of the house outline. Three other samples, from the shell layers that underlie the house deposits, yielded similar dates, ranging from about 1280 to 940 cal BP. AMS dating of charcoal from the base of an auger test at N40.5 E8, about 10 m north of House 1, produced an age range of 1060 to 920 cal BP. This is also thought to just predate the construction of House 1, with the concentrated shell of the higher levels representing refuse deposited in front of the house during its occupation.

Twelve results date the house occupation. The earliest, with an age range of 970 to 780 cal BP, comes from the charred wood of a hearth in a shallow pit (F42) at the base of the floor. Two other dates provide similar age ranges (Table 3-1). However, three additional dates from the base of the house floor are more recent and non-overlapping, at around 730 to 550 cal BP. Periodic cleaning of the house floor could result in more recent materials being deposited at the same lower level as those reflecting initial use of the house. The final occupation of House 1 is indicated by three dates taken from at or near the surface of cultural deposits, in one case from a hearth feature (F1) and in another from a concentration of FCR (F19). The three dates are very similar (Table 3-1), with age ranges within 550 to 290 cal BP. These three radiocarbon dates intercept the calibration curve at 460, 490, and 520 BP, indicating that house use may have been during the earlier portion of that age span. Final occupation, therefore, was perhaps sometime just over 400 BP.

This relatively early date for the last use of House 1 is supported by other types of evidence. The absence of artifacts of European manufacture or materials in the archaeological deposits indicates that occupation ended prior to European arrival on the west coast in the late 18th century. Few ethnographic accounts refer to this site, also suggesting considerable time had passed since it had been a major village, and in one of the few cases where Huu7ii is specifically mentioned it is clear that the village was already unoccupied (see Chapter 2). The position of the house row well back from the modern beach, unlike recent village sites elsewhere in Barkley Sound where the houses are located immediately above the high tide line, is likely a result of gradual geological forces that would have taken centuries. The presence of large mature trees on several of the house platforms also suggests that considerable time has elapsed since large houses last stood on the site. Dendrochronological analysis carried out by two students at the Bamfield Marine Sciences Centre involved coring seven of the largest trees on the site (Sookocheff 2004). Two Sitka spruces were the oldest trees in this sample, but the presence of considerable rot at their centres meant that their ages had to be estimated. This analysis indicated that the trees began growth around AD 1600, suggesting that the site was no longer being occupied a minimum of 400 years ago.

Table 3-1. Radiocarbon dates – Huu7ii House 1.

Lab. No.	^{14}C age (Convent.)	Calibrated age range (2 sigma - 95% probability)	^{13}C/^{12}C ratio	Unit	Depth (cm)	Comments
Beta-221952	370±70	530 to 290 BP	–23.7	N16-18 E26-28	25	Surface of cultural, in hearth
Beta-221951	410±70	540 to 300 BP	–25.4	N18-20 E16-18	10–20	Surface of cultural, in FCR
Beta-195635	470±60	550 to 440 and 350 to 330 BP	–25.3	N14-16 E6-8	12	Upper layer, in hearth feature
Beta-221950	610±40	660 to 540 BP	–22.6	N18-20 E34-36	37–44	
Beta-195633	640±50	670 to 540 BP	–26.6	N10-12 E2-4	50	In shell of back ridge - south wall
Beta-221957	670±70	680 to 550 BP	–25.9	N16-18 E16-18	75–80	Bottom of house floor in main block
Beta-221955	710±40	690 to 440 and 580 to 570 BP	–20.4	N18-20 E16-18	45–50	Deep in house floor
Beta-221961	710±60	730 to 550 BP	–23.2	N12-14 E18-20	88–93	Bottom of house floor in main block
Beta-195634	740±70	780 to 630 and 600 to 560 BP	–23.5	N18-20 E2-4	52–55	
Beta-195636	820±60	910 to 660 BP	–24.1	N14-16 E6-8	57	
Beta-236289	920±50	930 to 730 BP	–26.6	N18-20 E6-8	67	
Beta-221959	990±50	970 to 780	–26.4	N18-20 E16-18	65–69	In hearth pit at base of house floor
Beta-236288	1060±40	1060 to 920 BP	–24.3	N40.5 E8	109–125	Base of auger test ca 10 m north of House 1
Beta-195638	1170±70	1260 to 940 BP	–22.3	N18-20 E2-4	120	
Beta-221954	1190±40	1230 to 1210 and 1190 to 990 BP	–20.5	N18-20 E34-36	130–135	Layer F (shell)
Beta-195642	1230±60	1280 to 990 BP	–25.4	N10-12 E2-4	78	In shell
Beta-221956	1290±70	1310 to 1060 BP	–20.9	N18-20 E34-36	195–200	From top of basal sands
Beta-195639	1330±50	1310 to 1170 BP	–24.9	N14-16 E6-8	94	In dusky-red matrix
Beta-195640	1560±60	1560 to 1320 BP	–25.2	N18-20 E2-4	220	In brown sand at base – west wall

Taken together, the evidence indicates that people lived on this portion of the site for roughly a millennium. The initial occupation, which left refuse directly on beach sand, occurred around 1,500 or 1,400 years ago. By about 800 years ago a house had been constructed on top of these earlier midden deposits, although this house may have differed significantly in dimensions and placement from the structure evident through surface features. A large dwelling appears to have stood at this location for almost 400 years, although there is evidence that it was altered and expanded through time. More detailed treatment regarding the construction and occupation of the house is given in Chapter 4. Finally, House 1, the structure corresponding to the surface features, was abandoned just over 400 years ago, well prior to the first appearance of Europeans along the west coast of Vancouver Island.

Artifacts Recovered

In total, 960 artifacts were recovered through excavation within the surface platform of House 1

(Table 3-2). Of these, 748 (77.9%) were excavated in house floor deposits. An additional 58 artifacts (6% of total) came from the shell of the midden ridge that accumulated along the back of the house or shell that had slumped onto the back floor of the house; these artifacts would be contemporaneous with the upper house floor deposits. Artifacts from the strata underlying the house floor totalled 154 (16%). The relative under-representation of these earlier materials can largely be attributed to the more limited excavation in the underlying strata, as many units were discontinued at the base of the house floor.

The great majority of Huu7ii artifacts were manufactured from bone (775 examples; 80.7%). Only 154 (16.0%) of the artifacts are of stone, and these are heavily dominated by a single category (abrasive stones). The remaining raw material categories are minor: 14 artifacts of antler, 11 of tooth, four of shell, and two of wood. Artifacts are described below, classified first by raw material and then by form or presumed function. The number of examples in each category is given after the heading. Wherever possible, some discussion is given of the archaeological distribution of each artifact category and the ethnographic

Table 3-2. Artifacts from Huu7ii – House 1.

Bone	
Large barbed harpoon head	1
Single barb points	9
Larger barbed points	9
Points	243
Abrupt tip (65)	
Gradual taper (43)	
Small tapered (31)	
Fragments (104)	
Bipoints	184
Awls	36
Bone splinter (28)	
Cut limb bone (2)	
Bird bone (4)	
Fish spine (1)	
Composite (1)	
Deer ulna tools	4
Harpoon valves	85
Large slotted (19)	
Small slotted (1)	
Small channelled (30)	
Simple (9)	
Self-armed/ ancillary (10)	
Blank (1)	
Miniature valves (5)	
Fragments (10)	
Fishhook shanks	10
Chisels	16
Pendants	5
Other decorative items	7
Bird bone tubes	11
Polished rectangle	1
Prying tools	2
Foreshafts	3
Bark beaters	2
Whalebone wedges	8
Whalebone stakes	2
Whalebone blanks	18
Modified whale bulla	1
Lance heads	2
Knobbed whalebone club (?)	1
Spatulate whalebone implement	1
Bone continued	
Notched whalebone	1
Misc. worked whalebone	29
Misc. worked bone	84
total bone	***775 (80.7%)***
Antler	
Wedges	2
Worked antler	12
total antler	***14 (1.5%)***
Tooth	
Fishhook shank	1
Shark tooth pendant	1
Worked canines	6
Polished tooth section	1
Beaver incisor tools	2
total tooth	***11 (1.1%)***
Shell	
Mussel shell tools	2
Dentalium shell bead	1
Shell disk bead	1
total shell	***4 (0.4%)***
Wood	
Points	2
total wood	***2 (0.2%)***
Stone	
Stemmed ground slate point	1
Fishhook shanks	4
Celts	2
Net weight	1
Chipped pebble (pièce esquillée)	1
Ground slate knife	1
Ground schist	13
Saw	1
Abrasive stones	100
Large chipped slab	1
Hammerstones	11
Anvil stone	1
Gaming piece (?)	1
Quartz crystal/ calcite manuports	4
Red ochre	12
total stone	***154 (16.0%)***
Artifact total	**960**

use of similar objects within Nuu-chah-nulth territory.

Small bone points and bipoints dominate the assemblage, as is true of almost all excavated Nuu-chah-nulth sites. Although they vary in form and size, suggesting that they served a number of functions, the great majority would have been parts of composite fishing gear of various types. Where wood is preserved, as in the waterlogged deposits at Ozette, similar bone points are found intact as the piercing elements of composite fishing implements that are primarily of wood and bark. Collectively, these implements total 445, representing 57.4% of the bone artifacts and 46.4% of the artifact total. When other fisheries-related objects such as small harpoon valves and fishhook shanks of bone and stone are included, the total jumps to 526, or 54.8% of all artifacts. Clearly, fishing as an activity is well represented in the artifact assemblage.

Artifact density for the excavation within House 1 was 9.0 artifacts per cubic metre of deposit. This figure is well below that at the major village of Yuquot in Nootka Sound, which yielded approximately 17.9 artifacts per m^3, even excluding the numerous artifacts of European materials in the historic component (Dewhirst 1980). Similarly, T'ukw'aa, a major village of the Toquaht people on western Barkley Sound, yielded 13.3 artifacts per m^3, again excluding the relatively numerous historic items of European manufacture (McMillan and St. Claire 1992; McMillan 1999:69). The figure for House 1 at Huu7ii, however, is higher than that at Ch'uumat'a, another major Toquaht site, at 6.5 artifacts per m^3, and Ts'ishaa, the major traditional Tseshaht village not far from Huu7ii in the central sound, at 4.5 artifacts per m^3 (McMillan and St. Claire 2005:45). Part of the difference may be attributable to excavation primarily in a house floor at Huu7ii, whereas a considerable portion of the excavations at Ts'ishaa and Ch'uumat'a was in shell deposits representing "dump" activities.

Artifacts of Bone

Large barbed harpoon head (1)

This large sturdy harpoon head (Fig. 3-9), manufactured from sea mammal bone, is 32.5 cm in length (width at line guard = 2.9 cm; thickness = 1.2 cm). It is complete in length, and is missing only a small portion at the tip of one barb. It is sharply pointed, with three prominent, evenly spaced, barbs along one side. Below the barbs, a semicircular projection (extending 0.6 cm) forms a line guard to hold the attached line. The lower portion is spatulate in form, coming to a wedge base. The faces are flat, with slightly flattened sides, making it a rounded rectangle in cross-section.

This impressive artifact was found in association with Feature 3, a large pit and cobble concentration extending below the house floor in the deep unit excavated along the western edge of the house platform. If this large pit is a post mould for the house, the harpoon head should be contemporaneous with the house floor. A radiocarbon date outside the pit, and somewhat above the artifact, is 780 to 560 cal BP. A date of 1260 to 940 cal BP came from just below, in a different natural layer.

Barbed bone harpoon heads are considered one of the identifying features of the West Coast culture type (Mitchell 1990:356). They are reported, however, only in small numbers, from only a few West Coast sites. The Yuquot assemblage includes several such artifacts; one appears very similar in size and form to the Huu7ii example, but has a drilled hole through the line guard (Dewhirst 1980:291–295). It came from Zone III, dating from 1200 BP to historic contact, which makes it partially contemporaneous with the Huu7ii house. Several bilaterally and unilaterally barbed harpoon points came from relatively late deposits at Ch'uumat'a, but none are as large or similar in form to the Huu7ii example (McMillan and St. Claire 1996:34). Two large examples similar to the Huu7ii artifact also came from the Shoemaker Bay site, at the head of the long Alberni Inlet

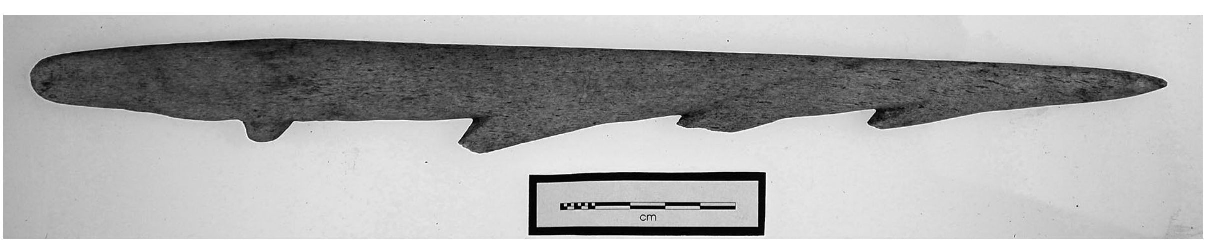

Figure 3-9. Large barbed harpoon head from Huu7ii.

from Barkley Sound (McMillan and St. Claire 1982:100–101).

Single barb points (9)
Nine artifacts are small bone points with a single sharp barb near one end (Fig. 3-10). Seven are complete, ranging between 3.0 and 4.3 cm in length (mean = 3.6; S.D. = 0.43 cm). Of these, two have pointed bases, three have roughly rounded bases, and two have flat bases that are round in cross-section. The remaining two artifacts are largely complete, missing only the basal portion.

Such points likely armed composite fishhooks that had shanks of wood or bone. Drucker (1951:22) describes a hook for catching cod or trolling for salmon as having a point "which was a barbed splinter of hardwood or bone." Jewitt (1967:68), at Nootka Sound from 1803 to 1805, described the fishhooks in use there as "a straight piece of hard wood, in the lower part of which is inserted and well secured, with thread or whale sinew, a bit of bone made very sharp at the point and bearded [barbed]." Similar artifacts have been found at most Nuu-chah-nulth sites, including Yuquot (Dewhirst 1980:178-181) and the contemporaneous Barkley Sound villages of T'ukw'aa, Ch'uumat'a, and Ts'ishaa (McMillan and St. Claire 1992, 1996, 2005). They are considered to be one of the characteristic artifacts of the West Coast culture type (Mitchell 1990:356).

Larger barbed points (9)
Artifacts in this category appear to have been fixed barbed points, all manufactured from polished segments of land mammal bone (Fig. 3-11). One, complete at 9.2 cm in length (width = 1.2 cm; thickness = 0.5 cm), has two shallow barbs near its tip and a pointed base. Two large tip fragments each have one pronounced barb remaining. Another, also missing its base, has two rounded barbs on one side and a possible barb remnant on the other; if so, this is the only bilaterally barbed point from Huu7ii. Three basal fragments are sharply pointed. Two have only one shallow barb remaining, whereas another has three; that example has been cut and snapped across at the distal end, rendering it non-functional. The final two examples are similar. One is complete at 8.6 cm in length (width = 1.0; thickness = 0.5 cm), with a blunt tip and a roughly pointed base. One side has one low enclosed barb, with four shallowly incised notches along the barb and three below. A vertical line incised into both faces runs parallel with the edge just in from the angular notch that forms the barb, extending for much of the length of the object. A fragment of a similar artifact has a rounded base, with a very shallow barb and a small notch below it close to the basal end; a vertical line incised on each face just in from the barb extends from the base to well above the barb.

Unilaterally barbed fixed bone points are a characteristic feature of the West Coast culture type (Mitchell 1990:356). They are reported for almost all major excavated Nuu-chah-nulth sites, including the Barkley Sound villages of T'ukw'aa, Ch'uumat'a, and Ts'ishaa (McMillan and St. Claire 1992, 1996, 2005). They were relatively common at Yuquot, where Dewhirst (1980:279) suggests that they armed arrows. They have also been found at the Makah sites of Ozette (McKenzie 1974:97) and Hoko River Rockshelter (Croes 2005:152). Their identification as arrow points is confirmed through the Ozette wet site excavations, where barbed bone points were occasionally found hafted

Figure 3-10. Single barb bone points.

Figure 3-11. Barbed fixed bone points.

on arrow shafts, although the great majority of arrow points were of wood (Croes 2005:153).

Points (243)

Three distinct categories of relatively small, unbarbed bone points can be discerned: "abrupt tip," "gradual taper," and "small tapered." Many others, however, can be classified only as "fragments."

Abrupt tip points are characterized by having their greatest width near the tip and sides that gradually taper to the base (Fig. 3-12). This is the largest category, with 65 examples. Such points tend to be quite stout, and range from rectangular to circular in cross-section. Bases take a variety of forms: some of the stout examples have flat bases, while others are rounded, pointed, or wedge-shaped. Some of the stout examples have quite blunt tips, although others are sharply pointed. Most have been fashioned from sections of hard land mammal limb bone. Size varies considerably; measurements are summarized in Table 3-3. Although the variability in form and size suggest the possibility of several different functions, most would have served as the arming points in composite toggling harpoon heads. Many fit comfortably into the excavated toggling harpoon valves from the site, although a few seem rather stout and bluntly pointed for this function. The shape of these points, with greatest width near the tip, may have been designed to withstand breakage upon impact. Nine examples show extensive impact damage at the tip, often destroying much of that end of the artifact. King (2007:41–43) found even higher levels of tip damage at T'ukw'aa and Ts'ishaa, also attributing this to their use in harpoon heads. Similarly, Dewhirst (1980:262) noted "blunting and breakage of tips" among the Yuquot artifacts classified as harpoon arming points. One thin, sharply pointed example from Huu7ii was found intact as part of a three-piece harpoon head, with its pointed base fitting into the narrow channels of the two valves. Croes (2005) also found several such points intact in their valves at the Hoko Rockshelter site. Such artifacts are common at excavated Nuu-chah-nulth and Makah sites, attesting to the importance of the harpoon technology in fishing and hunting. This is discussed further in the section on harpoon valves.

A category of "gradually tapering" points, with greatest width at or below the centre of the object, contains 43 examples (Fig. 3-13). Most correspond to Dewhirst's (1980) "spindle-shaped" category from Yuquot. This is a considerably more variable category than abrupt tip points. They range from fairly small and slender points to much larger and stouter objects. Measurements are given in Table 3-4. A bluntly pointed base is common, but some have rounded or flat bases. A few fairly rough examples could be classified as bone splinter awls, although their bases are more finished than arti-

Table 3-3. Bone points – abrupt tip.

Attribute	Range (cm)	Mean (cm)	S.D. (cm)	Number
length	0.4 to 6.6	3.9	0.7	46
width	0.4 to 1.0	0.7	0.2	61
thickness	0.3 to 0.8	0.5	0.1	62

Figure 3-12. Abrupt tip bone points.

Figure 3-13. Tapering bone points.

Table 3-4. Bone points – gradual taper.

Attribute	Range (cm)	Mean (cm)	S.D. (cm)	Number
length	3.5 to 9.3	5.4	1.1	19
width	0.4 to 1.2	0.7	0.2	35
thickness	0.3 to 0.9	0.7	0.1	42

facts in that category. Almost all are based on segments of hard land mammal limb bone, although one has been formed from a complete limb bone of a small mammal. Most in this category would have functioned as barbs on composite fishing hooks of various sizes. The variability in this category means that smaller divisions could be established (see King 2007), and additional functions (such as teeth on herring rakes, for example) are likely.

A category of "small tapered" points, with 31 examples, has been distinguished from the larger objects. Most are very slender (although a few are more robust), well-made artifacts of land mammal bone. Most taper to a narrow rounded base, although a few are wedge-based and one has a flat rectangular base. All are complete or nearly so, with lengths ranging from 1.4 to 4.1 cm (mean = 2.7 cm; S.D. = 0.5). These probably served as barbs on small composite fishhooks.

An additional 104 artifacts are fragments of bone points that are too incomplete to categorize further. With the exception of a very small number of sea mammal bone, all are manufactured from splinters of land mammal bone. Several are blackened by fire. Tips, midsections, and bases are all represented. Some of the tips could possibly have come from other pointed tool types, such as awls. A wide range of sizes is represented, from very slender to robust; a few would clearly have been from quite large implements.

Bipoints (184)

Bone bipoints, splinters of bone with both ends ground to sharp points, are among the most common artifacts at Huu7ii (Fig. 3-14). Of the total of 184 bipoints, 171 are slender objects with their greatest width near their centre. Splinters of bird bone are the most common raw material, although some have been fashioned from land mammal bone. Seventy-four are complete, ranging from tiny points to elongated slender objects. Lengths range from 2.0 to 6.2 cm, with a mean of 4.3 cm (S.D. = 0.6 cm). The 97 fragmentary examples are sufficiently complete to suggest that they belong to this category, although some may be from other slender sharply-pointed artifact types.

Two additional bipoints, both of land mammal bone, are markedly stouter. Both are complete. One is the largest of the bone bipoints at 7.4 x 0.5 x 0.5 cm, while the other is 3.9 x 0.5 x 0.3 cm.

An additional 11 bipoints are markedly asymmetrical, taking the form of an elongated scalene

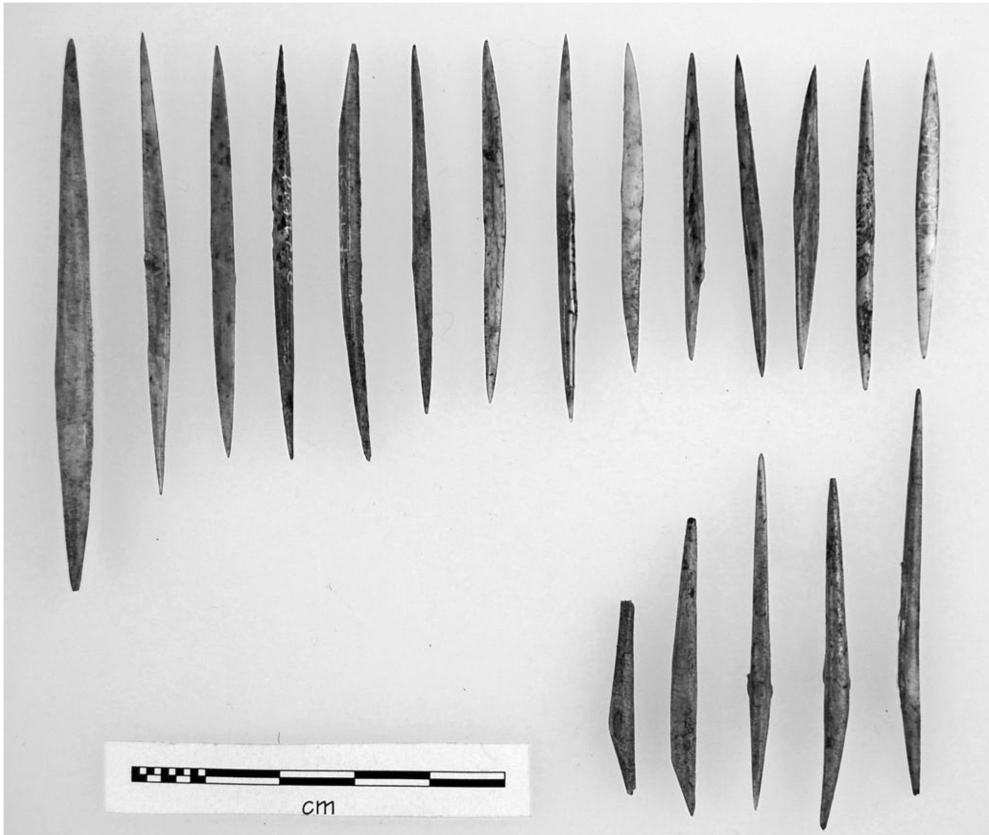

Figure 3-14. Bone bipoints (scalene examples on lower row).

triangle (Fig. 3-14, lower row). Seven scalene examples are complete, ranging in length from 3.2 to 5.4 cm (mean = 4.4 cm; S.D. = 0.6).

Bone bipoints may have served in several types of fishing gear. Many would have been used as gorge hooks. Ethnographically, such objects were baited and tied, and used not only for taking fish but also aquatic birds. Drucker (1951:34) describes a trap used by the Nuu-chah-nulth for catching diving waterfowl as consisting of many baited bone gorges tied to an anchored pole. Dewhirst's (1980:210–211) Nuu-chah-nulth consultants at Nootka Sound also confirmed the use of such artifacts to take both fish and birds. However, only one fragmentary example shows evidence of a central indentation for holding the line. The slender scalene examples, although also serviceable as gorge hooks, more likely functioned as arming points for small fishhooks. Although many fishhook shanks would have been of wood, the few bone fishhook shanks recovered have very narrow point beds that would take only very thin arming points such as the scalene bipoints.

Bone bipoints are common at all excavated Nuu-chah-nulth sites. For Yuquot, Dewhirst (1980:210–222) reports several varieties of "gorges," including the scalene form. Their high frequency at Huu7ii (19.2% of the artifact total) is similar to that at other excavated sites in Barkley Sound (Ts'ishaa: 25.9%; T'ukw'aa: 24.5%; Ch'uumat'a: 14%) (McMillan 1999:172; McMillan and St. Claire 1992, 1996, 2005).

Awls (36)

Several distinct categories of awls are present, although most (28; 77.8%) can be classified as bone splinter awls (Fig. 3-15). These are splinters of land mammal limb bone that have been sharpened to a point at one end while the bases have been left rough and irregular. Sharpened bone splinters could also have served as barbs on composite fishhooks, but the bases of such implements are usually more extensively modified for hafting; the rough or irregular bases of these examples, along with the sharp points, are the defining features of this category.

One large splinter awl, 13.8 cm in length, is missing only a small portion of the tip. It is based on a large flat bone section, and has the distal end worked to a sturdy point that is round in cross-sec-

Figure 3-15. Bone awls (left and top row: bone splinter awls; right: bird bone awls; bottom: fish spine awl, composite awl).

tion. Another large example, 11.3 cm in length, is based on a more slender flattened bone splinter; it is worked to a rather blunt point at one edge of the distal end. Several smaller awls have stout rounded points, although most are more slender sharpened splinters and two have narrow chisel-like tips. The 16 examples that appear to be complete or nearly so, although the rough bases preclude certainly in assessing completeness, range from 3.3 cm to 13.8 cm in length (mean = 7.4; S.D. = 1.8).

Bone splinter awls are commonly reported for Nuu-chah-nulth sites. They are considered one of the characteristic artifacts of the West Coast culture type (Mitchell 1990:356). Their frequency in the Huu7ii assemblage (3.6% of total bone artifacts) is similar to that at the other major excavated Barkley Sound villages (T'ukw'aa: 2.1%, Ch'uumat'a: 5.3%, and Ts'ishaa: 2.2%; McMillan and St. Claire 1992, 1996, 2005).

Four awls are made from bird limb bones (Fig. 3-15, right). The shafts are intact, but have been cut at an angle and polished to produce a sharp point. One, complete at 9.8 cm in length, retains the intact articular end of the bone at its base, allowing identification as the right radius of a loon (*Gavia stellata* or *G. pacifica*). Another, 8.9 cm in length, also is complete but no longer has the natural articular surface at the proximal end; nevertheless it can be identified as the right radius shaft of a cormorant (*Phalacrocorax* sp.). A larger example, 13.0 cm in length, also appears to be complete, but consists of the sharpened shaft only. The fourth is a smaller fragment, with its sharp tip produced in the same fashion as the three complete examples. Although such implements are usually classified as awls, Dewhirst (1980:190) considers similar slender examples from Yuquot to have been arming points on composite fishhooks. The presence of the complete articular end of the bone on one example, however, would support identification as an awl.

Two examples are based on mammal limb bones. One awl tip fragment resembles the above category in that the intact bone shaft has been cut at an angle to produce a point. However, this example was manufactured from the limb bone of a small mammal, and is considerably stouter than the bird bone awls. The second artifact is based on the fibula of a small sea mammal. Much of one articular end is intact, while the other end comes to a blunt point; polish is evident over much of the shaft. This object is complete at 13.1 cm in length.

An additional awl is based on a large fish spine that has been further sharpened. It is 5.5 cm in length. Although such artifacts are not common, they have also been reported for T'ukw'aa (McMillan and St. Claire 1992).

The final bone awl is an unusual composite tool. A small sharp bone splinter has been set an unknown distance into a bird bone shaft as a handle (Fig. 3-15, lower row). The shaft can be identified as the left ulna of a Western Grebe (*Aechmophorus occidentalis*). The complete artifact is 6.6 cm in length; only 0.4 cm of the bone point protrudes beyond the end of the shaft.

Deer ulna tools (4)

Deer (*Odocoileus hemionus*) ulnae were commonly used in tool manufacture. The irregular articular end served as a handle while the narrow shaft could be sharpened to a point or bevelled to a cutting edge, making it serviceable as an awl or knife. Deer ulna tools occur at most excavated Nuu-chah-nulth sites and are a characteristic artifact of the West Coast culture type (Mitchell 1990:356).

Two examples are complete, at 9.5 and 10.8 cm in length (Fig. 3-16). Both have been worked to a sharp point that is oval in cross-section. The largest is highly polished along most of the distal end and has considerable polish on the high points of the base where it was held. Several shallow worn grooves are evident near the tip on one side and one face. Such distinctive wear reflects use, possibly as a weaving implement. Deer ulna tools with similar wear have been reported from Ts'ishaa (McMillan and St. Claire 2005:50), Yuquot (Dewhirst 1980:143–145), Hesquiat Village (Haggarty 1982:125), and Shoemaker Bay (McMillan and St. Claire 1982:105). The second complete example is very similar, but lacks worn grooves at its tip; it is slightly shorter as the ulna is from an immature deer and it is missing the epiphysis at its base. A third object is a tip fragment, classified here due to its resemblance to the complete examples. This fragment is almost rectangular in cross-section near the tip and there is one worn notch on one side almost at the tip.

Figure 3-16. Deer ulna tools.

The fourth example may also be complete, although some of the base has broken away (Fig. 3-16, right). It was possibly still used after that time, as slight polish is evident over the broken lower surface. It is 7.6 cm in length. The shaft has been worked to a narrow, flat, spatulate end, which would be more serviceable as a knife than an awl. Ethnographically, such tools are best known as fish knives, particularly for herring (Drucker 1951:91; Koppert 1930:39). At Hesquiat Village, two ulna tools were recovered with fish scales still adhering to their surfaces (Haggarty 1982:127), confirming their identity as fish knives.

Harpoon valves (85)

All are parts of composite harpoon heads. A wide range of valve types and sizes is evident in the collection. Valves are classified primarily by their provision for an arming point or cutting blade. Valve categories are: *large slotted* (19), characterized by having a slot to take a broad cutting blade and a size sufficiently large for hunting sea mammals; *small slotted* (1), as above but of a size more suited to taking fish such as salmon; *channelled* (30), the characteristic Nuu-chah-nulth salmon harpoon type, with a channel to hold a rounded bone point; *simple* (9), lacking either a channel or slot, but with a gradually sloping surface to hold a wedge-based bone point, and *self-armed* or *ancillary* valves (10). In addition, the collection contains one unfinished example or "blank," ten fragments that are too incomplete to further classify, and five miniature examples. Five discoveries were made of paired valves: two large slotted pairs and three channelled pairs. In one case, two channelled valves still held their rounded arming point.

The 19 valves classified as *large slotted* (Figs. 3-17 and 3-18) all appear to be manufactured from sea mammal bone. All are sufficiently large

Figure 3-17. Large slotted harpoon valves (dorsal surfaces).

Figure 3-18. Large slotted harpoon valves (ventral surfaces).

that they were likely employed in hunting marine mammals. Most resemble those used ethnographically for taking whales, although some may have been used for smaller marine mammals. Eleven examples are complete, with lengths ranging from 8.3 to 13.9 cm (mean = 10.4 cm; S.D. = 1.2), widths from 1.4 to 3.0 cm (mean = 2.2 cm; S.D. = 0.4 cm), and thicknesses from 0.8 to 1.6 cm (mean = 1.2 cm; S.D. = 0.2 cm). On the ventral faces, the upper (distal) portion on each valve is a recessed flat platform; when paired with a matching valve this creates an open slot for the insertion of a flat cutting blade, ethnographically of large mussel shell (Fig. 3-19). A ridge on the upper dorsal portion of the valve, formed by cutting away the bone surface below the slot on the opposite face, served to hold the lashing that secured the cutting blade. The central portion of the ventral face is ground flat to

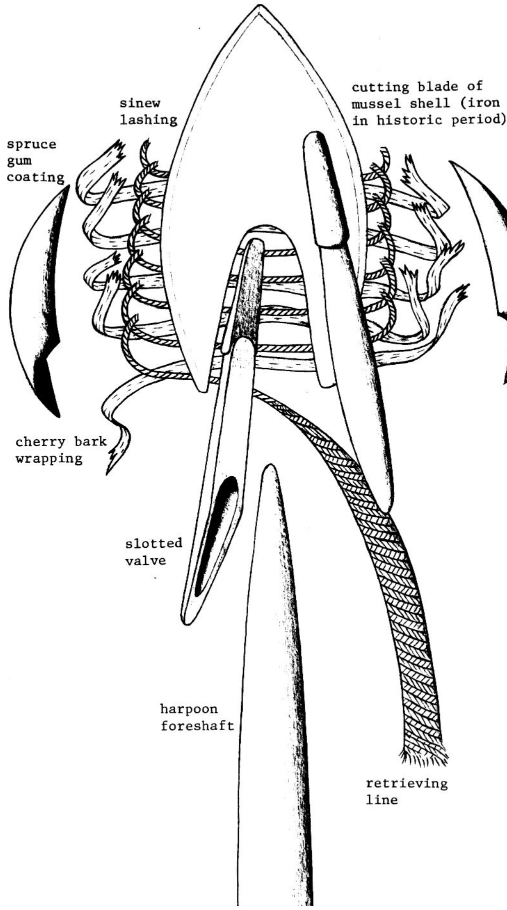

Figure 3-19. Drawing of a composite harpoon head, with two slotted valves, used for sea mammal hunting (Source: The Yuquot Project, Vol.1: The Indigenous Archaeology of Yuquot, a Nootkan Outside Village, p. 304, John Dewhirst, Parks Canada, 1980. Reproduced with permission of the Minister of Public Works and Government Services).

fit against its companion valve. The lower (proximal) portion of the ventral face has a marked oval channel or depression to create a socket for the insertion of the harpoon foreshaft when paired with a matching valve. The ventral face flares out from just below the widest point on the valve, coming to a blunt point at the proximal end. Two examples are unfinished; however, their large size (one is the largest of the complete valves) and presence of a slot and lashing ridge at the distal end place them in this category.

Two pairs of matching valves are included in this category, although neither was found with its arming blade (Fig. 3-20). These consist of the two smallest valves in the category and two valves of medium size. The former were not found in

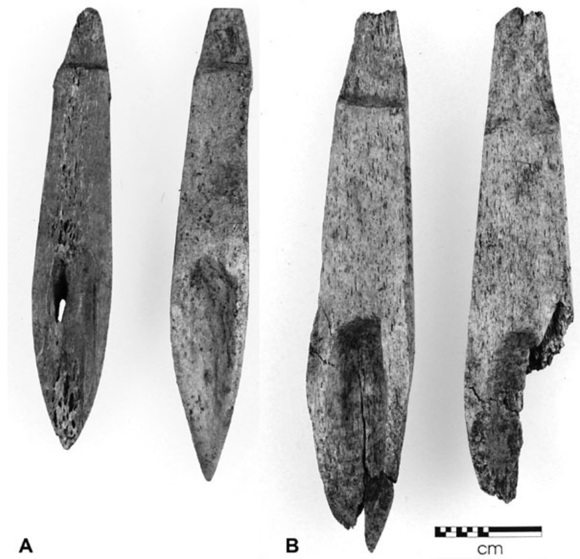

Figure 3-20. Two paired sets of large slotted harpoon valves found in the house floor deposits.

direct association, although they came from the same depth in the same excavation unit, but are so similar and fit so perfectly together that they are almost certainly a pair. One valve is slightly longer than the other, suggesting the ethnographic distinction between the "male" and "female" valves, as described by Drucker (1951:28).

These large slotted valves closely resemble those used ethnographically for hunting whales and other marine mammals. Whaling harpoon heads consisted of two paired valves of bone or antler tipped with a broad cutting blade of ground mussel shell, later replaced with metal; these parts were lashed together with strips of cherry bark and secured with spruce gum (Drucker 1951:28; Koppert 1930:60; Waterman 1967:30–31). The mussel shell blade sliced through flesh and allowed the harpoon head to penetrate the animal's body, while the valves (or "barbs") secured the harpoon head in the whale. The valves were often decorated with incised designs on their outer surface, in some cases in zigzag patterns representing the Lightning Serpent, which was associated with the Thunderbird in its whaling pursuits (Sapir 1922:314). Drucker (1951:28) comments that such designs were thought to have "magical virtue," enhancing the power of the harpoon.

None of the Huu7ii valves exhibit incised designs on their outer surface. However, one valve has a series of roughly-made parallel grooves running horizontally across the lower third of the dorsal surface. These may be intended as decorative, although they are so roughly done that it is possible that they are remnants of the manufacturing process. Another valve exhibits a series of deep angular cuts, also along the proximal third of the dorsal surface. Elsewhere, punctate zigzags and other incised designs were noted on valves excavated from Yuquot (Dewhirst 1980:301), Ts'ishaa (McMillan and St. Claire 2005:52), Toquaht territory (McMillan 1999:133–134; 2000:238), and the Makah sites of Ozette (McKenzie 1974:85) and Hoko Rockshelter (Croes 2005:141).

One *small slotted* valve is placed in a separate category due to its size (Fig. 3-21, lower left). It is complete, measuring 4.1 x 1.0 x 0.6 cm. Like the larger valves described above, much of the upper ventral surface has been cut away to produce a broad slot when paired with a similar valve. Unlike the larger valves, no ridge or other means of securing the lashing is evident on the dorsal surface. In size, this valve resembles the small channelled valves described below, which served ethnographically as parts of salmon harpoon heads. Small slotted valves were the most common valve type at Shoemaker Bay (McMillan and St. Claire 1982:84, 110), where two pairs of such valves were found with their wedge-based bone points still in place (McMillan and St. Claire 1982:81). Such valves are less common in West Coast sites, but are reported for Ts'ishaa (McMillan and St. Claire 2005:50–51).

Channelled valves, with 30 examples, make up the largest valve category (Fig. 3-21, top row). A rounded channel on the upper ventral surface characterizes such valves. Lashing to a similar companion valve results in a harpoon head with a rounded open socket at the distal end to hold a bone arming point that is round in cross-section (Fig. 3-22). The channels on the lower ventral faces formed a socket for insertion of the harpoon foreshaft. Although many of the valves in this category are fragmentary, they still display evidence of both channels. All are of a relatively small size, suggesting that they were parts of harpoons used in fishing. Measurements are summarized in Table 3-5. In seven cases (five complete), the dorsal face has been roughened and indented from slightly below the midpoint to the

Figure 3-21. Harpoon valves (upper row: small channelled valves; lower row: a small slotted valve, three simple valves, and three self-armed valves).

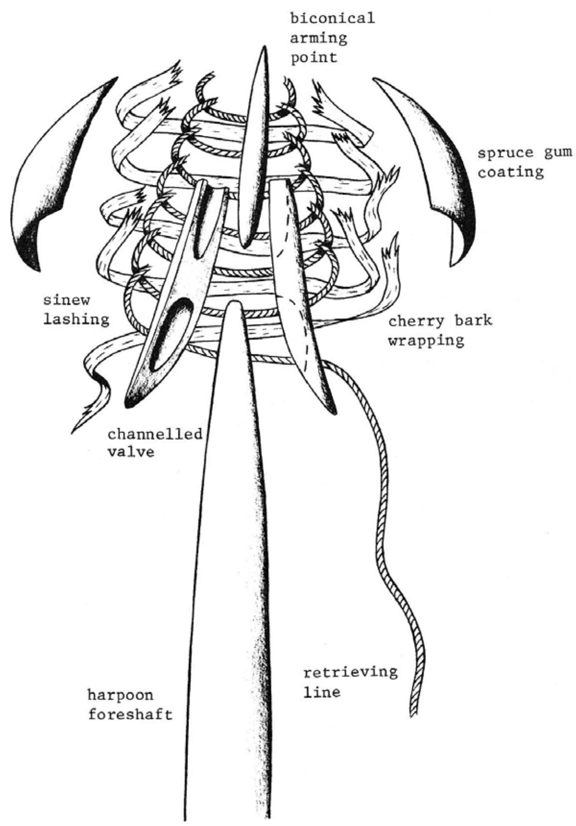

Figure 3-22. Drawing of a composite harpoon head with two channelled valves, a type used ethnographically for taking salmon (Source: The Yuquot Project, Vol.1: The Indigenous Archaeology of Yuquot, a Nootkan Outside Village, p. 232, John Dewhirst, Parks Canada, 1980. Reproduced with permission of the Minister of Public Works and Government Services).

distal end. Most of these show clear whittle marks where a portion of the surface has been cut away, presumably to facilitate lashing to the companion valves.

Three pairs of channelled valves were found together, in one case with the rounded arming point in place (Fig. 3-23). The valves in the smallest pair, each 3.4 cm in length, are complete. Both the other pairs are broken, but would clearly have been larger. The two long and thin valves in the complete three-piece harpoon head, at 4.5 and 4.9 cm length, are each missing only a small bit of the proximal end. The intact point, 4.6 cm in length, gradually tapers from an abrupt tip to a nearly pointed proximal end, where it is rounded and slender to fit into the narrow channels of the valves.

Harpoon heads with two channelled valves and a rounded point armed the typical Nuu-chah-

Table 3-5. Channelled Harpoon Valves.

Attribute	Range (cm)	Mean (cm)	S.D. (cm)	Number
length	3.1 to 6.0	4.7	0.8	12
width	0.7 to 1.2	1.0	0.2	27
thickness	0.4 to 0.9	0.6	0.1	29

Figure 3-23. Complete three-piece composite harpoon head with channelled valves immediately after discovery.

nulth salmon harpoons described and illustrated by Drucker (1951:19–20). Although such harpoon heads were used for salmon and other fish, it is also possible that they were employed in hunting smaller sea mammals. Croes (2005:138) reports that the Makah took fur seals using two-pronged harpoons with similar heads. The components of such harpoon heads are commonly found in Nuu-chah-nulth sites. Channelled valves become the dominant form in the upper zones at Yuquot, replacing self-armed valves that characterized the earlier periods (Dewhirst 1980: 231, 258–259). Channelled valves are also the most common type in the Barkley Sound sites of T'ukw'aa (McMillan and St. Claire 1992:46–47), Ch'uumat'a (McMillan and St. Claire 1996:37), and Ts'ishaa (McMillan and St. Claire 2005:50–52). Most valves from the Makah-area site of Hoko Rockshelter were the channelled variety, including three harpoon heads, in two cases still with their rounded arming points, found in a cache at the back of the shelter (Croes 2005:132–136).

Simple valves lack the well-prepared channel or point bed on the distal ventral face (Fig. 3-21, lower row centre; Fig. 3-24). In other features, they resemble valves in the categories above. Among the Huu7ii valves, in five cases the distal ventral face has been ground flat; when lashed to a similar valve it would hold a wedge-based arming point. Four smaller examples range from 3.6 to 5.3 cm in length (mean = 4.2 cm), 0.7 to 1.0 cm in width (mean = 0.9 cm), and 0.4 to 0.5 cm in thickness

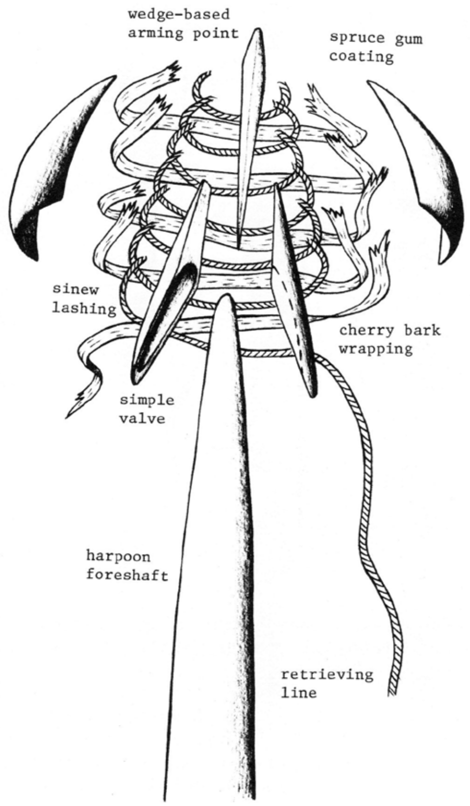

Figure 3-24. Drawing of a composite harpoon head with simple valves and a wedge-based arming point (Source: The Yuquot Project, Vol.1: The Indigenous Archaeology of Yuquot, a Nootkan Outside Village, p. 231, John Dewhirst, Parks Canada, 1980. Reproduced with permission of the Minister of Public Works and Government Services).

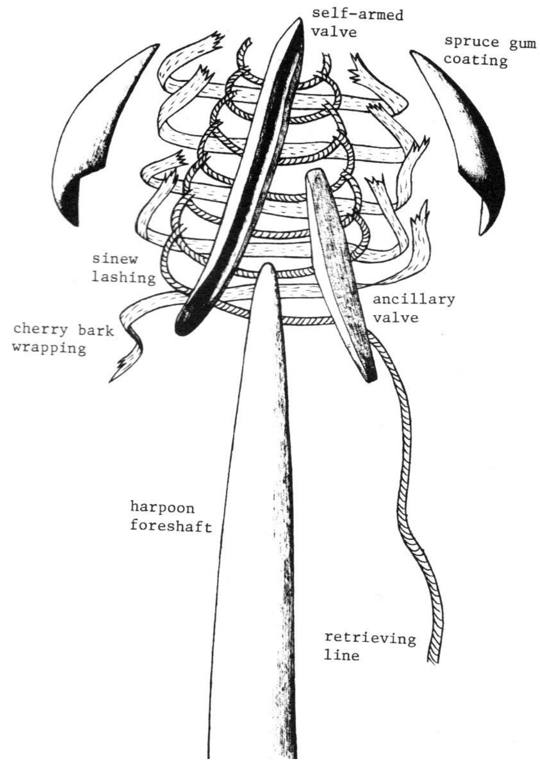

Figure 3-25. Drawing of a composite harpoon head with a self-armed valve (Source: The Yuquot Project, Vol.1: The Indigenous Archaeology of Yuquot, a Nootkan Outside Village, p. 230, John Dewhirst, Parks Canada, 1980. Reproduced with permission of the Minister of Public Works and Government Services).

(mean = 0.5 cm). A considerably larger example, at 9.0 x 1.8 x 1.1 cm, may have held a thin broad arming point, in a manner similar to the large slotted valves. Four additional valves are considered "simple" as they have not been carefully channelled or slotted at the distal end; instead the marrow cavity of the original land mammal bone runs the length of the ventral face. When paired, these open cavities would hold a bone arming point, of substantial size in two cases. None are complete, but the largest fragment (5.9+ cm in length) is clearly from a fairly large valve. Similar valves are reported for Yuquot (Dewhirst 1980:249–251). Two pairs were found intact with their wedge-base bone points in a cache at the back of the Hoko River rockshelter (Croes 2005:135, 136, 143).

Self-armed valves come to a point at the distal end and do not require a separate bone arming point. They may have been used with *ancillary* valves, which are shorter and not pointed at the distal end, to form a two-piece harpoon head (Fig. 3-25). They possibly also functioned as single-piece heads, with the lashing of the retrieving line forming a socket for the foreshaft (Dewhirst 1980:230). Three classic examples of this type are complete (Fig. 3-21, lower right). Each has a small channel at the proximal end of the ventral face to form a socket for the foreshaft when paired with an ancillary valve. On the dorsal surface, the proximal end flares out in typical valve fashion, coming to a blunt point. The widest part of the artifact is near the proximal end. Above the flared proximal portion, the artifact abruptly narrows; it is markedly indented around the centre of the largest example, presumably for holding the lashing to attach the companion valve. The distal end is rounded in cross-section and comes to a sturdy point. Measurements are 7.0 x 0.9 x 0.6 cm, 6.1 x 0.8 x 0.6 cm, and 5.3 x 0.9 x 0.4 cm. Two additional examples could be described as simple self-armed valves. They are flattened sections of bone with the original marrow channel running the length of the ventral face. Each comes to a flattened point at the distal end and flares out to a blunt point at the proximal end, with its greatest width near the latter. The largest is waisted near the distal tip, presumably to secure lashing. Both are complete, with measurements of 6.5 x 1.1 x 0.5 and 5.7 x 1.4 x 0.6 cm.

Only one ancillary valve was identified. It is complete at 5.0 x 0.8 x 0.6 cm. It is simple in form, with the marrow channel running the length of the ventral face. At the proximal end it flares out slightly to a rounded tip. It has been cut flat and bevelled across the distal end, leading to its identification as an ancillary valve.

Four slender artifacts are somewhat different in form and are only tentatively placed in this category. All have a very similar proximal end, characterized by a small channel from the base of the flat ventral face and a small flange, presumably to hold lashing, around the rounded dorsal face at the bottom. They do not flare out to a rounded point at the proximal end, as do other valves. Two are complete, while two others consist only of the proximal portion. Both complete examples have straight sides gradually converging from the flat proximal end to a slender point at the distal end. The largest, measuring 5.1 x 0.6 x 0.4 cm, is indented at both sides near the middle, presumably to secure lashing. The other, with measurements of 3.9 x 0.5 x 0.3 cm, is highly eroded.

Self-armed and ancillary valves were relatively common at Yuquot (Dewhirst 1980:230–248), where they formed the dominant type in earlier levels but were gradually superseded by channelled valves. They are also reported for Hesquiaht Village (Haggarty 1982:124). Small numbers of self-armed and ancillary valves have also come from the Barkley Sound sites of Ts'ishaa (McMillan and St. Claire 2005:51) and Ch'uumat'a (McMillan and St. Claire 1996:37). Mitchell (1990:356) specifically mentions self-armed and ancillary valves as characteristics of the West Coast culture type.

One small *blank* or unfinished valve is complete, measuring 3.7 x 1.0 x 0.6 cm. It has been roughed out to the characteristic shape, with a flat ventral face flaring out from the proximal end. It is still rough on the rounded dorsal surface and lacks any channels or slot on the ventral face.

Five *miniature valves* resemble the full-sized objects in form. Two have the appearance of simple valves, with small channels on the lower ventral faces and flat upper ventral faces. The one complete example measures only 1.6 x 0.6 x 0.3 cm. Three others (all complete, at 3.2 x 0.4 x 0.3 cm, 2.5 x 0.4 x 0.2 cm, and 2.4 x 0.6 x 0.3 cm) have the characteristic shape of self-armed valves. Only one has a shallow channel on the proximal portion of the ventral face, but all three have the characteristic flat upper ventral face, flared-out and roughly pointed proximal end, and pointed distal end. Such tiny valves could not have served any real function, but perhaps were parts of children's toys.

Ten *fragments* can be identified as valves but are too incomplete to place in a specific type. Most are small portions of the easily recognized proximal end, with part of a channel on the lower ventral face. Most closely resemble the small channelled valves that form the dominant valve type.

<u>Fishhook shanks (10)</u>

Four small, slender, rather delicate, bone fishhook shanks are complete (Fig. 3-26). Lengths range from 4.9 to 5.9 cm (mean = 5.4); maximum thickness ranges between 0.3 and 0.4 cm. All are very similar in shape. Notches from each side just below the flattened proximal end would have served for line attachment. The slightly curving shafts have flattened faces, with nearly rectangular cross-sections. The distal portions have the characteristic shape of these implements. One side of the flat rectangular base has a notch and pronounced lashing spur in three cases, only the notch in the fourth. The other side of the base flares out, with a very narrow point bed running the length of the

Figure 3-26. Bone fishhook shanks.

edge. These could have held only quite narrow and delicate arming points.

Four examples are fragmentary. One is similar to the complete artifacts but is missing a small portion at the proximal end; no provision for line attachment remains (Fig. 3-26, right). The flaring distal portion has a narrow point bed along one edge and two notches, rather than a lashing spur, at the other. It is 6.2 cm in length and 0.4 cm in greatest thickness. Three others are less complete distal fragments. One slender fragment, 0.3 cm thick, closely resembles the complete shanks. Another, 0.4 cm in thickness, is slightly larger, again with a well-defined lashing spur and very narrow point bed. The remaining distal fragment is considerably larger (1.3 cm wide and 0.7 cm thick) and less carefully made. Only a narrow incision is in the location for the point bed, which does not appear to have been completed, and an angular cut at the opposite edge serves to hold the lashing.

The remaining two artifacts in this category are blanks for fishhook shanks. Both are complete and have been fashioned from sea mammal bone (unlike all others in this category, which are of land mammal bone). Both are in a very preliminary stage of manufacture, having been roughed out to shape only, and lack point beds, lashing spurs, and notches for line attachment. Only the step on one side to form the base indicates the intended function. One (6.0 x 1.6 x 0.6 cm) would have produced a shank in the same size range as the intact examples. The other (10.3 x 2.7 x 1.0 cm) appears to have been intended as a larger, more robust shank.

Ethnographically, such objects were parts of composite fishhooks used for trolling. Most, however, were of wood, a fact confirmed through the wet site excavation at Ozette. Bone and stone fishhook shanks are commonly reported for Nuu-chah-nulth sites, and they are considered characteristic of the West Coast culture type (Mitchell 1990:356). In Barkley Sound, similar bone shanks were recovered from T'ukw'aa and Ch'uumat'a (McMillan and St. Claire 1992, 1996), but are surprisingly absent in the substantial assemblage from Ts'ishaa (McMillan and St. Claire 2005). Similarly, only stone fishhook shanks are reported from the Hoko River Rockshelter (Croes 2005) and the Ozette midden trench (McKenzie 1974).

Chisels (16)

Eight examples retain much or all of the natural end of the bone, allowing identification as wapiti (elk; *Cervus elaphus*) metapodials. Eight smaller fragments are very similar in thickness and density, suggesting that all have been manufactured from the same hard bone. In each case, the metapodial has been split lengthwise and ground to shape along the edges, bit and poll (Fig. 3-27). Some examples are highly polished over much of their surface. These hard bone implements would have been effective woodworking tools, either as chisels or small wedges.

Four examples are complete. The largest, measuring 10.8 x 4.1 x 2.0 cm, is highly polished over all surfaces. A large fragment has split off from the curving bit along one side but enough of the bit remains that it would still be serviceable. The poll has been ground flat. Two others (measuring 7.6 x 3.4 x 1.7 and 7.1 x 3.2 x 1.6 cm) are similar. In both cases, the poll has been ground flat and the bit has been worked to an almost pointed form. The fourth example has been highly worked to a short stubby shape, measuring 6.5 x 4.9 x 1.8 cm, with a flat poll and a straight angled bit.

Four others are poll fragments. The one example intact in width is 3.8 cm wide and 2.9 cm thick. Three have broken lengthwise, as well as being incomplete in length. In all four cases the poll has been ground flat. In addition, two bit fragments are roughly pointed in form. The remaining six fragments consist of five with part of the bit remaining and one fragment from the side of the implement.

Similar implements manufactured from split and ground wapiti metapodials have been found at the major Barkley Sound villages of T'ukw'aa (McMillan and St. Claire 1992) and Ts'ishaa (McMillan and St. Claire 2005). Such woodworking tools are also reported from the Makah-area sites of Ozette (McKenzie 1974:37; Gleeson 2005:248) and Hoko River Rockshelter (Croes 2005:167).

Figure 3-27. Bone chisels.

Pendants (5)
One finely carved bone object is particularly impressive (Figs. 3-28, 3-29). This item, made from a flat piece of hard land mammal limb bone, is 8.6 cm in length (maximum width = 3.1 cm; thickness = 0.5 cm). It has been incised on only one side; the other shows only the polished natural surface of the bone. A groove at one end is presumably for line attachment to allow suspension as a pendant. The incised imagery is complex. Two circular eyes appear to have been drilled with a tube, leaving steep sides and a flat bottom. The two circles are the same size, 0.7 cm in outer diameter, and may have been formed with the same tubular drill. A central drilled hole within each circle, 0.2 cm in diameter, does not extend through the bone. Looking at the design one way, the upper eye is that of the Thunderbird, with its downturned beak extending to the right. An incised line separates the upper and lower beak. Looking another way, the lower eye belongs to a whale, with its head to the left. An incised line defines the mouth. The whale's dorsal fin is also the crest on the head of the Thunderbird, and its tail is the Thunderbird's beak. Incised parallel lines of short dashes are evident along the upper and lower surfaces.

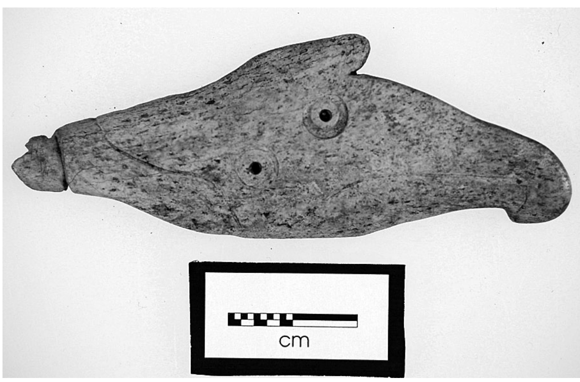

Figure 3-28. Bone pendant depicting Thunderbird and whale.

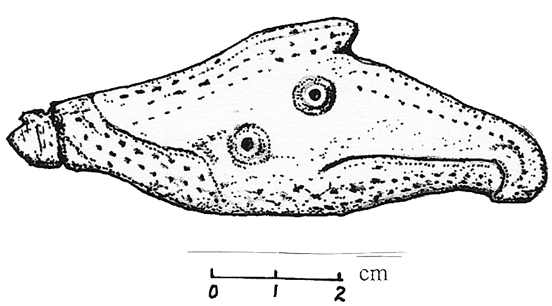

Fig. 3-29. Drawing of Thunderbird and whale pendant. The Thunderbird's head with its downturned beak extends to the right. The whale's snout, with an incised mouth line, is to the left, while its dorsal fin doubles as the crest on the head of the Thunderbird.

This beautifully carved pendant illustrates the vital importance of the Thunderbird and whale in Nuu-chah-nulth art and thought. The Thunderbird was the whaler of the supernatural realm, just as the Nuu-chah-nulth people were the whalers of the natural world. Nuu-chah-nulth oral traditions are replete with stories of these supernatural whalers and their prey, and both appear frequently in ethnographic artworks of all types from this region. Images of the Thunderbird and whale are ancient in Nuu-chah-nulth art, with some archaeological examples extending back perhaps as much as two millennia (McMillan 2000). This object also illustrates a common feature of Northwest Coast art known as "visual punning," by which elements of the design may have several meanings (such as the Thunderbird's beak also being the whale's tail).

This Thunderbird pendant came from the southwest corner of House 1, in an area of transition between the inside back corner and the shell deposit of the midden ridge. It is difficult to determine if it was deposited in the corner of the house, or was in the midden built up along the side, near the back wall. An age estimate of 1280 to 990 cal BP was obtained on the midden deposit, slightly deeper in the same natural stratum. However, materials of different ages could be incorporated in the midden ridge and the pendant likely dates to a somewhat later period during the house occupation.

Another artifact in this category is a highly polished stout object of land mammal bone, 3.7 cm in length and 0.7 cm in greatest width and thickness (Fig. 3-30, fourth from right). The bone has been ground away at the proximal end to form a 'neck' with a pronounced conical 'knob,' presumably for suspension, at the tip. The distal end is a curving wedge shape. It resembles a very small fishhook shank but has no provision for attaching a point. Classification as a pendant is somewhat conjectural.

The final three possible pendants are fragments from the proximal end (Fig. 3-30, right). Two are small, slender, flat bone sections that are notched on each side near the end to produce a knob, presumably for suspension. The third is a larger, slightly curving, flat section of sea mammal

Figure 3-30. Small decorated bone objects (left: incised objects; right: possible pendants).

bone, 1.5 cm wide at the break, with a small hole, 0.2 cm in diameter, drilled from each face near the rounded intact end. Similar small flat bone objects that have been notched or drilled for suspension came from the nearby sites of T'ukw'aa (McMillan and St. Claire 1992:52) and Ts'ishaa (McMillan and St. Claire 2005:54).

Other decorative items (7)

A tiny sculpture in sea mammal bone takes the form of a whale's tail (Fig. 3-31). The carving shows the graceful curve of the whale's flukes, with the central notch between them, although one fluke has partially broken away. Another break occurs across the narrow portion of the artifact, just below the flukes. As the depiction of the whale's tail would have been symmetrical, and over half remains, the total width across the tail of the complete object can be estimated at 1.2 cm.

The whale's tail is an ancient motif in Northwest Coast art (McMillan and Nelson 1989). In the Strait of Georgia region, cut-out bone figures in this shape have been recovered from Locarno Beach deposits, dating to about 2500 BP (Borden 1983:141). Images related to whales and whaling are relatively common in the sparse collection of decorated artifacts from excavated Nuu-chah-nulth sites (McMillan 2000). A large sea mammal bone cut-out figure in the form of the whale's tail came from the Barkley Sound village of T'ukw'aa (McMillan and St. Claire 1992:49).

Other decorative items include a small slender tapering bone object has been incised with numerous short diagonal lines, forming a herringbone pattern over all surfaces (Fig. 3-30, second from left). It is incomplete in length, having broken at the wider end; the remaining portion is 3.6 cm long. A second object is a thin flat piece of bone, probably scapula, that has been deeply notched around two of the three intact edges (Fig. 3-30, fourth from left). Its dimensions are 2.9 x 1.4 x 0.1 cm. The remaining four artifacts are characterized by incised parallel lines that encircle the object's width (Fig. 3-30). The stoutest consists only of one rounded end and a short section of the expanding sides, with two deeply carved grooves still remaining around the object. Another is a short curved bone segment, round in cross-section, that has two sets of three equally spaced parallel lines encircling the object. It has been cut at one end but is broken at the other; the fragment is 4.5 cm long and 0.6 cm in diameter. Another small split fragment also exhibits three equally spaced parallel lines across its width. The final object in this cat-

Figure 3-31. Small bone sculpture of a whale's tail.

egory is an elongated flattened piece of bone with parallel sides for much of its length, one bluntly pointed end, and one flattened end, although part of the latter has broken away. This artifact is 3.7 cm long and 0.7 cm wide. Three sets of four parallel incised lines encircle the artifact, with an additional two at the flattened end. No evident function can be discerned for any of these objects.

Bird bone tubes (11)

Eleven segments of bird limb bone show evidence of polish or wear at one end. In ten cases the wear is across a broken end that was snapped perpendicular to the long axis of the bone; only one example shows wear along an angular break. The diameter of the hollow tube at the worn end ranges from 0.4 to 0.7 cm, although two examples that have broken lengthwise would clearly have had larger diameters. Four bone segments could be identified to species and element: the right ulna of a Pelagic Cormorant (*Phalacrocorax pelagicus*), a gull (*Larus* sp.) ulna, a gull left humerus, and a goose (*Branta* sp.) radius.

Ethnographically, hollow bird bone tubes served a number of functions, including as drinking tubes and as drills. Sproat's (1987:63) observations of the Barkley Sound Nuu-chah-nulth in the 1860s included reference to use of a drill bit of hollow bird bone, a trait later confirmed by Drucker's (1951:79) informants at Alberni. What appears to be wear, rather than intentional fashioning, on these examples may support the idea that they were used as drills.

Polished rectangle (1)

A polished elongated bar of land mammal bone is complete, with measurements of 9.5 x 2.6 x 0.6 cm (Fig. 3-32, upper). All faces, sides and ends have been ground flat and straight, giving the object a rectangular outline and cross-section. It was found extending vertically from the house floor deposit.

Although the function of this object is uncertain, similar bone rectangles have been interpreted as net gauges (Stewart 1973:123). Dewhirst (1980:166-167) reports several polished bone rectangles from Yuquot, and tentatively suggests that some may have served as net gauges. A very similar artifact came from Ch'uumat'a (McMillan and St. Claire 1996:40, 42). Although Drucker's (1951:25) Nuu-chah-nulth informants denied the use of a gauge in net-making, such tools may have been employed in earlier times.

Prying tools (?) (2)

Two bone implements may have served as small tools for prying or a similar function (Fig. 3-32, centre and lower). One is a polished elongated rod of land mammal bone that has parallel sides and is oval in cross-section throughout its length. One end has been cut at an angle to produce a narrow, rounded, spatulate bit that exhibits considerable polish. The proximal end is rougher and appears to have been broken. This object measures 11.5 x 0.8 x 0.6 cm. The second artifact, based on a curving section of sea mammal bone, has flat faces and flattened sides that gradually converge to a rounded blunt point. This object has been ground to shape over its entire surface. Its dimensions are 11.3 x 2.5 x 0.3 cm.

Foreshafts (3)

All three artifacts in this category are fragmentary tapering segments of polished sea mammal bone (Fig. 3-33, lower). They have straight, gradually converging sides and are round to oval in cross-section. The largest comes to a blunt rounded tip at its intact end and is round in cross-section. It is broken at its base, but the fragment is 17.3 cm long and 1.7 cm in diameter near the base, although it is still expanding at the break. The second is a similar but smaller fragment from very near the tip end. It is oval in cross-section and is 1.6 cm in maximum width, although it is still expanding at that point. The third is a medial fragment of a larger and stouter example. It is oval in cross-section, with a maximum width of 2.1 cm.

Such implements were used as foreshafts on sealing or fishing harpoons. Although many ethnographic examples are of hardwood (Drucker 1951:19, 26; Koppert 1930:65), foreshafts of sea

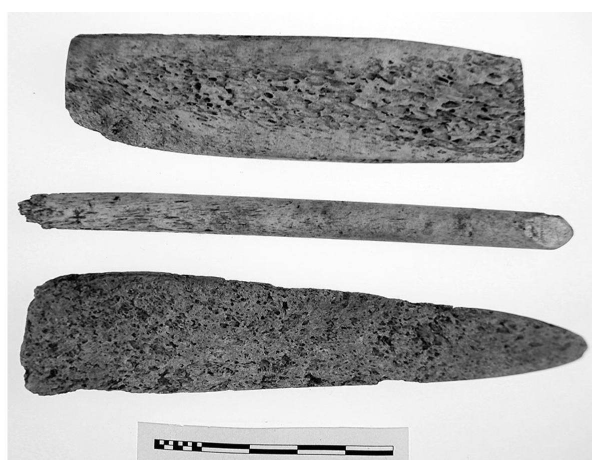

Figure 3-32. Three miscellaneous bone tools (upper: bone rectangle; centre and lower: possible bone prying tools).

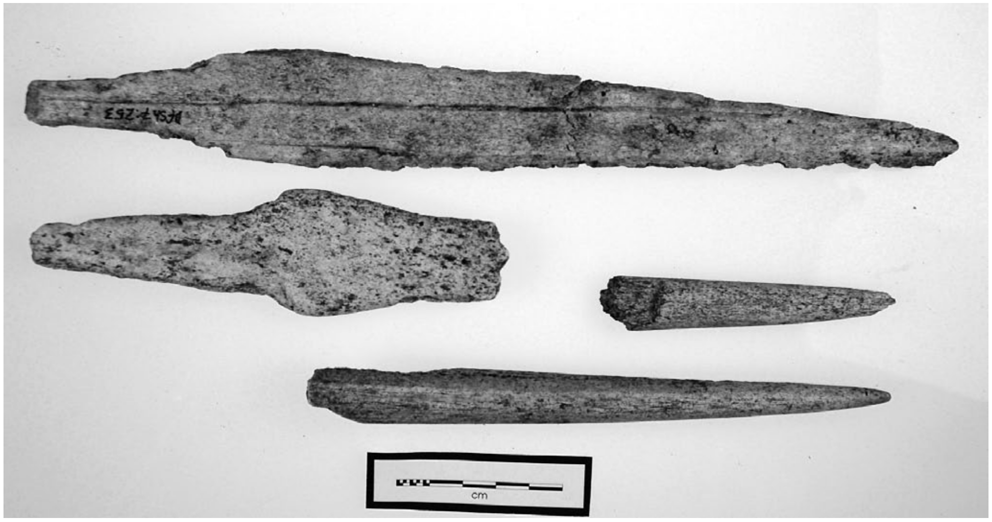

Figure 3-33. Whalebone tools (top: two possible lance heads; bottom: two foreshaft fragments).

mammal bone are found at most excavated Nuu-chah-nulth sites and are considered one of the identifying features of the West Coast culture type (Mitchell 1990:356). In Barkley Sound, similar artifacts came from Ts'ishaa (McMillan and St. Claire 2005:52) and a complete example, 35 cm in length, was found as a grave inclusion at Ch'uumat'a (McMillan and St. Claire 1996:23).

<u>Bark beaters (2)</u>

Both are fragmentary, consisting of the rectangular grooved striking surfaces of whalebone bark beaters (Fig. 3-34). One is intact at one end and both sides. It measures 8.8 x 3.8 x 2.8 cm. Six ridges formed by five deeply incised grooves run its length. The other is similar, but is intact only along one side, so is incomplete in both length and width. Three deeply incised grooves remain along the length of this fragment.

Figure 3-34. Whalebone bark beater fragments.

Whalebone bark beaters are one of the characteristic traits of the West Coast culture type (Mitchell 1990:356). A complete example, with a long handle ending in a rounded knob, came from T'ukw'aa (McMillan and St. Claire 1992:51–52; McMillan 1999:174) and two fragments of the grooved striking surfaces came from Yuquot (Dewhirst 1980:163). Ethnographically, such tools were used to pound cedar bark in order to soften and separate the fibrous strips in preparation for weaving into such items as robes, capes and hats. Drucker (1951:94) and Koppert (1930:42–43) describe their use by the Nuu-chah-nulth.

<u>Whalebone wedges (8)</u>

All artifacts in this category appear to be based on split sections of whale ribs, resulting in a curved outer surface and a flat inner face (Fig. 3-35). Six are complete, whereas one is split in width and missing its bit and the shortest is missing a portion of the proximal end. The sides are roughly straight and parallel for most of the object's length. Although several show adze or chisel scars along the sides, others have relatively little modification from the split rib. Most have rounded bits, which tend to be quite thick. In two cases, segments of the bit have been split off through use, although the object remained functional. Evidence of battering is visible on the proximal ends of most examples. Lengths of the complete wedges range from 16.0

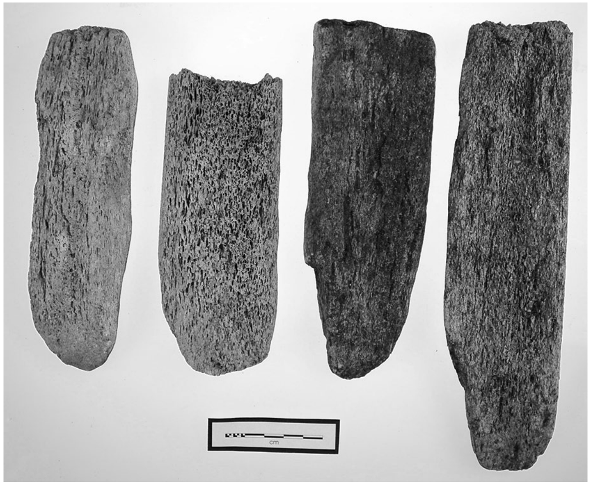

Figure 3-35. Whalebone wedges.

to 23.2 cm (mean = 19.0; S.D. = 2.73); widths are between 4.7 and 7.3 cm (mean = 5.9; S.D. = 0.53) and thicknesses between 1.8 and 2.7 cm (mean = 2.3; S.D. = 0.32).

Wedges played a vital role in the woodworking technology of all ethnographic groups along the Northwest Coast. Bone and antler examples are found at most archaeological sites in this region. Most wedges, however, would have been of wood, which has disappeared from the archaeological record at the vast majority of sites. Wedges were vital components of the Nuu-chah-nulth carpentry kit, but ethnographic sources describe them as made from hardwood such as yew (Drucker 1951:78; Koppert 1930:37). The predominance of wood is confirmed from the waterlogged deposits at Ozette, where wedges were one of the most common tool types recovered; wooden wedges were by far the most abundant, followed by whalebone, then by antler (Gleeson 2005:257). The whalebone wedges from Huu7ii resemble the Ozette examples (Gleeson 2005:258). Such implements are also found in other Nuu-chah-nulth sites, including the Barkley Sound village of Ts'ishaa (McMillan and St. Claire 2005:55).

Whalebone stakes (2)

One long, relatively slender, complete implement of whalebone is classified as a stake rather than a wedge as it comes to a thick blunt point at one end (Fig. 3-36, upper). The sides are nearly straight and show evidence of having been worked to shape. Small indentations from each side at the butt end possibly served to hold a tied grommet of bark or root. Evidence of battering is visible on the butt end. This object's dimensions are 27.1 x 5.1 x 2.5 cm.

A smaller whalebone object has relatively straight sides gradually converging to a rounded tip, with a flat butt end (Fig. 3-36, lower). It is complete, with dimensions of 15.7 x 3.4 x 2.0 cm. Its use as a stake is evident from its context, as it was found in the house floor in a vertical position with the bluntly pointed end down.

Whalebone blanks (18)

Ten whalebone blanks of similar size were found in the house floor deposit in a concentrated cluster, with some stacked on others and the long axes of most oriented in the same direction. This concentration was exposed and recorded in the field as a feature (F51; see Fig. 4-8); each object was then given a separate artifact number as it was removed. Although some of the blanks were in poor condition as found, laboratory stabilization and repair has meant that most are complete or nearly so, and that measurements in three dimensions can be obtained for each object. All retain the curved outer surface of the whalebone on the dorsal face. The most fully formed are rectangular bars, although others are more irregular in shape (Fig. 3-37). Six are constricted in width at one or both ends. Evidence of adzing to shape is visible on the sides or

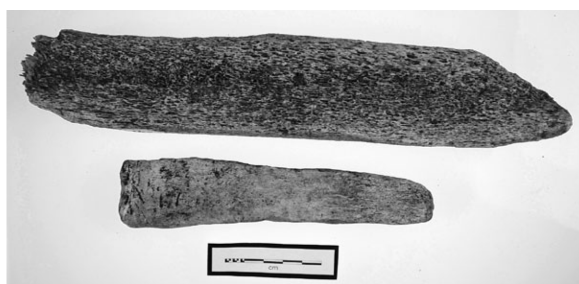

Figure 3-36. Whalebone stakes.

Figure 3-37. Whalebone blanks.

ends of most examples. Their similar size, as well as their occurrence together, suggests that all were intended for the same purpose. Lengths range from 11.9 to 15.6 cm (mean = 13.7; S.D. = 0.89), widths from 3.2 to 5.5 cm (mean = 4.2; S.D. = 0.51), and thicknesses from 1.6 to 3.0 cm (mean = 2.3; S.D. = 0.35).

The remaining eight blanks, found separately across the house floor excavation, are more variable but resemble those described above. Three complete examples (measuring 21.8 x 5.1 x 1.8, 13.2 x 2.6 x 0.9 and 13.8 x 4.2 x 1.8 cm) are well-shaped elongated rectangular bars in form. Three others are similar but incomplete. Two additional complete blanks (21.6 x 6.3 x 2.0 and 12.0 x 3.9 x 1.2 cm) have marked constrictions in width at one end.

The artifacts in this category reflect the importance of whalebone as a raw material in the technology. These prepared preforms were ready for further work to turn them into a variety of functional objects. Many (such as the ten blanks found together) are of suitable size for such tools as the large slotted harpoon valves used in sea mammal hunting.

<u>Modified whale bulla (1)</u>

One whale bulla (the dense bone of the inner ear in cetaceans) appears to have been modified. The thinner outer surface has been chipped away, leaving only the hard, dense bone at its centre. A series of apparent flake scars runs along the ridge where the thinner bone was removed, although this could possibly result from natural damage. This object could have served as a crude scraping tool. Its dense base fits nicely in the palm of the hand and provides weight for heavy use.

Very similar implements were found in some number at Ozette, where it was first suggested that these were crude scraping tools (Fisken 1994:375–376). In Barkley Sound, nearly identical artifacts came from the adjacent sites of Ts'ishaa and Himayis (McMillan and St. Claire 2005:56–57, 99).

<u>Lance heads (2)</u>

Two large whalebone artifacts have long, straight, gradually converging sides, a slight shoulder on each side toward the base, and a long tapering tang or stem (Fig. 3-33, upper). One complete example is 28.1 cm long, 3.5 cm in greatest width (just above the tapering stem), and 1.0 cm thick. The faces are flat, with slight bevelling to the sides. The sides are roughly formed, with chop marks still evident along one long side and the tang. The second object, consisting of the basal portion along with intact shoulders and part of the shaft, is very similar except for somewhat more pronounced shoulders above the basal tang. On the dorsal face of the complete artifact a deeply incised straight line runs almost the full length, from the middle of the base to near the tip, where it goes off one side. Another incised line extends for a shorter distance near one side. Perhaps this object was being sectioned into a narrower implement at one point.

Classification as lance heads is speculative. Two similar implements came from Ts'ishaa, where they were described as "roughed out preforms for large harpoon or lance heads" (McMillan and St. Claire 2005:56).

<u>Knobbed whalebone club (1)</u>

This roughly-made whalebone object is 27.4 cm in length, 5.9 cm in maximum width, and 2.0 cm in maximum thickness (Fig. 3-38). It appears to be complete; although much of one side has split away, this may have occurred prior to the production of this rough implement. Deeply carved grooves along one edge for about two-thirds of its length have produced four pronounced rounded knobs on one side. The lower third has been shaped to make a serviceable grip area. This presumably is a simple club, although it seems rather thin and fragile for such a purpose.

<u>Spatulate whalebone implement (1)</u>

An elongated section of whalebone cortex has roughly-shaped, straight, parallel sides and one fairly rough end. The other end has been worked to a smooth, curving, spatulate surface (giving the object the appearance of a large tongue depressor). Its dimensions are 16.0 x 3.9 x 0.7 cm.

<u>Notched whalebone (1)</u>

A thin fragment of sea mammal bone has been ground flat across what remains of both faces. One edge has also been ground flat. The other edge, which curves markedly, has seven closely spaced

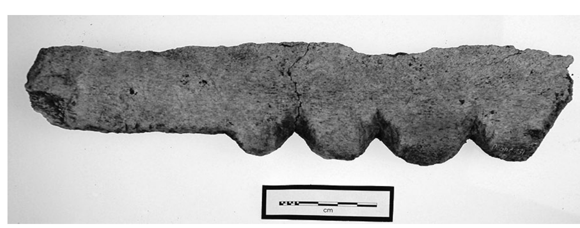

Figure 3-38. Knobbed whalebone club.

incised notches along part of its length. Below the notches and extending to the break, the object has been bevelled from both faces to produce a knife-like edge. It is too incomplete to assess function.

Miscellaneous worked whalebone (29)

Three sections of whale ribs retain the natural articular surface at one end but have been adzed at the other to reduce the thickness sufficiently so the bone could be snapped. In one case deeply incised lines extend at an angle across the bone at the opposite end as the adzing but were not cut through; numerous deep cut marks are evident across the surface of another. Two smaller segments of whale rib also show evidence of chop marks at one end, where they were snapped. All appear to be waste products from a preliminary stage in artifact manufacture. An additional rib fragment has cuts and abrasion along one edge, while two others show cut marks and some grinding to shape. A very large slab of unidentified whalebone appears to have been worked to produce a smooth curving end, but is too incomplete to assess further.

A large segment of whale vertebral disk has been ground on its porous inner surface, producing a bevelled knife-like edge around the curved outer surface. A small fragment of vertebral epiphysis has been ground flat around its curved outer edge. No function is evident for these objects.

The remaining 18 objects are flat segments of large sea mammal bone. Most are elongated bars of bone cortex that show some evidence of sectioning or other intentional shaping. Most would represent preliminary stages in artifact manufacture.

Miscellaneous worked bone (84)

A large wapiti (elk; *Cervus elaphus*) metapodial has been deeply sawn around the bone near its distal end and then snapped. A similar example is from the proximal end of a smaller wapiti metapodial. A considerably smaller third example is the cut end of a deer (*Odocoileus hemionus*) metapodial. In all three cases, only the cut articular end, which was probably discarded during the process of manufacturing an artifact from the bone shaft, remains. Ungulate metapodials were favoured raw materials for the production of small woodworking tools such as chisels.

The remaining objects are fragments. Most are segments of land mammal bone, although a few are sea mammal and one is bird. All show some evidence of grinding and polishing, cutting, or other modification. Many are fragments of artifacts that are too incomplete to classify further. Others, including a few quite large bone segments, appear to be unfinished or preliminary stages in tool manufacture.

Artifacts of Antler

Wedges (2)

A deer antler beam section appears to have been cut at an angle at one end to form a small wedge. Although damage has removed most of the bit, the artifact is otherwise complete (length = 12.9; width = 2.6; thickness = 1.9 cm). The second example, a bit fragment, is based on a section of split antler. The object has broken lengthwise and is also incomplete in length, but a portion of one straight side and most of a curving bit remain. Although only a small portion is present, it seems large enough to have come from an elk rather than deer.

Worked antler (12)

Although none in this category are finished artifacts, all appear to be the result of artifact manufacture. Two beam sections have been sawn from both sides along their length and then snapped, leaving about half the original width of the antler. One has also been sawn and snapped to length, while the other shows shallow incised lines running its length on the outer surface, presumably as preliminary steps in further sectioning the object. A smaller fragment also shows evidence of sawing from each side and snapping. Seven other artifacts are sections of antler cortex that have been worked into "blanks" for artifact manufacture. Two tines, one quite large and one just the tip, have been cut and snapped off; presumably this was done during artifact manufacture and these are the discarded ends. All antler pieces are relatively small and appear to have come from deer.

Artifacts of Tooth

Fishhook shank (1)

A finely-made fishhook shank preform, complete at 7.5 cm in length (width at base = 1.6 cm; thickness = 0.5 cm), has been carefully shaped from a large tooth, most likely sea lion (Fig. 3-39). A small amount of enamel is still visible at the proximal end. The object has been extensively worked, with grinding striations and polish covering all surfaces. The sides are flattened and the shank is rectangular in cross-section. One side projects out at the base, providing an area for a sharp narrow bone point to be tied and baited. A shallow notch near the base of the opposite side provides a slight lashing

Figure 3-39. Fishhook shank of large tooth.

Figure 3-40. Shark tooth pendant.

spur. The shank is fully formed, except for carving out the groove of the point bed and any provision for line attachment at the proximal end. Fishhook shanks of bone and stone are relatively common in Nuu-chah-nulth sites, although this large example of tooth appears to be unique.

Shark tooth pendant (1)

A tooth from a great white shark (*Carcharodon carcharias*) has been drilled to create a pendant, possibly as an ear ornament (Fig. 3-40). The tooth is 3.3 cm across its top and 4.2 cm from top to tip. It is triangular in shape, with natural serrations along each sharp side. The only modification is the drilled hole, ca. 2 mm in diameter, through the root near the upper surface. It was found in the lower house floor deposits, in the central portion of the house near a large hearth feature.

No similar artifacts have been reported for Nuu-chah-nulth sites. Nor does Drucker (1951), in his classic ethnography of the Nuu-chah-nulth, mention the use of shark teeth. However, Cook (1784:299), at Nootka Sound in 1778, inferred the presence of large sharks in the sound, "for the natives have some of their teeth in their possession." In his Culture Element Distribution study, Drucker (1950:190) lists shark tooth pendants worn as ear ornaments for only the northern Northwest Coast groups (the Tlingit, Haida, Tsimshian, and Haisla). Perhaps the most complete ethnographic account is provided by Emmons (1991) for the Tlingit. Emmons describes such objects as "the most highly valued earring, possessed only by chiefs" (p. 243), although elsewhere (pp. 244, 315) he refers to women wearing shark tooth earrings. His drawing of a shark tooth pendant (p. 243) is almost identical to the Huu7ii specimen. These items were in such demand that the characteristic shape was sometime copied in other materials (Emmons 1991:173). Emmons (1991:243) states that such objects, like other decorative materials such as dentalium and abalone shell, were "procured in trade from the south, at great cost."

White sharks are found along the Pacific coast as far north as the islands of southeast Alaska (Hart 1973:33; Castro 1983:89). They frequently venture into shallow water close to land (Castro 1983:89). The Nuu-chah-nulth were well aware of the great sharks that came into their waters. Enormous sharks, capable of devouring men and canoes, were thought to live in deep water locations such as at the base of cliffs, and aspiring war chiefs sought out such places for bathing rituals (Drucker 1951:154, 170). A shark tooth pendant of this size would have been a potent symbol of power.

Worked canines (6)

Two canines may have served as pendants. A large sea lion canine has been extensively modified, with grinding striations covering its entire surface (Fig. 3-41). The most extensive modification is at the root end, where it has been deeply constricted to produce a pronounced knob, presumably for suspension. It is 5.5 cm in length. The second example is a dog canine tooth that has been gouged out on one side at the tip end, near the base of the enamel. This damage may have occurred during the life of the animal, or it may be a deliberate

Figure 3-41. Sea lion canine pendant.

modification for suspension as a pendant. It is 3.6 cm in length.

The remaining four canines have all been split lengthwise, from the root almost to the enamel tip, which curves away from the split (Fig. 3-42). In two cases, the split surface has been ground and polished; on one of these the grinding extends to the outer surface as well. All four are roughly the same size, ranging from 2.8 to 3.4 cm in length. However, they come from different species: two are dog, one is harbour seal, and one is fur seal. Similar split and ground canine teeth came from T'ukw'aa and Ch'uumat'a (McMillan and St. Claire 1992:51; 1996:43), as well as Yuquot (Dewhirst 1980:314-316). Their function is not evident, although they may be at an early stage of manufacture and would eventually have been perforated as pendants.

Polished tooth section (1)

A small polished disk appears to be from a section of tooth. Although only a portion remains, it appears to have been circular or oval in shape. The top and bottom surfaces are flat and highly polished, whereas the curving edge has been ground and polished in facets. Based on the extant portion, the diameter of the object was about 1.7 cm; the thickness is 0.4 cm.

Beaver incisor tools (2)

One beaver (*Castor canadensis*) incisor is missing the root end, which has been snapped off, while the distal end has been ground to a flat surface. This segment is 3.2 cm in length. Another is a small seg-

Figure 3-42. Split canine teeth.

ment of beaver incisor that has been split lengthwise. Although beaver are available on the Vancouver Island mainland, they are not found in the islands of Barkley Sound, indicating that these objects had to have been brought into the site, presumably for use as tools. The complete artifact is typical of examples found at the Ozette site, which were snapped, the root end discarded, and the occlusal surface ground flat (Gleeson 2005:287). They were then hafted as small woodworking implements.

Drucker (1951) does not mention beaver tooth knives in his ethnography of the Nuu-chah-nulth, and specifically denies them for the Nuu-chah-nulth in his Culture Element Distribution study (1950:183). However, beaver incisor tools have been found in small numbers at most excavated Nuu-chah-nulth sites, such as Yuquot (Dewhirst 1980:133), Hesquiat Village (Haggarty 1982:122), T'ukw'aa (McMillan and St. Claire 1992:51), and Ts'ishaa (McMillan and St. Claire 2005:65–66). Two beaver tooth knives were found intact in their wooden hafts in the preserved house deposits at Ozette (Gleeson 2005:288), demonstrating Makah use of such woodworking tools in the late prehistoric or protohistoric period.

Artifacts of Shell

Mussel shell tools (2)

A small nearly complete mussel shell celt is missing only part of one side (Fig. 3-43). The slightly curving bit has been bevelled by grinding from the ventral face only. The poll has been ground flat. The dorsal surface of the shell also shows evidence of grinding. The length from bit to poll is 5.0 cm; 4.0 cm remains of its width but the original implement would have been somewhat wider. It would have been serviceable as a small woodworking tool, such

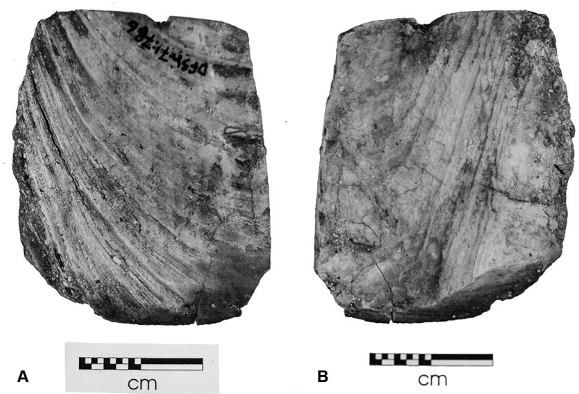

Figure 3-43. Mussel shell celt (dorsal and ventral faces)

as a chisel. The second artifact, a fragment of mussel shell that has been ground flat along one edge, is too incomplete for any function to be evident.

Ethnographically, the widespread availability of large mussel shells made them a favoured raw material for a variety of tools, particularly knives and celts. Sproat (1987:63) describes the use of sharpened mussel shells as woodworking tools by the Nuu-chah-nulth of Barkley Sound, as does Swan (1870:36) for the Makah. Mussel shell celts and knives are among the defining features of the West Coast culture type (Mitchell 1990:356), and they have been recovered from almost all excavated Nuu-chah-nulth and Makah sites.

Dentalium shell bead (1)
One very small dentalium bead was found during fine-screening a column sample. The tubular white shell appears to have been cut at each end. The resultant bead is 4.2 mm long and 2.7 mm in diameter.

Dentalium shells, strung as beads in necklaces and bracelets, and as ear or hair ornaments, were in widespread use among the Nuu-chah-nulth and Makah (Drucker 1951:139–140; Swan 1870:13, 16). Dentalia were obtained from deep-water beds off the west coast of Vancouver Island, and were highly valued as a trade commodity. Only small numbers, however, have been excavated from Nuu-chah-nulth sites. Six came from Ts'ishaa (McMillan and St. Claire 2005:64), while Yuquot, T'ukw'aa and Ch'uumat'a yielded only one or two examples each. In Makah territory on the Olympic Peninsula, small numbers of dentalium shells were found at Hoko River Rockshelter (Croes 2005:177) and Tatoosh Island (Friedman 1976:156). Only in the unique circumstance of Ozette, in the well-preserved floor of a high-status Makah house, do we find evidence of substantial quantities of dentalium in a west coast site (Wessen 1994:353).

Shell disk bead (1)
A small shell disk bead was recovered during fine-screening a column sample. This flat, circular, white bead appears to be made from clamshell. It is 6.5 mm in diameter and 1.6 mm thick. A small circular hole, 1.0 mm in diameter, has been drilled through the centre from each face. A similar small clamshell disk bead came from Ts'ishaa (McMillan and St. Claire 2005:64).

Artifacts of Wood

Points (2)
Two small pointed wooden objects show signs of having been whittled to shape (Fig. 3-44). Both small points (or possibly bipoints) are roughly circular in cross-section and have their greatest width (0.4 and 0.5 cm) near the centre, from which they taper to both ends. One is nearly complete (at 3.7 cm length), but is missing a small portion at each end; the other (at 4.1 cm length) is missing a more substantial portion of one end. Both are blackened by charring, which likely is responsible for their preservation. One was found in a patch of shell and ash within the black silt of the house floor, while the other came from an area of burned shell at the upper surface of the shell layer that underlies the house floor. Similar small wooden

Figure 3-44. Small charred wooden points.

points have been reported from waterlogged deposits, such as at the Ditidaht site of Wik̲palhuus (Eldridge and Fisher 1997:57), but have not generally been preserved in other contexts.

Artifacts of Stone

Stemmed ground slate point (1)
This finely-made projectile point of black slate is largely complete (Fig. 3-45, right). It is 3.9 cm in length and 0.3 cm thick. One corner has broken away, but extending the straight side suggests that the complete object was about 2.3 cm in maximum width. The sides are straight and bifacially bevelled, converging to a sharp tip. Deep triangular notches cut into the basal corners have produced a slightly contracting stem. The shape and size of this object suggest that it tipped an arrow, although Drucker's Nuu-chah-nulth informants denied the use of stone-tipped arrows (1950:186).

Small ground stone points are absent from the Yuquot and Hesquiat assemblages, and are not considered part of the West Coast culture type. However, they occur in small numbers at the excavated Barkley Sound sites of T'ukw'aa, Ch'uumat'a, and Ts'ishaa (McMillan and St. Claire 1992, 1996, 2005), although none closely resembles the stemmed point reported here. Ground stone points are more abundant in the Shoemaker Bay assemblage (McMillan and St. Claire 1982) and at sites in the Strait of Georgia region (Mitchell 1971).

Fishhook shanks (4)
Two finely made complete stone shanks were found in the same unit and level, only a short distance (about 24 cm) apart in house floor deposits (Fig. 3-46). A very slender example, of dark grey slate, has flattened sides and a rectangular cross-section. A well-defined lashing spur is at one side of the base. The projecting flange at the other side of the base has a narrow point bed along its edge that would hold only a small bone point. Two semi-circular notches at each side of the flat proximal end would have served for line attachment. It is 6.0 cm in length and 0.4 cm in thickness. The second example, of reddish-brown slate, is 6.4 cm long and 0.7 cm in thickness. It is somewhat stouter and is a rounded rectangle in cross-section. Two grooves for line attachment encircle the proximal end, while the distal end is flared out in the characteristic shape, with a point bed at one edge and lashing spur at the other.

Two fragmentary shanks are similar to the complete examples. One, of reddish-brown slate, is the proximal end, including most of the shaft. It is a flattened oval in cross-section. Two notches on one side and one on the other have been cut into the sides just below the flat proximal end, presumably for line attachment. A narrow vertical groove along one side from the notch to the flat end may also have held the line. The fourth example, of brown fine-grained sandstone, is the distal end of the shank, with much of the shaft. The shaft is a flattened oval in cross-section, while the flat distal portion is rectangular, with a well-defined lashing spur and narrow point bed.

Figuer 3-45. Ground slate artifacts (left: knife; right: stemmed projectile point).

Figure 3-46. Stone fishhook shanks.

Ethnographically, stone fishhook shanks were part of specialized trolling hooks, particularly for salmon, with the stone shank also serving as a weight. Such artifacts are found at almost all excavated Nuu-chah-nulth and Makah sites, including all the Barkley Sound villages, where they tend to occur in relatively late deposits (McMillan 1999:172). They are a characteristic feature of the West Coast culture type (Mitchell 1990:356).

Celts (2)

One complete large celt has been formed from a split pebble of hard black slate (Fig. 3-47). The dorsal face has a naturally smooth surface, although fine grinding lines are evident. The split ventral face shows considerable grinding and polish over its high points. Grinding from both faces along one end has produced a wide curving bit, 5.5 cm in length. Numerous small flakes removed along the bit indicate use damage. A ground bevel from the ventral face runs from the bit along much of one side. At the other end, the poll is rough and irregular. Dimensions are 8.3 x 7.4 x 1.9 cm.

An incomplete second example is also from black slate. One surface has been ground flat and smooth. One straight side has been sawn and ground perpendicular to the flat surface. A steep-angled bevel along one end has produced a straight bit that shows impact damage along its length. Measurements for this fragment are 8.4 x 4.4 x 0.9 cm. However, it has been split in thickness and is incomplete in all dimensions.

Small rectangular stone celts are reported for Yuquot (Dewhirst 1980) and Hesquiat Village (Haggarty 1982), leading Mitchell (1990:356) to list them as one of the characteristic traits of the West Coast culture type. However, they are not common at the Barkley Sound village sites. No intact stone celts were recovered from Ts'ishaa, although three fragments of ground and polished black slate were interpreted as possible celt preforms (McMillan and St. Claire 2005:60). No stone celts (with the possible exception of a reworked greenstone implement) are included in the substantial assemblage from T'ukw'aa (McMillan and St. Claire 1992). Stone celts are more abundant at Ch'uumat'a, but all come from deposits that predate the other village sites (McMillan and St. Claire 1996:26–29, 53). By the time House 1 at Huu7ii was occupied, mussel shell celts had apparently largely replaced those of stone in Barkley Sound. The irregularly shaped slate example discussed here is an exception, but differs considerably from the well-shaped rectangular examples of earlier times. It does, however, resemble an example reported for Ozette (Gleeson 2005:246).

Net weight (1)

A flattened oval cobble of fine-grained sandstone has a perforation that would make it serviceable as a net sinker (Fig. 3-48). The object is 12.6 x 8.0 x 1.9 cm. A hole, 2.1 cm in diameter, is asymmetrically placed, toward one end of the artifact. The hole appears to have been formed by pecking and grinding from each side, and has a smooth flattened interior surface.

Such objects are rare in Nuu-chah-nulth sites. Dewhirst (1980:222–225) reports considerable numbers of perforated sandstones from Yuquot

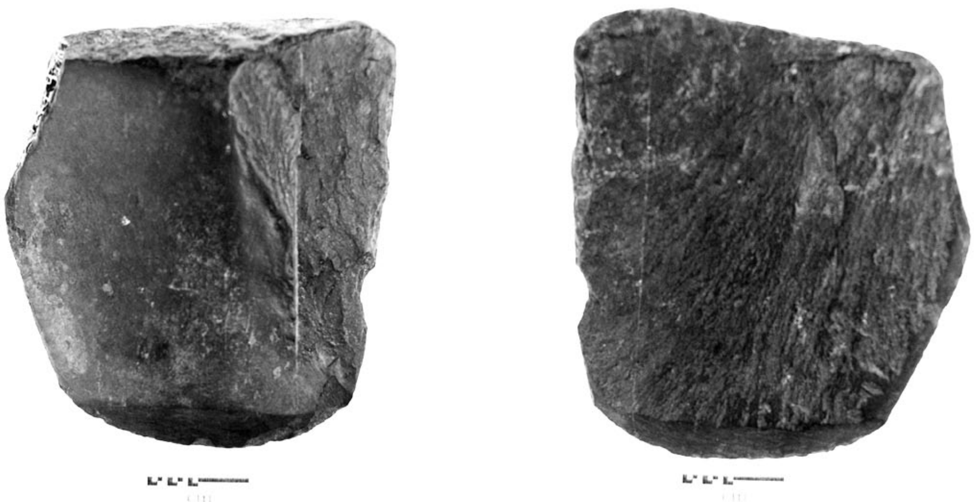

Figure 3-47. Stone celt (dorsal and ventral faces).

Figure 3-48. Stone net weight.

that resemble the Huu7ii example, although the holes were produced naturally through burrowing by piddock clams. Such holes are distinguishable by their straight walls, rather than the bifacial indentations on the Huu7ii example. Dewhirst argues that these were collected and brought into the site for their utility as sinkers and similar items. Another small example came from T'ukw'aa (McMillan and St. Claire 1992). Ethnographically, net sinkers were simply beach stones lashed with cedar withes (Drucker 1951:22–23), which makes them unrecognizable in sites where such materials are not preserved.

Chipped pebble (*pièce esquillée*) (1)
A small beach pebble of fine-grained metamorphic rock has been split lengthwise by bipolar percussion. One end shows only the impact scar from the initial blow. The other end has had extensive small flake removal from both faces, producing a straight edge. The object's dimensions are 4.0 x 2.8 x 0.8 cm.

Such items are often referred to in the archaeological literature as *pièces esquillées*, and may have served as small wedges or cores. They tend to occur in earlier deposits at west coast sites. Two such flaked pebbles came from Ch'uumat'a, from deposits dating to 3500 BP or slightly earlier (McMillan and St. Claire 1996:26). Six small "flaked stone wedges" came from early levels at Yuquot (Dewhirst 1980:125–128). They also occur in small numbers in late period sites: one came from T'ukw'aa (McMillan and St. Claire 1992:44). They are more abundant in Makah territory, such as at the Ozette midden trench (McKenzie 1974:121) and the Hoko River Rockshelter (Croes 2005:200–201).

Ground slate knife (1)
This is a large fragment of an implement made from a thin, flat, irregular piece of dark grey slate (Fig. 3-45, left). It has been ground smooth on both faces, and has been bifacially bevelled along one curving end to produce a knife edge. It is incomplete in both length and width, with dimensions of 9.3 x 5.7 x 0.3 cm.

Although Drucker's Nuu-chah-nulth informants denied the use of ground slate for cutting edges, he speculated that ground slate knives were probably used in prehistoric times (Drucker 1951:91). However, such tools are almost unknown for excavated Nuu-chah-nulth villages of this age. In Makah territory they are reported for the Ozette midden trench (McKenzie 1974:132) and the Hoko River Rockshelter (Croes 2005:195). Others were found in the waterlogged deposits of the Ozette house, three still in their cylindrical wooden handles (Gleeson 2005:284).

Ground schist (13)
All objects in this category are fragments of schist, ranging from green to grey, that show some evidence of grinding. One nearly complete artifact, measuring 11.7 x 2.3 x 0.8 cm, is an elongated bar with one long edge bifacially bevelled to produce a straight knife surface for its entire length. A fragmentary piece of green schist has a straight edge bevelled from one side, but this would not have been a serviceable knife edge. In other cases, grinding has produced flat faces or sides. A few show only small, flattened facets from grinding.

As neither schist nor slate are available on the islands of Barkley Sound, such materials would have to have been obtained from sources elsewhere on western Vancouver Island. Wilson (2005) notes possible source areas as the rocks of the Ucluth Formation to the northwest of Barkley Sound or the Leech River area to the southeast. Additional unmodified pieces of schist, including a large block, were collected during excavation and may be raw material or blanks for tool manufacture.

Sandstone saw (1)
A flat section of sandstone, measuring 9.6 x 4.6 x 0.6 cm, is incomplete in length and width. Both faces are flat, although only one has been ground smooth. The long intact edge has been bifacially bevelled to produce a straight surface that would be serviceable as a saw (Fig. 3-49).

Sandstone saws have been reported for several Nuu-chah-nulth sites, including Yuquot (Dewhirst

Figure 3-49. Sandstone saw.

1980), Hesquiat Village (Haggarty 1982), and Ch'uumat'a (McMillan and St. Claire 1996).

Abrasive stones (100)

Abrasive stones are the most common of the stone artifacts, making up 64.9% of the total for that category and 10.4% of all artifacts from the site. Most examples are fragmentary, hindering any attempt at classification. All are of sandstone, ranging from very fine-grained to quite coarse-grained. All relatively intact examples appear to be a size that could be held in the hand during use, although at least one is at the upper range for such an attribute. The fragmentary nature of most specimens prohibits definite statements on size.

Only eight artifacts are considered complete. Of these, five are large rounded sandstone cobbles, with both faces flattened through use. Edges may also be somewhat flattened but tend to be more rounded than the smaller shaped examples that have edges ground perpendicular to the faces. One exhibits traces of a reddish-brown material that may be remnants of red ochre at several points on the surface of one face. Another has an area of pitting at the centre of one face, indicating possible use as an anvil stone. These objects are generally larger and sturdier than others in the category, which has contributed to their intact state. All five are similar in size, with measurements of 14.6 x 11.6 x 1.8 cm, 14.7 x 10.1 x 2.2 cm, 15.1 x 8.1 x 2.0 cm, 15.7 x 10.2 x 3.7 cm, and 17.3 x 11.0 x 2.3 cm. The remaining three complete examples are smaller and more extensively shaped. A rectangular abrader, measuring 8.9 x 7.3 x 2.1 cm, may have continued in use after breaking in length as one short edge shows some polishing over a broken surface. Another (5.0 x 4.2 x 1.4 cm) has two flat faces and two converging long sides. The third (5.7 x 5.6 x 1.2 cm) is almost square in shape, with rounded corners.

At least 40 abraders can be classified as "shaped," as indicated by having at least a portion of one straight flat edge (Fig. 3-50). However, many are fragmentary medial pieces that lack any intact edges, so this number would have been substantially higher. Only two artifacts show evidence of having been sawn to shape along one side. Four shaped abraders take the form of an elongated bar. Another carefully shaped fragment has a curving indentation at the intact end and along each side near that end, resulting in this portion of the artifact resembling a fish tail (Fig. 3-50, lower right).

Most abraders (63%) show evidence of wear on two flattened faces. However, only 40% have roughly equal wear on both faces while a significant portion (23%) exhibit only relatively slight wear on one of the faces. Although the remainder (37%) show wear on one face only, this figure is certainly too high as many have split in thickness. In the great majority of cases, wear has resulted in an essentially flat surface. However, 13 examples have shallow dished depressions worn into the length of one face. Two others have shallow narrow grooves, presumably from sharpening small objects such as bone points.

The abundance of abrasive stones in this assemblage reflects their obvious importance in the technology. Such tools were essential in woodworking, as well as in the production of stone, bone, antler, and shell artifacts that were ground to shape. Drucker (1951:77, 79) notes the presence of such objects in the ethnographic carpentry toolkit, referring to "grindstones of sandstone for finishing" that were "small flattish slabs … picked up here and there." Archeologically, such implements are found in abundance at all excavated Nuu-

Figure 3-50. Shaped abrasive stones.

chah-nulth sites and are a characteristic feature of the West Coast culture type (Mitchell 1990:356; McMillan 1998a:879). Their relative importance at Huu7ii (10.4% of the artifact total) is somewhat higher than at other major excavated Barkley Sound sites, such as Ts'ishaa (7.9%; McMillan and St. Claire 2005:60) and T'ukw'aa (4.3%; McMillan 1999:172). However, that is far below their numbers at Yuquot and Hesquiat Village, where they comprise roughly half the total artifact assemblage (McMillan 1999:172), or Shoemaker Bay, where they form over a third of the total (McMillan and St. Claire 1982:124).

Large chipped slab (1)

One large sandstone slab measures approximately 56.5 x 26.0 x 4.7 cm. It exhibits pronounced flake scars along the length of one long side. For part of that length the flaking is bifacial, leaving a central ridge. The function of this object is not known.

Hammerstones (11)

All examples are rounded beach cobbles that show evidence of pitting on at least one end, suggesting use as hammerstones. All are of a size that could be used while held in one hand, although the largest are near the upper limit for such use. Two size categories can be distinguished.

Six fall into the small category. They range from 67.85 g to 637.1 g in weight (mean = 237.6 g) and 5.3 cm to 10.7 cm in maximum dimension (mean = 7.4 cm). The smallest, of vein quartz, shows a small area of pitting at one end only. Three gneiss cobbles are similar in size; of these, one shows significant pecking at one end only, whereas the other two show battering at one end and on one side. A larger cobble, of gabbro, has slight pecking at one end. The largest, of diorite, has extensive battering, producing flattened facets, along both sides near one end.

Five others are substantially larger. They range from 1269.4 g to 2416.5 g in weight (mean = 1981.3 g) and 12.6 cm to 19.2 cm in maximum dimension (mean = 16.4 cm). All are gneiss cobbles. Three show pitting at one end only. Another, in addition to the pitting at one end, has a battered area on the middle of one face, indicating that it was also used as an anvil stone. The largest object shows evidence of heavy battering, removing both ends of the elongated cobble.

Hammerstones are simple expedient tools that could be used for a wide range of tasks. For example, Drucker (1951:77) mentions the ethnographic Nuu-chah-nulth practice of laboriously producing stone mauls by pecking them to shape with any suitable hard cobble from the beach. Jewitt (1967:70) observed such use at Nootka Sound during his 1803 to 1805 captivity, stating, "Instead of a mallet for striking [the] chisel, they make use of a smooth round stone, which they hold in the palm of the hand." Such simple tools are found in archaeological assemblages all along the Northwest Coast.

Anvil stone (1)

A large cobble of hornblende gneiss weighs 8152 g (dimensions 26.4 x 17.6 x 11.4 cm). Extensive battering, presumably through use as an anvil, has produced two deeply pitted patches on one face. It was found on the house floor, sitting on a large flat rock, in association with a concentration of large boulders and adjacent to a large hearth feature.

Gaming piece (?) (1)

A spherical marble-sized pebble, 1.9 cm in diameter, has a somewhat polished surface. It appears to have been intentionally shaped into a perfectly round form. It came from well below the house floor, in the gravels at the base of the deep unit dug into the southeast corner of the house. A date of 1310 to 1060 cal BP came from just above this object.

There are few parallels for this object in the published literature for the Northwest Coast. Five polished spherical stones came from Kitselas Canyon, along the Skeena River (Coupland 1988:165–166), where they were classified as "ornamental and decorative items." Several others came from sites of the late Graham Tradition in Haida Gwaii, where they were considered to be "gaming pieces or manuports" (Mackie and Acheson 2005:295). Another has been reported for the Fraser River canyon, where it was associated with rock fortification features and was interpreted as a sling stone used in warfare (Schaepe 2006:687). Several of Drucker's Nuu-chah-nulth informants also affirmed the use of slings in Nuu-chah-nulth warfare (Drucker 1950:187; 1951:335). However, the Huu7ii artifact is substantially smaller than the Fraser Canyon example and may have been too small for such use. A "gaming stone" is a very tentative interpretation for this item.

Quartz crystal/ calcite manuports (4)

These four objects have been formed naturally through a "drip" process in a cave or cavity. Their presence within the house indicates that they were purposefully transported there. All may have had some ornamental or ritual value.

A small quartz crystal extends from an irregular base. The total length is 2.5 cm; the shaft of the crystal is 0.5 cm wide where it emerges from its base. The supernatural and ritual importance crystals had in Northwest Coast societies may be responsible for this item's presence on the house floor. Across much of western North America, quartz and other crystals were associated with activities of the shaman, including rituals of curing (Hickok et al. 2010:250–251; Pearson 2002:142). The Nuu-chah-nulth believed that supernatural quartz crystals grew in caves high up in the mountains; ambitious men sought out such objects, which became hereditary treasures (Drucker 1951:153, 367). In other cases, crystals were gifts from encounters with supernatural Wolves and other beings (Drucker 1951:368). They featured prominently in Nuu-chah-nulth ceremonial life, particularly the events associated with inviting guests (Drucker 1951:368, 377, 431, 443) and in the performance of the Wolf Ritual (Sapir and Swadesh 1955:93–94; Boas 1891:600). Crystals imbued with supernatural power were also used in sea mammal hunting rituals (Drucker 1951:169).

Three calcite objects have formed with central holes and could possibly have been used as beads. The smallest, a flattened oval, resembles a disk bead, although it appears to have formed naturally, possibly around a root. Its measurements are 1.0 x 0.8 x 0.3 cm. Its oval central hole, 0.5 cm in maximum dimension, closely parallels the outer form. The second object is a segment of a smooth shiny calcite tube, 2.7 cm long and 1.3 cm in diameter, with a straight hole extending through its centre for the entire length. The central hole is 0.45 cm at one end, decreasing to only 0.2 cm at the other. This would make a serviceable and attractive bead, which may be the reason for its presence in the house. The final object is also a calcite tube, 3.8 cm long, with a circular hole about 0.4 cm in diameter running its length. The outer surface is irregular, dull, and rough, making it less attractive and somewhat doubtful as a bead.

Red ochre (12)

Eleven samples are small crumbly patches of red-brown material, presumably red ochre (iron oxides), which were clearly distinguishable from the black silt of the house floor. The colour ranges from red (Munsell 10R 4/8) to dark reddish-brown (2.5YR 2.5/4).

Ochre was widely used as a pigment all along the Northwest Coast. Numerous ethnohistoric sources attest to the Nuu-chah-nulth use of red and black paint as body decoration. Ochre was ground into a powder and mixed with an organic binder, such as crushed or chewed salmon eggs, to form a durable paint (Drucker 1951:83). A fragmentary clamshell bowl, thickly encrusted with red ochre paint, was found at Ts'ishaa (McMillan and St. Claire 2005:64); similar examples came from the Ozette midden trench (McKenzie 1974:113) and the Hoko River Rockshelter (Croes 2005:185).

The final sample has a distinct context. It came from the southern edge of the excavation, from the shell deposits of the back midden ridge, rather than the house floor. A small concentration or pocket of shells that were not otherwise common in the midden deposit was found, perhaps as a single basketload. Red ochre occurred throughout these shells, heavily encrusting some examples. This ochre-covered patch of unusual shells was designated a feature (F54); further description can be found in the discussion of features below.

Features

Of the 51 features that were designated within the House 1 excavation, 48 (94.1%) were encountered in the house floor deposits. This is partially a result of the level of activity within the house, but also reflects the fact that many units (particularly those of the central excavation block) were discontinued when the base of the house floor was reached. Major features evident at the lowest house floor level are described (and illustrated) in Chapter 4. Only two features were recorded in the strata underlying the house deposits. An additional feature was noted during excavation into the back midden ridge in an attempt to expose a house feature that had become buried under this shell accumulation.

Everyday domestic activities within the house would have included maintenance of fires for cooking, light, and warmth. Evidence of such mundane practices was scattered in abundance throughout the house deposits, taking the form of patches of tan-coloured ash or concentrations of angular fire-cracked rocks (FCR), often with charcoal (see Fig. 3-3). These comprised just over half the total number of recorded features within the house floor (25; 52%). Only substantial concentrations of such materials were designated as features, although ash, charcoal, and FCR were scattered throughout much of the floor deposits. Most indicate only ephemeral and shifting hearth positions, although one patch of ash over 20 cm in thickness suggests more prolonged use. Several substantial FCR piles indicate clearing the residue from cooking activities. One very large concentration of FCR and charcoal at the lowest level of the house floor (F45) had a maximum diameter of about 1.8 m. Three ash patches were associated with small stake holes, suggesting the roasting of food on wooden spits directly over the fire. In these three cases, nine, 11, and 17 small stake holes were noted.

Two more formal hearths were recorded, both at the base of the house floor in the central excavation block (see Chapter 4). In one case (F36), a circle of rounded cobbles, about 70 cm in diameter, enclosed a thick concentration of ash, the only such rock-lined hearth encountered in House 1 (Fig. 4-12). The second example (F42), also unique among the House 1 hearths, was located in an excavated depression, about 1.0 m across, located near the centre of the house (Figs. 4-10, 4-13). Charred wood, retaining the recognizable shape of the burned logs, filled the pit. Sand visible below the charred logs suggests that the pit was sand-lined. Radiocarbon analysis from the charred wood gave a result of 990±50 BP (970 to 780 cal BP), the oldest date from the house floor. This large hearth fits Drucker's (1951:71) description of an ethnographic Nuu-chah-nulth house containing "a large shallow circular depression" near its centre "that served as the fireplace on ceremonial occasions." This central feature presumably served the entire household on special occasions, whereas the smaller hearths scattered across the house floor were used by individual families for everyday cooking.

In addition to the three ash patches with stake holes mentioned above, six features consisted of stake holes or moulds. The largest cluster (F55), from the upper levels of one of the eastern units, consisted of 14 stake holes, ranging in diameter from 3 to 8 cm. Other clusters consisted of four, six, and seven stake holes, with individual diameters between 4 and 13 cm. Two others were single stake holes, with diameters of 4 and 8 cm. The larger of the two (F4) was associated with an articulated row of salmon vertebrae along its edge, suggesting that this food refuse lodged against a bench support or similar feature, thus escaping housecleaning efforts (Fig. 4-3). Many of these stake hole features occurred near the sides of the house and may represent uprights in sitting, sleeping, and storage facilities.

Three similar but larger straight-sided features are considered post moulds. One (F2), 20 cm in diameter, occurred in the upper portion of the house floor near the west wall of the house, while the other two are at the base of the house floor near the back wall (Fig. 4-9). One (F10) is about 35 cm in diameter, whereas the other (F47) is an oval of about 45 by 30 cm. All three likely held substantial posts but are not large enough to represent the primary house posts of a large structure such as House 1.

Four large boulder-filled pits likely indicate the positions of major support posts. All are described in Chapter 4 and their locations noted on Fig. 4-9. In two cases whale vertebrae and other large bones occur with the large boulders in the pit. Such features occur along both the east and the west walls of the excavation, which correspond to the edge of the house platform as visible on the surface, and can be seen primarily in the unit profiles (e.g. Fig. 3-8). The largest of the four features (F56) was located at the centre of the back wall. This very large pit, filled with large boulders and a considerable number of complete whale vertebrae, had become buried under the shell refuse of the back midden ridge, suggesting that the house position had shifted somewhat over time. Another large rock-filled pit (F52) is located a short distance further into the house and may represent a slightly later position of the back wall.

Another feature associated with the house that stood at the lowest house floor is a long shallow trench (F46) that ran diagonally across the central excavation block (see Chapter 4; Figs. 4-9, 4-10). Dug about 10 cm from the base of the house floor into the underlying shell deposit and filled with sand, this trench has been interpreted as a drainage feature. Its length can be traced for about seven metres across the excavated area, but its actual extent may well be greater. If this is indeed a drainage feature, it likely continues into the unexcavated front portion of the house platform. Drainage trenches lined with planks were prominent features on the floors of the excavated houses at Ozette.

Of seven pit features, with sloping sides and rounded bottoms, six were visible on the lowest house floor (see Chapter 4; Fig. 4-9). The upper pit (F31), an oval of about 28 by 17 cm and about 20 cm depth, was filled with shell, particularly intact articulated mussel valves, making it highly evident in the black silt of Layer B. A pit (F48) in one of the eastern units, containing ash and FCR, was only partially excavated but was 30 cm across where it disappeared into the unit wall. Two additional pits, near the southwestern corner of the house, were also only partially exposed within their excavation units. A basin-shaped pit (F13) was about a metre across where it extended into the unit wall, whereas the other (F14) was about 1.2 m across and was lined with sand and pebbles at its base. The final three pits occurred in close proximity in the central excavation block, near the back centre of the house. The largest (F44), an irregular oval about 1.5 m by 90 cm at its surface, had distinct pits within, reaching a maximum depth of about 60 cm. Immediately to the southwest was a smaller pit (F18), about 60 cm across and 55 cm deep, containing a large rock slab. To the south of the largest pit and beside the rock-lined hearth described above was a pit (F43) about 80 cm in diameter, with four large boulders and smaller rocks placed on its top.

Two miscellaneous features complete the total for the house floor deposits. F37 was a small pile of rounded, egg-sized rocks, along with some FCR. It is likely that the rounded rocks were intended for use as boiling stones in cooking. The second feature (F51) was a cache of ten whalebone blanks stacked in a pile on the lowest house floor (see artifact descriptions and Chapter 4). Each blank had been roughly worked to a similar shape and size (Figs. 3-37 and 4-7). Such blanks would have been a preliminary stage in the manufacture of a variety of tools. Whalebone was a common raw material at Huu7ii, and these blanks would have been a suitable size for the production of such important items as the large valves for harpoon heads used in sea mammal hunting.

Only two features were recorded in the strata underlying the floor deposits. A rock and whalebone concentration (F7) at the western edge of the excavated area appeared to be circular in form although only part of it could be examined within the unit. The circular shape and charred nature of the whalebones suggest that this may have been a hearth. Packed in with the whalebones were at least 25 small rounded stones of roughly uniform size, presumably representing boiling stones used in cooking. The second feature (F40), in the easternmost unit, was also a rock concentration that may have been a hearth. In this case, a roughly circular pile of rounded and angular rocks, with charcoal among them, sat on a thin shell layer just into the gravel at the base of the cultural deposit.

The final feature came from the shell of the midden ridge that accumulated along the back of House 1. This ridge had built up over several substantial features at the back of the house floor, suggesting that the house position had shifted somewhat over time. In order to more fully expose a large rock-filled pit (F56) at the back of the house, several small unit extensions were dug into the midden ridge. While removing this material one feature (F54) was recorded. This consisted of two small adjacent patches, each about 18 cm in diameter, of distinctive shells covered with red ochre. Although both patches extended into the unit wall, most of each could be excavated. A grab sample that encompassed much of one patch was collected for shell identification (by shell analyst Ian Sumpter). When the shells were examined under a microscope in the lab, many of the valves were clearly caked with ochre. The 90 shells that made up the sample were primarily unusual species, not the common mussel shells that made up most of the midden ridge. The most common species, at 55.6% of the sample total, was the western bittersweet clam (*Glycymeris septentrionalis*). A few of the valves were very small, making it unlikely that they were collected for food. Following were the smooth pink scallop (*Chlamys rubida*) at 15.6%, the rose-painted clam (*Semele rubropicta*) at 12.2%, the black turban snail (*Tegula funebralis*) at 10%, and the keyhole limpet (*Diodora aspera*) at 3.3%. Most of these were too small to be primarily food refuse. Also in the sample were one broken northern abalone (*Haliotis kamtschatkana*) valve, one topsnail (*Calliostoma* sp.), and one plate from a giant Pacific chiton (*Cryptochiton stelleri*). Only the black turban snail and the northern abalone were present in the analyzed midden deposits (Sumpter, Appendix D). These concentrations of unusual ochre-encrusted shells, perhaps deposited as two basket loads, seem unlikely to be simple food refuse and perhaps indicate some ritual treatment.

Subsistence Remains

Analysis of the vertebrate fauna recovered from the excavation units is reported in Appendix A (by Gay Frederick). In this study, over 80,000 vertebrate elements were examined from selected excavation units within the outline of House 1. See Appendix A for discussion of which units and levels are included in this analysis. From the large number of elements in the sample, just over 43,000 could be assigned to species, genus, or family (Appendix A). Fish dominated the identified specimens in the unit samples, comprising 92% of the total, distantly followed by marine mammals (4%), land (including commensal) mammals (3%), and birds (2%). Samples analyzed came from both house floor deposits and sub-floor midden. Although most of the 2006 excavation units were discontinued at the base of the house floor, information on the underlying midden comes from a number of units that were more deeply excavated, particularly the two that reached the sterile beach sand at the base of deposits (N18-20 E2-4 along the west wall and N18-12 E34-36 near the southeast corner). Faunal abundance was greatest in the house floor deposits. As would be expected, damage through trampling was particularly evident on faunal elements from the house floor.

The faunal remains provide ample evidence of a heavy dietary reliance on fish. Among the wide range of species present in the unit samples, hake, salmon, rockfish, greenling, dogfish, and sole are particularly common (Appendix A). Although small fish such as herring and anchovy were recovered in the unit samples, they are clearly under-represented. Fine-screen examination of the column samples, as reported in Appendix B, demonstrates the magnitude of this biasing factor. The prominence of hake in the unit samples stems largely from a huge concentration of more than 12,000 bones collected from the sub-floor midden in three consecutive levels of one unit, although hake are still well represented even when this concentration is removed from the analysis. The emphasis on hake at Huu7ii differs from other excavated Barkley Sound sites, such as Ts'ishaa (Frederick and Crockford 2005) and Ma'acoah (Monks 2006), where hake played a more minor role. A significant shift appears to have taken place from the sub-floor midden to the house floor deposits, as salmon become much more important in the latter, particularly in the uppermost levels (Appendices A and B).

Several less common fish species are also worthy of note. Bluefin tuna elements (Fig. 3-51) occur in small numbers throughout the deposits, as is the case for virtually all excavated Nuu-chah-nulth sites, including the Barkley Sound villages of Ts'ishaa, T'ukw'aa, Ch'uumat'a, and Ma'acoah (Crockford 1997a; Frederick and Crockford 2005; McMillan 1999:142–143; Monks 2006). This large powerful fish, with archaeological specimens estimated at over 2 m in length (Crockford 1997), came into British Columbian waters during warmer summer conditions. Although there are no ethnographic accounts of taking this large fish, and only a few ethnohistoric references to its use, its presence in faunal assemblages indicates a fairly constant role in the diet over millennia. Halibut, on the other hand, feature prominently in the ethnographic and historic accounts of Nuu-chah-nulth life, yet are relatively rare in the Huu7ii fauna, as was also the case for the faunal sample

Figure 3-51. Bluefin tuna vertebra in hand shortly after being excavated. Note the size of this large fish.

from Ts'ishaa (Frederick and Crockford 2005). In general, halibut elements occur in relatively low frequencies in faunal assemblages along the outer Northwest Coast compared to their ethnographic importance, likely reflecting such cultural practices as butchering the large fish on the beach, where most bones were discarded, and boiling the dried flesh before consumption, reducing the survivability of the remaining elements (Orchard and Wigen 2008). Also of note are two species of large shark, the seven-gill shark and the great white, each represented by a single tooth (the former in the faunal sample and the latter, drilled as a pendant, among the artifacts) in the house floor deposits.

A separate study of vertebrate fauna focused on the fine-screened column samples taken from selected unit walls at the completion of excavation. See Appendix B (by Iain McKechnie) for specific locations of the column samples. Over 36,000 faunal elements were examined, of which just over 15,000 were identifiable to species, genus, or family. Fish remains overwhelmingly dominate these samples, comprising 99.8% of the identifiable bone from House 1 (Appendix B). Herring, which make up 65.9% of the fish total, are consistently the major species represented. Other important species include salmon (10.7%), anchovy (10.1%), hake (4.2%), greenling (3.5%), rockfish (1.8%), and dogfish (1.7%). This study demonstrates that the field-recovered unit samples greatly under-represent smaller fish such as herring and anchovy.

Instead, fine-screen recovery of these small fish species reveals the magnitude of their role in the economy at Huu7ii at the time House 1 was occupied.

A variety of cetacean species also played significant roles in the diet at Huu7ii. Whale elements were widely distributed across the excavated units and were common in both the sub-floor midden and the floor deposits (Appendix A). Most were too fragmentary for accurate species identification through visual examination. However, a sample of 101 elements from across the House 1 deposits was examined through aDNA analysis (Arndt and Yang, Appendix C). The great majority, 83.3% of the identifiable elements, were from humpback whales, with grey whales coming a distant second at 13.1% and finback and right whales represented by only a few elements (Appendix C). This is very similar to other excavated Barkley Sound sites, which are characterized by a similar dominance of humpback whales (Monks et al. 2001; McMillan et al. 2008:225–226). Unlike T'ukw'aa and Ts'ishaa, where portions of mussel shell cutting blades from whaling harpoon heads were found embedded in whale bones (Monks et al. 2001:66; McMillan and St. Claire 2005:69), no evidence of active hunting was evident in the Huu7ii assemblage. However, the marked predominance of humpbacks, rather than the grey whales that tend to travel closer to shore, strongly suggests that this assemblage resulted from selective hunting, rather than from scavenging drift animals (Appendix C). Several species of porpoise and dolphin were also taken in considerable numbers (Fig. 3-52). The people who lived at Huu7ii clearly had developed effective open-ocean strategies and technology for hunting such large prey as whales and fast-swimming elusive animals such as porpoises.

Other sea mammals, including northern fur seals, northern sea lions, and harbour seals, played significant roles in the diet. Fur seals were particularly important, as was the case at virtually all Nuu-chah-nulth sites, including the large Barkley Sound village of Ts'ishaa (Frederick and Crockford 2005; McMillan 1999:140). The presence of significant numbers of very young animals suggests exploitation of a fur seal rookery in the general vicinity of Barkley Sound, rather than relying on the migratory herds that characterize the modern population (Appendix A; Crockford et al. 2002).

The land mammal assemblage is dominated by dogs, which were particularly abundant on the house floor. All age classes are represented, although puppies are particularly common. All skeletal parts are present, with several animals being nearly complete. Unlike hunted animals, whose elements undergo selection in a faunal assemblage, this appears to be natural population kept as pets. As at the nearby site of Ts'ishaa (Frederick and Crockford 2005:179), both large and small dog

Figure 3-52. Articulated porpoise vertebrae in situ in house floor deposits.

breeds are present, with the smaller animals being particularly common. Measurements on the latter are consistent with Crockford's (1997b) Type 1 dogs, a size represented ethnographically by small long-haired animals that were kept separate from the general canine population. After dogs, deer were the most abundant land mammal, particularly in the midden layers below the house. In contrast, although the numbers are very small, elk and bear occur only in the house floor deposits (Appendix A).

Analysis of shellfish from the House 1 area (Sumpter, Appendix D) was restricted to one column sample from near the southwest corner (Unit N10-12 E2-4). The west wall of this unit cut into the midden ridge, providing much more abundant shell remains than further out onto the house floor. The shell collected in the column sample was overwhelmingly mussel (*Mytilus californianus*), which comprised 94.3% by weight of the shell total. Barnacles followed distantly at 3.3%. These taxa reflect the rocky foreshore of the site location; clams and other sediment beach species, which are not readily available in the immediate vicinity, are relatively rare in the Huu7ii sample. Species diversity is low, with only 12 shellfish species identified from House 1 compared to 53 in contemporaneous deposits at Ts'ishaa (Sumpter 2005). Although this analysis was based on only one column from the house periphery, field observations during the excavation confirm the low shellfish variability and the overwhelming dominance of mussel.

Although the diet was dominated by a variety of fish, sea mammals, and shellfish, plants would also have played a significant role. Ethnographic accounts document a wide range of plants used by Nuu-chah-nulth people for food and medicine (Drucker 1951:56–57; Turner and Efrat 1982; Turner et al. 1983). Although Huu7ii's restricted island environment would have limited access to food plants, analysis of preserved pollen in a core taken from a bog at the back of the site (Pellatt, Appendix F) demonstrates that a number of plants that could potentially have contributed to the diet grew in the general area. The large rose family (Rosaceae) identified in the pollen includes such food species as serviceberry, wild strawberry, and wild crabapple, as well as the Pacific cinquefoil, whose edible root was gathered in quantity by the Nuu-chah-nulth (Turner 1975). Within this family, genus *Rubus* pollen was identified, which would include such common species in the Nuu-chah-nulth diet as the thimbleberry, wild raspberry, and salmonberry. Pollen from the heather family (Ericaceae) was identified as "likely salal or red huckleberry" (Pellatt, Appendix F). Also identified in the pollen was *Corylus*, the hazelnut, and the fern family (Polypodiaceae), several species of which were gathered by the Nuu-chah-nulth for their edible rhizomes and shoots (Turner 1975). Pollen from these plants increases in abundance in the upper portion of the bog core, corresponding in time to when the main portion of the village, including House 1, was occupied.

The presence of such edible plants in the pollen record shows that they were growing in the general site vicinity but cannot demonstrate use by the site occupants. Paleoethnobotanical analysis relies on plant remains such as seeds being preserved in archaeological deposits, generally by charring. Unfortunately, examination of matrix samples taken from hearths and other burnt contexts failed to reveal any direct evidence for plant use at Huu7ii in the form of preserved seeds or other food refuse (Weathers, Appendix E). The lack of such botanical remains is likely a factor of poor preservation in the alkaline site deposits.

In general, the most abundant Huu7ii fauna, such as rockfish, greenling, herring, and mussels, reveal an emphasis on inter-tidal and near-shore resources that could have been procured in the immediate site vicinity. However, other species, such as porpoises, fur seal, and bluefin tuna, demonstrate a more open-ocean capability. Significant shifts in resource use appear to have occurred in the final period of occupation. Salmon increase dramatically, from a minor taxon in the sub-floor midden to about 68% of the fish total in the house floor, resulting in a drop in the relative importance of all other fish (Appendix A). This major jump in salmon importance suggests that they were being taken elsewhere, probably at a major salmon river along the Barkley Sound shoreline, and were brought back to the site as preserved fish. This would suggest that the people of Huu7ii had obtained access to a broader territory during this final period of occupation. This idea is also supported by the shellfish analysis, which shows a dramatic rise in importance of clams in the most recent layer (from an average of 1.6% of the total by weight to 33.9% in the uppermost stratum; Appendix D). In earlier times people primarily gathered the large mussels available in the rocky vicinity of the site, whereas in the final stage they also consumed large numbers of clams from more distant beaches.

Chapter Four: HUU7II HOUSE 1 AND NUU-CHAH-NULTH HOUSEHOLD ARCHAEOLOGY

The Archaeology of Plank Houses

The household was the fundamental economic, social, and political unit on the Northwest Coast (Ames 2005:15), essential to understanding the dynamics of past societies. Although households of the past were social units that cannot be studied directly, they left physical traces through the remains of the dwellings they occupied and the residues of their daily activities that survive within such structures. In a broad comparative study of houses and households, Blanton (1994) states that houses communicated rank and power, as well as other aspects of social and personal identity, and that they served as mnemonic devices that guided behaviour within the society. Living in the house structured daily life as the occupants were constantly provided with cues regarding appropriate behaviour. Blanton (1994:10) describes the house as "a material frame that structures not only day-to-day interactions, but also the more infrequent formal household rituals." More specifically for the Northwest Coast, Ames and Maschner (1999:147) provide a similar view:

> Houses ... were the physical manifestation of the household and its social rank; they were theatre and stage for social and spiritual rituals, but they were also shelter in the Northwest's dank climate; they were food-processing factories, in which food resources were butchered, roasted, smoked, rendered, dried, boiled, stored, and consumed; and they were the objects of enormous effort and great skill. Their interior arrangements were often a map of the relative status of the household's members.

Although distinct regional styles are clearly evident, Northwest Coast houses shared a basic pattern. All along the coast, split cedar planks served as wall and roof boards that covered a framework of wooden posts, beams, and rafters. Among the Salishan and Wakashan groups (including the Nuu-chah-nulth) described historically, these planks were designed to be removable. Such an architectural scheme allowed the transport of planks between seasonal villages, leaving only the framework standing during times of residence elsewhere. Plank houses could be very large, sheltering a household group that consisted of a number of related families. Villages generally consisted of a row of houses along the beach, all facing the sea; however, in locations where space was limited, several house rows might exist. Status was reflected in house size, as the largest house in the village usually belonged to the most highly ranked chief, and also in house position, as the large chiefly homes were generally located toward the centre of the house row (Ames and Maschner 1999:152).

These large plank houses present considerable challenges to archaeological research. All the structural components of these dwellings—the posts, beams, rafters, and planks—decay over time in the damp ground of the west coast, leaving little for study but features such as post moulds and the bounded traces of interior activities. In addition, the huge size of many houses requires excavation on a very large scale to reveal an adequate picture of construction details and activities. As remains of past houses often exist within extensive deep shell midden deposits, often with no surface indications, traditional excavation approaches tend to slice through house floors in the quest to obtain a representative sample of artifacts and faunal elements, as well as to understand the site stratigraphy and chronology. The development of household archaeology on the Northwest Coast required a shift in strategy, one involving large-scale horizontal clearance across a house floor.

Despite the difficulties involved, household archaeology has become a prominent aspect of research on the Northwest Coast over the past few decades (Ames 2005:15, 2006:16; Gahr et al. 2006; Matson 2003a:7–9). Recent archaeological studies based on extensive exposure of house floors include R.G. Matson's work at Shingle Point, which involved a Coast Salish shed-roof house (Matson 2003b), and the long-term studies of Ken Ames and his colleagues on several Chinookan houses along the Columbia River (Ames 1996; Ames et al. 1992; Smith 2006; Sobel 2006). Such studies have yielded detailed information on house construction, maintenance, and repair, as well as insights into the everyday life of the people who lived in these structures. Perhaps the most important demonstration of the insights to be gained from a household approach to archaeology, however, comes from the uniquely preserved dwellings at Ozette.

Ozette, on the outer coast of the Olympic Peninsula, was one of the major traditional villages of the Makah people. The Makah are closely related to the Nuu-chah-nulth and Ozette is only about 90 km from Huu7ii by canoe, so the Ozette research is particularly relevant to the present study. Ozette's unique context stems from an ancient disaster: a mudslide that rushed down the steep slope behind the village, destroying the houses at its southern end. The slide, perhaps triggered by a seismic event, occurred not long prior to European arrival on the coast, perhaps at the beginning of the 18th century. Although the force of the slide flattened the houses, the thick wet mud also kept the remains water-saturated, preserving the structural elements and most of the house contents. Excavation, using hydraulic techniques to expose the delicate wood and bark objects, continued for over a decade, ultimately exposing the complete floors of three houses, plus portions of several others (Samuels and Daugherty 1991:23; Samuels 1989:143; Huelsbeck and Wessen 1994:3). Ozette provides an unprecedented opportunity to study the nearly complete material culture of a pre-European Northwest Coast household at a single moment in time. The house architecture can be reconstructed (Maugher 1991) and activities and social distinctions within the house interpreted through spatial patterns in the floor middens (Samuels 1989, 1991, 2006). Insights into the social realm also emerged from detailed studies of faunal remains, which suggested differential access to resource areas between houses and status-related differences in the distribution of preferred resources within houses (Huelsbeck 1989, 1994a; Wessen 1988, 1994). Ozette provides many important lessons for other projects involving household archaeology on the Northwest Coast. However, the large-scale multi-year excavation at Ozette is unparalleled on the Northwest Coast, and the wealth of preserved architectural elements and house contents allowed studies that would be not be possible in areas without such exceptional preservation.

Although research at Huu7ii was on a more modest level, this site also presented an opportunity to investigate past households. The village consisted of a row of houses extending parallel to the beach. Fairly distinct flat platforms, originally mapped by Al Mackie and Laurie Williamson (2003) in 1984, indicate the position and approximate dimensions of each house (Fig. 1-3). At least 10, and perhaps 12, houses once stood in this area. A substantial back midden ridge, ranging up to two meters in height, marks the rear position of the houses along the length of the site. At several of the house locations, narrow side midden ridges extend out at right angles from the back ridge, gradually tapering off toward the front. The fronts of the houses are more difficult to discern, although some have a slight edge where the floor had been built up. The level spaces mark the locations of house interiors, while the ridges indicate where refuse accumulated outside the house, against the rear and side planks. This process can be seen in an 1874 photograph of a house at Nootka Sound (Fig. 4-1); the planks have been removed, leaving only the frame, so the flat interior living and activity space is evident, as is the ridge that has built up around the outer edge.

The largest house at Huu7ii, labelled House 1 by Mackie and Williamson (2003), was located near the middle of the house row. It extended for a length of about 35 m parallel to the beach and was about 17 m wide, based on surface indications and subsurface auger testing. Such a large house is assumed to correlate with high status, as ethnographically it was the *taayii hawilh* (head chief) who occupied the largest and most impressive dwelling in a Nuu-chah-nulth village (Barrett-Lennard 1862:128; Colnett in Galois 2004:115; Jewitt 1967:52; McMillan and St. Claire 2005:9; Walker 1982:61). More generally for the Northwest Coast, Coupland and Banning (1996:3) note that "big houses often provide a material correlate of wealth and complexity," and that such structures "can also be a symbol of affluence that may signal to others the relative success of its owner, a person who can regularly hold feasts and ceremonies within his house." Similarly, Sobel (2006:171) makes three points regarding highest-status households occupying the largest houses: (1) as house construction was costly, large houses reflected great wealth, thus conferring prestige on the household that occupied such a structure; (2) large dwellings could hold large households, which could be more productive and influential than smaller households and achieve greater prestige; and (3) households that could construct large residences could hold major social and ritual gatherings, thus maintaining or enhancing their prestige in the society (see also Coupland 2006:80–82). House 1, therefore, offered an opportunity to investigate past life within a large residential structure that was presumably

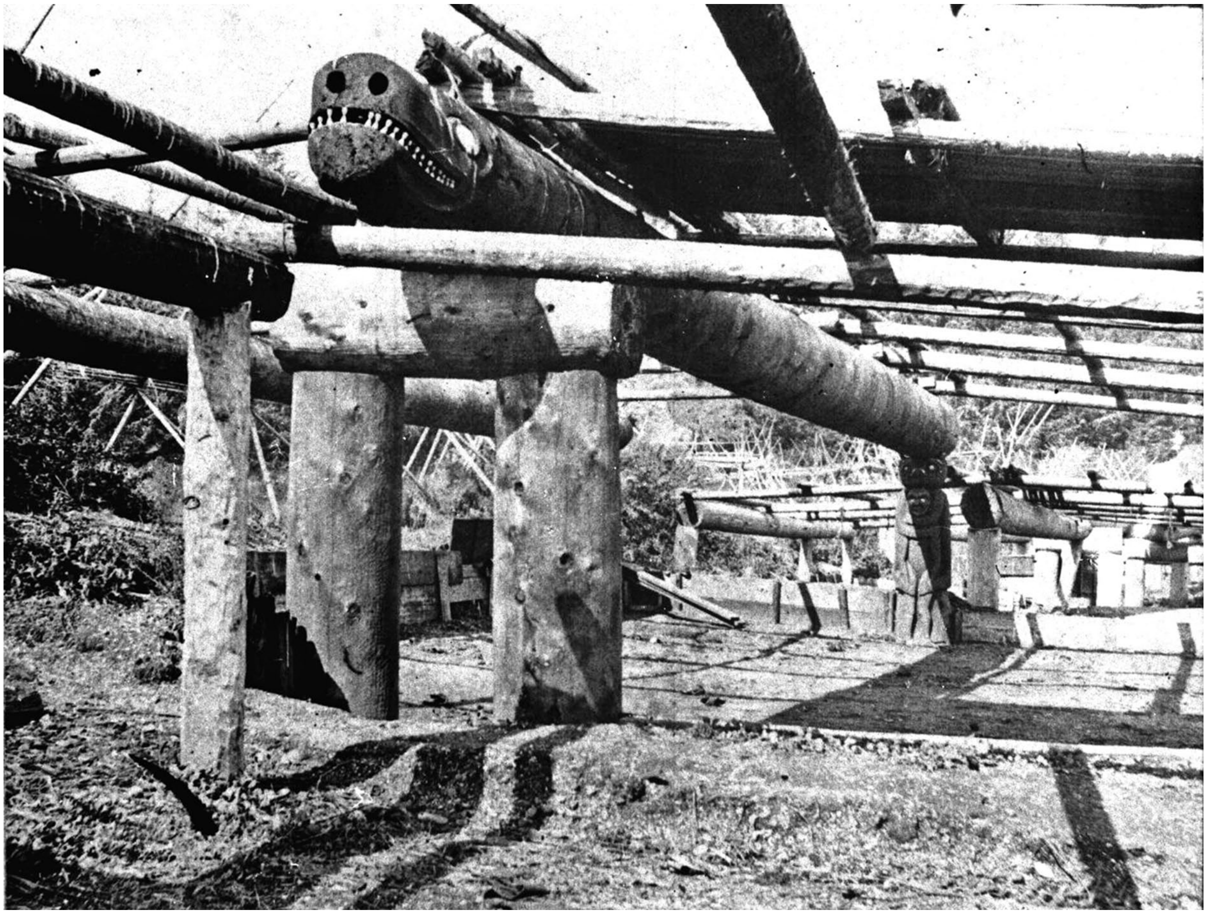

Figure 4-1. House frames at Yuquot, Nootka Sound, 1874. The wall planks have been removed, exposing details of the house form. Note the low gabled style of the framework, the decorated end of the gable beam (and carved rear support post), the flat house floor inside, and the midden ridges that have accumulated along the rear and sides of the house. (Richard Maynard photo, courtesy of Royal British Columbia Museum, Victoria, PN 10508)

home to the most highly ranked social unit in the community.

Except for two units on a higher terrace behind the main village, all excavation at Huu7ii took place within the outline of House 1 as visible on the site surface. In all, the units excavated over two field-seasons covered 101 m^2 or about 17% of the house floor (McMillan 2008). The recovered information relevant to household archaeology is presented in this chapter. To interpret these incomplete remains, various lines of analogy are useful. The preserved protohistoric houses at Ozette provide one source of analogy. Another is the extensive ethnohistoric and ethnographic documentation regarding Nuu-chah-nulth houses and households in the early contact period, beginning in the 1770s. Kiix7in, an early historic Huu-ay-aht village with still-standing wooden architectural remains, offers additional insights into village layout and architectural form. The last two sources of information are discussed in the next two sections.

Ethnohistoric and Ethnographic Information on Nuu-chah-nulth Houses

Ethnohistoric and ethnographic accounts, although collected several centuries after the final occupation of Huu7ii, provide information on the nature of Nuu-chah-nulth houses. The European and Euro-American explorers and fur traders who arrived off the coast in the late 18th century provided the earliest written descriptions of Nuu-chah-nulth villages. More minor accounts come from later travellers and settlers in the 19th century. Most major ethnographic sources date to the early 20th century and were based on recording the extensive knowledge of elderly community members. Although the personal experiences of these consultants could extend back only to the late 19th century, such "memory culture" reconstructions (e.g., Drucker 1951) incorporate knowledge that reflects much earlier beliefs and practices.

Early accounts indicate that houses in Nuu-chah-nulth villages varied considerably in size, with some being very large. The earliest detailed description is by Captain James Cook, at Nootka Sound in 1778. He states that houses ranged up to 150 feet (45.7 m) in length, 24 to 30 feet (7.3 to 9.1 m) in width, and 7 to 8 feet (2.1 to 2.4 m) in height (Beaglehole 1967:317). Charles Clerke, one of Cook's officers, gives slightly different size estimates: "Their Houses are very large, some of them 100 feet [30.5 m] in length, and 12 or 14 [3.7 or 4.3 m] in height" (Beaglehole 1967:1327). Alexander Walker (1982:116), who was at Nootka Sound only seven years after Cook, gives a slightly lower estimate for the length of the largest house at 70 feet (21.3 m), with a width of 30 feet (9.1 m) and a height of 12 to 14 feet (3.7 to 4.3 m). James Colnett, at the same location in 1787, states that the largest house, which was occupied by the chief, was located near the centre of the village (Galois 2004:115), although he gives no specific size estimate. Robert Haswell, with the American trading ship *Columbia* in 1789, states that "the houses are in general about 30 feet [9.1 m] wide but of various lengths," the latter extending up to 100 feet (30.5 m) (Howay 1990:61). Slightly later, John Jewitt (1967), who was at Nootka Sound from 1803 to 1805, described the same village, noting that it was a row of houses that varied in size according to status, with the head chief occupying the largest (Jewitt 1967:52). Jewitt's description indicates that these structures did not vary greatly in width, being around 36 to 40 feet (11 to 12.2 m), but were markedly different in length, with that of the head chief extending for about 150 feet (45.7 m). Although the specific figures for house dimensions differ between these early observers, it is clear that some houses were very large and that these were the residences of the highest status individuals.

Although the most detailed early historic descriptions refer to Nootka Sound, Clayoquot Sound to the south was also a centre of culture contact during the maritime fur trade. In 1788, Captain John Meares was invited to feast with Wickaninish, the head chief of that area. Although Meares gives no size estimate for Wickaninish's dwelling, he expressed astonishment when he entered the house "at the vast area it enclosed" (Meares 1790:138). His astonishment also extended to the "enormous beams" that supported the roof (Meares 1790:138). The American trader John Boit, at Clayoquot in the winter of 1791–1792, visited a house he described as "large and commodious" (Howay 1990:384). A few days later he visited Wickaninish at his home, estimating that structure's dimensions at about 80 feet (24.4 m) long, 40 feet (12.2 m) wide, and 12 feet (3.7 m) high (Howay 1990:385). The Spanish were also in Clayoquot Sound, with a 1791 journal description indicating that the largest houses were about 35 yards (32 m) long and 12 yards (11 m) wide (Wagner 1933:159). In the previous year, during the Quimper expedition, Wickaninish's house was described as being 90 feet (27.4 m) long and having more than 100 inhabitants (Wagner 1933:85).

For Barkley Sound, unfortunately, we lack such detailed descriptions of houses dating to the early contact period. However, we do have the later observations of Gilbert Malcolm Sproat, who provides an eyewitness account of life in Barkley Sound in the early 1860s. At one village, Sproat (1987:31) described a long row of houses, which he considered "large and strongly constructed." Although he does not give the lengths, he estimates the widths at 25 to 40 feet (7.6 to 12.2 m) and heights at 10 to 12 feet (3 to 3.7 m). Elsewhere, however, he indicates the approximate length of the house by stating that the ridgepole could be 80 or 90 feet (24.4 to 27.4 m) long (Sproat 1987:32).

According to Philip Drucker (1951:69), the primary ethnographic source, the long axis of Nuu-chah-nulth houses was parallel to the beach. However, he acknowledged that some, which he considered more recent, were constructed end-on to the water. He states that houses were between 30 and 48 feet (9.1 and 14.6 m) in width, with the larger ones ranging up to 100 feet (30.5 m) in length (Drucker 1951:69). Similarly, a Sapir consultant, Dick Thlamaahuus, in the early 20th century judged the large traditional Huu-ay-aht houses to have been about 100 feet (30.5m) long (Sapir et al. 2009:255). For the Tla-o-qui-aht ("Clayoquot"), Koppert (1930:9) maintains that the largest houses could shelter 20 families, although he does not provide a specific size estimate. Swan (1870:5), writing in the late 19th century about the Makah, the close relatives of the Nuu-chah-nulth to the south, states that houses among that group were variable in size, with some being 60 feet (18.3 m) long and 30 feet (9.1 m) wide.

Many ethnohistoric and ethnographic sources note the role of houses as visual displays of status differences. Not only were the houses of chiefs larger than others in the village, but they also frequently had highly evident embellishments such as carved support posts or beams, or painted designs on the outer or inner surfaces. John Webber, the artist on the Cook expedition, sketched the large carved posts inside Chief Maquinna's house at Nootka Sound in 1778 (Fig. 4-2; Cook, in Beaglehole 1967:319). Colnett also describes large carved and painted house posts in the chief's house at Nootka Sound in 1787 (Galois 2004:115), as does Haswell in 1789 (Howay 1990:62). Meares, visiting Wickaninish in Clayoquot Sound in 1788, described entering the house through the mouth of a huge carved figure. Once inside, he noted that the support posts were carved with "gigantic images" and the rafters were carved and painted (Meares 1790:138). Spanish visitors to Clayoquot Sound in 1790 and 1791 also describe entering the house through the mouth of a huge figure (Wagner 1933:85, 166). Sproat (1987:32) describes carved house posts for large houses in Barkley Sound in the mid-19th century. In describing the ethnographic Nuu-chah-nulth house, Drucker (1951:69) also notes the presence of carved human figures on the support posts, stating that these images were inherited chiefly rights. Furthermore, he states that some chiefs had the additional hereditary privilege of having the projecting ends of the ridgepoles, which extended out the front of the dwelling, carved as animal heads, most commonly sea lions. Koppert (1930:17) also describes houses in Clayoquot Sound with carved upright posts in human form, and notes that such privileges were restricted to the most highly ranked chiefs. Such prominent symbolism allowed chiefs to proclaim and entrench existing status distinctions (Grier 2006a:148).

A detailed specific account of chiefly prerogatives in house display was recounted by the knowledgeable Tseshaht elder Tom Sayach'apis to the anthropologist Edward Sapir in 1913 (Sapir 1910–1914, notebook XV:39, 39a, 40a; McMillan and St. Claire 2005:9–10, 12). This description refers to a house that once stood at the Tseshaht origin site of Ts'ishaa, on an outer island of the Broken Group in central Barkley Sound (Fig. 1-1). Thunderbirds and Lightning Serpents were painted on the outer wall facing the beach, while the same images, with the Thunderbirds grasping whales, appeared on the chief's rear wall screen. Carved interior support

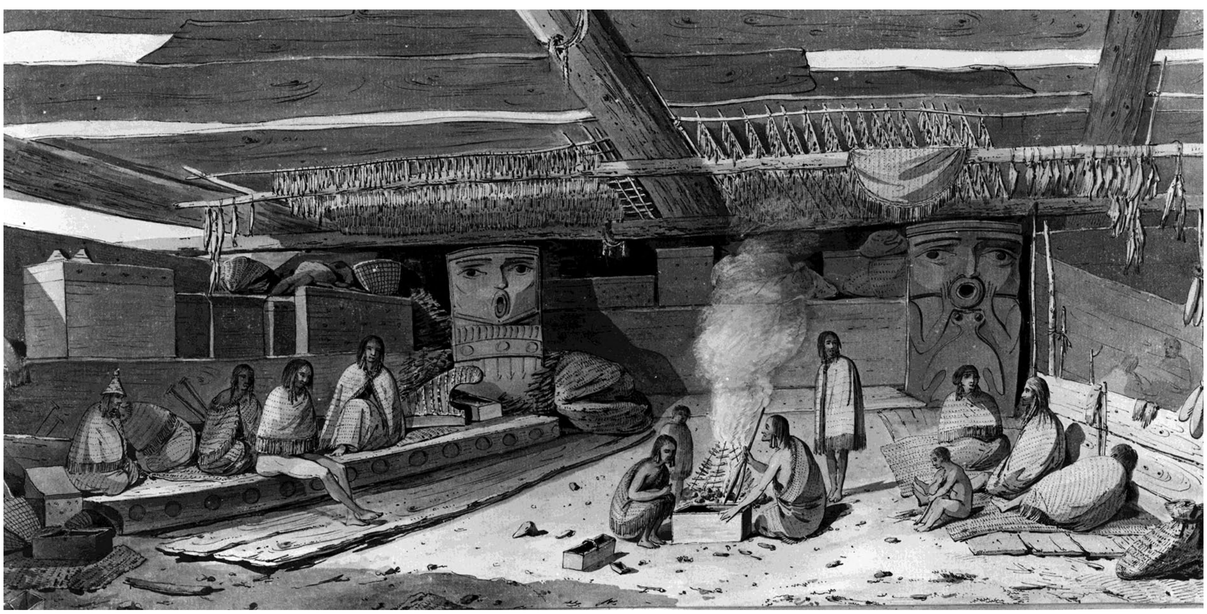

Figure 4-2. This 1778 painting shows the interior of a Nuu-chah-nulth house at Yuquot, Nootka Sound, at the beginning of the contact period. The people at centre are boiling food in a wooden box, using tongs to add heated rocks, as well as roasting small fish directly over the fire. The dirt floor is strewn with the debris of everyday activities. To the left, people are sitting on a low bench, with large wooden boxes and baskets for storage behind them and along the rear wall. To the right, people are reclining on planks covered with matting against a low plank partition. Note also the fish drying on poles below the roof planks and the two large carved figures at the back wall. (Courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, 41-72-10/499)

posts depicted specific figures from the Tseshaht origin story, while the central beam that ran the length of the house was embellished with painted geese in flight and circles representing the stars of the Milky Way. Additional embellishments, both inside and out, visibly proclaimed the inherited status of the community's head chief.

Sapir consultant Dick Thlamaahuus in 1922 described a variety of decorative embellishments on Huu-ay-aht houses he recalled from his childhood. In one case, drilled holes on the outer planks allowed light from the fires to stream through, from the outside resembling the Milky Way (Sapir et al. 2009:255). Another house featured star designs along the centre beam and human face depictions on all four posts at the corners. The post at the head of another dwelling was embellished with the carving of a human figure holding a humpback whale (Sapir et al. 2009:257). Although these descriptions are of houses that date to a later period than those that stood at Huu7ii, they indicate the importance of visual markers of status distinctions and inherited privileges in important Huu-ay-aht dwellings.

The ethnographic descriptions, including diagrams in Drucker (1951:68) and Koppert (1930:13), clearly refer to houses with gabled roofs. Such structures featured three roof beams, supported on posts, which extended for the length of the house. The central beam was somewhat elevated above the side beams, giving the roof a two-pitch or gabled form. Ethnohistoric sources, however, often refer to the roof as "flat," suggesting the shed-roof architectural style that had a single-pitch roof and a series of beams spanning two posts across the width of the house. Cook, for example, mentions flat roofs on the houses he observed at Nootka Sound (Beaglehole 1967:317). In addition, Clerke states that, "the Roof is a flat Surface, tho' somewhat shelving" (Beaglehole 1967:1327). In contrast, José Moziño's account of Nootka Sound in 1792 clearly refers to a structure with a gabled roof; after commenting on the huge beams, he states that: "The supports in the middle are higher so that the roof is pitched toward the sides" (Moziño 1970:17). Jewitt (1967:52) also describes a house in Nootka Sound that is clearly gabled. At Clayoquot Sound, the American traders Haswell in 1789 (Howay 1990:61) and Boit in 1792 (Howay 1990:385) both describe the houses as having flat roofs, although Haswell's description of an enormous ridge pole and smaller "side poles which are on a small decent [sic] from the ridge" indicates that these were gabled houses. The typically low pitch of the gabled roofs may have led to the confusion, as early observers may have perceived such roofs as essentially flat (Mauger 1991:134).

Arima and Dewhirst (1990:397) distinguish between the low gable roofs of the "Northern and Central Nootkans" and the shed-roof houses of the "Southern Nootkans" (the latter beginning just southeast of Barkley Sound, with the immediate neighbours of the Huu-ay-aht, the Ditidaht). Barkley Sound may have been an overlap area between the two architectural styles (Mauger 1991:136; Mackie and Williamson 2003:150). Sproat's description of a Barkley Sound house in the 1860s seems to contain elements of both styles, although the details are not entirely clear. He describes "strong cross-pieces" connecting the upright posts, presumably spanning the width of the house, with the large ridgepole resting lengthwise on these (Sproat 1987:32). Such a structure would have a very low gabled roof, although the beams across the width of the house are characteristic of the shed roof form. The coexistence of the two architectural styles in Barkley Sound is demonstrated in a sketch by the artist Frederick Whymper, who accompanied an 1864 expedition across Vancouver Island, of a Uchucklesaht village, just north of Huu-ay-aht territory, that clearly shows buildings of both types (Hayman 1989:192). Similarly, the standing 19th-century structural elements at Kiix7in, discussed in the next section, include remains of both gabled and shed-roof houses, along with one house that is a composite of the two styles (Mackie and Williamson 2003).

Cook (1784:315) noted that doors were simply gaps left where the unequal lengths of the planks provided an opening. Similarly, Moziño (1970:17) in 1792 observed that doorways were "left open at the place where the planks of the wall best permit." Koppert (1930:16) also reports that the "opening for a doorway is left at random" where gaps occur in the planks. Drucker (1951:70) describes Nuu-chah-nulth houses as aligned lengthwise with the beach, with the doorway in one of the narrow ends (i.e., not facing the beach). Jewitt (1967:54) similarly places the doorway at an "end" of the house, although he allows that Maquinna's was "in the middle." However, Cook noted that the entrance to the house generally faced the water (Beaglehole 1967:317). King, one of Cook's officers, gives an intermediate view that the doorways were at the house corners (Beaglehole 1967:1395). Some variability is evident, as Koppert (1930:16) states that the doorway "is commonly found toward the center of the side of the house, or to one side of the front facing the beach." As is discussed below, the position of the doorway is of considerable archaeological interest, as status residential areas within the house were defined by their relationship to the entrance.

Inside the house, the packed earthen floor was on a single level (Drucker 1951:71). Along the inside of the walls, the wooden benches that provided sitting and sleeping space consisted of mat-covered planks supported on short posts. Early descriptions agree that these benches were very low, between six inches and two feet off the floor (Boit in Howay 1990:384; Cook 1784:315; Drucker 1951:71; Haswell in Howay 1990:62; Meares 1788:139; Sproat 1987:33). Low plank dividers or mat screens provided some privacy in the individual family compartments along each side of the house, as did stacks of wooden boxes containing household goods (Arima and Dewhirst 1990:397; Carmichael 1922:21; Cook 1784:315; Drucker 1951:72; Haswell in Howay 1990:61; Moziño 1970:19). Most activities within the house, particularly during the dark winter months, took place around the fires (Fig. 4-2). Each family had its own hearth for daily cooking (Clerke in Beaglehole 1967:1328; Drucker 1951:71; Haswell in Howay 1990:61; Jewitt 1967:54; Sproat 1987:33), which Koppert (1930:17) describes as "nothing more than a circle of stones loosely placed together." However, Drucker (1951:71, 1965:149) also notes that for ceremonial occasions there was a larger fireplace in a shallow circular depression at the centre of the house. Walker (1982:116) also observed that the fireplace was in the centre of a dwelling in Nootka Sound in 1785.

Many early observers commented on what they perceived as a low level of housekeeping, and noted that considerable quantities of domestic debris were strewn across the floor. Cook (1784:316), for example, noted at Nootka Sound in 1778 that, "as they dry their fish within doors, they also gut them there, which, with their bones and fragments thrown down at meals, and the addition of other sorts of filth, lie every where in heaps." The sketch of the inside of that house by Cook's artist John Webber shows debris such as animal bones and stones from the cooking fires lying on the floor (Fig. 4-2). Similarly, Moziño (1970:19) commented in 1792 that inside the houses "they make large fires, clean their fish, and remove shellfish and snails from their shells, leaving a large part of the remains thrown on the floor." When housekeeping took place, much of this refuse was tossed immediately outside the dwelling. Colnett in 1787 referred to the accumulation of "fish scales Guts Bones &c surrounding all their Habitations … rising above the Platform of their Houses" (Galois 2004:115). Similarly, Sproat (1987:33) noted the dumping of domestic refuse (consisting particularly of "putrid fish and castaway molluscs") outside the houses in Barkley Sound. Such practices led to the creation of the back and side ridges around the house platforms at Huu7ii and attest to the dynamic complexity of shell midden formation.

Status differences were reflected in the location of residential areas within the house. Ethnographic sources state that the house chief and his family lived in the right rear corner, from the perspective of someone inside the dwelling facing the door (Arima 1983:69; Drucker 1951:71, 1965:148; Marshall 1989:19). However, Koppert (1930:19) places the most highly ranked area at the left rear corner (again, from the perspective of someone in the house facing the door). Haswell, at Nootka Sound in 1789, noted that the chiefly family lived on the right hand side at "the further end of the house" (Howay 1990:61–62). Sproat (1987:33–34), describing Barkley Sound dwellings in the 1860s, stated that the "principal occupant lives at the extreme end, on the left of the building as you walk up from the main door." The person of second rank, often a brother of the chief, occupied the other rear corner with his family. The corners closer to the door were also places of honour, occupied by the third and fourth ranking families (Arima 1983:69; Drucker 1951:71, 1965:148; Marshall 1989:19). Those of lower rank took up residence along the side walls. Although using this information to determine the most highly ranked area within a house requires knowing where the door was located, all corners, particularly those at the rear of the house, were associated with high-status residents and were more prestigious than intermediate areas.

Ozette provides one of the few archaeological cases where excavation has been on a scale sufficient to assess such social differences across a house floor. Its excellent preservation of organic materials has also greatly aided such studies. Ozette House 1, the largest and apparently the most highly ranked of the excavated houses, contained perhaps ten family living areas (Samuels 1989:146, 2006:206). One of the rear corners, furthest from the beach and the doorway, featured a large carved wooden panel depicting a whale and a bench plank inlaid with operculum shells (Mauger 1991:110, 112). Valuable dentalium shells, perhaps strung as a necklace, were far more abundant in this corner than anywhere else in the house (Huelsbeck

1989:160; Kirk and Daugherty 2007:108; Wessen 1994:178–179). A concentration of food remains in this living area also suggested the hosting of feasts (Huelsbeck 1989:166; 1994a:80). As is consistent with the ethnographic data, this corner appears to have been the living area of the chiefly family.

Ethnographic studies tend to present a normative and rather static picture of past cultures. Drucker's (1951) ethnographic reconstruction, with his "ethnographic horizon" set in the late 19th century, provides a somewhat idealized treatment of "traditional" culture traits (McMillan 2009). Ethnohistoric sources, on the other hand, make it clear that there was considerable variability in architectural features and social practices related to households. The Huu-ay-aht site of Kiix7in, with its still-standing structural remains, provides additional valuable insights on the variability that existed within Nuu-chah-nulth villages.

The Houses at Kiix7in

The Huu-ay-aht village of Kiix7in (DeSh-1) is located on the eastern shore of Barkley Sound, south of the entrance to Bamfield Inlet. It is only a short distance from Huu7ii, about 4 km to the southeast across Trevor Channel. Prior to the amalgamations that formed the modern Huu-ay-aht, this was the major village of the *Kiix7in7ath*, whose territory likely included Bamfield and Grappler Inlets, as well as the eastern shoreline of the sound south almost to Cape Beale (Fig. 2-1; St. Claire 1991:65). Following amalgamations, Kiix7in, with its formidable hilltop fortification adjacent to the village, became the principal Huu-ay-aht centre or "capital" (Huu-ay-aht First Nations 2000). In 1874, federal Indian agent George Blenkinsop described Kiix7in as one of two major Huu-ay-aht villages, referring to it as their "headquarters" and summer home (Blenkinsop 1874). The Kiix7in houses were occupied until near the end of the 19th century, when the Huu-ay-aht moved across Trevor Channel to the southern end of Diana Island (Huu-ay-aht First Nations 2000:37). As the village was not inhabited into the 20th century, the large plank houses were never demolished to construct smaller European-style homes, as happened elsewhere. The impressive wooden structural elements that remain at this site, providing the most complete evidence of a traditional village in Nuu-chah-nulth territory, led to a cooperative initiative of the Huu-ay-aht First Nation and the Government of Canada that resulted in the designation of this important location as a National Historic Site (Huu-ay-aht First Nations 2000).

Radiocarbon dates on the archaeological deposits at Kiix7in show that this site was occupied long prior to contact with Europeans (Sumpter 2003). The wooden architectural remains standing on the surface, however, date to a later, historic, occupation. Dendroarchaeological analysis of one house ("Quaksweaqwul"), based on cores taken from intact posts and beams, suggests that it was constructed after the growth year of 1835 (Smith et al. 2005). The other structures visible at Kiix7in also appear to date to the early and mid-19th century, with some constructed as late as 1850 (Smith et al. 2005:200). Although they are several centuries later than the houses that stood at Huu7ii, they provide important information on the nature of Nuu-chah-nulth architecture and village layout.

Mackie and Williamson (2003) present a detailed study of the standing wooden structures at Kiix7in. Eight large traditional houses are represented by surviving elements of their frames, including standing posts that in some cases still support beams. Flat platforms with low back midden ridges and occasional small side ridges also define house locations. House sizes, as mapped and measured by Mackie and Williamson (2003:109), vary considerably, with the largest estimated at 22 m by 17 m. Houses were generally aligned with their narrow ends to the beach, presumably because of limited space, although a few had their longest dimension parallel to the beach. Architectural style also varied, with evidence of three gable-roof houses, four shed-roof houses, and one house of composite form, the latter having a gable roof for its rear two-thirds and a shed roof at its front (Mackie and Williamson 2003:113).

The Kiix7in houses contribute numerous insights and cautions to the study of household archaeology on the Northwest Coast. Mackie and Williamson (2003:143) note that the differing architectural styles, evident through surviving posts and beams, would not be discernible through normal archaeological evidence such as post moulds, as gable beams often rest on other beams, unsupported by posts. The presence of two houses on a single platform and other houses without discernible surface platforms or midden ridges also show the difficulty in reconstructing house size and form without standing remains. Perhaps the greatest knowledge to be gained from Kiix7in concerns the architectural variability evident at this one location. Reconstruction drawings of the village (Huu-ay-aht First Nations 2000:35; Mackie and Williamson 2003:114) illustrate this variability: in house size, in gabled vs. shed-roof forms, in orientation to the water, and in the position of the doorways. Such information serves as a necessary corrective to the normative and idealized reconstructions presented in most ethnographic sources (e.g., Drucker 1951; Koppert 1930).

Depositional and Taphonomic Factors

Plank houses provided the physical setting for a wide range of domestic and social activities (e.g., Suttles 1991). These ranged from daily mundane practices such as food preparation and consumption to periodic communal gatherings for feasts and ceremonies. The physical layout of the house constrained and structured the activities carried out within (Grier 2006b:104), imposing a spatial pattern on the residues of daily life. Such ordinary household activities over generations formed the archaeological house floor deposits. House floors, however, contain a palimpsest of materials deposited over a considerable period of time (Allison 1999:12; LaMotta and Schiffer 1999:20). The archaeological record contained in house floor deposits is not a direct reflection of past activities; a host of additional factors altered and reshaped the record throughout the time the house was occupied, at abandonment, and in the years following abandonment (LaMotta and Schiffer 1999). Such factors confound any attempt to read social behaviour directly from material remains.

Over two decades ago, Schiffer (1985, 1987) warned of the now-discredited "Pompeii premise," the idea that the recovered pattern of material remains primarily reflects the human activities that took place there. In fact, relatively few items used in a house are likely to be found in their use location (LaMotta and Schiffer 1999). Among the various cultural and natural processes that transform the archaeological record within houses, one of the major factors is housekeeping. Periodic cleaning of house floors removed accumulated debris, redepositing items in secondary locations that were primarily outside the house. Such activities might have been particularly directed at removing sharp objects such as broken shells and angular fire-cracked rocks that were nuisances to barefooted house occupants, and clearing the floor may have been standard practice prior to ceremonies that featured dancing (Samuels 2006:211). Larger items in the central area would have been most affected, whereas small objects in out-of-the-way locations on the house periphery would have been most likely to escape housekeeping activities. This is particularly true for such difficult-to-reach locations as under the low benches along the walls. This point has been made for Ozette, where Samuels (1991, 2006) distinguishes between the "traffic zone" (the open central area) and the "bench zone" (the out-of-the-way periphery), with artifact density being considerably greater in the bench zone. Ozette House 1, thought to be the most highly ranked of the excavated houses, showed a slower rate of midden development with fewer objects incorporated into the floor deposit than the others, possibly reflecting more frequent housecleaning in preparation for social and ceremonial gatherings in this elite house (Samuels 2006:226).

Such housekeeping activities also shaped the archaeological record at Huu7ii. As is discussed below, the artifacts in House 1 were strongly concentrated along the back and side walls, presumably in the general location of the benches. Another example involves a row of articulated salmon vertebrae found directly beside a small stake mould, 8 cm in diameter, near the southwest corner of the house (Fig. 4-3). If the mould marks the location of a support post for a bench, the remains of this salmon may have been hidden under the bench and protected by proximity to the post, thus eluding any housekeeping efforts. In addition, the apparent conflation of radiocarbon dates on the house floor, as discussed in Chapter 3, may be a result of housekeeping activities, as older hearth materials (including charcoal as well as fire-broken rock)

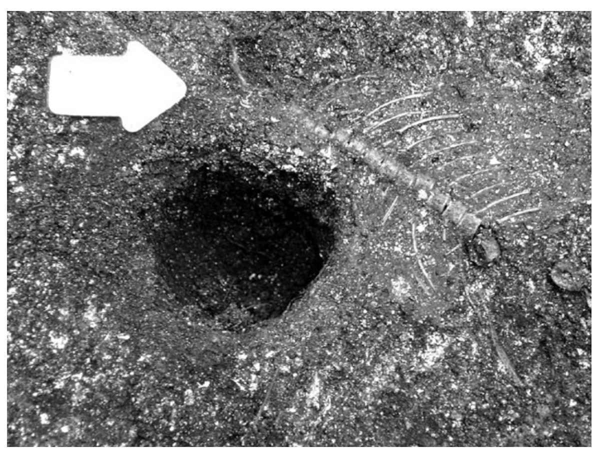

Figure 4-3. This small post hole (F4) near the southeast corner of the house may mark a bench support. A row of articulated salmon vertebrae is immediately adjacent, possibly as food refuse that became trapped under the bench and eluded housekeeping activities.

would have been removed and more recent fires lit on the same floor surface.

Curation also would have played a role in shaping artifact presence and distribution. Objects requiring considerable labour to manufacture, and those made from material that was difficult to obtain, would have been valued and were removed from activity areas after use and stored. They might only enter the archaeological record after being broken beyond the possibility of repair or reworking, at which point the fragments were discarded. Loss, particularly around the bench areas, might also account for their presence in the floor deposit. Simple, easily manufactured tools, on the other hand, might have been discarded after use. Small items such as bone points, particularly those that had been broken, were less likely to be curated and were trampled into the floor deposit, either accidentally or after breakage and discard. The biasing effect of curation was particularly marked upon abandonment, as at that time most objects that were still of use were removed from the structure, leaving only discarded debris and larger objects that were too heavy to move to a new location. Such practices may remove all evidence of particular activities that had been carried out within the house. The Ozette houses are particularly important in this regard as their accidental burial in a mudslide means that they were not subject to the biasing effects that occur at abandonment.

Other factors affect the archaeological record throughout the time following abandonment. A major biasing effect is the decay of most organic materials. The loss of all objects of wood, bark, root, hide, and similar materials robs the archaeological record of almost all architectural elements and most items of material culture. The remarkable preservation at Ozette, a result of its water-saturated context, meant that most of the posts, beams, planks, benches and other elements of the houses could be studied (Mauger 1991), as could a vast array of artifacts, the great majority of which are of normally perishable materials (Daugherty 1988:20–22; Samuels 1989:148). Such preservation is lacking at Huu7ii, as is the case at most midden sites, removing much of the record of past activities in the house.

Another post-abandonment process is bioturbation, the impact of animals and plants on the site deposits (Schiffer 1987). Little evidence of disturbance by animals was noted at Huu7ii, and the fact that large trees are today restricted to the western edge of the House 1 platform limited most root damage to that area. However, large trees in areas adjacent to the house occasionally fell and crashed across the platform. Thick columns of rotted wood that mark such events extend deep into the archaeological deposits, greatly compressing and convoluting the upper portion of the house floor. Furthermore, when these forest giants hit the ground their branches punched deep holes into the house floor. Fortunately, such destruction was restricted to relatively small areas. The thick upper layer of roots, rotted wood, and forest duff that covered the house floor deposits protected them from later disturbance by animals and humans, such as through recent camping on the site.

Examining the House 1 Floor

Excavations at other locations on the Northwest Coast indicate that houses were occupied for generations and might stand or be rebuilt in the same place for several centuries. The Meier and Cathlapotle sites on the lower Columbia show evidence of use for perhaps 400 years (Ames 2006:24; Ames et al. 1991:286). Houses at Dionisio Point in the Strait of Georgia were occupied for roughly 200 years (Grier 2006b:101). House 1 at Ozette has generally been interpreted as showing about 100 years of use (Huelsbeck 1989:157; Samuels 1991:186), although Samuels (2006:210) has recently revised this estimate downwards. However, that house had not been abandoned and was still in active use at the time it was demolished by a mudslide.

House 1 at Huu7ii demonstrates similar lengthy use. Radiocarbon dates and other chronological evidence are discussed in Chapter 3. Twelve dates come from the house floor deposits and are essentially non-overlapping with those from the underlying midden (Fig. 4-4). Calibrated dates, at 2-sigma deviation, span the period from roughly AD 1000 to 1600. Examination of the age ranges suggests that a conservative estimate of the occupation period is between AD 1200 and 1500. A slightly greater occupation span (ca. AD 1150 to 1550) seems more likely, although the house may have been rebuilt or remodelled during this time, as is discussed below. By AD 1600, however, large trees had begun to grow on the site (Sookocheff 2004), presumably indicating that it had fallen into disuse. The House 1 occupation is thus estimated at 300 to 400 years. In human terms this is 12 to 16 generations, assuming a generation is about 25 years, and constitutes a lengthy record of an enduring social unit in one place.

As mentioned, excavation units covered 101 m^2, representing 17% of the total floor surface of House 1 as indicated by the surface platform. The

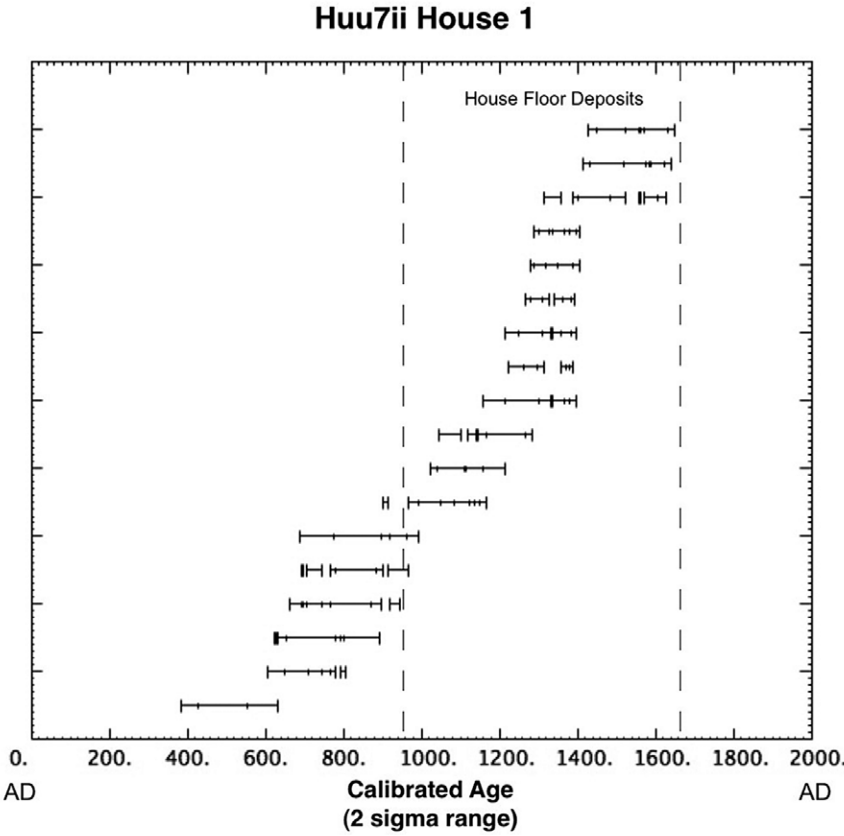

Figure 4-4. Calibrated radiocarbon dates for excavation units on the House 1 platform. Twelve results are from the house floor deposits.

units were concentrated in the southern half of the structure (furthest from the beach), with the largest block (8 x 4.5 m) along the centre of the southern wall. In this central block, the largely shell-free black floor deposit is about 50 to 70 cm thick, although shell becomes more abundant and the house floor more difficult to discern around the two rear corners. Little information is available for the northern half of the structure or along the eastern wall. Even in areas with the most extensive coverage, specific architectural details and dimensions remained elusive. Units placed in the southwestern corner specifically to expose the transition from back and side ridge middens to interior floor deposits revealed only a gradual change. It seems likely that the wall planks had been removed repeatedly and that keeping midden debris from the ridges out of the house was a constant problem. As a result, no sharp distinction marked the exact house position. Furthermore, some house features had been buried as the back midden ridge accumulated, suggesting that the house location had shifted somewhat over time. This is discussed further below.

As social relations should be manifest spatially within houses, a distributional study of artifacts may be revealing. As discussed, however, a variety of cultural and natural factors shaped the distribution of objects within the house, both during and after its occupation. In an attempt to understand such factors, Hayden and Cannon (1983) conducted an ethnoarchaeological investigation of Maya houses with dirt floors, where debris from food preparation and other household activities was dropped onto the floor, which was regularly swept clean. They note that in such circumstances the best indicators of past activities would be relatively immobile features, as well as very small items such as bits of bone or shell that become fixed in the floor matrix. They specifically note that: "Artifact distributions in sedentary contexts provide the least reliable, most ambiguous indicators of specific activity areas, but are nevertheless the indicators most widely used" (Hayden and Cannon 1983:138).

The distribution of artifacts found within the house floor deposit at Huu7ii shows a concentration near the back wall and at the middle of the west wall, both in the hypothetical "bench zone" (Fig. 4-5). This distribution likely reflects periodic housekeeping activities, during which the central area of the house was swept clean. The artifact distribution reveals no evidence for status distinctions associated with the rear corners of the house.

Particular artifact types, however, might provide more specific indicators of status. In Nuu-chah-nulth society, whaling was associated with chiefly prerogative; only a high-ranking chief held the right to first thrust the harpoon into the whale (Arima 1983:38; Arima and Dewhirst 1990:395; Jewitt 1967:69; Koppert 1930:56; McMillan 1999:18). We might therefore assume that whaling equipment would be associated with high-status residential areas. At Ozette, the abundance of whaling gear in House 1 relative to the other excavated houses was used to argue for the higher status of the group occupying that structure (Wessen 1988:195). Although there is no particular association with the house corners, Huelsbeck (1989:161) argues that most would have originated from such locations prior to their disturbance by the mudslide. At Huu7ii, however, although the large slotted valves of the whaling harpoon heads tend to occur along the back and west walls, only one was found in a corner unit (Fig. 4-6).

Other artifacts that may be status-related include decorative items such as tooth and bone pendants and shell beads. Their distribution also fails to show any correlation to the presumed high-status corners (Fig. 4-7). In fact, many were found well out onto the central house floor. These include impressive and presumably important ornaments such as a pendant made from the large drilled tooth of a great white shark (Fig. 3-40), which was found near the southern edge of the large hearth in a shallow depression near the centre of the house. An extensively ground sea lion tooth pendant that has been ringed for suspension (Fig. 3-41) came from the same general area, although at a higher level. These intact and presumably valued objects

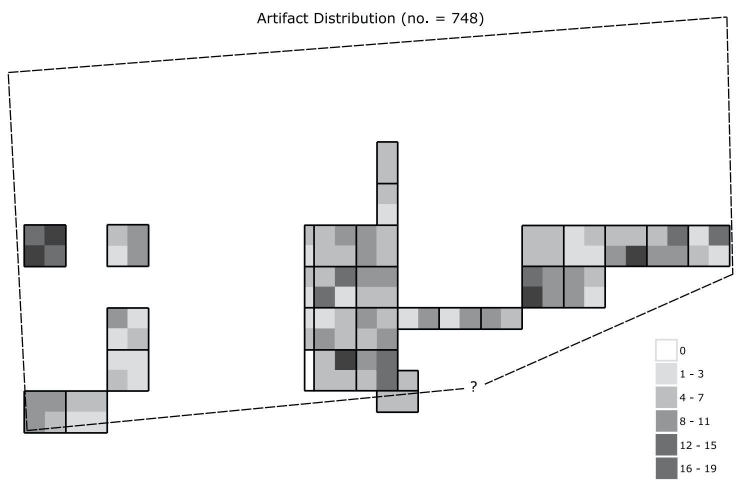

Figure 4-5. Distribution of artifacts across the House 1 floor deposits.

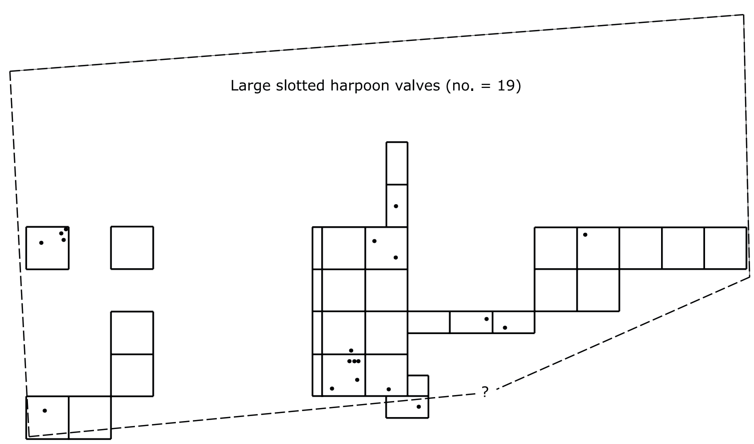

Figure 4-6. Distribution of large slotted harpoon valves across the House 1 floor deposits.

would not have been discarded; perhaps they were lost during social or ceremonial events in the dark winter months, when the house was lit only by the central fire, and were trampled into the house floor.

Plank houses were centres of production, where both men and women worked at a variety of manufactures, particularly during inclement weather (Suttles 1991:217). However, direct evidence of such activities, such as workshop areas, would not be expected to remain on the house floor due to periodic cleaning. One exception may be a cache of ten whalebone blanks (F51), stacked in a pile on the house floor, which was found in one of the eastern units (Figs. 4-8, 4-9). Each blank was similar in size (averaging just under 14 cm) and shows evidence of adzing or cutting to shape (see artifact descriptions in Chapter 3; Fig. 3-37). Such blanks would be a preliminary step in artifact manufacture. Many of the artifacts recovered from Huu7ii were of whalebone or other sea mammal bone; these blanks would be about the right size for the manufacture of such implements as the large

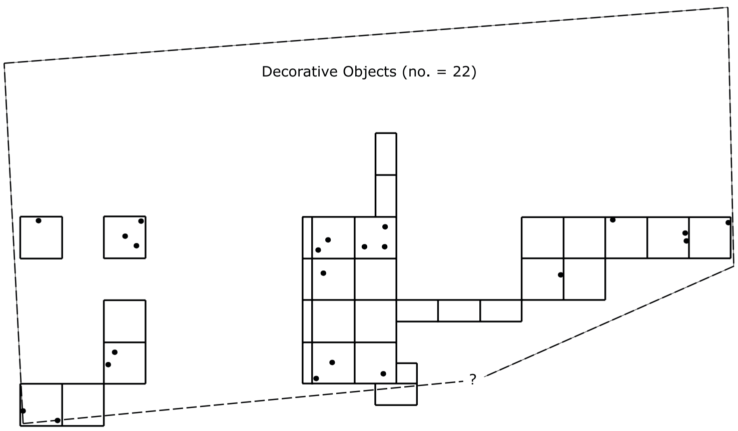

Figure 4-7. Distribution of decorative objects across the House 1 floor deposits.

Figure 4-8. Cluster of ten whalebone blanks (F51) in situ on the house floor.

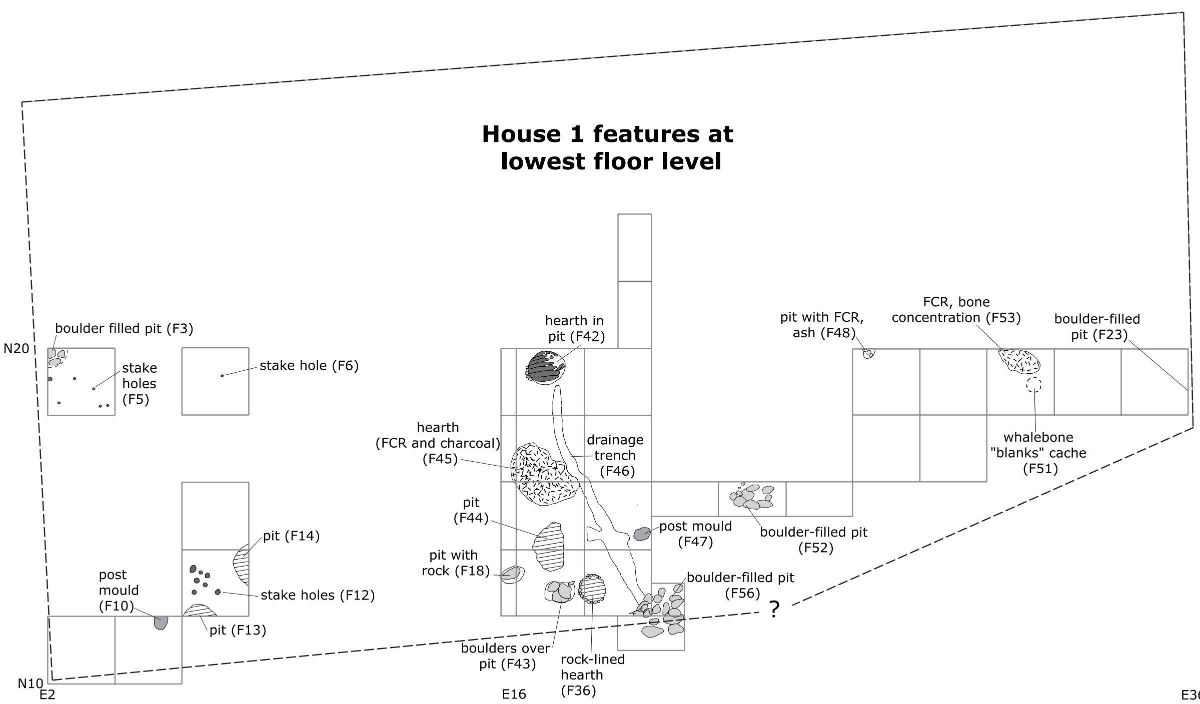

Figure 4-9. Distribution of features across the lowest floor level of House 1.

harpoon valves used in whaling. Other sea mammal bones sitting on the house floor, such as a sea lion radius and a partial whale rib placed together in the same alignment at the base of the central excavation block, may represent potential raw material for artifact manufacture, rather than simply dietary discards. They may reflect what LaMotta and Schiffer (1999) term "provisional discard," where objects were set aside for possible later use.

Like artifacts, the numerous faunal elements found on the house floor tend to be concentrated in peripheral areas, such as along the south wall, where this may be a result of midden build-up along the wall entering the house. Examination of the distribution of faunal remains across the house floor did not reveal distinct patterns that could be interpreted as reflecting status differences (Frederick, Appendix A). Although whaling was ethnographically associated with status, cetacean remains were not concentrated in any particular area. Like other faunal elements, bones of large sea mammals were most common at the house periphery but also appeared in considerable numbers in the central area of the house adjacent to a large hearth and other features, where they may mark activity areas associated with tool production. The remains of sea otters, whose pelts served as chiefly robes ethnographically, also failed to reveal any spatial patterning, being found out into the central portion of the house as well as around the periphery (Frederick, Appendix A). Uncommon land mammal species such as elk, bear, marten, and mink, also potentially status-related, similarly lack any convincing pattern. Although valued types of fish, such as salmon and bluefin tuna, may also be associated with status, no obvious pattern emerges from their distribution; units with the greatest concentrations are located both along the house periphery and the central area near the large hearth.

Features are far more likely than artifacts to be intact and in their original position on the house floor. Various types of features occurred throughout the house floor deposit, but were particularly abundant across the lowest level of the floor. Figure 4-9 shows the distribution of features across that surface, whereas Figures 4-10 and 4-11 provide a more detailed view of the central 8 x 4 m excavation block, where features were most concentrated. Feature types include hearths of varying size and form, small pits, stake holes, post moulds, large rock-filled pits that presumably were the locations of major support posts, and a long shallow drainage trench extending into the house from the back wall. Features are discussed in Chapter 3; only those that were exposed on the lowest house floor level are discussed in detail here.

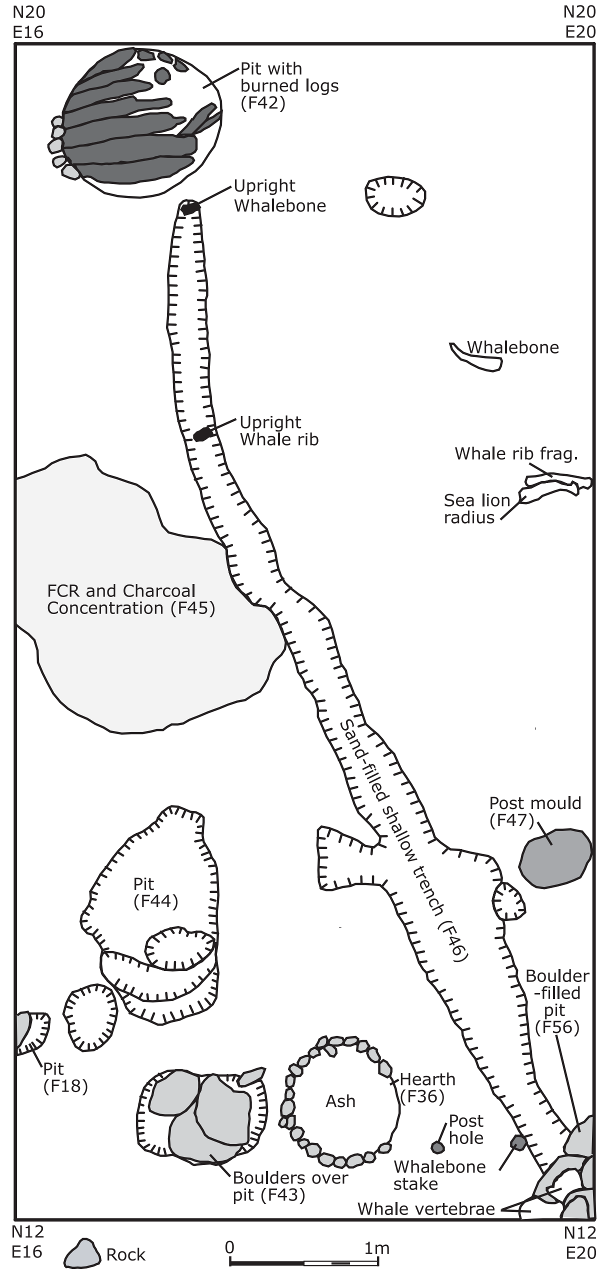

Figure 4-10. Features exposed at the lowest floor level in the central excavation block.

Hearths, often simply patches of ash or concentrations of FCR and charcoal, were scattered throughout the floor deposit. Large patches of tan-coloured ash were particularly evident in the deposits of the central excavation block. One large ash patch, about 80 cm across, was surrounded by 11 small stake holes; another had nine small stake holes in or beside the ash, while a third ash

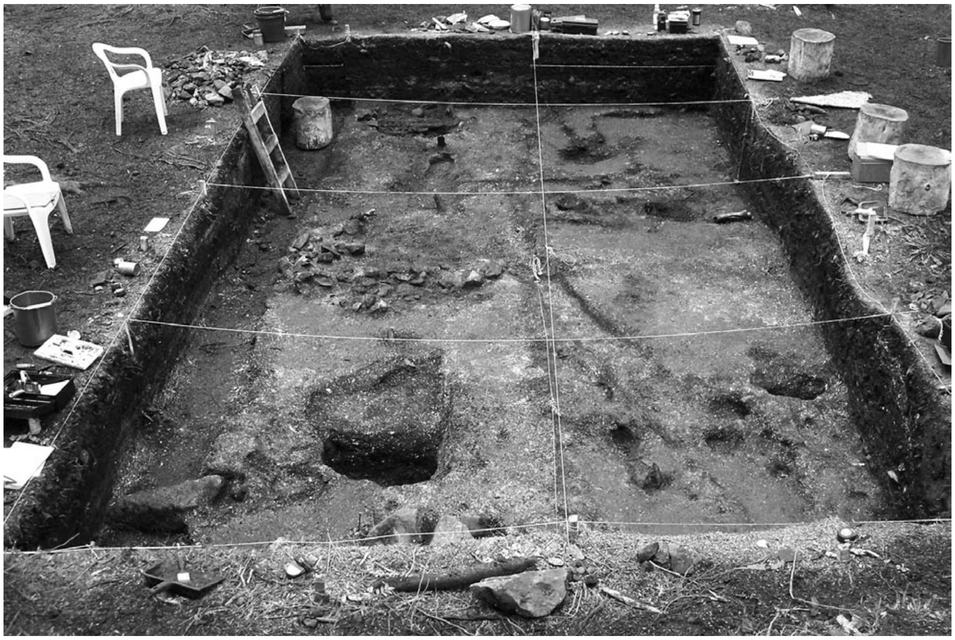

Figure 4-11. House 1 central excavation block at the base of the house floor (photo taken from the back midden ridge looking north toward the beach). The initial 50 cm test trench runs along the left side of the eight 2 x 2 m units excavated as a single block. Note the shallow sand-filled drainage feature (F46) running diagonally across the base of the house floor, as well as the hearths at upper left (F42) and centre left (F45) and the pit (F44) at lower left.

patch was associated with 17 stake holes. One of the patches was at least 20 cm thick, showing prolonged use of a hearth in this location. Five designated hearth features sit on the lowest level of the house floor (Fig. 4-9). In the eastern portion of the house, a pit with FCR and ash (F48) extends from the house floor into the underlying midden. Although it was only partially within the excavation unit, it was about 30 cm across at the wall. In the same general area, a large concentration of FCR (F53) also contained quantities of bone, particularly whalebone. Both features could represent redeposited materials from hearths.

Three more formal and intact hearths were uncovered in the central block (Fig. 4-10). Perhaps the best example of a formal hearth is F36, a thick circular patch of ash, about 70 cm in diameter, with rounded cobbles around the outside edge of the ash (Fig. 4-12). Another (F45) is a large oval concentration of FCR and charcoal, extending at least 1.8 m in its maximum dimension. The third (F42), in approximately the centre of the house, is unique in being in a large shallow pit. The depression is oval in shape, measuring roughly 1 m by 90 cm across. The concentrated charcoal that sits at the top of the pit retains the recognizable form of burned logs, and some of the reddish wood is still

Figure 4-12. Circular rock-lined hearth (F36) being excavated in central block.

intact (Fig. 4-13). Sand and ash are visible in the pit under the burned wood. A sample of the charcoal from this feature provided the radiocarbon age estimate of 990 ± 50 BP (970 to 780 cal BP at 2 sigma; Table 3-1), the oldest date from the house floor.

Various ethnohistoric sources note that each family within the house had its own hearth for daily cooking (Clerke in Beaglehole 1967:1328; Haswell in Howay 1990:61; Jewitt 1967:54; Sproat 1987:33). Koppert's (1930:17) description of this as "nothing more than a circle of stones loosely placed together" fits several of the excavated examples. More common, however, are simply patches of ash without any defining stone circle. The numerous ash patches, shifting position somewhat over time through the floor deposits, provide evidence of everyday activities such as cooking and of warming the inhabitants on rainy winter days. The stake holes associated with some ash patches may reflect techniques of cooking directly over the fire. In addition to these everyday hearths, Drucker (1951:71) notes that there was a larger fireplace in a shallow circular depression at the centre of the house that was used for ceremonial occasions. This description closely fits the large hearth (F42) with abundant charred wood in a shallow depression near the centre of House 1, suggesting that this was the focal point for household or community events. Ozette House 1 had a large central hearth, in addition to the hearth complexes that were widespread just outside the bench zone, which was interpreted as a "feasting hearth" used for house-wide gatherings (Samuels 2006:208). This formed part of the evidence that this was the highest status dwelling among the excavated Ozette houses (Samuels 1989:153, 1991:266).

At the base of the central excavated block, a shallow trench filled with dark brown sand (10YR 4/2) has been interpreted as a drainage feature (F46). The sand in this shallow depression, dug about 10 cm into the underlying shell matrix, clearly distinguishes this feature from the black house floor deposit. The trench runs diagonally across the excavated block, extending northwest from a large rock-filled pit that may mark the location of a large support post into the central portion of the house, where it tapers out in the vicinity of the large central hearth (Figs. 4-10, 4-11). It can be traced for about seven metres in the excavated block; whether it also occurs in the northern half of the house is unknown. Its width varies, from about 40 cm near its centre, where it is most clearly de-

Figure 4-13. Large central hearth (F42) in shallow sand-lined pit, with charred logs still partially intact.

fined, to about 70 cm at its widest and about 20 cm where it tapers out at its northern end. Two whale ribs protrude upright from within the trench, one near its northern end and the other about 1.5 m to the south (Fig. 4-10). One possibility is that these ribs served to secure planks that were part of the drainage feature. The Ozette houses had drainage systems consisting of ditches dug into the floor midden that were lined with planks, and some were associated with whalebones (Huelsbeck 1994b:288–289; Mauger 1991:120–122; Samuels 1991:187, 190).

Several pits with sloping sides were dug from the house floor into underlying strata. Near the southwestern corner, a basin-shaped pit (F13) has been only partially exposed; it is a metre across where it extends into the unit wall and slopes to 27 cm depth, although it clearly would have been deeper if completely excavated. Nearby, another partially excavated large depression (F14) is about 1.2 m across and 15 cm deep at the unit wall, although this is clearly only a portion of a larger feature. The base of this pit is lined with sand and pebbles, which contain large pieces of charcoal. In the central excavation block, three pits in close proximity have been completely exposed. The largest (F44) is an oval shaped pit with sloping sides, which measures about 1.5 m by 90 cm at its surface (Fig. 4-10). Its bottom is irregular; much is only about 20 cm in depth but there are deeper pits within, extending up to 60 cm depth. Nearby is a smaller pit (F18), about 60 cm across and 55 cm deep, containing a large rock slab. Also nearby, and directly beside the large rock-lined hearth (F36), is a larger pit (F43), about 80 cm in diameter, with four large boulders and some smaller rocks on its upper surface (Fig. 4-10).

Stake and post holes or moulds occurred throughout the floor deposits. On the base of the house floor, three stake features occurred in the western units (Fig. 4-9). Near the western wall, F5 is a loose cluster of six stake holes, ranging from 4 to 13 cm in diameter, associated with ash patches. Further into the house, F6 is a single stake hole, 4 cm in diameter. Closer to the southwest corner, F12 is a cluster of seven stake holes, ranging between 5 and 12 cm diameter. In the central block, along the southern edge of the house, are four stake holes (F49), each about 7 cm in diameter. These relatively small stakes were concentrated near the walls of the house, suggesting that most served such purposes as bench supports. Two larger circular features are classified as post moulds, marking the location of more substantial wooden uprights. F10, near the southwest corner, is about 35 cm in diameter and is associated with two large boulders. F47, in the central block beside the presumed drainage trench, is an oval-shaped straight-sided pit, measuring about 45 by 30 cm at its surface and at least 40 cm in depth (Fig. 4-10).

Much larger boulder-filled pits are interpreted as marking the locations of major house support posts. The rocks and whalebones placed in the holes not only helped to hold the post in place but also reduced the contact between the wood and the wet ground, thus slowing the rate of decay. At Ozette, a preserved wooden upright support post was located intact in a substantial pit lined with very large rocks (Mauger 1991:96). Similarly, excavation around the bases of several 19th century totem poles at the Haida site of Ninstints revealed that the carved wooden posts had been placed in large pits and braced with large rocks (Abbott and Keen 1993). The Ninstints excavation was not of sufficient scale to reveal the size of the original pits, but they appear to have been over two meters in diameter (Abbott and Keen 1993:17). These two examples of known use support the interpretation of similar large rock-filled pits at Huu7ii as the locations of major house support posts.

Four large boulder-filled pits were exposed in House 1. The largest (F56) was at the middle of the back wall (Fig. 4-9). It was first encountered as a large concentration of boulders and whalebone, the latter including a considerable number of complete vertebrae. As this feature extended into the corner of the central excavation block and partially under the back midden ridge, the excavation area had to be expanded to expose it. The large rocks, some greater than 50 cm in maximum dimension, sat in a very loose soft matrix, so that excavation under the rocks was by texture, removing the loose matrix to reveal a very large pit. Traces of highly degraded wood remained in the pit, strengthening its identification as a major house post location. The excavation exposed a depth of about 1.6 m before being halted without reaching bottom, as large loose rocks and the overhanging back midden ridge made it too difficult and dangerous to continue. The feature is about 1.7 m across from north to south, and more than 1.5 m east to west, as large rocks and whale vertebrae continue into the wall. This massive feature is considerably larger than its Ozette counterpart.

Two other large, boulder-filled pits, visible only in the wall profiles, occurred at opposite ends of the house (Fig. 4-9). One (F3) is approximately midway along the west wall of the house. Three large boulders filled the upper portion of the pit, with the largest (about 70 cm in maximum dimension) standing vertically. Below these rocks was a concentration of large whalebones. The pit containing these is about 1.4 m deep. On the opposite wall, near the southeast corner of the house, F23 is a smaller boulder-filled pit, measuring about 70 cm across at its upper surface and at least 60 cm in depth (Fig. 3-8). It occurs somewhat higher than the two larger post features just described and the house floor is thinner and less evident in this area, suggesting that this might represent a later expansion of the house, as is discussed below. The final such feature (F52) is just east of the central excavated block, near the back wall of the house (Fig. 4-9). It was encountered as an oval concentration of very large rocks, covering an area of about 1.2 m by 70 cm (Fig. 4-14). Removal of the boulders revealed a pit underneath, giving a total depth to the feature of about 1.2 m. It occurred at an equivalent depth to F23 near the southeast corner.

Several lines of evidence suggest that the house had at least one major episode of rebuilding, when the back wall was moved slightly closer to the beach and shifted somewhat in its orientation. The house may well have been enlarged with an extension to the east at that time. The largest of the boulder-filled post locations (F56) would appear to mark the original position of the back wall. When the house structure moved northward, this feature became largely buried under the back midden ridge that accumulated behind the new house location. The large rock-lined hearth (F36) and another boulder concentration with pit (F43) were also partially covered by the back midden ridge, suggesting that they belong to the first house location. The second back wall orientation may be marked by a line that extends from where the back and side ridges meet at the southwest corner through the later post locations of F52 just east of the centre and F23 at the eastern edge. A smaller post mould (F47) is also along this line near its centre and may also mark the location of a post along the realigned back wall. The slightly higher elevation of the posts along this line indicates their later date. Extension of the house to the eastward at that time is somewhat conjectural, but the thinner floor deposit and the somewhat elevated position of the post on the east wall offer support for this argument. The pit for the east wall post intrudes into a stratum with

Figure 4-14. Gabe Williams washes the exposed rocks of a large feature (F52) that continues into the unit wall. A large pit extended well below the rocks of this feature.

a calibrated date of AD 1290 to 1420 from its upper portion, indicating that the house rebuilding occurred somewhere around two centuries prior to the final use of this house location (or about the mid-point in a postulated 400 year occupation).

Discussion of Household Archaeology at Huu7ii

If the surface indications accurately reflect house size, House 1 at Huu7ii was a very large structure, enclosing approximately 595 m^2. Such a massive dwelling presumably sheltered a large and powerful kin group. This house was substantially larger than those described by early European observers and those recorded ethnographically. Of the various late-18th century estimates of size, only Cook (Beaglehole 1967:317) gives a length greater than the Huu7ii house, at 150 feet (45.7 m). His width estimate of 30 feet (9.1 m), however, is substantially less than the apparent width for House 1, resulting in an estimate of about 418.1 m^2 for the large Nootka Sound house he was observing. Only a few decades after Cook, Jewitt (1967:52) also gave an estimate for the maximum house length at Nootka Sound of 150 feet (45.7 m), although his estimate for maximum width is somewhat greater at 40 feet (12.2 m). These figures suggest an inside area of 557.4 m^2, the only such estimate approaching the size of House 1 at Huu7ii. Sproat's mid-19th century estimates for the largest houses in Barkley Sound yield an area of only about 334.5 m^2 (Sproat 1987:31–32). Taking the maximum length and width figures from Drucker's (1951:69) classic ethnographic description of a 19th-century Nuu-chah-nulth house yields an interior size estimate of about 445.9 m^2. At Ozette, House 1, the most highly ranked of the excavated houses, was only about 246 m^2, far below the size of House 1 at Huu7ii.

Some caution should be exercised in interpreting house size from the evidence on the surface. A lesson from Kiix7in is that two closely spaced structures can stand on the same platform. However, although our aerial coverage is perhaps too limited to be certain, there is no excavated evidence for more than one dwelling. In addition, the surface "footprint" of the house, consisting of the flat platform and the back and side ridges, reflects only the placement of the last structure to stand at that location. The excavated features near the back wall of the house that became partially buried by the back midden ridge belonged to an earlier stage that was not necessarily as large as the final form the house took. However, the pattern of closely spaced dwellings across the entire house row at Huu7ii (Fig. 1-3) suggests that it is unlikely that any house standing there had been markedly smaller.

These substantial dwellings may have been viewed as essentially "permanent," symbolizing continuity of the household over time. Archaeological evidence from a growing number of sites suggests that houses could stand or be rebuilt in the same location over lengthy periods of time. A lower Columbia River example is the Meier site, which features a plank house that was occupied for as much as 400 years (Ames 2006:24; Ames et al. 1991:286). Internal house features also tend to remain in the same location throughout the house occupation, suggesting continuity in social relations and behaviour within the house. At Meier, support posts were periodically replaced in exactly the same locations (Ames 2006:24). At Dionisio Point in the Strait of Georgia, the distribution of hearths and major support post locations remained stable over the two centuries or so the house was in use (Grier 2006b:105). At Yuquot in Nootka Sound, two excavated clusters of superimposed firepits were interpreted as indicating that they were within a house, where the hearths were maintained in specific areas over long periods of time (Dewhirst 1980:50; Marshall 2000:77). Ozette also provides excellent examples of houses being exactly superimposed over earlier houses, with floors and support posts in the same locations, despite being separated by sand or mudslide deposits (Marshall 2000:77). In his ethnographic study of the Nuu-chah-nulth, Drucker (1951:72) states that the "old houses are said to have lasted almost indefinitely." Planks for the roofs and sides and various poles and rafters were continually being replaced, but the framework could stand for a very long period, although major posts and beams were occasionally replaced as needed. As Drucker (1951:73) phrases it: "Thus, over a long period, the entire roof and siding of a house might be renewed, and one by one the posts and beams would be replaced, but it would still be the same old house that had stood in that place since the lineage who owned it had been given the right to build their house there in the dim epochs of traditional times."

Excavation at Huu7ii House 1 suggests a slightly more dynamic situation than what is described above. Specific house locations, represented archaeologically by the surface platforms, were owned prerogatives of individual chiefs. A house of this size, located near the centre of the house row that made up the village, was almost certainly the dwelling of the *taayii hawilh*, or head chief. A substantial plank house stood in this location for about 300 to 400 years. Yet Huu7ii also provides evidence that such structures could shift somewhat over time. House 1 appears to have had at least one major remodelling, where the back wall of the house was moved forward and its orientation altered, possibly while the house was being expanded. The idea that house rebuilding would always replicate the previous form and location is too restrictive for actual human behaviour. In addition, like the initial house construction, any substantial expansion of a house or building a new structure on the same location served to conspicuously signal the status of the chiefly occupant (Coupland 2006:81). As chiefs owned the house locations, however, the general position of the house relative to other houses in the village likely remained the same over long periods of time.

Large houses made imposing statements regarding chiefly wealth and power. In their size, form, and embellishments, houses sent political messages that served to legitimate and entrench hierarchies (Coupland 2006; Grier 2006a). Large, seemingly permanent houses also symbolized stability and long-term continuity of the social group that resided within. Nuu-chah-nulth society featured considerable flexibility in tracing descent, so individuals had options in choosing group membership that resulted in commoners having considerable residential mobility between houses (Drucker 1951:279). This constant flux in household membership was balanced by the seeming permanence of the house. Chiefly status and power were enhanced by ownership and control of these major structures. As Ames (1996:147) has phrased it: "If one lives in a house that has stood several centuries, at the cost of continual work, then whoever controls that dwelling will be able to exert considerable control over other aspects of life, particularly on the coast where the house itself was the major instrument of production."

Within the houses, status differences were also made visible and affirmed. Family sleeping areas were allocated by rank, with the chiefly rear corners being visible reminders of status differences or "materialization of hierarchy" (Coupland et al. 2009; Grier 2006a). At ceremonial events within the house, the specific rank order of chiefs and other elite was publicly expressed through a seating pattern governed by rigid rules (Drucker 1951:260). The presence of a formal central hearth may also have relevance to status differences. In their study of hierarchy and communalism along the Northwest Coast, Coupland et al. (2009) note that only the Wakashan area of the central coast has houses characterized by both a large central hearth and family hearths dispersed near the sleeping areas. Drucker (1951:71) describes Nuu-chah-nulth houses as having both small family hearths for daily cooking along the sides and corners and a "large shallow circular depression that served as the fireplace on ceremonial occasions." Thus, according to Coupland et al. (2009), Nuu-chah-nulth houses struck a balance between hierarchy, represented by separate status-determined living areas, and communalism, in the form of the central fire used by all occupants during special events. At Ozette, only House 1 had a central (or "feasting") hearth, supporting arguments that this was the highest ranked of the excavated houses (Samuels 1989:153, 1991:266, 2006:208). The Ozette hearth, however, is not truly central as it is located well to one end of the structure (Coupland 2009:95; Samuels 2006:207). The large hearth at Huu7ii much more closely matches Drucker's description as it located in a circular depression in roughly the centre of the house. Such a feature may have enhanced household cohesion as all members of the group gathered around this fire during social and ritual events, including feasting.

One limitation to household archaeology is the requirement for broad horizontal exposures across large portions of the house and its internal features. This requires large-scale, long-term, excavation projects. Ozette provides an excellent example of the scale of work necessary to understand the architecture and investigate past social behaviour associated with houses, but that work continued year-round for over a decade (Samuels and Daugherty 1991:13). As Ames (2005:12) points out, such large-scale research is not only prohibitively expensive but also conflicts with modern concerns to preserve as much of the site as possible for future generations. Despite two seasons of fieldwork at Huu7ii, involving substantial crews, there are many features of the architecture and internal organization that we do not understand. Many features on the house floor have been only partially exposed and large portions of the house remain unexamined. The sheer size of the house, the fact that it stood as the centre of the household's activities for several centuries, and the evidence for remodelling and shifting of the house position, impose major challenges to archaeological interpretation. Yet the various analyses reported here provide significant glimpses into life within this high-ranking house at Huu7ii.

Chapter Five:
HUU7II BACK TERRACE

Raised Terraces and Sea Level Changes

A relatively small, flat, elevated landform lies behind the east-central portion of the main site (Figs. 1-3, 3-1). Inland from the midden ridge behind the house platforms, the land drops off considerably before rising again to the back terrace. Although considered all part of the same site (and encompassed within the same archaeological site number), the two areas are spatially separated, lacking continuous midden deposits. The excavation units on the back terrace were located about 40 m inland from the top of the back midden ridge and about 100 m inland from the top of the modern beach. Directly behind this raised terrace, the land drops to a low area of freshwater bog. This low area extends eastward well beyond the site to the rocky shoreline along the northeastern edge of the island, indicating that at a time of higher sea levels this would have been a marine channel that could have provided canoe access for the early occupants of the site. As sea levels dropped, saltwater inundation of the area ceased and a freshwater bog formed. Analysis of a peat core taken from the bog directly behind the excavation units shows that the shift from marine channel to freshwater bog occurred sometime prior to 3800 cal BP (Pellatt, Appendix F).

Several studies cast light on sea level changes over time in Barkley Sound. Dallimore et al. (2008) have recently presented a sea level history based on a core from Effingham Inlet, at the top of Barkley Sound. From a lowstand of about 46 m below present at 13,500 cal BP, sea levels rose rapidly, intersecting modern levels just prior to about 6000 cal BP and stabilizing at "a few metres above present" around 5500 cal BP (Dallimore et al. 2008:1356–1357). Friele and Hutchinson (1993) present a similar sea level curve for central western Vancouver Island that is based primarily on Clayoquot Sound data. In their model, sea levels rose rapidly from early Holocene lows until reaching three to four metres above present between about 6000 to 4800 cal BP, a period they term the Ahous Bay Stillstand. Examination of Dallimore et al's sea level curve suggests that the highstand in Barkley Sound was closer to two metres above modern levels than four, which would better fit with the Huu7ii data. Subsequent gradual emergence of the land relative to the sea throughout the late Holocene is attributed to tectonic uplift of the coastal crust (Clague et al. 1982; Dallimore et al. 2008; Friele and Hutchinson 1993).

Radiocarbon dates discussed below indicate that this portion of the site was occupied initially at the end of the Ahous Bay Stillstand and continued in use for almost two millennia. The upper surfaces of the back terrace excavation units are between 4 and 4.5 m above the uppermost part of the beach, where vegetation begins, and about 3 m above the House 1 platform. When the depth of cultural deposits is discounted, the original surface of the back terrace would have been only slightly above sea level, assuming a two-metre elevation above modern levels, at initial occupation. The front village area with the house platforms would have been an active inter-tidal zone at this time.

Raised terraces with mid-Holocene occupations located behind late period village sites are known at other locations in Barkley Sound. Excavated examples include Ts'ishaa in the central sound (McMillan and St. Claire 2005) and Ch'uumat'a at the sound's western edge (McMillan 1998b; McMillan and St. Claire 1996). In Huu-ay-aht territory, the nearby village of Kiix7in reveals a similar pattern. Although it has not been excavated, a core taken from a raised landform at the late-period village provided a date from its base of 5320 to 5050 cal BP, equivalent to the early dates from Ts'ishaa and slightly earlier than the occupation of Huu7ii (Sumpter 2003; Sumpter et al. 2002).

Excavation Methods and Extent

As this portion of the Huu7ii site is a considerable distance from the House 1 excavation, a separate datum and grid were established. Large trees growing across the relatively flat terrace constrained choices for excavation locations. A 0–0 grid post was driven into the ground surface near the southern edge of the site, just above the drop-off to a low boggy area. The 2004 excavation unit was established on an open flat space four metres to the north, on a magnetic north line, with unit coordinates of N4-6 E0-2. In 2006, an additional unit, with coordinates of N2-4 W18-20, was laid out to the west. Both units are shown in Figure 3-1. A metal spike driven into the trunk of a large tree immediately south of the initial unit served as the vertical datum for both. Secondary datum points consisted of wooden posts driven in beside each unit, with the top surveyed to a known depth below the primary datum. All unit depth measurements were taken using string and line levels from the tops of those posts.

As in the House 1 area, all cultural deposits were removed by trowelling in 5 cm levels, taking care to separate materials from differing natural layers. Levels were numbered while natural layers were given alphabetical designations; both were recorded on all bags and forms. Artifacts were recorded in three-dimensional provenience and faunal remains were placed in bags by level and layer. After removal by trowel, the deposits were screened through ¼" (6 mm) mesh to recover additional materials. Smaller faunal elements that would pass through that screen size were examined through analysis of the column samples (20 x 10 x 5 cm) taken from one wall of each unit. The column samples also provided data for shell and archaeobotanical analyses. Charcoal samples were collected for possible radiocarbon dating. On completion, profile drawings were made of the stratigraphy on all four walls of each unit (Fig. 5-1). The units were backfilled at the end of the field season.

The 2004 unit reached an average depth of 2.3 m before encountering the sterile beach sands at the base of the deposit. This involved the removal of about 9.1 m^3 of matrix. The 2006 excavation was halted at an average of about 2.35 m depth, without reaching the sterile beach sands. However, a 1.25 by 0.5 m block was excavated along one wall to the beach sands about 45 cm below. In all, about 9.7 m^3 of deposit was excavated in this unit. Total excavation on the back terrace, therefore, encompassed about 18.8 m^3.

Stratigraphy and Chronology

The stratigraphic profile of the 2004 unit is shown in Figure 5-2. A thick red-brown accumulation of forest debris, rotten wood, and roots marked the upper layer. Below was a thick layer of black silt with abundant rocks (Layer B), lacking any

Figure 5-1. Preparing the stratigraphic profile of the 2004 back terrace unit (N4-6 E0-2).

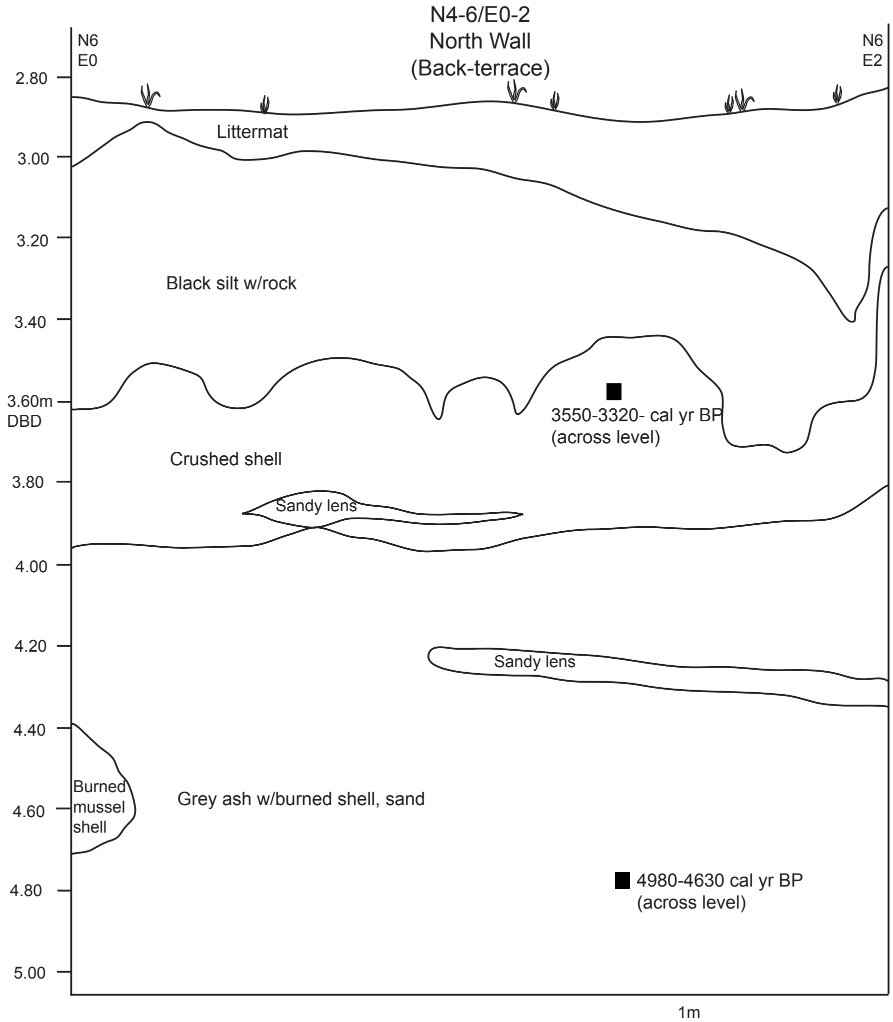

Figure 5-2. Stratigraphic profile of 2004 back terrace unit (N4-6 E2-4), showing locations of radiocarbon dates.

definite evidence of human occupation. Below that was the first obviously cultural layer, characterized primarily by finely crushed shell (Layer C). This very finely crushed shell with grey silt was unlike the shell strata from the House 1 area, more closely resembling the mid-Holocene deposits from the similar back terrace at Ts'ishaa (McMillan and St. Claire 2005). The lowest cultural stratum (Layer D), comprising almost half the total depth of the unit, was a thick layer of burned shell, grey ash, and sand. The light brown sand of the original beach marked the bottom of this unit. A core taken from the unit floor to a depth of over 1.5 m revealed no further cultural deposits. Below the light brown sand, compacted yellow-brown sand (Munsell 10YR 6/8) extended to bedrock.

The 2006 unit showed a similar stratigraphic sequence (Fig. 5-3). The thick upper matrix was again composed of red-brown rotted wood, roots, and forest debris. Below was a thick layer of black sandy silt (Layer B). Small numbers of faunal elements and bits of charcoal showed that this layer was cultural. Layer C consisted of black sandy silt with crushed shell and relatively abundant faunal remains. The lowest cultural layer (D), comprising almost half the unit depth, contained very dark greyish-brown sandy silt with trace or low amounts of shell and small quantities of faunal elements. Again, the cultural deposits were underlain by sterile beach sand.

Six radiocarbon dates are available for the back terrace units, spanning a period from about 3,000 to almost 5,000 years ago (Table 5-1). The most recent age estimate (3090 to 2780 cal BP) came from near the top of Layer B in the 2006 unit. A slightly older age estimate (3550 to 3320 cal BP) came

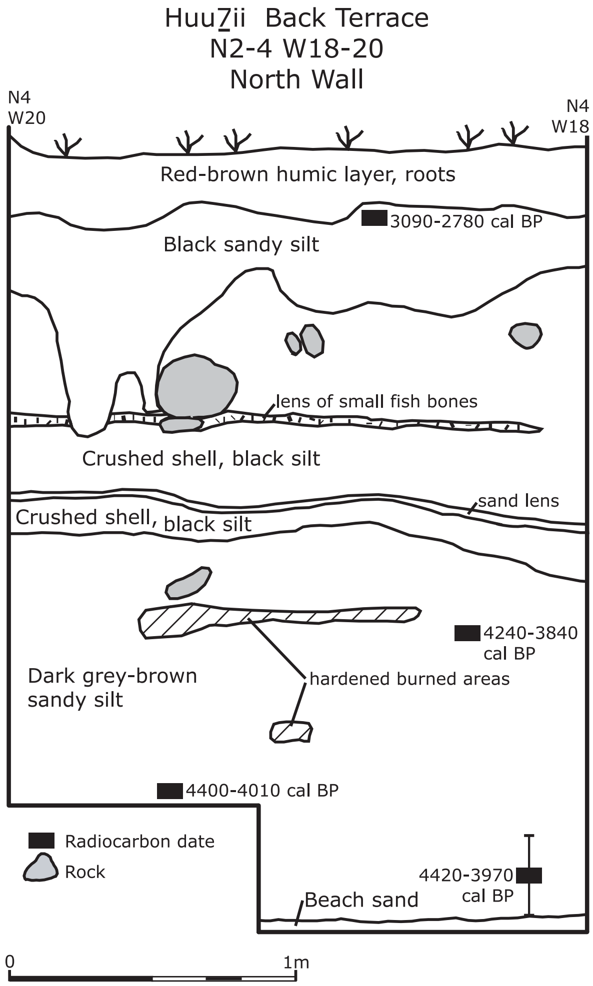

Figure 5-3. Stratigraphic profile of 2006 back terrace unit (N2-4 W18-20), showing locations of radiocarbon dates.

from the top of Layer C, the first obviously cultural layer in the 2004 unit. The remaining four dates all came from the thick basal stratum of the two units. An age range of 4240 to 3840 cal BP was obtained from charcoal collected about mid-depth in the stratum, while two near-identical dates of around 4400 to 4000 cal BP came from near its base (Fig. 5-3). The oldest age estimate, at 4980 to 4630 cal BP, came from charcoal collected across a level near the base of the deposit in the 2004 unit (Fig. 5-2). These dates confirm a mid-Holocene occupation of this portion of the site, corresponding to a time of higher relative sea levels.

Artifacts Recovered

A total of 61 artifacts came from the two units excavated on the Huu7ii back terrace (Table 5-2). This low figure gives an artifact density of only 3.2 artifacts per m^3 excavated, only slightly over one-third of the artifact density within House 1 deposits. Bone artifacts dominate this small assemblage, comprising 60.7% of the total. As in the considerably later House 1 deposits, small bone points of a variety of forms are the most common artifacts. Stone tools make up 32.8% of the total, with abrasive stones being the most abundant stone artifact type. Unlike the much larger assemblage from the early component at Ts'ishaa, chipped stone artifacts are relatively rare, making up only 13.1% of the artifact total. Artifacts of shell and antler each comprise 3.3% of the total.

In both units, artifact abundance was substantially greater in the thick lowest stratum (Layer D). In distribution by layer, three (4.9%) came from

Table 5-1. Radiocarbon dates—Huu7ii back terrace.

Lab. No.	^{14}C age (Convent.)	Calibrated age range (2 sigma - 95% probability)	$^{13}C/^{12}C$ ratio (‰)	Unit	Depth (cm)	Comments
Beta-221953	2830±60	3090 to 2780 BP	–26.6	N2-4 W18-20	20	Layer B, near top of cultural
Beta-195637	3190±60	3550 to 3320 BP	–25.9	N4-6 E0-2	105	Near top of shell (Layer C)
Beta-221960	3690±70	4240 to 3840 BP	–23.4	N2-4 W18-20	107	Layer D
Beta-221962	3810±50	4400 to 4080 and 4030 to 4010 BP	–22.1	N2-4 W18-20	225	Deep in Layer D
Beta-221963	3810±80	4420 to 3970 BP	–24.9	N2-4 W18-20	2.35–2.8	Base of Layer D, in hole dug to sand
Beta-195641	4280±70	4980 to 4800 and 4770 to 4630 BP	–26.6	N4-6 E0-2	200	Layer D, near basal sand

Table 5-2. Artifacts from Huu7ii back terrace.

Bone	
Barbed bone points	2
Bone points	16
Abrupt tip (3)	
Large, gradual taper (2)	
Small, slender (3)	
Tip fragments (8)	
Bone splinter awl	1
Bird bone perforator	1
Spatulate bone tools	2
Worked whalebone	4
Misc. worked bone	11
total bone	***37***
Antler	
Harpoon valve	1
Worked tine tip	1
total antler	***2***
Shell	
Disk bead	1
Ground mussel shell	1
total shell	***2***
Stone	
Celt	1
Ground schist tool	1
Abrasive stones	8
Hammerstone/anvil stones	2
Plane/ scrappers	2
Chert core/scraper	1
Flake-core	1
Flakes/ flake tools	4
total stone	***20***
total artifacts	61

Layer B, 16 (26.2%) from Layer C, and 42 (68.9%) from Layer D.

Artifacts of Bone

Barbed bone points (2)
One small barbed point appears to be nearly complete. Two closely spaced, low, enclosed barbs are near the tip (Fig. 5-4). The base appears to be split for attachment to a shaft or shank. It is roughly round in cross-section and is 5.3 cm in length. The second artifact is a mid-section fragment with one low barb.

Bone points (16)
Three small bone points are classified as "abrupt tip," with greatest width near the tip (Fig. 5-4, upper right). Two are complete, measuring 3.7 x 0.6 x 0.5 cm and 2.2 x 0.5 x 0.4 cm. Both come to a constricted flattened base. The third example is a tip fragment. Abrupt tip points are common in Nuu-chah-nulth sites, including the later component at Huu7ii, and are generally considered to be arming points in composite harpoon heads. The wider tip of such points helps to withstand impact damage from such use. Complete harpoon heads, with abrupt tip points still intact in their valves, are reported from a number of West Coast sites, including the later component at Huu7ii (see Chapter 3).

Figure 5-4. Bone points from the Huu7ii back terrace (left and upper: two gradually tapering points, two barbed points, three abrupt tip points; lower: two small tapering points).

Two much larger fragmentary points are gradually tapering (Fig. 5-4, left). Both are missing their bases, but have remaining lengths of 8.7 and 6.2 cm. In both cases, considerable polish is evident over the entire surface. Such points could serve a variety of functions, including as arming points on various fishing gear.

Three very small points are complete, with lengths of 2.4, 2.9, and 3.9 cm. Two are very slender, although the shortest is somewhat stouter.

Eight other examples are fragments. One long, very slender object, missing its base, is sharply pointed and almost round in cross-section. Seven others are tip fragments.

Bone splinter awl (1)
One stout splinter of land mammal bone has been

worked to a polished point, while the rest of the artifact has been left rough. Its measurements are 4.1 x 0.6 x 0.6 cm. Bone splinter awls are commonly found in Nuu-chah-nulth sites, including the later component at Huu7ii (see Chapter 3).

Bird bone perforator (1)
A section of hollow bird limb bone has split lengthwise. A rough rounded projection at one side of one end shows polish, as if it had been used as a perforator. It is 7.3 cm in length.

Spatulate bone tools (2)
The largest is a burned section of sea mammal bone with parallel sides and a rounded blunt end. The other end is missing. The remaining portion is 18.0 cm long and 3.0 cm wide.

The second object is a section of land mammal bone that has split lengthwise. The sides near the bevelled rounded tip have been ground and polished, whereas those at the broken base have been left rough. What remains is 9.0 cm long and 1.5 cm wide. It would serve as a blunt piercing or slicing implement.

Worked whalebone (4)
Two linear fragments, 16.2 and 14.1 cm in length, appear to have been roughly sectioned to shape. Both exhibit further shaping by grinding at one end. Two fairly deep parallel saw marks run diagonally across the width of the longest example. An additional small segment has a straight polished edge nearly at right angles to the flat face.

The fourth artifact is a large fragment in many pieces. It is irregular in shape, with an open oval "haft-like" area showing polish around its outer edges. It is too incomplete to determine function.

Miscellaneous worked bone (11)
The most distinctive artifact in this category is the modified vertebra of a harbour porpoise (*Phocoena phocoena*). The sides of this thick oval disc have been ground flat around its circumference. Measurements are 4.0 x 3.1 x 2.7 cm. Although no function is evident, it could have served as a gaming piece.

A small land mammal limb bone has been split lengthwise and cut or ground over two long surfaces. As it still retains much of the rough articular end of the bone, this may be the discarded waste product of tool manufacture. The remaining nine objects are fragmentary. All show evidence of grinding to shape and some have fairly extensive polish through use, but they are too incomplete to further classify.

Artifacts of Antler

Harpoon valve (1)
A small antler valve fragment is incomplete at the distal end but retains the distinctive pointed shape of the proximal end. It appears to be unfinished, with no channels or slot evident.

Worked tine tip (1)
A small segment of antler tine, 6.8 cm in length, shows polish and a small amount of damage at its rather blunt tip. It may have served as a flaker or a piercing implement.

Artifacts of Shell

Disk bead (1)
A tiny complete shell disk bead, 0.3 cm in diameter and 0.15 cm thick, was found during fine-screen sorting of the column samples. It is white in colour and appears to be clamshell.

Shell disk beads are relatively rare in Nuu-chah-nulth sites. One was also found in the later House 1 deposits at Huu7ii. Similarly, single examples of shell disk beads came from both the main village and the earlier back terrace at Ts'ishaa (McMillan and St. Claire 2005a).

Ground mussel shell (1)
A roughly rectangular piece of mussel shell shows possible polish over one flat face and a straight rounded edge. It dimensions are 4.6 x 1.9 x 0.7 cm.

Artifacts of Stone

Celt (1)
A small celt of fine-grained serpentinized metamorphic rock is complete except that the bit end has been largely battered away (Fig. 5-5, upper left). Several long flakes have also been driven off from the poll through use. All remaining surfaces are highly polished. Faces and sides have been ground flat, with polished facets where they join. The poll is slightly rounded and the straight sides expand to the bit. Artifact dimensions are 6.0 x 3.6 x 2.1 cm, but the length would be slightly greater if the bit was fully intact.

Ground schist tool (1)
This small flat artifact, oval in shape, appears to be almost complete, missing only a small portion at each end. Its measurements are 4.7 x 3.1 x 0.4 cm. The edges appear to have been ground flat all around this implement. No function is obvious.

Figure 5-5. Stone artifacts from the Huu7ii back terrace (upper left: celt; upper right and lower row: abrasive stones).

Figure 5-6. Two hammerstones–anvil stones found together in the Huu7ii back terrace.

Schist does not occur in the immediate site vicinity. One possible source is the Leech River Schist, found along the outer shore of Vancouver Island to the southeast of Barkley Sound (Wilson 2005:122). Schist also occurs in the Ucluth Formation to the northwest of the sound.

Abrasive stones (8)
Six sandstone abraders appear to have been carefully shaped, with at least one intact straight edge ground perpendicular to the flat faces (Fig. 5-5). Three are complete (at 13.2 x 7.3 x 2.0 cm, 8.3 x 6.2 x 1.5 cm, and 7.9 x 5.5 x1.9 cm). All three are four-sided, but irregular rather than rectangular. One has one edge that has clearly been sawn to shape, then polished flat. Four of the six shaped abraders show equal wear on both faces, while two show wear on one face only. The remaining two objects are small fragments of irregular shape, with part of a bevelled edge intact. They may possibly be fragments of other artifact classes, such as sandstone saws.

Hammerstones/anvil stones (2)
Two large rounded beach cobbles were found in direct association with each other (Fig. 5-6). Both show evidence of battering in several locations. One has extensive evidence of battering on both ends, both sides, and one face. The other shows somewhat less pronounced battering on one end, both sides, and one face. The deep pitting on the faces of these cobbles suggests use as anvil stones. Such objects were used in the bipolar reduction of pebbles in tool manufacture, although evidence of such technology was not abundant in the excavated materials from the back terrace. A similar anvil stone came from the back terrace at Ts'ishaa, where small stone cores and debitage were relatively common (McMillan and St. Claire 2005:88–89).

Plane/scrapers (2)
Two split cobbles, both similar fine-grained metamorphic rocks, show wear on the ventral faces (Fig. 5-7, left and centre). On the larger example, the high points of the ventral face have been worn flat and are polished. The second, more elongated, object has unifacial retouch along one side, creating a rough cutting or scraping edge. Several high points at the centre of the ventral face show polish through use, although this is not as marked as on the larger example. Measurements are 8.4 x 8.2 x 3.9 cm and 8.2 x 5.0 x 2.6 cm.

Both objects may have served as woodworking tools, with the polish occurring as a result of using the rough ventral face as a plane or rasp. The retouched edge on one example gives an additional scraping edge. Dewhirst (1980:135) reports a similar "cobble plane" from a late period context at Yuquot.

Chert core/scraper (1)
A blocky flake of red chert has been bifacially retouched along one edge (Fig. 5-7, right). Its measurements are 5.2 x 4.3 x 2.5 cm; the length of the retouched edge is 4.0 cm. This red-brown chert is unique in the excavated Barkley Sound assemblages and its source is unknown. However, chert commonly occurs among the rocks that make up the islands of Barkley Sound and on the Ucluelet side of the sound (Wilson 2005:118, 123).

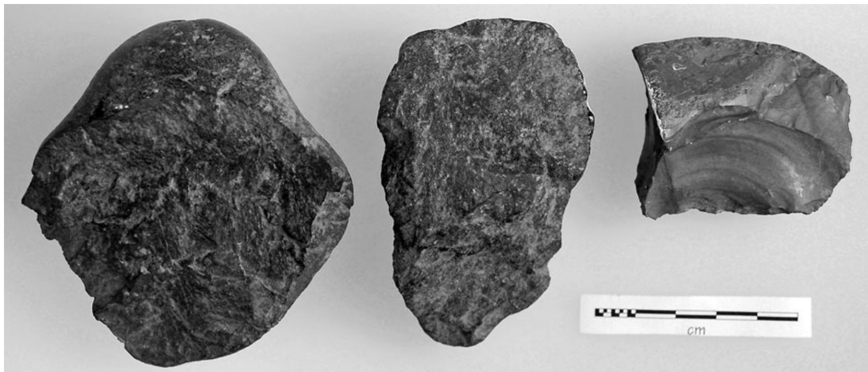

Figure 5-7. Chipped stone from the Huu7ii back terrace (left and centre: plane/scrapers; right: red chert scraper).

Although generally green or grey in colour, reddish brown chert has been noted (Wilson 2005:123).

Flake-core (1)
This small, elongated block of porphyritic andesite has a small remnant platform at its upper surface and flake scars visible on its lower faces. It may have been detached as a flake from a larger artifact from which flakes had been struck. Its measurements are 5.3 x 3.6 x 2.7 cm.

Flakes/flake tools (4)
Although heavily water-rolled, a relatively large flake of greenish stone, possibly andesite, retains evidence of a platform and bulb of percussion. The shape and the rounded nature of the curved edge opposite the bulb of percussion suggest use as a cutting tool, although the rounded edge may be entirely a result of water-rolling. It was found on the beach sand at the base of the cultural deposit. Its measurements are 6.2 x 5.9 x 1.8 cm.

A smaller flake of green chert, snapped in length, has possible retouch along one broken edge. A small, elongated spall is also of green chert. Chert sources, characteristically yielding a light green stone, occur at various locations around Barkley Sound and the Ucluelet area (Wilson 2005:123). Flakes of green chert, occasionally retouched as tools, are also recorded from the early components at Ch'uumat'a (McMillan 1998:11–12; 1999:115) and Ts'ishaa (McMillan and St. Claire 2005:89). Another small flake is from a fine-grained, but poor quality, metamorphic rock.

Features

Distinct features were not common in the back terrace units. Only one was recorded in the 2004 excavation. This consisted of a large patch, extending across much of one quadrant, of black sandy silt that was clearly distinct from the crushed shell matrix elsewhere in Layer C. Large angular rocks were found throughout this matrix, along with a number of large chunks of sea mammal bone. This feature was recorded near the top of Layer C, at the same level as a charcoal sample that provided a radiocarbon date of 3190 ± 60 BP (3550 to 3320 cal BP).

The uppermost of two features recorded in the 2006 unit was a concentration of postholes, stake holes, and pit-shaped intrusions of dark matrix extending from Layer B into the shell of Layer C. A round post mould near the unit's southwest corner was 25 cm in diameter. The other elements of this feature were visible in the profiles, particularly along the south wall. Several apparent stake holes were about 10 cm in diameter. A pit-like depression in the southeast corner extends about 80 cm into the underlying layer. Only part of this feature was exposed within the unit.

A rock feature was recorded deeper in this unit, in Layer D. A cluster of four large rocks extended into the west wall, possibly indicating that only part of this feature had been exposed. The rocks were surrounded by a concentration of porpoise elements (vertebrae and ribs). This feature occurred a short distance below a radiocarbon date of 3690 ± 70 BP (4240 to 3840 cal BP).

Subsistence Remains

Over 3,000 vertebrate faunal elements from the back terrace unit samples were identified to species, genus, or family (Appendix A). As in the later House 1 deposits, the identified elements from these samples are heavily dominated by fish (87.8%), followed distantly by sea mammals

(7.8%), land (including commensal) mammals (3.2%), and birds (1.2%). Birds are particularly rare compared to the House 1 floor deposits. Analysis of the fine-screened column samples provides over 17,000 additional identified elements, among which fish comprise 99.9% of the total, even more strongly demonstrating the reliance on fish by the early occupants of Huu7ii (Appendix B).

In the unit samples, the most common fish species are rockfish and greenling, rather distantly followed by salmon, dogfish, and perch (Appendix A). Herring and anchovy were also recovered, but in relatively small numbers. When the faunal elements from the fine-screened column samples are considered, however, herring leap to the dominant species, comprising 94.9% of the total identified fish assemblage (Appendix B). This huge dominance of herring is even greater than in the later House 1 samples, demonstrating the importance of this vital food source over the 5,000-year history of the site. Anchovy also greatly increases in importance, ranking a very distant second to herring. Also important, although in considerably lesser numbers, were greenling, salmon, perch, rockfish, and dogfish (Appendix B). The latter five taxa are consistent with the unit sample results, but the dominance of small fish in the assemblage is evident only in the fine-screened samples.

Marine mammals also played a major role in the diet. Whales, fur seals, and several species of porpoise and dolphin are particularly abundant (Appendix A). As most whale elements are fragmentary and no aDNA analysis was carried out for this portion of the site, the particular whale species present could not be determined. However, it is highly likely that humpbacks would predominate, as in the later Huu7ii deposits and at other Barkley Sound sites.

Despite a clear maritime emphasis in the faunal remains, land animals were well represented. Although the numbers are relatively small, land mammals appear to be more abundant than in the later House 1 deposits. Dog remains were abundant throughout. As in the later deposits, very young animals were common, indicating a "natural" population kept as pets, and a high proportion of the dogs appear to be from a distinct small breed (Appendix A). Of the other land mammals, mink are the most abundant, in contrast to their relatively low occurrence in the later deposits. Deer were also important, although perhaps less so than in later times.

Shell analysis was based on a 2.2 m column sample taken from the north wall of the 2004 unit (Appendix D). As in House 1, shell from throughout this column was overwhelmingly mussel (*Mytilis californianus*). At 96.5% of the shell total by weight, this preponderance of mussel is even greater than in the House 1 sample. Barnacles are a very distant second at 2.1% by weight. Species diversity is even lower than in House 1, with only 10 taxa identified. Clams are very rare, reflecting the lack of sediment beaches in the vicinity, which might have been even more pronounced during the period of higher sea levels when this portion of the site was occupied.

As was the case for the House 1 deposits, the search for plant remains through flotation analysis was unsuccessful (Appendix E). Matrix samples were collected from burnt contexts such as hearths in the expectation that charred seeds or other evidence of edible plant use might be preserved. Column samples were also examined for archaeobotanical remains. However, conditions of poor preservation in the alkaline deposits seem to have removed all evidence of food plants (Appendix E). Although Huu7ii's island location provided relatively limited access to edible plant resources, analysis of pollen in a core taken from the bog directly behind this early occupation area demonstrates that a number of potential plant foods grew in the general vicinity of the site (Appendix F; see discussion in Chapter 3). However, these tend to be more abundant in later time periods.

In general, even at this early period the people of Huu7ii were clearly focused on maritime resources, as is demonstrated by the dominance of fish and sea mammal remains. Abundant fish species such as herring, rockfish, greenling, perch, and dogfish could all have been obtained from the near-shore waters, while the large mussels that dominate the shell remains could have been taken from the intertidal rocks in the site vicinity. However, the relatively abundant porpoise, dolphin, and whale remains, along with a few albatross and bluefin tuna elements, clearly show that the food quest also took people well offshore. From the earliest occupation of Huu7ii, people were venturing out to sea to pursue large prey such as whales and fast, difficult-to-hunt animals such as porpoise and fur seals, requiring specialized gear and strategies. Seasonal indicators cover much of the year, suggesting that this portion of the site was occupied year-round (Appendices A and B).

Chapter Six:
SUMMARY AND DISCUSSION

The archaeological materials from Huu7ii cast light on ancient Nuu-chah-nulth life in eastern Barkley Sound, with part of the site extending back almost 5,000 years. In later times this was a major Huu-ay-aht village, the home of the original *Huu7ii7ath* local group. The modern Huu-ay-aht (*Huu7ii7ath*) take their name from this local group, who were literally "the people of Huu7ii." From their permanent base at Huu7ii, the *Huu7ii7ath* were able to exploit resources throughout their *hahuulhi* (chiefly territory), encompassing most of the Deer Group islands. A row of large houses once extended across the site, with significant differences in house size that would have reflected status distinctions. The largest house in the row, House 1, is argued to be a chiefly residence. Despite its obvious importance, Huu7ii ceased to be a major residential centre well prior to European arrival in this area, presumably as a result of group amalgamations and coalescence at villages along the adjacent Vancouver Island shoreline (see Chapter 2).

Perhaps the most important of the post-amalgamation village sites was Kiix7in, along eastern Barkley Sound just south of Bamfield Inlet. The impressive array of early to mid-19th century house structures remaining on the site surface has resulted in this important Huu-ay-aht heritage location being designated as a National Historic Site (see Chapter 1). Underlying these historic house remnants are shell midden deposits dating to precontact times. Radiocarbon results from both the main village and the adjacent high rocky defensive area demonstrate that Kiix7in was occupied at the same time as the front house row at Huu7ii (Sumpter 2003). Huu7ii, however, was no longer an active village at the time when the house structures visible at Kiix7in were in use. The two sites are complementary; the archaeological results from Huu7ii tell us of Huu-ay-aht life in early times, while Kiix7in extends that picture into the 19th century and provides insights into construction and design of the monumental cedar plank houses that characterized traditional Nuu-chah-nulth villages (Mackie and Williamson 2003).

Periods of Occupation

The Huu7ii excavation provided evidence of two distinct occupations, separated in both space and time. Traces of the earliest occupation were found on the elevated terrace at the back of the site, where radiocarbon dates indicate human presence from about 4800 to 2900 cal BP. Although this location is immediately adjacent to the later village, the deposits are not continuous between the two areas and there is no overlap in the dates from each. Our earliest age determination for the midden deposits underlying House 1 is about 1500 cal BP, leaving a substantial temporal gap between the two components. The late component lasted until about 400 years ago, leaving the site unoccupied well prior to European arrival in this area.

Further investigation across the site would likely fill in some of this temporal gap. Excavation in the late component village was restricted to the outline of House 1, well to the west of the early component location. Additional work at other house platforms in the village area might push back the earliest dates for the later component. However, the two locations are physically separate and at different elevations, clearly representing two distinct periods of time. Pollen recovered from a bog directly behind the raised terrace units provides support for the idea of two separate occupation periods. Three pollen zones were identified in the bog core, with the middle one (Pollen Zone II; ca. 2430 to 1350 BP), marked by an increase in herbaceous plants and bog species, being interpreted as a time when the site may not have been in use (Pellatt, Appendix F).

Early Component

Initial occupation of the site occurred at a time when sea levels were significantly higher (see Chapter 5). Traces of this earliest presence are restricted to a relatively small area of elevated terrace located immediately inland of the main village area. At the time the site was first occupied, a marine channel behind the raised terrace would have provided canoe access to this part of the site. As sea levels dropped toward the end of this early period, this marine channel gradually became a freshwater bog (Appendix F).

Similar mid-Holocene occupations on raised terraces directly adjacent to later villages are now known from a number of locations around Barkley Sound. Two excavated examples, from which we have recovered assemblages that can be compared to the Huu7ii back terrace, are Ts'ishaa in the Broken Group islands (Fig. 1-1; McMillan 2003b; McMillan and St. Claire 2005) and Ch'uumat'a on the sound's western shoreline (Fig. 1-1; McMillan 1998b, 1999; McMillan and St. Claire 1996). In Ucluelet, at the western edge of the sound, the Little Beach site has elevated deposits of similar age, although it is not associated with a later village site. Although very small, the recovered assemblage from that site is contemporaneous with the Huu7ii back terrace. In Huu-ay-aht territory, Kiix7in has yielded a similar date from a core into a raised landform adjacent to the historic village (Sumpter 2003; Sumpter et al. 2002), although no excavation has taken place to recover cultural materials.

One aspect that distinguishes the mid-Holocene artifact assemblages from the later village materials is the prevalence of stone, including a relative abundance of chipped stone implements. At Ts'ishaa, stone artifacts made up 68.8% of the early component assemblage total, with chipped stone accounting for 43.4% of the artifact total (McMillan 2003b:44; McMillan and St. Claire 2005:77). By contrast, in the later village deposits at Ts'ishaa, chipped stone made up only 0.7% of the artifact total. At Ch'uumat'a, in the early component stone comprised 24.4% of the artifact total and chipped stone accounted for 10.6%, whereas chipped stone was absent from the later deposits (McMillan 1998b:10). Similarly, the relatively small assemblage from the Huu7ii early component contained 32.8% stone artifacts, with chipped stone making up 13.1%. Chipped stone was almost absent in the later House 1 assemblage, comprising only 0.2% of the total. The Huu7ii lithic assemblage seems rather non-descript, containing little in the way of diagnostic artifacts, compared to the other two sites, both of which featured large well-made projectile points (in the Ts'ishaa case including one of Oregon obsidian), along with schist knives, choppers, and cores. The small artifact assemblage from Little Beach also includes a well-made chipped stone projectile point and a cobble chopper (Arcas Consulting Archeologists 1991). Huu7ii, Ch'uumat'a and Ts'ishaa all yielded small flakes, some of which exhibit retouch, of green chert, which occurs in a number of locations around Barkley Sound (Wilson 2005:123). All lithic materials in the Huu7ii assemblage could have been obtained locally; unlike the other sites there is no indication of trade for tool materials.

The faunal assemblage from the Huu7ii back terrace closely resembles that of equivalent age from Ts'ishaa. A wide range of fish dominates the vertebrate fauna, with herring being the most abundant in the fine-screened samples. At both sites, land mammals are relatively more abundant than in later periods. Dogs are particularly common in these early deposits, with evidence that they were kept as pets. Mink remains are also relatively abundant at both sites, with river otter also well represented at Ts'ishaa (Frederick and Crockford 2005). Shellfish deposits at both sites consist predominantly of California mussel. Most resources could have been taken in the immediate site vicinities, as the common fish, such as herring, rockfish, greenling, and perch, were available in the nearshore waters and the abundant large mussels could have been gathered along the rocky shoreline. However, the inhabitants at both sites also regularly ventured out to sea in pursuit of whales, fur seals, and several species of porpoise and dolphin, with less common species such as albatross and bluefin tuna also demonstrating use of open ocean resources. Seasonal indicators cover much of the year, suggesting year-round occupation at this early time (Appendices A and B).

The early components from Ch'uumat'a and Ts'ishaa, as well as the materials from Little Beach, seem dissimilar to later Barkley Sound assemblages. All three sites feature such traits as relatively abundant chipped stone implements (including large projectile points), large ground slate points, and burials under rock cairns. These distinctive traits are also found in the early component at Shoemaker Bay, at the head of the long Alberni Inlet that extends into the centre of Vancouver Island from Barkley Sound. At that site, the entire archaeological sequence can be related to cultural stages in the Strait of Georgia region to the east; the late Nuu-chah-nulth arrival in the area is also documented through oral history and ethnographic data (McMillan and St. Claire 1982). In the Strait of Georgia, these traits characterize the Charles and Locarno Beach phases, which are contemporaneous with the west coast sites mentioned above (Mitchell 1990). Other diagnostic items that link these early west coast components to the Charles and Locarno Beach phases include stone labrets at Little Beach (Arcas Consulting Archeologists 1991) and Shoemaker Bay I (McMillan and St. Claire 1982) and a distinctive incised and drilled decorative stone object from the base of Ch'uumat'a that resembles contemporaneous Charles phase examples (McMillan 1998b, 2003a; McMillan and St. Claire 1996). None of these traits persist into later period sites in Nuu-chah-nulth territory.

One possible explanation for this apparent culture change involves cultural replacement, with the ancestors of the Barkley Sound Nuu-chah-nulth arriving from further north on the coast at the end of this period and replacing or absorbing earlier populations (Arcas Consulting Archeologists 1991; McMillan 1998b, 2003a). However, gradual coast-wide changes not involving population movements or replacement may also account for these changes. Decline in the importance of the chipped stone technology, for example, is a widespread feature of later time periods along the British Columbian coast. We still have too little excavated data of the requisite age from Nuu-chah-nulth territory to resolve this issue. The early component from Huu7ii, with its rather limited cultural remains, adds little to this debate. Other than a small number of chipped stone items, the meagre artifact assemblage seems rather similar to that from the late period.

Late Component

All recovered materials dating to the late component at Huu7ii came from units excavated within the surface outline of House 1. Such materials can be divided into those that came from the house floor layers, dating from about 800 to 400 cal BP, and those from the underlying midden, dating from about 1500 to 800 cal BP. Pollen Zone III (ca. 1350 BP to present), from a core taken in a bog immediately behind the site, roughly corresponds to this final occupation period (Appendix F). A decrease in red cedar, shrubs, and herbaceous plants that is evident in the pollen sequence may indicate clearing of vegetation on and around the village area, consistent with the activities of a substantial resident population.

Artifacts recovered from the late component at Huu7ii fit comfortably within the West Coast culture type, generally considered as the archaeological remnant of Nuu-chah-nulth culture (Mitchell 1990; McMillan 1998a). Most of the key traits that identify this culture type are well represented: numerous small bone points and bipoints, small single barb points, larger barbed bone points and harpoon heads, large and small bone valves of several types as parts of composite harpoon heads, bone and stone fishhook shanks, bone splinter awls, deer ulna tools, whalebone wedges and bark shredders, and abrasive stones. The near-absence of chipped stone implements is also an identifying feature. As Mitchell (1990:357) noted, this array of implements closely resembles known Nuu-chah-nulth material culture and indicates a range of common activities such as fishing, sea mammal hunting, food preparation, and woodworking and other manufacturing. The Thunderbird and whale pendant (see Chapter 3) from Huu7ii also links the site occupants to modern descendants, as Thunderbirds and whaling imagery are pervasive in ethnographic and modern Nuu-chah-nulth art. In general, the Huu7ii assemblage closely resembles the contemporaneous collections from other major Barkley Sound village sites such as T'ukw'aa (McMillan and St. Claire 1992; McMillan 1999) and Ts'ishaa (McMillan and St. Claire 2005).

The West Coast culture type, however, was defined on a small number of excavated sites further north in Nuu-chah-nulth territory, particularly Yuquot in Nootka Sound. Some differences exist in the Barkley Sound artifact assemblages. Ground stone celts are considered one of the defining traits of the culture type (Mitchell 1990:356), yet are rare in Barkley Sound. Except for a few possible preforms, they were absent from the large villages of T'ukw'aa and Ts'ishaa, and occurred at Ch'uumat'a only in contexts that are somewhat older than the other two sites. A shift to celts of mussel shell in preference to those of stone appears to have occurred during this late period, perhaps about 1200 years ago (McMillan 1999:177; McMillan and St. Claire 1996:53). This fits well with the Huu7ii data, as the only definite stone celt was found in the sub-floor midden near the base of the deposit, whereas a mussel shell celt came from the house floor. The stemmed ground slate point from the Huu7ii house floor provides another example of apparent minor regional differences. Ground stone points are not characteristic of the West Coast culture type as defined, yet are found in small numbers at all major Barkley Sound sites: Ts'ishaa, T'ukw'aa, and Ch'uumat'a, as well as Huu7ii (McMillan 1999:172; McMillan and St. Claire 2005:59).

Analysis of the House 1 faunal remains indicates a way of life that was even more based on maritime resources than the early component. The late Huu7ii assemblage closely resembles that from the contemporary large village of Ts'ishaa. Fish dominate the vertebrate fauna at both sites, with major species including herring, rockfish, and greenling (Appendix A; Frederick and Crockford 2005). When the fine-screened column samples are considered, herring dominate throughout the 5000-year record of human presence at both sites (Appendix B; McKechnie 2005). Length estimates suggest that adult fish of spawning size were being targeted (Appendix B). As great numbers of spawning herring moved into the protected waters around the islands in Barkley Sound, they attracted an array of predators, including larger fish, marine mammals, and birds, which in turn became prey for human hunters and fishers. Taking large numbers of these spawning fish, as well as presumably collecting and drying the roe for consumption, was a key aspect of economic life at these Barkley Sound villages. In addition, salmon become increasingly important in the upper layers at both sites. One aspect that differentiates the Huu7ii faunal assemblage is the great abundance of Pacific hake remains in the sub-floor midden.

Marine mammals also played an important role in the economy at both sites. Whale remains were abundant throughout, as befitting Nuu-chah-nulth culture that accorded great prestige to powerful and successful whaling chiefs (Arima 1983:38–44; Monks et al. 2001:75–76; Sapir et al. 2004). Humpback whales were the dominant species, possibly representing resident populations in the sound (Appendix C; McMillan and St. Claire 2005). The occupants of both villages successfully pursued several species of porpoise and dolphin, demonstrating their mastery of marine hunting skills and technology. Fur seals were also a major part of the diet (Appendix A; Frederick and Crockford 2005), as is the case for all major excavated Nuu-chah-nulth village sites (Crockford et al. 2002:152; McMillan 1999:140). Although these animals today only appear along this coast during their annual migrations, discovery of newborn and juvenile fur seal bones at Huu7ii and Ts'ishaa indicates that these animals were being taken from a local breeding population somewhere in the vicinity of Barkley Sound (Appendix A; Crockford et al. 2002; Frederick and Crockford 2005).

The faunal pattern at Huu7ii is consistent with the ethnographic information that this was the homeland of an independent local group with territory restricted to the islands of the southern Deer Group. Prior to the amalgamations that gave rise to the modern Huu-ay-aht, access to wider territory would have been constrained by the presence of other independent local groups, such as the *Kiix7in7ath* along the adjacent shoreline of the sound. Most resources found at Huu7ii could have been obtained within the relatively small island territory of the original local group. The most abundant fish in the faunal remains, such as rockfish, greenling, sea perch, sole, and dogfish, could have been taken just offshore from the site, and herring come into shallow waters around the islands in great numbers while spawning. In addition, the large mussels that played a major role in the economy were abundant on the rocky shoreline in the site vicinity.

The inhabitants of Huu7ii likely lived there for much or all of the year, as their relatively restricted territory would not have required a seasonal pattern of movement. Analysis of the faunal remains provides some support for this supposition. Spring through fall indicators are well represented, but winter occupation is less clearly demonstrated. However, the abundance of salmon vertebrae in the house floor may indicate fish taken in the fall and preserved for winter use (Appendix A). Herring are also available in the shallow inshore waters throughout the winter and spring (Appendix B; Frederick and Crockford 2005:190). Many of the key resources, such as rockfish, greenling, flatfish, and mussels, could have been obtained year-round in the site vicinity. The detailed ethnographic information from Ts'ishaa clearly indicates that prior to the amalgamations that formed the historic groups, the major Barkley Sound villages were year-round bases from which the resources of each *hahuulhi* (chiefly territory) could be harvested (McMillan and St. Claire 2005).

A significant economic shift appears to have taken place late in the site's occupation. Salmon remains increase dramatically, from a minor taxon in the sub-floor midden to about 68% of the fish total in the house floor deposits (Appendix A). Measurements of salmon vertebrae diameters suggest that the house occupants were targeting medium to large salmon, probably either chum (*Oncorhynchus keta*) or chinook (*O. tshawytscha*) (Frederick et al. 2006:49). Formerly dominant fish species, such as rockfish, greenling, and Pacific hake, decline considerably in relative importance. Herring, however, continues to be the dominant species throughout when the fine-screened column samples are considered (Appendix B). This pronounced late period shift in importance from rockfish to salmon also occurs at the other Barkley Sound village sites where faunal analysis has been completed: Ts'ishaa (Frederick and Crockford 2005; McMillan et al. 2008; McMillan and St. Claire 2005) and Ma'acoah (Monks 2006). This apparent sound-wide trend suggests that broader changes were taking place in land and resource use.

Although salmon could have been taken as they passed the islands in Barkley Sound on their way to streams up Alberni Inlet, their great abundance in the house floor suggests that they were taken in quantity near the mouths of major spawning rivers during the late summer or fall. As no such rivers exist in the Deer Group islands, the salmon were likely obtained along the Barkley Sound shoreline, where rivers such as the Sarita sustain substantial salmon runs. Unlike other fish, which are represented by both vertebral and cranial elements, salmon remains consist almost entirely of vertebrae, suggesting that they were caught and processed (including removal of the heads) away from the site (Appendix A; Frederick et al. 2006). The preserved fish brought back to Huu7ii could have served as a winter staple. Use of a salmon spawning river indicates that the people of Huu7ii during this late period had access to the resources of a larger territory, either directly or through kin ties and trade.

The acquisition of a major salmon river by the *Huu7ii7ath* local group is indicated in a 1913 account by Sapir consultant "William" (Sapir 1910–1914, notebook XXIV:7; Inglis and Haggarty 1986:179). At some point prior to their amalgamation with neighbouring groups, according to William, the *Huu7ii7ath* "killed off" the original inhabitants of the Sarita River area and absorbed their territory, with its rich salmon fishery. The *Ch'imaataksu7ath* local group, the people of Cape Beale, also obtained rights to the Sarita, joining the *Huu7ii7ath* in harvesting the river's rich bounty (Arima et al. 1991:218). This may reflect an early stage in the local group amalgamations that eventually led to the historic Huu-ay-aht and the acquisition of a much larger territory that included several major salmon rivers (see Chapter 2).

Discussion

An impressively large house once stood on the Huu7ii "House 1" platform. In fact, a major structure persisted in this location for several centuries, although it seems to have been rebuilt and its location shifted at some point in its history (see Chapter 4). Surface indications reveal that the dimensions of this dwelling were larger than any of the early historic or ethnographic estimates for Nuu-chah-nulth high-status residences. A house of this size would have presented an imposing statement of chiefly wealth and authority. It is possible, and perhaps even likely, that the message of chiefly power would have been further enhanced with such embellishments as house front painting, carved architectural elements, and associated figures, as are known for slightly later Huu-ay-aht high-status residences (Sapir et al. 2009:255–257), including at Kiix7in (Huu-ay-aht First Nations 2000).

Although the House 1 floor was only partially exposed through excavation, significant details were revealed of the architectural features and the activities that took place within the house (see Chapter 4). This massive structure, near the centre of the row of houses that made up the village, was very likely the residence of the *taayii hawilh*, the head chief of the *Huu7ii7ath* local group, who would have directed the group's economic and social activities throughout his *hahuulhi* in the Deer Group islands. Within the house, one of the rear corners would have been the domestic space of the *taayii hawilh* and his family. No strong correlation with status, however, could be discerned in the distribution of artifacts (Chapter 4) and faunal remains (Appendix A) across the house floor. Many activities took place around the centre of the house, particularly around the large central hearth that provided warmth and light to the entire household on special occasions (Drucker 1951:71). On a house floor occupied over several centuries, however, subsequent use and housecleaning tended to remove traces of earlier activities. These large plank houses present major challenges to archaeological interpretation due to their great size and the limited excavation extent of most projects, the perishable nature of their structural elements, and the fact that they were used, cleared off, reused, and rebuilt over very long periods of time.

About two centuries before the first Europeans sailed into Barkley Sound, Huu7ii ceased to be a major village. The houses were abandoned and the people moved elsewhere, perhaps taking their valuable planks with them. Trees began to grow on the flat platforms where the large plank-clad houses formerly stood. This location was apparently uninhabited during the war with the Clallam, around the mid-18th century, as oral traditions of that conflict state that the Huu-ay-aht survivors took refuge in the woods at Huu7ii (Chapter 2; Arima et al. 1991:225; Sapir et al. 2009:325).

The movement away from Huu7ii is likely associated with the process of amalgamations that gave rise to the modern Huu-ay-aht (see Chapter 2). Other Barkley Sound Nuu-chah-nulth groups also emerged in their present form through a series of amalgamations. These political unions generally were a result of declining populations, particularly following European contact when introduced diseases and intensified warfare led to catastrophic losses. In the Huu-ay-aht case, however, the process of amalgamation appears to have taken place somewhat earlier, prior to European arrival. Cultural advisor "William" told Sapir in 1913 that the Huu-ay-aht bands “joined long before white people came,” attributing the merger to the fact that the groups were “reduced in number” (Huu-ay-aht First Nations 2000:52; Inglis and Haggarty 1986:179; Sapir 1910–1914, notebook XXIV:7, 7a). Warfare and a major natural disaster were the known causes for this population loss.

Oral traditions tell of a prolonged war with the Uchucklesaht (*Huuchukwtlis7ath*), a neighbouring Nuu-chah-nulth group that at one time controlled much of eastern Barkley Sound (Sapir and Swadesh 1955:339–341). At the beginning of this war narrative, the Uchucklesaht were living at a village on northwestern Diana Island, a short distance from Huu7ii. The *Huu7ii7ath* local group could not have been in residence in their ancestral village at this time and were likely forced over to the adjacent mainland shore, possibly after suffering extensive casualties (McMillan 2009:630–631; St. Claire 1991:75). During this war the Uchucklesaht attacked and nearly annihilated the *Kiix7in7ath* (Sapir and Swadesh 1955:339–341). Later, a massive earthquake and tsunami, presumably the seismic event known to have occurred in AD 1700 (Ludwin et al. 2005), destroyed the villages at Cape Beal and Pachena Bay, forcing the survivors of these groups to join the others (Chapter 2; Arima et al. 1991:220–222, 230–231). Kiix7in became the capital of the amalgamated group (Huu-ay-aht First Nations 2000), and most ethnographic traditions refer to when this was the major residential location.

Huu7ii, however, was never “abandoned” in any sense involving surrender of ownership. This is, after all, the location from which the modern Huu-ay-aht take their name. Although Huu7ii was never designated as a reserve, unlike several other portions of Diana Island, the Huu-ay-aht continued to use the entire island and its surroundings for fishing and other resource gathering activities. Huu7ii’s history and importance are embedded in Huu-ay-aht tradition and the Huu-ay-aht past is very much a living presence at such places (Huu-ay-aht First Nations 2000:37). The site continues to be one of the major Huu-ay-aht heritage locations (Fig. 6-1).

Kiix7in, with its impressive still-standing wooden architectural elements, is perhaps the pre-eminent Huu-ay-aht heritage site. Its recent designation as a National Historic Site com-

Figure 6-1. Members of the Huu-ay-aht First Nation (former Chief Councillor Robert Dennis at right) drum during a ceremony at Huu7ii at the end of the 2006 field project.

memorates its significance, not only to the Huu-ay-aht but also more broadly as part of Canada's heritage (Huu-ay-aht First Nations 2000). The greater attention that followed this designation fits with Huu-ay-aht initiatives for cultural tourism, as the Huu-ay-aht have developed plans to share their culture and history with visitors to their territory. In fact, all their heritage sites and surrounding lands play prominent roles in Huu-ay-aht economic development plans for the future (Huu-ay-aht First Nations 2000:37). Kiix7in, however, remains the hub of Huu-ay-aht initiatives for future cultural tourism. Such proposals include construction of a road-accessible cultural centre near Kiix7in, where displays will present Huu-ay-aht heritage and culture to visitors, with trails leading to the edge of the village site and to other nearby locations in Huu-ay-aht territory (Larry Johnson, Huu-ay-aht Director of Lands and Resources, personal communication 2011). The fragile decaying house elements across the site surface, however, pose problems for either large-scale public visitation or extensive archaeological excavation at Kiix7in. It has even been suggested that a replica village could be constructed at an adjacent beach to allow visitors to experience Huu-ay-aht heritage at Kiix7in without disturbing the original (Lavoie 2011). The recovered objects and information from Huu7ii should play a prominent role in any planned interpretation centre to present Huu-ay-aht history, as was the initial incentive for the research reported here.

The Huu-ay-aht recently became one of five Nuu-chah-nulth First Nations to collectively finalize a modern treaty with Canada and British Columbia. This document, known as the Maa-nulth Final Agreement, came into effect in 2011. It establishes wide-sweeping provisions regarding lands, resources, and governance. Each First Nation under the agreement has much greater control over the management and protection of its heritage resources. Although Huu7ii receives no specific attention, the agreement has a separate section dealing with Diana Island, in which British Columbia and the Huu-ay-aht agree to negotiate Huu-ay-aht participation in management planning and to enact measures to protect the cultural and environmental values of the island. The Maa-nulth Final Agreement also calls for the transfer of certain masks, headdresses, and other heritage objects currently held by the Canadian Museum of Civilization, Parks Canada Agency, and Royal British Columbia Museum to the First Nations involved. These items, along with the archaeological materials from Huu7ii, could form a strong basis for a future cultural facility supporting Huu-ay-aht tourism initiatives and local educational programs.

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Appendix A: Vertebrate Fauna from the Huu-ay-aht Archaeology Project: Results from the 2006 Huu7ii Village Excavations and Summary of 2004 and 2006 Data

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Introduction

Huu7ii Village, DfSh-7, is a large village site located on Diana Island in the Deer Group Islands at the southern entrance to Barkley Sound on the west coast of Vancouver Island (Fig. 1). The 2004 archaeological excavations at the site recovered large quantities of faunal remains, some of which have been analyzed and summarized in the 2006 report to the Huu-ay-aht First Nation (Frederick et al. 2006). Excavations at the site were resumed in the summer of 2006, directed by Dr. Alan McMillan and Denis St. Claire, in association with the Huu-ay-aht First Nation. This report summarizes the identification and analysis of selected samples of the level vertebrate faunal remains from excavation units within House 1 and an excavation unit in the older back terrace deposits. The results from the two years' excavations are then combined and discussed.

As in 2004, two types of faunal samples were collected from Huu7ii Village during the 2006 field season: 1) fauna from *excavation units* hand-picked from ¼" screens in the field, and 2) fauna recovered from bulk sediment *column samples.* Only the level fauna from the screens are reported here.

Site Context and Excavation

The site of Huu7ii is an extensive shell midden village site with numerous rectangular house depressions arrayed along a beach on the northeast portion of Diana Island (Fig. 2). Excavations in 2006 focused on the central and southeastern portions of the largest house depression, House 1, extending the horizontal coverage within this house feature (Fig. 3). One 2 m by 2 m unit, N18-20 E 34-36, was excavated to the base of cultural deposits, a depth of about two metres. The other fourteen 2 m by 2 m and six 1 m by 2 m units within the house depression were excavated down to the base of identified house floor layers, roughly 60 cm to one metre below surface. In addition, a second excavation unit was excavated down to the base of cultural deposits on the older back-terrace portion of the site, to the west of the unit completed in 2004.

Stratigraphy similar to that described in the report on the 2004 excavations was encountered within House 1 in 2006, with an upper unit of ash spreads, hearth areas, fragmented and diffuse shell in a dark soil matrix overlying a lower unit of much more concentrated shell dump layers. Vertebrate remains were recovered throughout the sequence.

Site Chronology

Radiocarbon age estimates from the excavations of the House 1 area place the age of these deposits between 330 and 1560 cal yr BP. A date of 920 ± 50 (930–730 cal years BP) was obtained from unit N18-20/E6-8 at a depth of 4.20–4.25 D.B.D. This date fixes the occupation of House 1 beginning at about 800 BP with a terminal date between 300 and 400 BP The date for abandonment of the site is partially based on dendro-chronological dates obtained from trees growing on and within the house depressions at the site. Dates from the back terrace portion of the site span the period of 3090 to 4980 cal yr BP., placing its occupation at a time when sea level in the area was 3 to 4 metres higher than today (Frederick et al. 2006).

Methods

Field Recovery Proceedures

Excavation Units
Cultural deposits were removed from the 2x2 m excavation units in arbitrary 5 cm levels. Each unit was further subdivided horizontally into 1x1 m

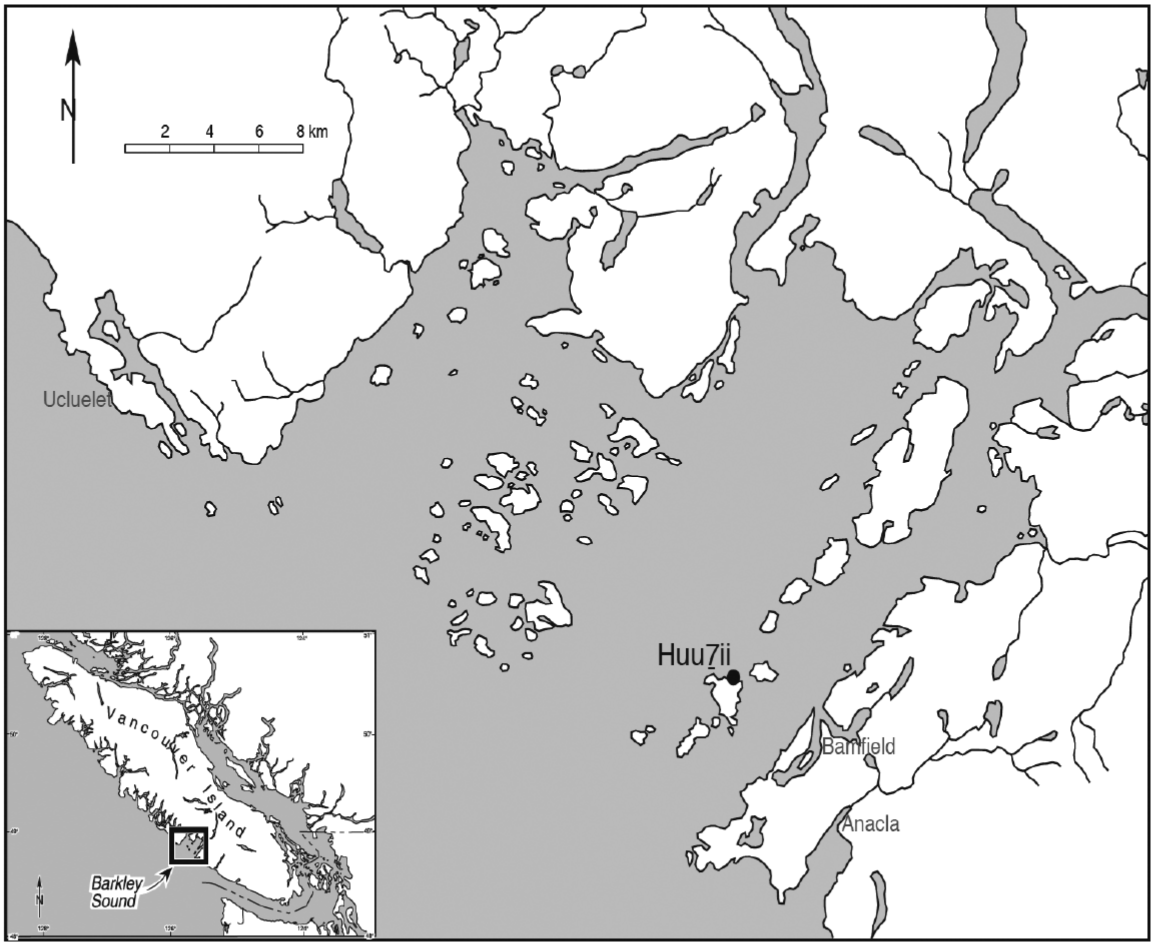


Figure 1. Map of Barkley Sound showing the location of Huu7ii village (DfSh-7).

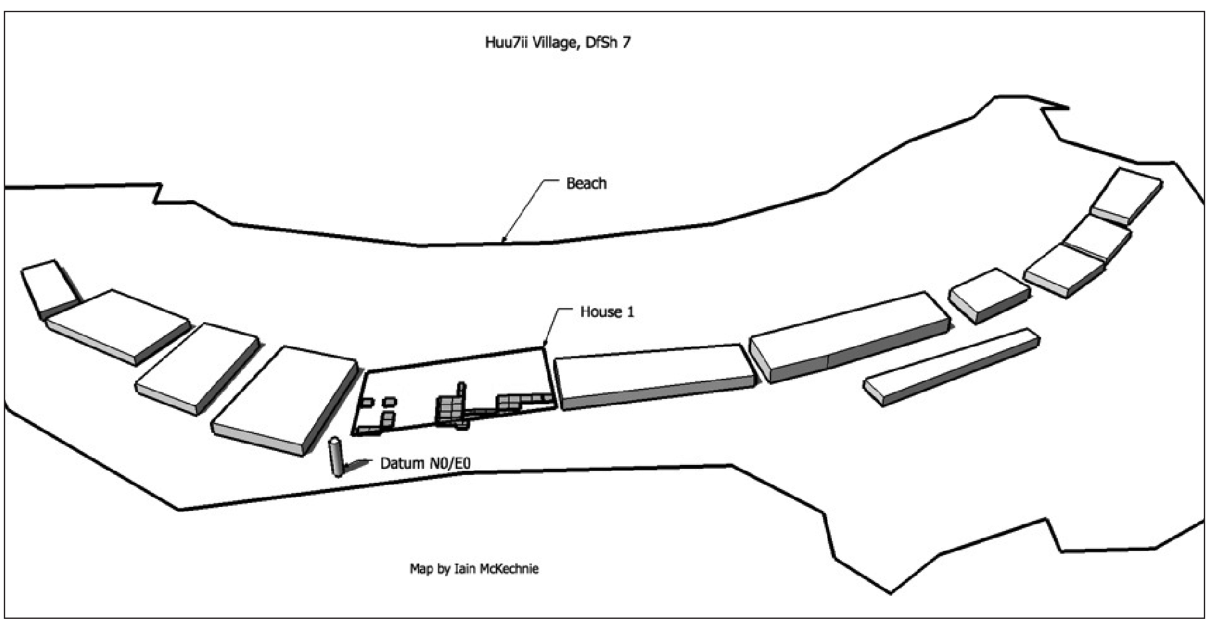


Figure 2. Map of Huu7ii village showing the probable placement of houses and the locations of 2004 and 2006 excavation units in House 1. (Map by Iain McKechnie.)

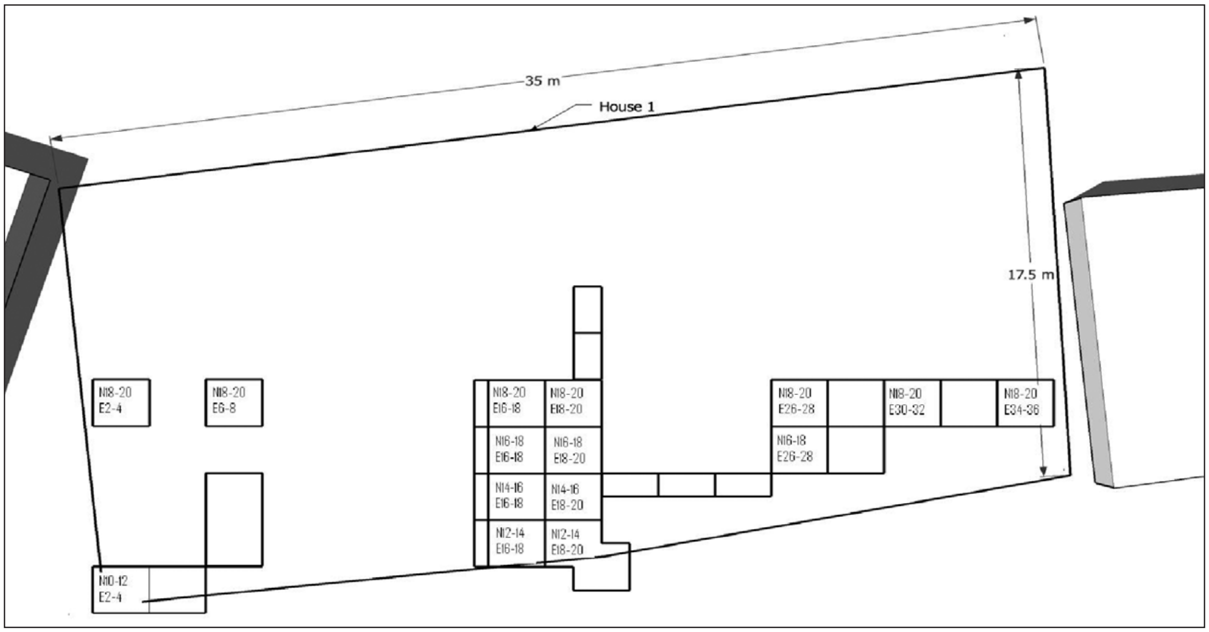


Figure 3. Excavation units, House 1. (Map by Iain McKechnie.)

quadrants (i.e., NW, NE, SW, SE). In addition, sediments from broadly defined stratigraphic 'layers' were excavated and screened separately. Numbered arbitrary levels are referenced to the horizontal datum plane and layers are given letter designations, beginning at the surface. All deposits were put through ¼" mesh screens in the field and all visible vertebrate fauna collected.

Column Samples

Column bulk samples were recovered from the side walls of excavation units. As in the excavation units, individual column sample levels were removed in 5cm arbitrary increments referenced to the site datum plane and stratigraphically distinct layers were kept separate. These samples were analyzed separately and are reported by Iain McKechnie (this volume).

Faunal Identification Procedures

Vertebrate fauna from the 2006 excavation unit samples were identified by Gay Frederick, using the comparative skeletal collection at the University of Victoria Zooarchaeology Laboratory. Identification data were recorded by skeletal element in a *Paradox 35* database, noting relevant osteological and provenience information. This database was then converted to a *Quattro Pro* and/or an *Excel* spreadsheet. With the exception of fish spines, ribs, branchials, and scales, identification was attempted for all skeletal elements recognizable to species, genus or family level. Confidence codes were assigned to each examined specimen to indicate the certainty of identification (for criteria, see Frederick and Crockford 2005). Briefly, Code 22 indicates certainty to species, Code 21 certainty to genus and probable species, Code 20 certainty to genus. Codes below 20 reflect less and less certainty. Identifications for rockfish (*Sebastes* sp.) and salmon sp. (*Oncorhynchus* sp.) were rarely attempted beyond genus level. Identifications are conservative.

Results

Vertebrate Faunal Sample

Vertebrate faunal remains from selected levels of twelve 2006 excavation units within House 1, and the 2006 unit on the back terrace have been identified. Figs. 3 and 4 show the House 1 units and their relation to features identified in the house floor. The intent was threefold.

Firstly, we wished to further examine the shifting pattern of fauna, especially fish species, utilization through time seen in the 2004 sample. To this end, bird, mammal and fish remains from selected levels in units N14-16/E16-18, N16-18/E26-28 and N18-20/E34-36 in the house were identified (Fig. 3). The first two units were excavated to the base of the house floor deposits while the third was excavated to the base of all cultural

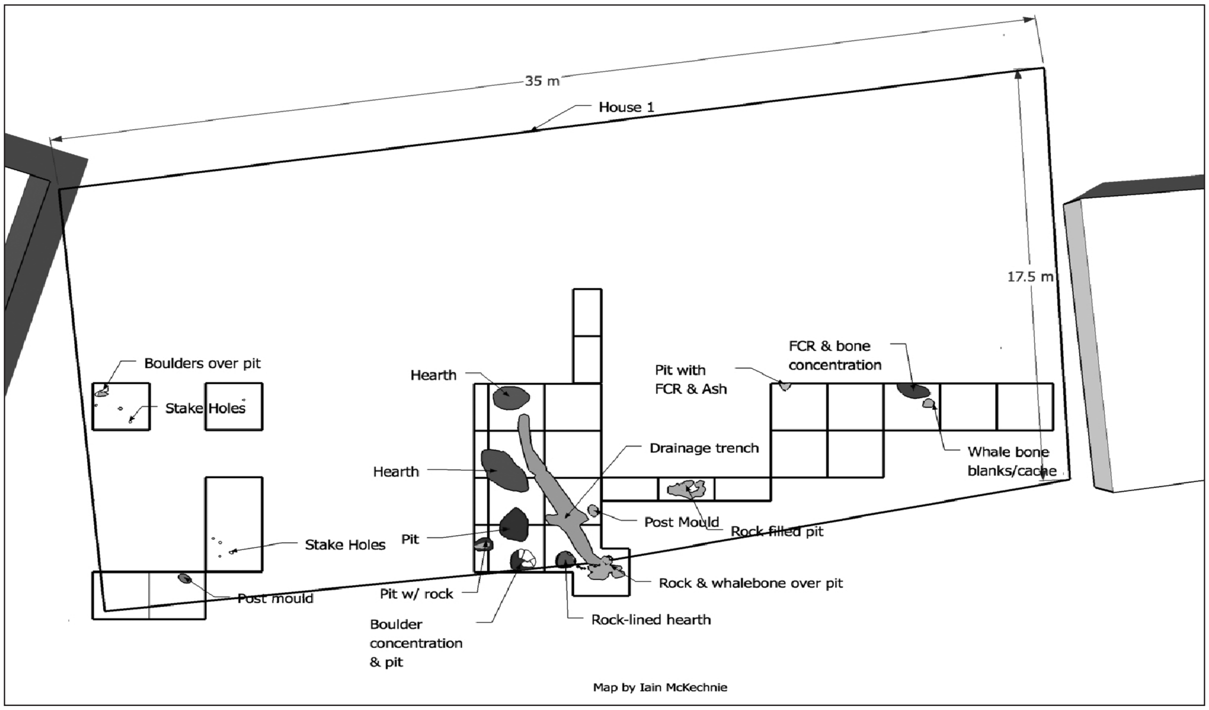


Figure 4. Excavation units and features, House 1. (Map by Iain McKechnie.)

deposits, reflecting the full period of occupation for this lower area of the site. Bird, mammal and fish remains from alternate levels of the 2006 back terrace unit down to sterile deposits were identified to compare with the 2004 sample patterns from this area of the site.

Secondly, we wished to increase the sample size of bird and mammal remains to better examine their patterns of exploitation. To this end, the bird and mammal sample from the above four units was augmented with the identification of only bird and mammal remains from house floor deposits of an additional six units: N12-14/E18-20, N16-18/E18-20, N18-20/E16-18, N18-20/E18-20, N18-20/E26-28 and N18-20/E30-32 (Fig. 3). This additional bird and mammal sample was intended to elucidate horizontal patterning of the much less frequent bird and mammal remains within House 1 floor deposits with the dampening effect produced by the overwhelming amount of fish bone removed.

Thirdly, to further examine the horizontal distribution of bird, mammal and fish remains across the house floor, the faunal samples for the single level DBD 3.80–3.85 m, associated with features in the main block excavation area within the house, were augmented. Bird, fish and mammal remains from this level only also were identified from units N12-14/E16-28, N14-16/E18-20 and N16-18/E16-18. Only bird and mammal, not fish, remains were also identified from units N12-14/E18-20 and N18-20/E26-28 for this level (Fig. 3).

A total of 35,044 specimens was examined from the 2006 level samples, with the majority being fish. The NSP (Number of Specimens) for fish is 24,506 (70%), for bird 1,480 (4%), and mammal 9,058 (26%). Of the 35,044 vertebrate specimens (NSP) examined, 14,782 specimens were identified to species, genus or family (Identification Code 20 and above). The NISP (Number of Identified Specimens) for fish is 12,426 (84%), for bird 544 (4%), and for mammal 1,815 (12%), including 1,035 (7%) marine mammal, 587 (4%) commensal mammal and 193 (1%) land mammal specimens. Table 1 lists the taxa identified in the 2006 unit samples and Table 2 presents the quantified 2006 data.

Table 3 presents the combined level sample data from both years of excavation. A total sample of 80,308 vertebrate specimens has now been examined from the 2004 and 2006 unit level samples. The sample includes 12,378 mammal specimens (15%), 2,275 bird specimens (3%) and 65,655 fish specimens (82%). Of these, 43,833 (55%) have been identified to species, genus or Family. Of the identified specimens (NISP) 353 are land mammal (1%), 782 commensal mammal (2%), 1693 sea mammal (4%), 859 bird (2%) and 40,146 fish (92%).

Table 1. Species and genera identified from DfSh-7, Huu7ii village, 2006 level sample.

Common Name	Scientific Name
Land and Commensal Mammals	
Deer mouse	*Peromyscus* sp.
Beaver	*Castor canadensis*
Mule deer	*Odocoileus hemionus*
Elk	*Cervus elaphus*
Dog	*Canis familiaris*
Wolf	*Canis lupus*
Black Bear	*Ursus americanus*
Raccoon	*Procyon lotor*
Mink	*Mustela vison*
Sea Mammals	
River otter	*Lontra canadensis*
Sea otter	*Enhydra lutris*
Fur seal	*Callorhinus ursinus*
Northern sea lion	*Eumatopias jubata*
Harbour seal	*Phoca vitulina*
Elephant seal	*Mirounga angustrostris*
Harbour porpoise	*Phocoena phocoena*
Dall's porpoise	*Phocoena dalli*
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*
Humpback Whale	*Megaptera novaeangliae*
Whale sp.	Cetacea
Birds	
Canada goose	*Branta canadensis*
Cackling Canada goose	*Branta canadensis minima*
Snow goose	*Chen caerulescens*
Surf scoter	*Melanitta perspicillata*
White-winged scoter	*Melanitta fuscus*
Mallard	*Anas platyrhynchus*
Goldeneye	*Bucephala clangula*
Bufflehead	*Bucephela albeola*
Old squaw duck	*Clangula hyemalis*
Harlequin duck	*Histrionicus histrionicus*
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Common loon	*Gavia immer*
Pacific loon	*Gavia pacifica*
Western grebe	*Aechmophorus occidentalis*
Red-necked grebe	*Podiceps grisegena*
Short-tailed albatross	*Phoebastria (nee Diomedea) albatrus*
Black-footed albatross	Phoebastria nigripes
Northern Fulmar	*Fulmarus glacialis*
Sooty Shearwater	*Puffinus griseus*
Fork-tailed storm petrel	*Oceanodroma furcata*
Double-crested cormorant	*Phalacrocorax auritus*
Pelagic cormorant	*Phalacrocorax pelagicus*
Cormorant sp. (medium)	*Phalacrocorax pelagicus\ penicillatus*
Birds continued	
Bald eagle	*Haliaeetus leucocephalus*
Sharpshinned hawk	*Accipiter striatus*
Gull sp.	*Larus* sp.
Black-legged Kittiwake	*Rissa tridactyla*
Great blue heron	*Ardea herodias*
Common murre	*Uria aalge*
Marbled murrelet	*Brachyrhamphus marmoratus*
Northwestern crow	*Corvus caurinus*
Common Raven	*Corvus corax*
Turkey Vulture	*Cathartes aura*
Fox sparrow	*Passerella iliacum*
Varied Thrush	*Ixoreus naevius*
Surf bird	*Aphriza virgata*
Shorebird	Charadriformes
Fish	
Dogfish shark	*Squalus acanthias*
Skate	*Raja* sp.
Ratfish	*Hydrolagus colliei*
Anchovy	*Engraulis mordax*
Herring	*Clupea pallasi*
Salmon	*Oncorhynchus* sp.
Chinnok Salmon	*Oncorhynchus tshawytscha*
Sablefish	*Anoplopoma fimbria*
Pacific cod	*Gadus macrocephalus*
Hake	*Merluccius productus*
Rockfish sp.	*Sebastes* sp.
Plainfin Midshipman	*Porichthys notatus*
Cabezon	Scorpaenichthys marmoratus
Irish lord sp.	*Hemilepidotus* sp.
Red Irish lord	*Hemilepidotus hemilepidotus*
Buffalo sculpin	*Enophrys bison*
Spinyhead Sculpin	*Dasycottus setiger*
Great Sculpin	*Myoxocephalus polyacanthocephalus*
Striped seaperch	*Embiotica lateralis*
Pile perch	*Damalichthys vacca*
Lingcod	*Ophiodon elongatus*
W-S Greenling	*Hexagrammos stelleri*
Rock greenling	*Hexagrammos lagocephalus*
Kelp greenling	*Hexagrammos decagrammus*
Bluefin Tuna	*Thunnus orientalis*
Halibut	*Hippoglossus stenolepis*
Petrale sole	*Eopsetta jordani*
Rock Sole	*Lepidosetts* sp.
Dover sole	*Microstomus pacificus*
Pacific sanddab	Citharichthys *sordidus*

Table 2. DfSh 7, vertebrate fauna, selected level samples, 2006 sample.

Common Name	Scientific Name	NISP/NSP
Land Mammals		
Mule deer	*Odocoileus hemionus*	120
Elk	*Cervus elaphus*	10
Beaver	*Castor canadensis*	4
Black Bear	*Ursus americanus*	1
Canid	Canidae	1
Wolf	*Canis lupus*	1
Raccoon	*Procyon lotor*	5
Mink	*Mustela vison*	24
River otter	*Lutra canadensis*	27
	Land Mammal NISP	193
	Unidentified Land Mammal NSP	650
	Total Land Mammal NISP/NSP	**843**
Commensal Mammals		
Dog	*Canis familiaris*	583
Deer mouse	*Peromyscus* sp.	4
	Commensal Mammal NISP	587
Sea Mammals		
Sea otter	*Enhydra lutris*	28
Northern sea lion	*Eumatopias jubata*	57
Fur seal	*Callorhinus ursinus*	169
Otarid	Otaridae	33
Harbour seal	*Phoca vitulina*	78
Elephant seal	*Mirounga angustirostris*	1
Pinniped	Pinnepedia	40
Harbour porpoise	*Phocoena phocoena*	83
Dall's porpoise	*Phocoena dalli*	24
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	45
Porpoise/Dolphin sp.	Delphinidae/Phocoeinidae	131
Whale sp.	Cetacea	320
Large whale	Cetacea	23
Humpback Whale	*Megapters novaeangliae*	3
	Marine Mammal NISP	1,035
	Unidentified Sea Mammal NSP	2,483
	Total Marine Mammal NISP/NSP	**3,518**
Undetermined Mammal	Undetermined NSP	4,110
	Total Mammal NSP/NISP	**8,471**
Birds		
Canada Goose	*Branta canadensis*	4
Cackling Canada goose	*Branta canadensis minima*	5
Snow goose	*Chen caerulescens*	1
Goose sp.	*Anser/Branta/Chen* sp.	18
Mallard	*Anas platyrhynchus*	1
Surf scoter	*Melanitta perspicillata*	4
White-winged scoter	*Melanitta fuscus*	2
Scoter sp.	*Melanitta* sp.	12
Goldeneye	*Bucephela clangula*	2
Bufflehead	*Bucephela albeola*	2
Common Merganser	*Mergus merganser*	2
Red-breasted Merganser	*Mergus serrator*	2
Merganser sp.	*Mergus* sp.	1
Oldsquaw Duck	*Clangula hyemalis*	1
Harlequin duck	*Histrionicus histrionicus*	2
Duck sp.	Anatidae	25
Common Loon	*Gavia immer*	7
Pacific loon	*Gavia pacifica*	4
Loon sp. (medium)	*Gavia pacifica\stellata*	27

Table 2 continued.

Common Name	Scientific Name	NISP/NSP
Loon sp.	*Gavia* sp.	4
Western grebe	*Aechmophorus occidentalis*	2
Red-necked grebe	*Podiceps grisegena*	2
Grebe sp.	*Podiceps/Aechmophorus*	8
Short-tailed Albatross	*Phoebastria albatrus*	16
Black-footed albatross	*Phoebastria nigripes*	1
Albatross sp.	*Phoebastria* sp.	1
Northern Fulmar	*Fulmarus glacialis*	2
Sooty Shearwater	*Puffinus griseus*	13
Shearwater sp.	*Puffinus* sp.	35
Fork-tailed storm petrel	*Oceanodroma furcata*	1
Double-crested cormorant	*Phalacrocorax auritus*	13
Pelagic cormorant	*Phalacrocorax pelagicus*	17
Cormorant sp.	*Phalacrocorax* sp.	22
Turkey Vulture	*Cathartes aura*	1
Geat blue heron	*Ardea herodias*	3
Shorebird, large	Scolopacidae	1
Shorebird, small	Scolopacidae	1
Surfbird	*Aphriza virgata*	1
Gull, large/very large	*Larus* sp.	22
Gull, medium/large	*Larus* sp.	10
Gull, medium	*Larus* sp.	16
Gull, small/very small	*Larus* sp.	24
Gull sp.	*Larus* sp.	8
Black-legged Kittiwake	*Rissa tridactyla*	5
Common murre	*Uria aalge*	71
Murre sp.	*Uria* sp.	8
Marbled murrelet	*Brachyrhamphus marmoratus*	13
Bald eagle	*Haliaeetus leucocephalus*	16
Sharpshinned hawk	*Accipiter striatus*	1
Hawk sp.	Accipitridae/Falconidae	1
Northwestern crow	*Corvus caurinus*	33
Common Raven	*Corvus corax*	2
Varied Thrush	*Ixoreus naevius*	9
Fox sparrow	*Passerella iliaca*	2
Songbird	Fringillidae/Turdidae	1
	Identified bird NISP	544
	Unidentified Bird NSP	936
	Total Bird NISP/NSP	**1,480**
Fish		
Dogfish shark	*Squalus acanthias*	1,100
Skate	*Raja* sp.	5
Ratfish	*Hydrolagus colliei*	248
Anchovy	*Engraulis mordax*	3
Herring	*Clupea pallasi*	407
Salmon	*Oncorhynchus* sp.	3,214
Chinnok Salmon	*Oncorhynchus tshawytscha*.	16
Sablefish	*Anoplopoma fimbria*	1
Pacific cod	*Gadus macrocephalus*	141
Hake	*Merluccius productus*	1,932
Gadid, not Hake	Gadidae	6
Rockfish sp.	*Sebastes* sp.	2,450
Plainfin Midshipman	*Porichthys notatus*	4
Cabezon	*Scorpaenichthys marmoratus*	88
Red Irish lord	*Hemilepidotus hemilepidotus*	80
Buffalo sculpin	*Enophrys bison*	3
Great Sculpin	Myoxocephalus polyacanthocephalus	7

Table 2 continued.

Common Name	Scientific Name	NISP/NSP
Spinyhead Sculpin	Dasycottus settiger	2
Sculpin sp.	Cottidae	4
Striped seaperch	*Embiotica lateralis*	49
Pile perch	*Damalichthys vacca*	99
Perch sp.	Embiotocidae	120
Lingcod	*Ophiodon elongates*	226
W-S Greenling	*Hexagrammos stelleri*	1
Rock greenling	*Hexagrammos lagocephalus*	22
Kelp greenling	*Hexagrammos decagrammus*	1,053
Greenling sp.	Hexigrammidae	327
Bluefin Tuna	*Thunnus orientalis*	18
Halibut	*Hippoglossus stenolepis*	22
Petrale Sole	*Eopsetta jordani*	646
Rock Sole	*Lepidosetts* sp.	13
Dover sole	*Microstomus pacificus*	1
Pacific sanddab	*Citharichthys sordidus*	3
Flatfish sp.	Pleuronectiformes	115
	Identified Fish NISP	12,426
	Unidentified Fish NSP	12,080
	Total Fish NISP/NSP	**24,506**

Table 3. DfSh 7, vertebrate fauna, selected level samples, 2004 and 2006 combined sample.

Common Name	Scientific Name	NISP/NSP
Land Mammals		
Mule deer	*Odocoileus hemionus*	202
Deer sp.	*Odocoileus* sp.	1
Elk	*Cervus elaphus*	16
Ungulate sp.	*Cervidae*	3
Beaver	*Castor canadensis*	5
Black Bear	*Ursus americanus*	2
Canid	*Canidae*	3
Wolf	*Canis lupus*	1
Raccoon	*Procyon lotor*	6
Mink	*Mustela vison*	71
Marten	*Martes Americana*	6
River otter	*Lutra canadensis*	37
	Land Mammal NISP	353
	Unidentified Land Mammal NSP	926
	Total Land Mammal NISP/NSP	**1,279**
Commensal Mammals		
Dog	*Canis familiaris*	773
Deer mouse	*Peromyscus* sp.	9
	Commensal Mammal NISP	782
Sea Mammals		
Sea otter	*Enhydra lutris*	45
Northern sea lion	*Eumatopias jubata*	117
Fur seal	*Callorhinus ursinus*	285
Otarid	Otaridae	42
Harbour seal	*Phoca vitulina*	125
Elephant seal	*Mirounga angustirostris*	1
Pinniped	Pinnepedia	95
Harbour porpoise	*Phocoena phocoena*	114
Dall’s porpoise	*Phocoena dalli*	59

Table 3 continued.

Common Name	Scientific Name	NISP/NSP
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	69
Porpoise/Dolphin sp.	Delphinidae/Phocoeinidae	236
Whale sp.	Cetacea	479
Large whale	Cetacea	23
Humpback Whale	*Megapters novaeangliae*	3
	Marine Mammal NISP	1,693
	Unidentified Sea Mammal NSP	4,121
	Total Marine Mammal NISP/NSP	**5,814**
Undetermined Mammal	Undetermined NSP	5,080
	Total Mammal NSP/NISP	**12,378**
Birds		
White-Fronted goose	*Anser* sp.	1
Canada goose	*Branta Canadensis*	7
Cackling Canada goose	*Branta canadensis minima*	8
Snow goose	*Chen caerulescens*	1
Goose sp.	*Anser/Branta/Chen* sp.	24
Mallard	*Anas platyrhynchus*	1
Duck, Diving	*Aythya* sp.	2
Surf scoter	*Melanitta perspicillata*	9
White-winged scoter	*Melanitta fusca*	14
Scoter sp.	*Melanitta* sp.	14
Goldeneye	*Bucephela clangula*	3
Bufflehead	*Bucephela albeola*	2
Common Merganser	*Mergus merganser*	6
Red-breasted Merganser	*Mergus serrator*	2
Merganser sp.	*Mergus* sp.	1
Oldsquaw Duck	*Clangula hyemalis*	1
Harlequin duck	*Histrionicus histrionicus*	2
Duck sp.	*Anatidae*	42
Common Loon	*Gavia immer*	15
Pacific loon	*Gavia pacifica*	7
Loon sp. (medium)	*Gavia pacifica/stellata*	41
Loon sp.	*Gavia* sp.	4
Western grebe	*Aechmophorus occidentalis*	4
Red-necked grebe	*Podiceps grisegena*	5
Horned grebe	*Podiceps auritus*	2
Grebe sp.	*Podiceps/Aechmophorus*	10
Short-tailed Albatross	*Phoebastria albatrus*	29
Black-footed albatross	*Phoebastris nigripes*	1
Albatross sp.	*Phoebastria* sp.	3
Northern Fulmar	*Fulmarus glacialis*	3
Sooty Shearwater	*Puffinus griseus*	25
Shearwater sp.	*Puffinus* sp.	49
Fork-tailed storm petrel	*Oceanodroma furcata*	1
Storm petrel sp.	*Oceanodroma* sp.	1
Double-crested cormorant	*Phalacrocorax auritus*	19
Pelagic cormorant	*Phalacrocorax pelagicus*	28
Cormorant sp.	*Phalacrocorax* sp.	32
Geat blue heron	*Ardea herodias*	4
Shorebird, large	*Scolopacidae*	1
Shorebird, small	*Scolopacidae*	2
Shorebird, medium	*Scolopacidae*	1

Table 3 continued.

Common Name	Scientific Name	NISP/NSP
Surfbird	*Aphriza virgata*	1
Western sandpiper	*Calidris mauri*	1
Gull, large/very large	*Larus* sp.	33
Gull, medium/large	*Larus* sp.	17
Gull, medium	*Larus* sp.	35
Gull, small/very small	*Larus* sp.	48
Gull sp.	*Larus* sp.	8
Black-legged Kittiwake	*Rissa tridactyla*	9
Kittiwake sp.	*Rissa* sp.	1
Common murre	*Uria aalge*	94
Murre sp.	*Uria* sp.	9
Marbled murrelet	*Brachyrhamphus marmoratus*	32
Rhinoceros auklet	*Cerorhinca monocerata*	1
Turkey Vulture	*Cathartes aura*	1
Bald eagle	*Haliaeetus leucocephalus*	28
Sharpshinned hawk	*Accipiter striatus*	1
Hawk sp.	*Accipitirdae/Falconidae*	1
Osprey	*Pandion halaietus*	3
Northern pygmy owl	*Glaucidium gnoma*	1
Western screech owl	*Otus kennicotti*	5
Great horned owl	*Bubo virginianus*	1
Northwestern crow	*Corvus caurinus*	44
Common Raven	*Corvus corax*	3
Spotted towhee	*Pipilo maculates*	1
Varied Thrush	*Ixoreus naevius*	11
Fox sparrow	*Passerella iliaca*	2
Songbird	*Fringillidae/Turdidae*	4
	Identified bird NISP	859
	Unidentified Bird NSP	1,416
	Total Bird NISP/NSP	**2,275**
Fish		
Sevengill shark	*Notorynchus cepedianus*	1
Dogfish shark	*Squalus acanthias*	2,224
Skate	*Raja* sp.	19
Ratfish	*Hydrolagus colliei*	508
Anchovy	*Engraulis mordax*	10
Herring	*Clupea pallasi*	996
Clupeid sp.	Clupeidae	1
Salmon	*Oncorhynchus* sp.	7,882
Chinnok Salmon	*Oncorhynchus tshawytscha.*	16
Salmon/Trout	*Omcorhynchus/Salvelinus* sp.	1
Sablefish	*Anoplopoma fimbria*	3
Pacific cod	*Gadus macrocephalus*	229
Hake	*Merluccius productus*	17,583
Gadid, not Hake	Gadidae	41
Gadid	Gadidae	4
Rockfish sp	*Sebastes* sp.	5,185
Plainfin Midshipman	*Porichthys notatus*	12
Cabezon	*Scorpaenichthys marmoratus*	149
Red Irish lord	*Hemilepidotus hemilepidotus*	118
Irish lord sp.	*Hemilepidotus* sp.	31
Buffalo sculpin	*Enophrys bison*	7

Table 3 continued.

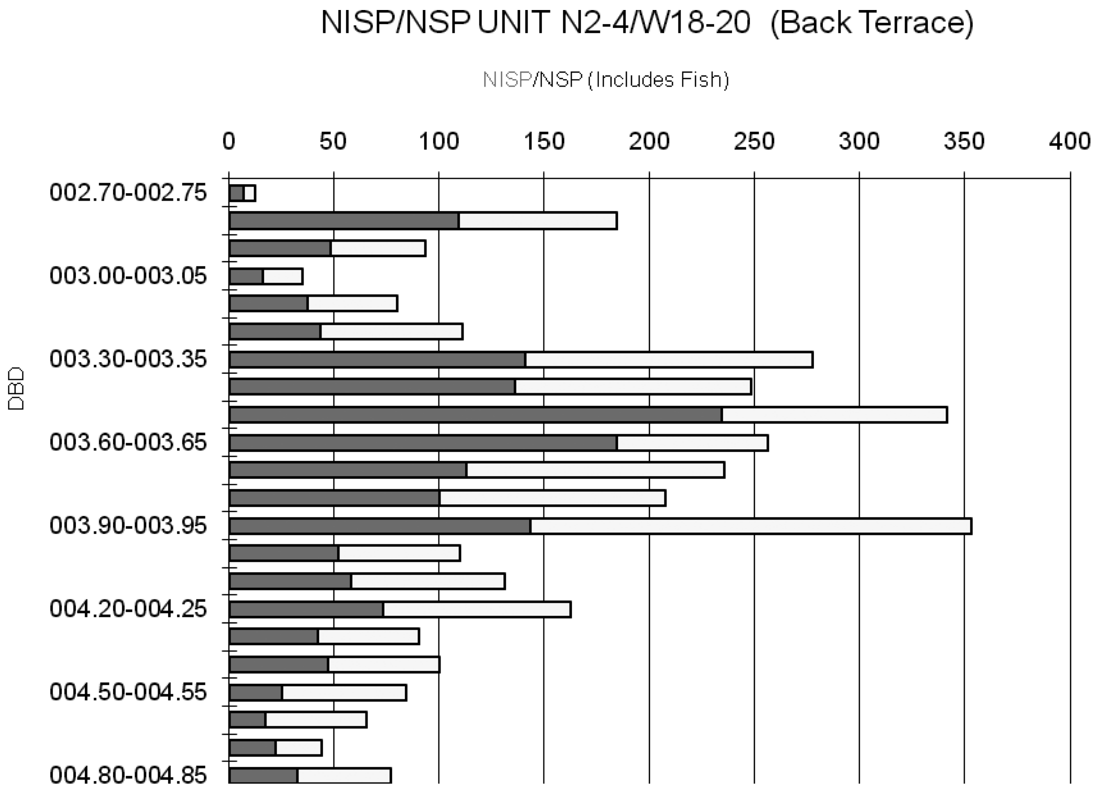
Common Name	Scientific Name	NISP/NSP
Great Sculpin	*Myoxocephalus polyacanthocephalus*	7
Spinyhead Sculpin	*Dasycottus settiger*	2
Sculpin sp.	Cottidae	8
Striped seaperch	*Embiotica lateralis*	74
Pile perch	*Damalichthys vacca*	201
Perch sp.	Embiotocidae	285
Lingcod	*Ophiodon elongates*	504
W-S Greenling	*Hexagrammos stelleri*	4
Rock greenling	*Hexagrammos lagocephalus*	52
Kelp greenling	*Hexagrammos decagrammus*	1,192
Greenling sp.	Hexigrammidae	1,324
Bluefin Tuna	*Thunnus orientalis*	32
Halibut	*Hippoglossus stenolepis*	74
Petrale Sole	*Eopsetta jordani*	1,073
Rock Sole	*Lepidosetts* sp.	18
English sole	*Parophrys vetulus*	1
Sand sole	*Psettichthys melanostictus*	1
Starry flounder	*Platichthys stellatus*	1
Dover sole	*Microstomus pacificus*	1
Pacific sanddab	*Citharichthys sordidus*	3
Flatfish sp.	Pleuronectiformes	264
	Identified Fish NISP	40,146
	Unidentified Fish NSP	25,509
	Total Fish NISP/NSP	**65,655**

Each year's sample contains a few very low frequency species that were not identified in the other year's sample, primarily flatfish, ducks, shorebirds and raptors/owls. The basic patterns otherwise are little changed, except for the overwhelming frequency of hake in one particular 2004 unit.

Discussion

Before looking at the three questions, some general observations are worth making. It is clear that there is generally a much higher concentration of total bone in the levels associated with the house floor surfaces than in the midden levels or in the back terrace units. This can be seen in Figure 5. In some units there is also more unidentified relative to identified bone in these levels, indicating higher fragmentation, something one might expect in house floor deposits. Although the level D.B.D. 3.80–3.85 was chosen to examine in close detail across the 2006 block excavation, as this level is most nearly associated with a series of features including hearth, pit and trench areas (Fig. 4), the actual peak in bone density varies among units depending on the location, from as high as D.B.D. 3.55–3.60 in one unit to as low as D.B.D. 4.10–4.15. The level D.B.D. 4.10–4.15 was used as the final level of the house floor deposits for the 2006 sample. While it is obvious that the division is not exact and there may be some mixing of lower deposits with the house floor deposits, those deposits below 4.15 D.B. are clearly midden not floor deposits. The pattern is not as clear for the 2004 units. One shows a more diffuse concentration between D.B.D. 3.29–3.83 (Unit N2-4/E18-20). Another shows one peak between D.B.D. 3.90–4.05 and a more exaggerated one at level D.B.D. 4.55–4.60 likely related to the frequency of hake remains in the sub-floor midden, while in the third unit the overwhelming concentration of hake between D.B.D 4.50–4.70 masks all other patterns, making the peak at D.B. 3.95–4.00 seem minimal. (Note: Figure 5 bar graphs for units N14-16/E16-18 (2006), N18-20/E34-36 (2006) and N2-4/W18-20 (2006) include NISP/NSP for fish as well as bird and mammal.)

The following paragraphs discuss the 2006 sample and the combined 2004 and 2006 sample in relation to the three questions of interest. In each category of fauna, the data are presented for the 2004 and 2006 full units in one table and the total 2006 sample, including all partial unit samples, in another table.



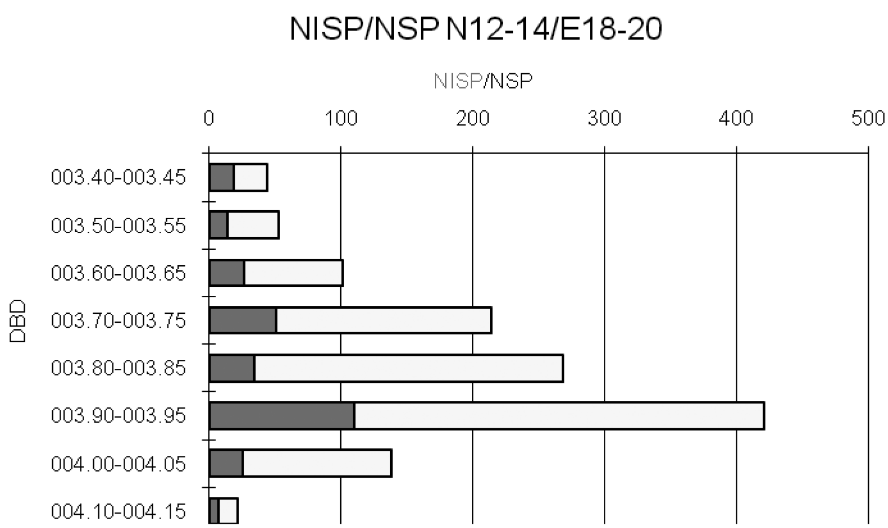
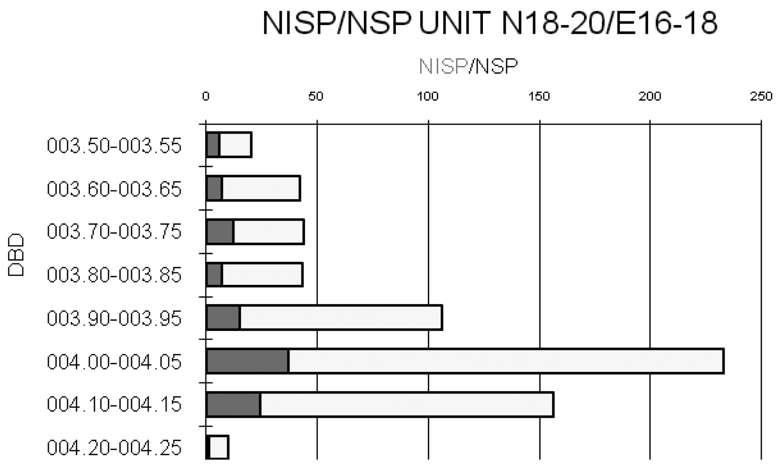
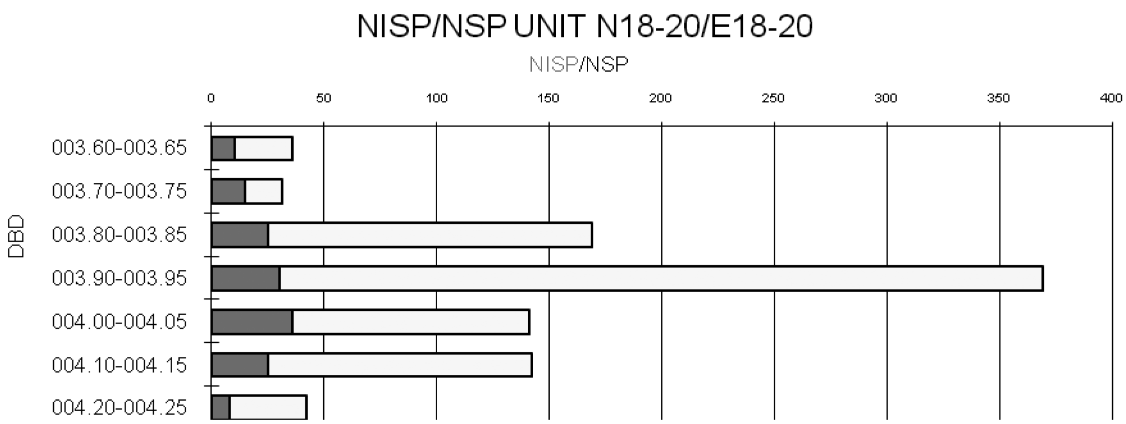


Figure 5. Vertebrate density by level in selected excavation units.





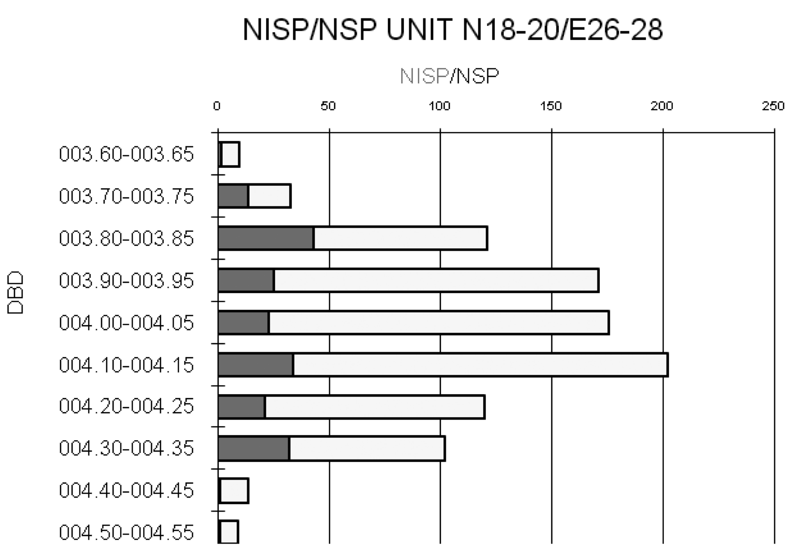
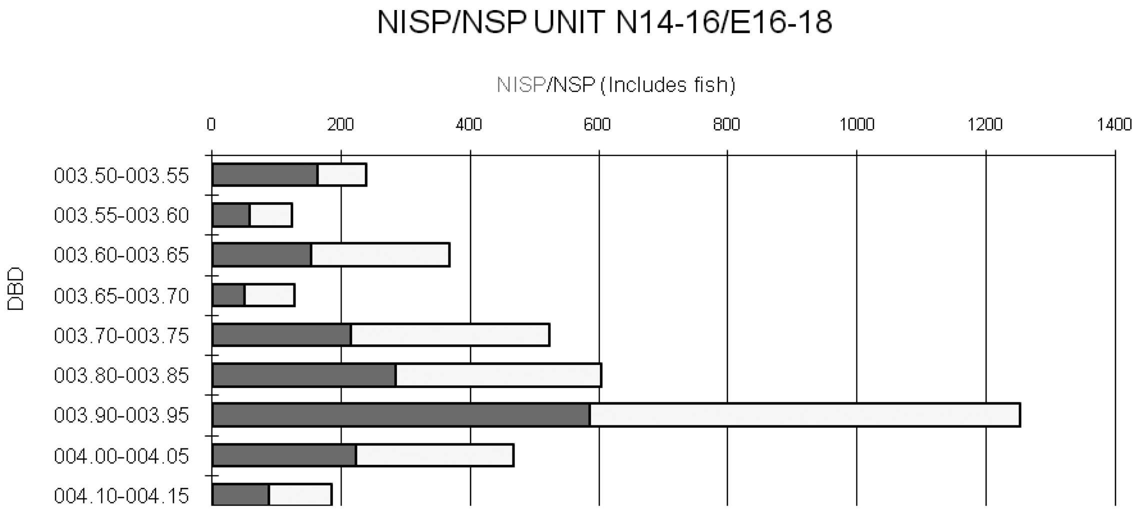
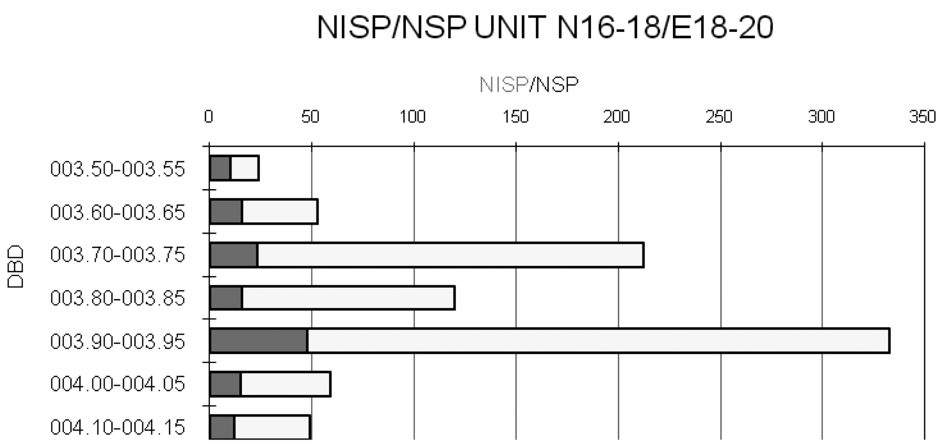


Figure 5 continued.





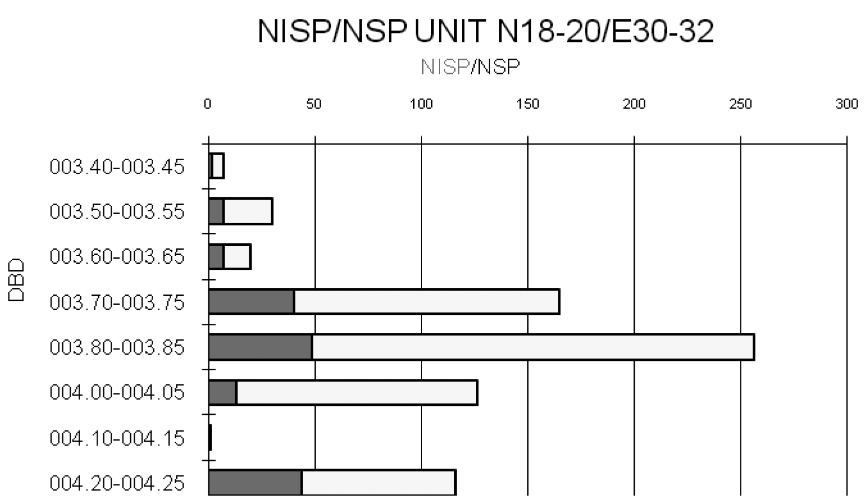


Figure 5 continued.

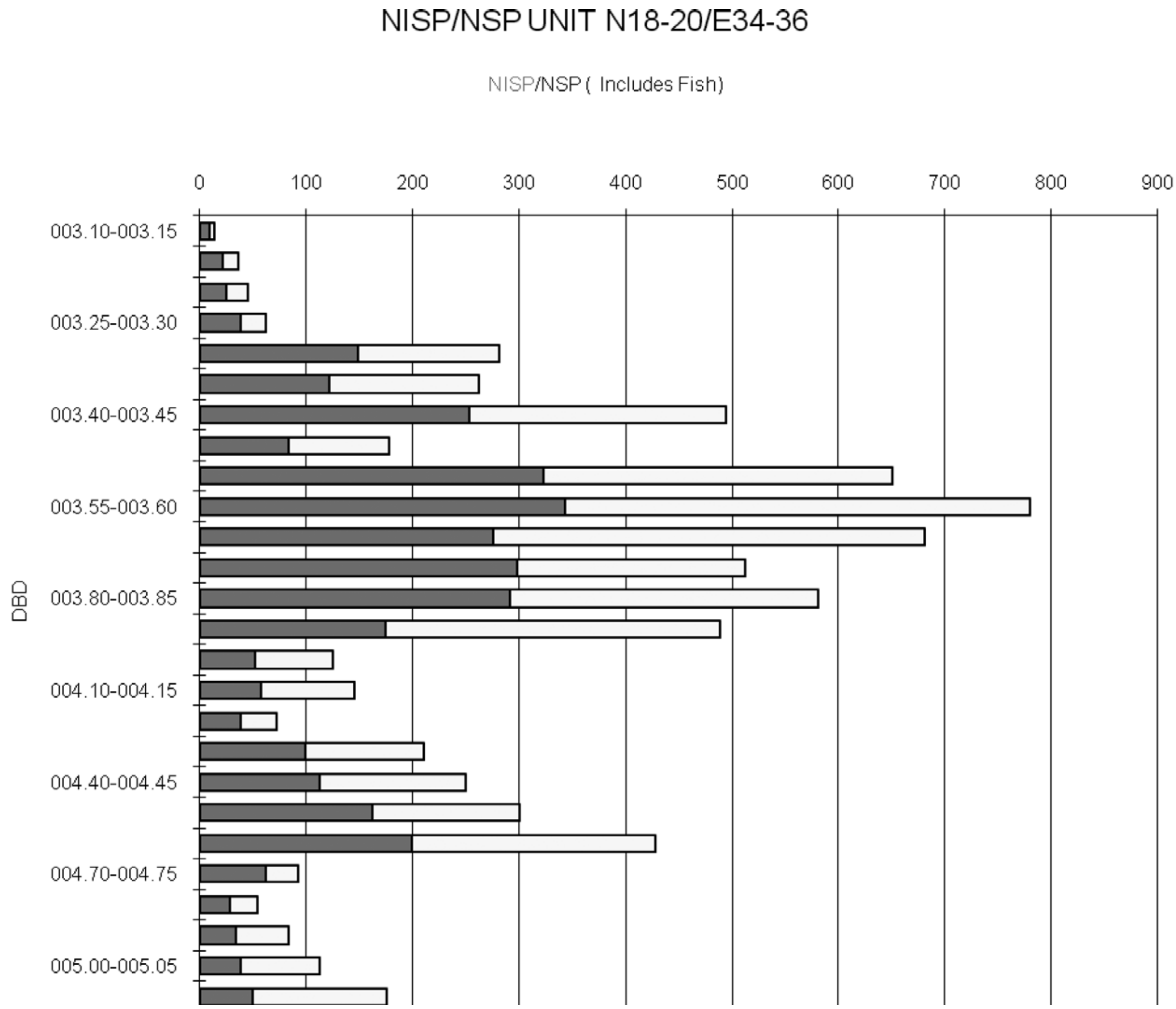


Figure 5 continued.

A. Changes Through Time in Taxa Frequencies

A major finding from the 2004 sample was the difference in taxa frequencies among the back terrace unit, the House 1 floor deposits and the sub-floor midden deposits of the main site area. These differences were especially marked for fish with some differences among mammal and bird frequencies. The increased bird and mammal sample helps to clarify these latter differences while the retrieval of a sub-floor midden sample from the other end of the house clarifies the shifts in fish frequencies. .

To see if the data from the one 2006 house unit taken to sterile deposits, N18-20/E36-38, and the second Back Terrace unit, N2-4 /W18-20, confirm or change the broad patterns observed in the 2004 samples, tables present the 2006 full unit data, and compare and then combine these data with the 2004 sample data. Note that the back terrace sample includes one unit from each year but the 2004 house floor and sub-floor midden sample is from three excavation units, while the 2006 sample is from only one unit. Note also that not every species found in very low frequency was recovered from the full unit samples (e.g., vulture, elephant seal). Tables 4 through 17 present these data.

<u>Land Mammal</u>

While the sample sizes for land mammal are still so small that sample error must be considered a factor in some frequencies, it is interesting to note that the relative frequency of land mammal bone in the back terrace units does seem considerably higher than in the younger deposits.

Three patterns observed in the 2004 samples are supported and strengthened with the addition of the 2006 samples: deer is clearly the most important land mammal in the later deposits and also important in the back terrace deposits; the overwhelming preponderance of mink in the back terrace units compared to a much lower frequency in the younger deposits is confirmed; and there are a greater number of species represented in the house floor deposits relative to the other two stratigraphic divisions. Elk, black bear and marten occur only in these latest deposits. Deer remains are correspondingly relatively less frequent in the house floor deposits. The sub-floor midden deposits are particularly low in land mammal remains. The increased House 1 floor deposit sample from 2006 does not appreciably change the relative importance of the land mammal species (Tables 4 and 5).

Commensal Mammals

The high frequency of dog remains in the Huu7ii site is fully confirmed with the increased sample size. Dogs are by far the most frequently occurring mammal taxon at this site. The 2004 samples suggested a weak association of deer mouse with only the house floor deposits (Table 6). The larger sample does not confirm this association. On the other hand, the 2004 pattern of a higher frequency of dog remains in the house floor deposits relative to the sub-floor midden deposits and the very high frequency of dog remains in the back terrace is confirmed and strengthened. The average number of dog specimens per unit (for the four excavated to sterile deposits) in the sub-floor midden deposits is 20.5 as compared to 29 for the house floor deposits and 113.5 for the back terrace units. While some of this difference might be accounted for by the differing number of levels sampled in the three subdivisions and/or greater fragmentation of bones in some areas, the difference is still marked, given that the back terrace sample comes from only two excavation units while the younger

Table 4. Land mammal fauna, 2004 and 2006 full unit samples.

	2004			2006			Combined 2004/2006		
Taxa	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace
Deer (%)	44	92	34	85	60	43	**59**	**89**	38
Elk (%)	10.5	0	0	3	0	0	8	0	0
Ungulate sp. (%)	4	3	0	0	0	0	2	1	0
River Otter (%)	14	5	0	6	20	8	11	7	3
Mink (%)	14	0	61	0	0	43	9	0	**55**
Marten (%)	10.5	0	0	0	0	0	7	0	0
Raccoon (%)	0	0	2	3	0	3	1	0	2
Black Bear (%)	2	0	0	0	0	0	1	0	0
Wolf (%)	0	0	0	0	0	3	0	0	1
Canid sp. (%)	2	0	1	3	0	0	2	0	1
Beaver (%)	0	0	2	0	20	0	0	2	1
Total %	**101**	**100**	**100**	**100**	**100**	**100**	**100**	**99**	**101**
NISP	**57**	**39**	**64**	**33**	**5**	**37**	**90**	**44**	**101**

Table 5. Land mammal fauna, 2006 total sample.

Taxa	House Floor	Sub-Floor Midden	Back Terrace	NISP
Deer (%)	66	**71**	43	**120**
Elk (%)	7	0	0	**10**
River Otter (%)	**16**	8	8	**27**
Mink (%)	6	0	**43**	**24**
Raccoon (%)	3	0	3	**5**
Black Bear (%)	1	0	0	**1**
Wolf (%)	0	0	3	**1**
Canid (%)	1	0	0	**1**
Beaver (%)	1	**21**	0	**4**
Total %	**101**	**100**	**100**	
NISP	**142**	**14**	**37**	**193**

Table 6. Commensal mammal fauna, 2004 and 2006 full unit samples.

	2004			2006			Combined 2004/2006		
Taxa	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace
Dog (%)	92	100	99	100	94	99	97	96	99
Deer Mouse (%)	8	0	1	0	6	1	3	4	1
Total %	100	100	100	100	100	100	100	100	100
NISP	50	32	113	66	50	111	116	82	224

Table 7. Commensal mammal fauna, 2006 total sample.

Taxa	House Floor	Sub-Floor Midden	Back Terrace	NISP
Dog (%)	100	87	99	583
Deer Mouse (%)	0	13	1	4
Total %	100	100	100	
NISP	442	34	111	587

deposit samples are from four excavation units. The high overall frequency of dog remains in the floor deposits relative to the sub-floor midden deposits in the total 2006 sample (Table 7) also reflects the greater number of house floor levels represented in this sample. All age groups of dogs are present in each of the major stratigraphic units and both small and large dogs are represented in the sample, with small dogs comprising by far the larger proportion, particularly in the back terrace deposits (Frederick et al. 2006).

Sea Mammals

The general pattern of a higher frequency of sea mammal remains associated with the sub-floor midden deposits is confirmed by the additional 2006 full unit sample, but some specific patterns seen in the 2004 sample are not supported (Tables 8, 9, and 10).

The high frequency of fur seal remains in the 2004 back terrace sample is not replicated in the 2006 back terrace sample and while the increase in whale remains from the back terrace through the sub-floor midden to the house floor deposits seen in the 2004 sample is not supported by a similar increase in the 2006 sample, whale remains are more frequent in the more recent deposits than in the back terrace deposits in the combined sample. However the lower frequency of porpoise remains (all species together) in the house floor deposits relative to the sub-floor midden and the back terrace deposits seen in the 2004 sample is supported by both the increased full unit 2006 sample and the total 2006 sample. Additionally, of the specifically identified porpoise and dolphin, the Pacific white-sided dolphin is seen to be more frequent in the back terrace deposits than in the younger deposits (Table 8). Sea otter remains, though not frequent in any stratigraphic unit, are more common in the house floor deposits.

These patterns are more clearly seen in Table 10 which groups taxa to increase individual sample size. It should be remembered that whale bone in particular tends to fragment into many pieces and is therefore clearly over-represented by NISP. Balancing this is the likelihood that very little of a whale skeleton actually ends up in the site. What is clear is the importance of porpoise at this site. In both the midden and the back terrace deposits porpoise as a group is the most frequently occurring sea mammal taxon by NISP, while in the house floor deposits it is either equal to or second in importance to whale remains by NISP. The increased house floor samples (Table 9) do suggest that fur seal may be slightly more frequent in the house floor deposits than is suggested by the full unit samples.

Mammal Age Classes and Body Part Distribution 2006 Sample

When possible, mammal specimens were given an age designation, then grouped into age categories of Adult, Adult/Sub-adult/Older Juvenile, and Juvenile/Young Juvenile/New Born/Foetal. Age class percentages were established for the mammal taxa deer, mink, river otter, dog, northern fur seal, harbor seal, northern sea lion and porpoise as a group. Table 11 presents these data. The patterns found are similar to those observed in the 2004 samples.

It is clear that for deer, mink, river otter, harbor seal and northern sea lion, adult animals were

Table 8. Sea mammal fauna, 2004 and 2006 full unit samples.

	2004			2006			Combined 2004/2006		
Taxa	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace
Sea Otter (%)	4	2	3	16	0	1	**7**	2	2
Northern Sea Lion (%)	8	9	12	8	2	5	8	7	8
Northern Fur Seal (%)	15	15	31	11	3	8	14	12	18
Ottarid (%)	0	0	0	4	1	0	1	<1	0
Harbour Seal (%)	10	6	8	9	8	13	10	6	11
Pinniped (%)	16	7	8	6	1	5	13	5	6
Harbour Porpoise (%)	4	6	5	7	39	3	5	**14**	4
Dall's Porpoise (%)	7	5	3	3	10	2	6	6	2
Pacific W-S Dolphin (%)	3	3	10	4	0	15	3	2	**13**
Porpoise Sp. (%)	9	18	8	10	14	26	9	17	19
Whale Sp. (%)	24	30	12	21	22	21	**23**	**28**	17
Humpback Whale (%)	0	0	0	0	1	0	0	<1	0
Total %	**100**	**101**	**100**	**99**	**101**	**99**	**99**	**100**	**100**
NISP	**192**	**320**	**106**	**89**	**101**	**136**	**281**	**421**	**242**

Table 9. Sea mammal fauna, 2006 total sample.

Taxa	House Floor	Sub-Floor Midden	Back Terrace	NISP
Sea Otter (%)	3	4	1	28
Northern Sea Lion (%)	6	3	5	57
Northern Fur Seal (%)	**20**	10	8	169
Harbour Seal (%)	6	9	**13**	78
Elephant Seal (%)	<1	0	0	1
Ottarid/Pinniped (%)	9	1	5	73
Harbour Porpoise (%)	5	**21**	3	83
Dall's Porpoise (%)	2	6	2	24
Pacific W-S Dolphin (%)	3	2	**15**	45
Porpoise sp. (%)	10	11	26	131
Humpback Whale (%)	<1	<1	0	3
Whale Sp. (%)	**35**	**34**	21	343
Total %	**99**	**101**	**99**	
NISP	**701**	**198**	**136**	**1,035**

Table 10. Sea mammal, grouped taxa, 2004 and 2006 full unit samples.

	2004			2006			Combined 2004/2006		
Taxa	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace
Sea Otter (%)	4	2	3	16	0	1	**7**	2	2
Northern Sea Lion (%)	8	9	12	8	2	5	8	7	8
Northern Fur Seal (%)	15	15	31	11	3	8	14	12	18
Harbour Seal (%)	10	6	8	9	8	13	10	6	11
Pinniped/Ottarid (%)	16	7	8	10	2	5	14	5	6
Porpoise Sp. (%)	23	32	26	24	63	46	23	**39**	**38**
Whale Sp.	24	30	12	21	23	21	**23**	**28**	17
Total %	**100**	**101**	**100**	**99**	**101**	**99**	**99**	**99**	**100**
NISP	**192**	**320**	**106**	**89**	**101**	**136**	**281**	**421**	**242**

Table 11. Age classes, selected mammal taxa, 2006 sample.

Taxa	Age Class			Total %	NISP
	Adult (%)	Adult/Subadult/ Older Juvenile (%)	Juvenile/Young Juvenile/ New Born/Foetal (%)		
Deer	**75**	13	12	100	107
Mink	**100**	0	0	100	23
River Otter	**90**	3	7	100	29
Dog	40	18	42	100	543
Northern Fur Seal	39	31	31	101	154
Harbour Seal	**69**	10	20	99	74
Northern Sea Lion	**75**	25	0	100	54
Porpoise	35	55	10	100	239

targeted. For the deer, this would maximize both meat and raw materials, while for both river otter and mink it would provide the best pelts. Similarly, for harbor seal and northern sea lion, adult animals provide the most return for effort in terms of both meat, and hides and bone for manufactures.

For harbor seals, there are no newborn animals in the 2006 sample. Young juvenile animals are more common, though still rarer than older animals, in the older deposits than in the house floor deposits. Eleven percent (total NISP 18) of the remains in the back terrace deposits, 29% (total NISP 17) of those in the sub-floor midden deposits, but only 5% (total NISP 39) of the remains in the house floor deposits are classed as young juvenile. As in the 2004 sample, the focus is clearly on the older animals. None of the 2006 sea lion remains are young juveniles and of the older animals assigned to a sex category (NISP 41), only one is female. This strongly suggests that adult male animals are being specifically targeted throughout the time span of the site.

Dog and northern fur seal age class data stand in contrast to this pattern. There are as many puppies as adult dogs in the 2006 sample, indicating a "natural" rather than selected population. As was found in the 2004 sample, juvenile dog remains are particularly frequent in the house floor deposits and the back terrace deposits, with many of those recovered from the house floor deposits in the new born/very young juvenile age range. This suggests a high percentage of young pup deaths.

The fur seal age categories show a differing pattern for a different reason. All three age categories are represented in roughly equal proportions. The youngest age category includes 29 specimens from unweaned rookery animals. This could only happen if the people were exploiting breeding rookeries and taking unweaned juvenile animals (up to four months old) from the rookeries as well as adult animals. Juvenile but weaned animals of four to six months of age would also be found in the general vicinity of a breeding rookery. The pattern of breeding rookery exploitation is strengthened by the presence in the sample of a small number (NISP 5) of adult male fur seal specimens, while most of the adult animal specimens (NISP 50) are female. (Not all adult specimens presented clear evidence of sex.) Rookery age fur seal pups were found in all areas of the site, but the percentage of rookery age to older animals is greater in the younger part of the site, increasing from 8% (total NISP 13) in the back terrace deposits, to 16% (total NISP 19) in the sub-floor midden deposits and 20% (total NISP 122) in 2006 house floor deposits.

The pattern for porpoise is less clear, partly because of the difficulty of distinguishing between adult and sub-adult (i.e., mature and immature) animals, as epiphyseal fusion is delayed in these sea mammals. What is clear is that adult or sub-adult/older juvenile animals, not young juveniles are represented disproportionately in the 2006 sample.

The same taxa were examined for patterns of body part distribution. Table 12 presents these data. The pattern for deer is strongly biased towards limb bones. This could be a result of the whole carcass not being brought back to the site or the curation of long bone elements for manufactures or a combination of the two factors. The relatively even split between the three categories for both dog and fur seal again suggests a similarity but for different reasons. Puppies and dogs appear not to be food animals nor do their bones appear to be favoured for manufactures, resulting in the deposition of more or less complete skeletons. Very juvenile fur seal remains are also unlikely to provide good bone material for manufactures and the skeleton of the female fur seal is gracile, also providing little in the way of strong useful bone for manufactures. All aspects of the skeleton are therefore as likely to end up in the

Table 12. Body part distribution, selected mammal taxa, 2006 sample.

Taxa	Body Part			Total %	NISP
	Skull and Mandible	Axial Skeleton	Limbs		
Deer (%)	5	9	**86**	100	111
Mink (%)	22	**70**	9	101	23
River Otter (%)	14	34	52	100	29
Dog (%)	39	26	35	100	493
Northern Fur Seal (%)	24	32	44	100	154
Harbour Seal (%)	21	31	48	100	75
Northern Sea Lion (%)	11	26	**63**	100	54
Porpoise (%)	18	**80**	2	100	261

deposits. Harbour seal skeletal elements also follow this pattern and again, few if any harbour seal bones seem to have been chosen as artifactual material. The skeleton of a large male northern sea lion on the other hand does provide good strong material for manufactures and this may be reflected in the high proportion of sea lion limb bone specimens in the sample, although the 2004 sample did not show this pattern. The strong emphasis on axial skeleton remains in the porpoise sample is partly a reflection of the greater number of vertebrae and the lack of rear limb elements in this taxon, but also reflects the presence in the site of a number of sections of aligned vertebrae likely representing segments still articulated by the tough horizontal ligaments between vertebrae when deposited. Some of these sections exhibit evidence of tooth punctures, suggesting they were fed to the dogs. Porpoise in the 2004 sample display the same pattern.

Birds

Generally, the marked increase in bird remains seen in the house floor deposits in the 2004 sample is supported by the 2006 additional sample, the back terrace deposits being particularly low in bird remains (Tables 13 and 14).

The small sample sizes for birds, as for the land mammals, urge caution in interpretations of the frequency changes observed for individual species, so taxa have been grouped. Even then, sample sizes are still small, likely affecting patterns seen. Ducks, for example, in the 2004 sample decrease through time in importance, while in the 2006 sample they increase through time. A few patterns do seem supported. A range of ducks was taken, both dabbling and diving species, with the emphasis on the latter. Ducks and geese are emphasized more in the back terrace deposits than they are in the younger deposits. In the younger midden and house floor deposits

Table 13. Bird fauna, 2004 and 2006 full unit samples.

Taxa	2004			2006			Combined 2004/2006		
	House Floor	Sub-Floor Midden	Back Terrace	House Floor	Sub-Floor Midden	Back Terrace	House Floor	Sub-Floor Midden	Back Terrace
Goose (%)	2	6	14	4	0	0	3	5	**11**
Duck (%)	13	8	28	18	12	0	15	9	**21**
Loon (%)	9	8	0	14	6	0	**11**	8	0
Grebe (%)	2	6	0	1	0	0	2	5	0
Cormorant (%)	6	21	4	8	19	0	6	**20**	3
Alcids (%)	17	7	7	9	25	0	**14**	10	5
Albatross (%)	4	4	11	0	6	0	3	5	**8**
Shearwater Petrel Fulmar (%)	13	4	0	21	0	0	**16**	3	0
Gull Kittiwake (%)	25	15	7	15	25	10	**22**	**17**	8
Eagle Hawk Osprey (%)	2	6	18	0	6	10	2	6	**16**
Crow Raven (%)	<1	14	4	5	0	80	2	11	**24**
Owl (%)	3	0	0	0	0	0	2	0	0
Shorebird Heron (%)	1	1	4	1	1	0	1	1	3
Small Forest Bird (%)	2	0	4	5	0	0	3	0	3
Total %	**99**	**100**	**101**	**101**	**100**	**100**	**101**	**100**	**102**
NISP	**215**	**72**	**28**	**114**	**16**	**10**	**329**	**88**	**38**

Table 14. Bird fauna, 2006 total sample.

Taxa	House Floor	Sub-Floor Midden	Back Terrace	NISP
Goose (%)	6	4	0	**28**
Duck (%)	11	16	0	**56**
Loon (%)	8	8	0	**42**
Grebe (%)	3	0	0	**12**
Cormorant (%)	10	12	0	**52**
Alcid (%)	19	16	0	**92**
Albatross (%)	3	8	0	**18**
Shearwater/Petral/Fulmar (%)	**11**	4	0	**51**
Gull/Kittiwake (%)	17	**20**	10	**80**
Eagle/Hawk/Osprey (%)	3	4	10	**18**
Crow/Raven (%)	5	8	**80**	**35**
Shorebird/Heron (%)	2	0	0	**6**
Small Forest Bird (%)	3	0	0	**12**
Total %	**101**	**100**	**100**	
NISP	**473**	**25**	**10**	**508**

the focus clearly shifts to sea birds, especially loons, grebes, alcids, shearwaters and gulls. These species all increase in frequency in the younger deposits while eagles, hawks, ospreys, and particularly crows are considerably more frequent in the back terrace deposits. Shearwaters do not occur in the back terrace deposits, although albatross bones are more common in these earlier deposits than in the later ones.

Grouping taxa into larger aggregates helps clarify some possible patterns although it is important to remember that the apparent patterns for the back terrace deposits may be more a function of sample size than cultural selection, as only 38 identified bird bones were recovered from these two units (Table 15).

The focus on ducks and geese (32%) and a range of "forest" birds (42%) is marked for the back terrace deposits. It is possible that if this area of the site was more seasonally occupied, the crow, eagle and songbird remains could represent residents rather than exploited resources, and this might also account for their remains in the younger deposits. Ignoring this part of the sample, there is still a marked shift to exploitation of marine and foreshore birds, especially in the off-shore marine category, in the younger deposits. In the subfloor midden they form 69% of the sample, in the house floor deposits, 74% as opposed to only 27% in the back terrace deposits. The pattern of increase through time is most marked for loons, alcids and shearwaters. The range of species exploited suggests also a range of uses, from food to primarily bone or feathers for manufactures.

Table 15. Bird fauna, grouped taxa, 2004 and 2006 full units.

	2004			2006			Combined 2004/2006		
Taxa	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace
Ducks, Geese (%)	15	14	42	22	12	0	18	14	**32**
Loons, Grebes, Cormorants, Alcids (%)	34	42	11	32	50	0	33	**43**	8
Albatross, Shearwater etc. (%)	17	8	11	21	6	0	**19**	8	8
Gull, Kittiwake, Shorebirds (%)	26	16	11	16	26	10	**22**	**18**	11
Eagle etc/Owl, Crow/Raven, Small Forest Birds (%)	7	20	26	10	6	90	9	17	**42**
Total %	**99**	**100**	**101**	**101**	**100**	**100**	**101**	**100**	**101**
NISP	**215**	**72**	**28**	**114**	**16**	**10**	**329**	**88**	**38**

Fish

In analyzing the fish remains, the data for the sub-floor midden deposits in the 2004 units have again been presented with a choice of percentages, the one in brackets excluding the major dump of more than 12,000 hake bones in three levels of unit N18-20/E6-8. This extremely high frequency of hake is not repeated in any of the other units taken to basal sterile deposits and it is best seen as an anomaly rather than representative of the site pattern. The addition of the 2006 full unit sample fully supports the late shift to a strong focus on salmon supplemented to a lesser degree with rockfish, greenling and herring. One must keep in mind that herring and anchovy definitely and likely also small greenling, are very underrepresented in the level samples. Still, this affects all areas excavated equally and therefore should not affect the relative proportions of other taxa to each other. Salmon make up fully 68% of the combined full unit House Floor sample while they are merely 1% (2%) in the sub-floor midden combined sample (Table 16).

In the 2006 sample, where hake are present at a frequency of only 5% as opposed to the 78% (40%) of the 2004 sample, rockfish, greenling and flatfish, especially Petrale sole, are the most frequently occurring taxa in the subfloor midden. The low frequency of hake in this one 2006 full unit is a bit misleading, as if one includes in the calculations all the 2006 partially excavated units, including the few levels in this area excavated deeper than D.B.D. 4.15, hake is seen to form 32% of the sub-floor midden sample and 16% of the house floor sample (Table 17). Regardless of the "correct" percentage, the more complete sample still shows a marked focus in the sub-floor midden deposits on hake, accompanied by a strong emphasis on rockfish (26%) and both greenling and flatfish.

Table 16. Fish fauna, 2004 and 2006 full unit samples.

Taxa	2004			2006			Combined 2004/2006		
	House Floor	SubFloor Midden*	Back Terrace	House Floor	SubFloor Midden	Back Terrace	House Floor	SubFloor Midden	Back Terrace
Dogfish (%)	2	5 (14)	10	2	3	11	2	5 (13)	**11**
Ratfish (%)	1	1 (2)	6	<1	4	4	1	1 (2)	5
Hake (%)	2	78 (40)	<1	1	5	<1	2	**75 (37)**	<1
Flatfish (%)	1	3 (7)	2	1	17	3	1	**3 (8)**	2
Herring (%)	7	1 (2)	1	3	5	9	6	1 (2)	5
Salmon (%)	67	1	10	71	5	17	**68**	1 (2)	13
Sculpin (%)	1	<1 (1)	1	3	1	3	1	1 (1)	2
Perch(%)	1	<1 (1)	13	1	3	3	1	1 (1)	**8**
Lingcod (%)	2	<1 (1)	5	3	1	2	2	<1 (1)	**4**
Greenling (%)	9	2 (5)	15	10	17	27	9	2 (6)	**21**
Rockfish (%)	6	9 (2)	37	5	37	19	6	**10 (26)**	**27**
Other** (%)	1	1 (2)	<1	<1	<1	<1	1	1 (2)	<1
Total %	**100**	**101**	**100**	**100**	**99**	**99**	**100**	**101**	**99**
NISP	**6,500**	**19,889 (7,343)**	**1,353**	**2,194**	**671**	**1,388**	**8,694**	**20,560 (8,014)**	**2,741**

* Percentages and NISP in brackets exclude the thousands of hake bones in three levels of unit N18-20/E6-8.

** Other includes Bluefin Tuna, Pacific Cod, Pollock, Gadid, Skate, Plainfin Midshipman, Sevengill Shark, Sablefish, Anchovy.

Table 17. Fish fauna, 2006 total sample.

Taxa	House Floor	Sub-Floor Midden	Back Terrace	NISP
Dogfish (%)	9	2	**13**	1,100
Ratfish (%)	2	3	4	246
Hake (%)	16	**32**	1	1,932
Flatfish (%)	6	**12**	3	800
Herring (%)	2	4	9	407
Salmon (%)	**30**	3	17	3,230
Sculpin (%)	1	1	3	184
Perch (%)	2	3	3	268
Lingcod (%)	2	<1	2	226
Greenling (%)	8	13	**27**	1,403
Rockfish (%)	19	**26**	19	2,450
Other (%)	2	<1	<1	178
Total %	**99**	**99**	**101**	
NISP	**9,976**	**1,063**	**1,388**	**12,426**

The marked shift to salmon in the house floor levels is maintained in the full unit 2006 sample but is not as marked in the full 2006 sample (30%). Salmon are supplemented by the lesser focus on greenling and rockfish. In the total 2006 sample there is also a slightly higher percentage of dogfish and hake in the house floor levels. It is possible that this represents also some mixing of the lower deposits.

In the back terrace units, the 2004 and 2006 full unit samples generally agree well (Table 15). Greenling and rockfish are the principal taxa with slightly lesser amounts of salmon, dogfish and perch. Again, it is well to keep in mind that herring are definitely strongly underrepresented in the level samples, as is clearly shown in the 2004 column samples.

The taxa represented by the category "Other" are not present in sufficient quantities to provide reliable patterning. It is, however, worth noting that Pacific cod, bluefin tuna, gadid, plainfin midshipman, skate and anchovy occur in all three stratigraphic subdivisions and pollock in both house floor and sub-floor midden, while a single tooth of sevengill shark comes from the house floor and a single bone of sablefish from the sub-floor midden.

Within the category flatfish, the Petrale sole is the most frequently occurring species and halibut is found in low frequencies in each of the three stratigraphic divisions. Among the sculpins, cabezon and red Irish lord are the most frequently occurring species, among the perch, pile perch and among the greenlings, kelp greenling.

Looking at the overall picture presented by the differing samples, it is clear that in both the back terrace deposits and the sub-floor midden deposits, there is a more broad scale exploitation of near shore fish resources while in the later house floor deposits there is a much more concentrated focus on salmon although other taxa are still exploited in considerable numbers.

Season Markers

Establishing season of occupation for each of the three stratigraphic units at Huu7ii is difficult, but a small number of species with restricted seasonal availability in Barkley Sound and/or clear birthing patterns can be used as markers for season of capture and by extension season of occupation, keeping in mind the potential influence of preservation technology. Seasonality data is from Frederick and Crockford 2005 and Campbell et al. 1997.

Northern fur seals clearly maintained breeding rookeries in the Barkley Sound area in previous times. Northern fur seals pup are today born in June and July, are weaned at about four months and until six months of age remain in the vicinity of the breeding rookeries. Today's rookeries are all north of the Aleutian Islands, except for a small rookery re-established in the 1960s on San Miguel Island off California. Outside the breeding season, fur seals are pelagic, staying well off-shore in the Pacific from the Aleutian Islands to California. It is possible that the more southerly rookeries could have had a slightly earlier birthing period. Recent isotopic data suggest that the northwest populations in the past may have had a longer nursing period and the recently weaned pups fed in the offshore vicinity of the rookeries (Newsome et al.

2007). Nursing pups younger than four months clearly mark a summer season of exploitation, young weaned juveniles a late summer early fall season. The Barkley Sound area would also have had access to the migratory females and older juveniles heading north in the spring to breed on the Pribilof Islands. During the winter and early spring season fur seals today range well off shore, returning to near shore waters around Barkley Sound in April on their way to the northern breeding rookeries. Migratory adult animals and older juveniles, then, would be available late spring through early fall. The presence of very young harbor seals and northern sea lions can also be used to mark the summer season.

While the spring northward migratory movement of the grey whale along the west coast of Vancouver Island is well established, and DNA analysis confirms the presence of this species in the Huu7ii faunal assemblage, some grey whales are recorded off the Barkley Sound area well outside this season. Additionally, the vast majority of the whale bones identified using DNA are in fact humpback whale, a species formerly with a resident population in Barkley Sound.

Among the birds, shearwaters, albatross, turkey vulture, sharp-shinned hawk, bufflehead duck, white-fronted goose, and snow goose are the most useful season markers for the Barkley Sound area. Shearwaters are common off the west coast of Vancouver Island from March through November, with the peak period of abundance May through October. They are absent December through February. Short-tailed Albatross are only present in the Barkley Sound area in the summer months, remaining offshore. The turkey vulture is present mid spring through fall with a well established migratory pattern, gathering in large concentrations to head south in the fall. They are not present on Vancouver Island during the winter months. Bufflehead ducks do not breed in the Barkley sound area but are present there in the winter. The sharpshinned hawk, snow goose and white-fronted goose are fall and spring migrants through the Barkley Sound area.

A number of fish species are also season markers. While some salmon are available year around, the numbers are greatly increased during the late summer through fall spawning season. While there are no sizable streams or rivers on Diana Island, pinks, chum and coho heading for streams draining into Alberni Inlet would be passing by the island in large numbers between August and January. These fish could be taken in marine waters on their way to the spawning grounds, although the site residents may also in later times have had access to a wider territory, including the lower Alberni Inlet region. It is possible that the salmon remains in the Huu7ii site represent dried/smoked fish caught elsewhere and preserved for winter consumption. This interpretation is suggested by the high proportion of vertebral elements to cranial elements in the faunal remains from the site (Frederick et al. 2006). An abundance of salmon remains, then, likely represents the period from late summer through winter.

Herring are also available in Barkley Sound for much of the year, but they are much more abundant from late September through May, with a period of peak abundance close in shore during the February through May spawning season. They too were smoked for later consumption by more recent populations and likely this is a long established pattern. However, their peak availability for capture is certainly spring.

Several species of marine fish recorded in the Huu7ii fauna are only available off the west coast of Vancouver Island during the late spring and summer months. These include hake, anchovy, Pacific sardine (found in the 2004 column samples) and bluefin tuna. The presence of these species is directly related to a complex interplay of environmental circumstances, including the El Nino-Southern Oscillation cycles, resulting in fluctuations in ocean temperatures. These species are good summer season markers.

Summary Discussion of Changes Through Time

The more than 80,000 faunal specimens analyzed from the Huu7ii Village site level samples present a clear picture of a marine focused subsistence pattern, but one which also changed through time. The addition of the 2006 level sample basically confirms the major patterns established in the 2004 sample (Frederick et al. 2006) and clarifies some questions arising from the 2004 results. In general, the fishing activities become more focused and less broadscale through time, while the opposite is so for bird and mammal remains. The most significant shifts through time are summarized briefly.

Back Terrace (5000–3000 BP)

The fauna indicate a broadscale exploitation of local resources. Fish remains are of primarily inshore fish species, most importantly herring, (based on 2004 column data), then rockfish and greenling, with lesser amounts of salmon, perch and dogfish. Deer is the most important land mammal, with many mink bones also present. There is at present no clear explanation for this high frequency of mink in the older deposits. Dog remains are particularly frequent in these deposits and include a high proportion of small dogs. Sea mammals, especially porpoise/dolphin, then whale and fur seal, with lesser amounts of sea lion and harbor seal, are more frequently occurring than the land mammals, confirming the marine focus of the economy. Bird remains are few, those present being primarily ducks, geese, and forest/forest edge birds, although albatross is represented. The land mammal and most bird and fish remains suggest an inshore focus to the exploitation activities. The focus on white-sided dolphin and whale, however, together with the presence of a few albatross and bluefin tuna bones, clearly indicates the offshore maritime capabilities of the site occupants.

Season of occupation would seem to be broad. The albatross, very young fur seal pups, anchovy (2004 column data), hake and blue-fin tuna clearly mark a summer presence. The focus on geese suggests the fall and spring migratory seasons, spring also being marked by the frequency of herring remains. Salmon remains suggest a fall and possibly winter occupation.

<u>Midden Deposits Below House 1 Floor (c. 1500–800 BP)</u>

The major focus of subsistence activities remains marine inshore fish in these deposits. There is a shift, however, to a greater focus on hake, along with rockfish, flatfish and dogfish. Herring and anchovy remain important (2004 column sample data). While the focus on hake is less marked in the enlarged sample, clearly showing that the "dump" in the one 2004 unit is an anomaly rather than a site wide pattern, hake still figures strongly in the combined data even when this anomaly is removed from consideration. Salmon are less commonly occurring than in the back terrace deposits. As suggested in the 2006 report, hake and anchovy increase in frequency in the upper levels of this stratigraphic unit, suggesting that a period of oceanic conditions more favourable to these species occurred just prior to 800 BP

There are fewer land mammal remains in the sub-floor midden deposits than in either of the other two stratigraphic units. In terms of relative frequency of land mammals, deer are even more frequently occurring than in the back terrace deposits, with few other land mammal species present. Dog remains are still frequent, though less numerous than in the back terrace deposits. The frequency of sea mammal remains increases in the sub-floor midden deposits. Among the sea mammals, there is a considerable increase in whale remains, even though porpoise/dolphin species are still the most frequently occurring sea mammal taxon. Within porpoise/dolphins, there is a shift in focus from the white-sided dolphin to the harbor porpoise. Fur seals and harbor seals decrease slightly in frequency while sea otter and northern sea lion occur in much the same frequency as in the older deposits.

A wide range of bird species was being utilized and the overall quantity of bird remains increased. The more marine focus is also seen here, with cormorants, loons, gulls, and alcids now far more frequently occurring than ducks and geese or forest/forest edge birds. Both albatross and shearwaters are present, also suggesting a more off-shore focus.

As with the back terrace deposits, spring through fall seasons of exploitation are represented but the summer season is more strongly marked. The very young fur seal pups, albatross, hake, bluefin tuna and anchovy are joined by turkey vulture and shearwaters. Of particular importance is the increased frequency of occurrence of hake, strongly marking this season. Herring remain important, marking the spring season. The relative decrease in salmon remains may suggest less winter occupation, if these are preserved fish.

Altogether, there is a suggestion that these deposits are perhaps more strongly focused towards off-shore resources and the summer season.

<u>House 1 Floor Deposits (c. 800–400 BP)</u>

The greatest changes in faunal taxa and frequencies occur with the shift from the sub-floor midden deposits to House 1 floor deposits. Land mammal remains are still not frequent overall, but in these deposits there is a decreased focus on deer, with three taxa present, in very low frequencies, that are not found in either of the other two stratigraphic units: elk, marten and black bear. Although marten and black bear could be found on Diana Island, they and definitely elk are more likely to have been procured on the larger Vancouver Island perhaps representing access to a wider territory of exploitation or increased trade/kin connections. River otter and mink are also more frequent in the house floor deposits than in the midden deposits. Dogs remain important in these deposits, but the proportion of the sample that is young or very young puppies is substantially greater than in the other deposits.

Among sea mammals, whale continues to be important as do porpoise/dolphin species, but the latter are decreased in frequency from the midden deposits. There is a slight increase in the focus on fur seal and harbor seal. The most marked change, however, is a considerable increase in frequency of sea otter remains relative to their presence in older deposits, although they are still few in actual numbers. There is also a decrease in the actual frequency of sea mammal remains from the midden deposits (combined 2004/2006 full unit sample NISP 421) to the house floor deposits (combined 2004/2006 full unit sample NISP 281). This might simply represent patterns of disposal of remains related to an inside the house/outside the house context, or represent a real decrease in exploitation.

Among the bird taxa, the shifting focus to more marine birds is strengthened, with shearwaters, alcids, and loons all increasing in frequency. Also apparent is a marked increase in the actual frequency of bird remains in these deposits, with a NSIP of 329 for the combined 2004/2006 full unit sample compared to that of 88 for the midden deposits and only 38 for the back terrace deposits. While the latter figure is impacted by the fact that only two units are represented by this sample, the subfloor midden sample comes from the same number of units and a greater depth of deposit than the house floor sample.

It is with the fish, however, that we see the most marked changes. Fully 68% of the House 1 floor fish remains (combined 2004/2006 full unit sample) are salmon, a huge increase in frequency from earlier deposits, even though the actual number of fish remains differs little between the midden deposits (excluding the anomalous "dump" of hake) and the house floor deposits (Table 16). There is a corresponding decrease in the relative frequency of nearly all other taxa, although greenling and rockfish are still quite important. Anchovy (2004 column data) and hake in particular are decreased in abundance relative to the older midden deposits. Herring remains important (based on the 2004 column sample data). Shifts of this magnitude suggest a major change in taxa exploited, in access to those taxa, a change in season of occupation, or some combination of these factors.

Given the absence on Diana Island of a major salmon spawning stream, an increase of such size does suggest access, either direct or through trade or kin links, to a wider territory of exploitation, one including a major salmon spawning stream or streams. It may also reflect a longer period of winter occupancy, if the salmon remains represent preserved fish. The preponderance of vertebral relative to cranial elements in the salmon sample does suggest that these may be preserved fish remains (Frederick et al. 2006). The marked decrease in both hake and anchovy may also argue for a less intensive occupation during the summer months, but the presence still of albatross, shearwaters, bluefin tuna, unweaned fur seal pups and some hake and anchovy clearly indicates some summer occupation. The occurrence of migratory ducks and geese and the continued importance of herring mark the shouder seasons. It is also possible that the increase in salmon remains and decrease in hake and anchovy reflects a change in availability related to ecological rather than socio-cultural factors. The possibility of such regional shifts in availability related to complex oceanic and climatic variables has yet to be fully explored.

The shifts in mammal taxa combined with the marked focus on salmon in the house floor deposits may also reflect the imprint of a fully realized ranked social system associated with ownership of access to resources and the accumulation of surplus. The increased sea otter and the land mammal taxa found in these deposits but not in earlier ones, elk, black bear and marten, might be considered species associated with the elite, either as preferential food or associated with elite accoutrements. Again, caution is urged in this interpretation as the land mammal samples are small and there is a strong correlation between size of sample and number of species represented.

All these potential explanations of the patterns observed need to be analyzed within a regional context, both that of Barkley Sound as a cultural and ecological area, and the wider context of the west coast of Vancouver Island.

B. Horizontal Patterning of Fauna within 2006 House 1 Floor Deposits

A major question is whether or not there are distinctive and meaningful differences in the horizontal distribution of the fauna within House 1 which might be used to identify activity areas and/or ranked family areas. To examine this question the relative frequencies by NISP of bird and mammal remains from selected levels of nine 2006 excavation units, down to 4.15 D.B.D., are presented in Tables 18 to 27.

Bird, mammal and fish NISP/NSP from the single level 3.80–3.85 D.B.D. are presented following each full house floor deposit table. The sample sizes for bird and mammal from this single level are often very small, making interpretation difficult, but these more specific data do help to clarify some of the patterns seen in the larger sample.

Figures 6 through 10 also present the actual number of bird and mammal remains in each unit sample of house floor to 4.15 D.B.D, including both specifically identified and unidentified remains. In interpreting these figures one needs to remember that the sample from unit N18-20/E34-36 represents a greater volume of deposit, 16 levels rather than the 6 to 9 levels of the other units, because these deposits begin at 3.10 D.B.D. rather than between 3.40 and 3.60 D.B.D. This presumably represents the buildup at the edge of the house depression.

Major Category Patterns

Looking first at the actual number of all bird and mammal remains recovered from the House 1 floor deposits in these units (Fig. 6), it is apparent that despite the greater depth of deposit in unit N18-20/E34-36, it is unit N12-14/E18-20 on the southern periphery of the house floor that produced the greatest number of bird and mammal remains. Unit N16-18/E18-20 located towards the center of the house floor produced the next highest frequency, then units N18-20/E18-20 and N18-20/E34-36. The concentration in N12-14/E18-20 is produced by land mammal, dog and sea mammal remains, but not bird remains. N18-20/E34-36 has greater concentrations of land mammal, dog and bird remains, while the concentration in unit N16-18/E18-20 is the result of a concentration of sea mammal remains (Figs. 7–10).

Patterning that takes into account the discrepancy in volume of deposit represented and is perhaps more meaningful, is presented in Tables 18–27. Percents in *italics* are the proportion of the taxon NISP in that unit. Percents **not in italics** are the proportion of the unit total represented by the taxon. Note that the higher numbers for unit N18-20/E34-36 result partially from the greater number of levels identified for this unit. Cells with an dark shaded background are those with higher than expected frequencies of that taxon, given both the overall frequency of the taxon and the proportion of the total sample in that particular excavation unit. Those cells with a lightly shaded background have lower than expected frequencies. The relative frequencies of taxa with a very low NISP are not considered in this patterning as the sample size effect is too great.

Looking at the distribution of the major categories including both specifically identified bone and bone only identified to major category (Table 18) it is clear that two units contain a disproportionate amount of the total identified bird and mammal bone sample, N12-14/E18-20 and N18-20/E34-36. Both these units are at the peripheries of the house depression (Fig. 3) and may in fact contain some midden ridge deposits from outside the house. The higher proportion of identified relative to total bone in these units may also partly result from the frequency of dog remains in these units. The greater amount of bone from unit N18-20/E34-36 also results from the greater number of levels identified for this unit, twice the number of levels as for any other unit. This makes the concentration in unit N12-14/E18-20 even more anomalous, especially as this unit also contains considerable disturbance from features. Units N16-18/E18-20 and N18-20/E18-20 also contain higher concentrations of bone, and are positioned just to the east of several hearth features in the contiguous central units (Fig. 4).

It is apparent that there is a higher than expected proportion of commensal mammals in unit N12-14/E18-20, a slightly higher than expected

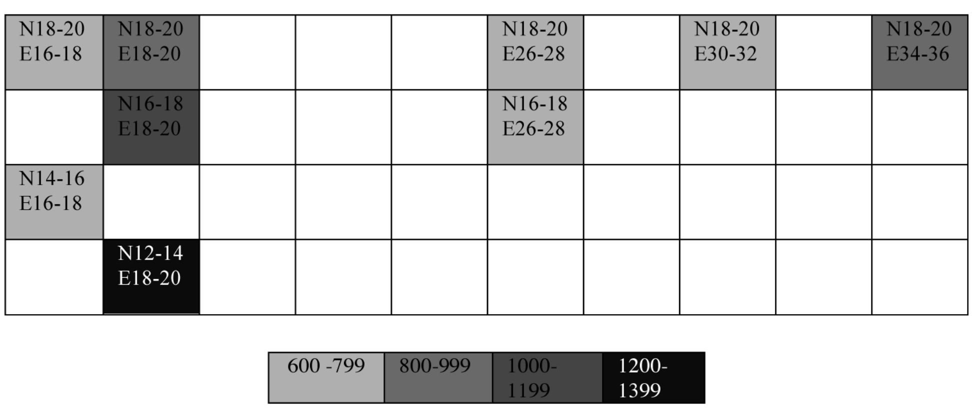


Figure 6. 2006 House 1 floor to 4.15 D.B.D. bird and mammal NSP/NISP.

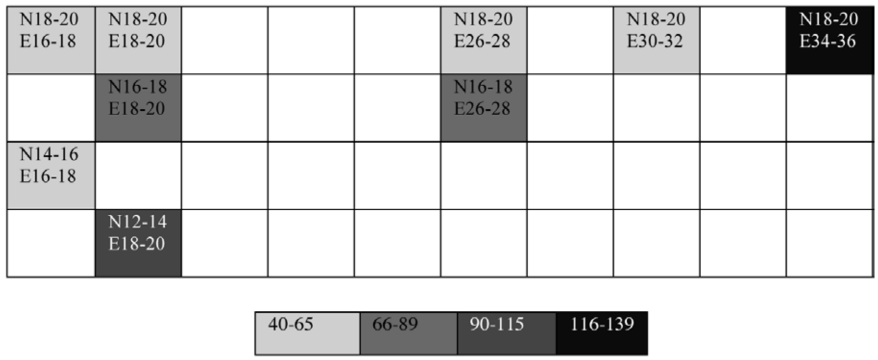


Figure 7. 2006 House 1 floor to 4.15 D.B.D. land mammal NSP/NISP.

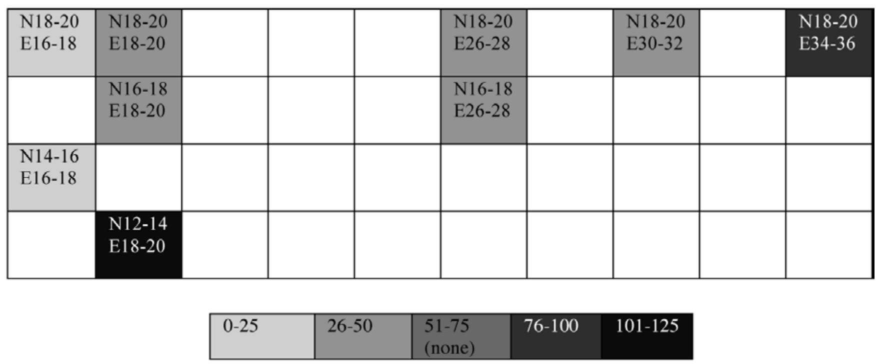


Figure 8. 2006 House 1 floor to 4.15 D.B.D. commensal mammal NISP.

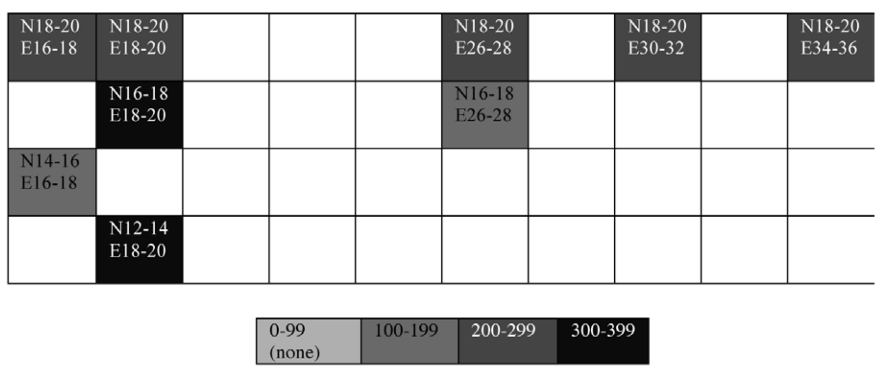


Figure 9. 2006 House 1 floor to 4.15 D.B.D. sea mammal NSP/NISP.

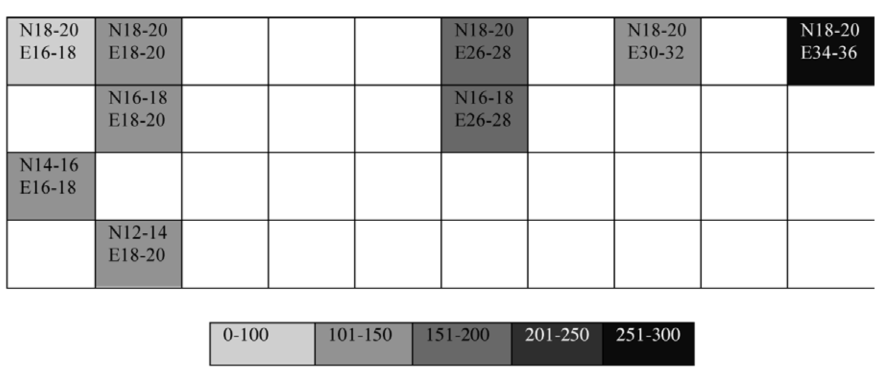


Figure 10. 2006 House 1floor to 4.15 D.B.D. bird NSP/NISP.

Table 18. Horizontal distribution of major faunal categories including unidentifed bone, 2006 House 1 floor deposits to 4.15 D.B.D.

Taxa	Excavation Unit N12-14 E18-20	N14-16 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36	Tot.%	Total NISP/NSP	Sample % Tot. Bone	Sample % Id'd Bone (Code 20+)
Land Mammal (%)	*16* 8	*9* 8	*10* 6	*8* 8	*7* 5	*12* 11	*7* 7	*10* 10	***21*** **13**	*100*	655	8	8
Commensal Mammal (%)	***29*** **9**	*5* 3	*11* 4	*3* 2	*7* 3	*11* 6	*7* 4	*7* 4	***20*** **8**	*100*	413	5	25
Sea Mammal (%)	*16* 28	*6* 19	*14* 30	*10* 34	*12* 29	*9* 27	*11* 34	*9* 33	*13* 29	*100*	2,266	29	40
Bird (%)	*9* 9	*9* 15	*8* 10	*7* 15	*9* 12	***14*** **25**	***12*** **21**	*10* 19	***22*** **27**	*99*	1,278	16	27
Undeter. Mammal (%)	*19* 46	*13* 55	***17*** **50**	*8* 41	***15*** **50**	***7*** **32**	*8* 34	*7* 34	*6* 22	*100*	3,141	41	
Total %	100	100	100	100	99	101	100	100	99			99	100
Total NISP/NSP	1,302	750	1,062	641	954	701	723	651	969		7,753		NISP 1,651
Unit % Total Bone	*17*	*10*	14	8	12	9	9	8	12	99			
Unit % Id'd% Bone (Code 20+)	*18*	*7*	*11*	*7*	*13*	*7*	*9*	*10*	*19*	*101*			
No. of Levels Id'd	8	9	7	7	6	8	6	7	16				

Table 19. Horizontal distribution of major faunal categories, including unidentified bone, 2006 House 1 floor deposits at 3.80–3.85 D.B.D., NISP/NSP.

Taxa	Excavation Unit N12-14 E16-18	N12-14 E18-20	N14-16 E16-18	N14-16 E18-20	N16-18 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36	Total NISP/NSP	*Sample Taxon % without no fish units*
Land Mammal	19	19	13	7	11	21	4	13	7	4	29	16	163	*2*
Comm. Mammal	9	9	2	10	2	16	0	6	1	6	13	31	105	*1*
Sea Mammal	68	75	42	66	56	117	10	46	8	34	74	59	655	*6*
Undet. Mammal	108	173	121	146	45	165	16	80	24	25	120	30	1043	*10*
Bird	20	13	16	13	16	40	15	37	28	51	30	55	334	*3*
Fish	1,449	Not Id'd	428	873	379	1540	291	385	337	Not Id'd	880	383	6,945	*79*
Total NISP/NSP	1,673	289	622	1,115	509	1,899	336	557	405	120	1,146	574	9,245	
Tot. NISP/NSP without Fish	224	289	194	242	130	359	45	172	68	120	266	191	2,300	
Total Unit Sample % Bird And Mammal	*10*	*13*	*8*	*11*	*6*	*16*	*2*	*7*	*3*	*5*	*12*	*8*	2,300	*101*
Total Unit Sample % With Fish	*19*	*Not Id'd*	*7*	*13*	*6*	*21*	*4*	*6*	*5*	*Not Id'd*	*13*	*6*	8,836	100

concentration in N18-20/E34-36 and a lesser concentration in unit N18-20/E16-18. Bird and land mammal remains are present in higher than expected relative frequencies in unit N18-20/E34-36. Bird remains are also more frequent than expected in units N16-18/E26-28 and N18-20/E26-28. The pattern for sea mammals is less strongly marked, but a lower than expected relative frequency is present in unit N14-16/E16-18.

A comparison of identified to unidentified bone reveals that a higher proportion of bird, sea mammal and especially commensal mammal specimens are identified than is the case for land mammals. This may indicate a greater fragmentation of land mammal bones for the production of artifacts with much probable land mammal bone ending up in the Undetermined Mammal category. There does not seem to be any concentration of unidentified bone in a particular unit although there is a suggestion of a slightly lower proportion of identified to unidentified bone in the more central units of the house floor.

Some of these patterns are maintained in the single level sample from 3.80–3.85 D.B.D. but the addition of more units and fish complicates the picture. Here, as in the larger sample, commensal mammals and bird are present in higher than expected frequency in N18-20/E34-36; bird are low in N12-14/E18-20; N16-18/E18-20 is high in undetermined mammal; N18-20/E16-18 is low in commensal mammal; N16-18/E26-28 is low in undetermined mammal. But the strong emphasis on land mammal in N18-20/E34-36 seen in the full house floor sample is not reflected in the smaller sample, nor is the emphasis on commensal mammal seen in N12-14/E18-20. In both samples, units N12-14/E18-20 and N16-18/E18-20 have the two highest concentrations of bone, with or without fish. In the single level, this concentration is driven by greater amounts of either sea mammal and undetermined mammal or just undetermined mammal, suggesting greater fragmentation of bone in these areas. In the larger sample, the high frequency in N12-14/E18-20 is driven primarily by commensal mammal, but there is also a relatively high frequency of undetermined mammal. In the single level sample, unit N18-20/E16-18, vertebrate faunal remains are particularly sparse, especially bird and mammal. This may relate to the presence in this level of a hearth feature taking up much of the unit.

The fish sample is clearly concentrated in two main units in the 3.80–3.85 D.B.D. sample, N12-14/E16-18 and N16-18/E18-20.

<u>Taxa Patterns</u>

These patterns are further elucidated by more detailed breakdown into species and taxa group distributions (Tables 20 to 27). If one looks at the breakdown within faunal categories, it is apparent that the high bone concentration in unit N12-14/E18-20 is driven by the higher than expected amount of dog bone in this unit. The concentration in unit N18-20/E34-36, on the other hand, is driven by higher than expected amounts of land mammal and bird bone. Higher than expected concentrations of sea mammal bone are found in the two central units N18-20/E16-18 and N18-20/E18-20. Figures 6 to 10 also agree with these patterns.

Land and Commensal Mammal Fauna

<u>Land Mammal Taxa</u>

Even with this augmented 2006 sample, the frequencies of identified land mammal remains in the house floor deposits are so small that real patterns of distribution are difficult to substantiate (Tables 20 and 21). There are only 125 bones spread between 7 taxa, with the vast majority (NISP 88, 66%) being deer. River otter has a NISP of 19, while the other five taxa are represented by 10 or fewer specimens. Given this cautionary note, elk remains do seem more concentrated in units N12-14/E18-20 and N14-16/E16-18, towards the southern edge of the house floor. There is in general a strong correlation between sample size and number of species represented, with the chances of rare species showing up greatly increased with larger samples. The unit N14-16/E16-18, although it has one of the smaller samples, still produced four species of land mammal, including two of the less frequently occurring species, elk and mink. This does suggest that the presence of two rare species in this unit is anomalous. Additionally, six of the nine identified specimens from this unit come from the single level 3.80–3.85 D.B.D. This also is an anomalous pattern.

Also apparent in both the full house floor sample and the single level 3.80–3.85 D.B.D. sample, is the low frequency of remains in unit N18-20/E16-18. This might relate to the presence in this unit of extensive features, or to the location of the unit towards the center of the house. Again, sample sizes are still too small to present reliable patterning.

<u>Commensal Taxa</u>

Only dog remains, no deer mouse, were found in this portion of the 2006 sample. There are more

Table 20. Horizontal distribution of identified land mammal and commensal mammal fauna, 2006 House 1 floor deposits to 4.15 D.B.D.

Taxa	Excavation Unit									Tot. %	NISP	Sample %
	N12-14 E18-20	N14-16 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36			
Deer (%)	*10* 67	*4* 33	*6* 29	*2* 50	*12* 66	*15* 86	*6* 50	*7* 75	***38*** **86**	*100*	82	66
Elk (%)	***30*** **25**	***30*** **33**	*10* 6	*0* 0	*0* 0	*0* 0	*10* 10	*10* 13	*10* 3	*100*	10	8
River Otter (%)	*5* 8	*5* 11	***32*** **35**	*5* 25	***26*** **33**	*0* 0	***16*** **30**	*0* 0	*11* 6	*100*	19	15
Mink (%)	*0* 0	***25*** **22**	***50*** **24**	***13*** **25**	*0* 0	*0* 0	*0* 0	*13* 13	*0* 0	*101*	8	6
Raccoon (%)	*0* 0	*0* 0	*0* 0	*0* 0	*0* 0	*33* 7	*33* 10	*0* 0	*33* 3	*99*	3	2
Bear, Canid (%)	*0* *0*	*0* 0	*0* 0	*0* 0	*0* 0	*50* 7	*0* 0	*0* 0	*50* 3	*100*	2	2
Beaver (%)	*0* 0	*0* 0	*100* 6	*0* 0	*0* 0	*0* 0	*0* 0	*0* 0	*0* 0	*100*	1	1
Total %	100	99	100	100	99	100	100	101	101			*100*
NISP	12	9	17	4	15	14	10	8	36		125	
Unit Sample %	*9*	*7*	*14*	*3*	*12*	*11*	*8*	6	29	100		
Dog (%)	***29***	*5*	*11*	*3*	*7*	*11*	*7*	*7*	*20*	*100*		
NISP	121	22	44	14	27	45	28	29	83		413	

Table 21. Horizontal distribution of land mammal and commensal mammal fauna, House 1 floor at 3.80–3.85 D.B.D. NISP

Taxa	Excavation Unit												Total NISP	*Sample Taxon%*
	N12-14 E16-18	N12-14 E18-20	N14-16 E16-18	N14-16 E18-20	N16-18 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36		
Deer	2	2	2	1	1	2	0	4	1	0	2	7	24	*60*
Elk	0	0	1	0	0	0	0	0	0	0	0	1	2	*5*
Raccoon	0	0	0	1	0	0	0	0	1	0	0	1	3	*7.5*
River Otter	0	1	1	0	1	0	0	0	0	2	0	0	5	*12.5*
Mink	0	0	2	0	0	3	0	0	0	0	1	0	6	*15*
Total NISP	2	3	6	2	2	5	0	4	2	2	3	9	40	
Id'd Unit Sample %	*5*	*8*	*15*	*5*	*5*	*13*	*0*	*10*	*5*	*5*	*8*	***23***		*100*
Dog	9	9	2	10	2	16	0	6	1	6	13	31	105	
Id'd Unit Sample %	*9*	*9*	*2*	*10*	*2*	*15*	*0*	*6*	*1*	*6*	*12*	***29***		*101*
Unid'd L. Mam. NSP	17	16	7	5	9	16	4	9	5	2	26	7	123	
Total NSP/NISP	28	28	15	17	13	37	4	19	8	10	42	47	268	
Total L./C. Mam. Unit Sample %	*10*	*10*	*6*	*6*	*5*	*14*	*<1*	*7*	*3*	*4*	***16***	***18***		99

Table 22. Horizontal distribution of dog age classes, 2006 House 1 floor deposits to 4.15 D.B.D.

Age Class	Excavation Unit									NISP	Total Sample %
	N12-14 E18-20	N14-16 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36		
Adult/Subadult (%)	43	53	53	44	54	53	36	54	36	73	49
Juvenile (%)	21	40	37	44	33	47	29	31	**63**	52	35
Foetal/<12 Weeks (%)	**36**	7	11	11	13	0	**36**	15	0	23	16
Total %	100	100	101	99	100	100	101	100	99		100
NISP	28	15	19	9	15	15	14	14	30	148	
No. of Levels Id'd	8	9	7	7	6	8	6	7	16		

dog remains (NISP 413) in the House 1 floor deposits than any other mammal taxon. There is a clear concentration of dog remains in unit N12-14/E18-20, at the southern edge of the house floor. This horizontal pattern is not strongly associated with the level 3.80–3.85 D.B.D., just with the full house floor deposit sample. But there is a high frequency of dog remains in the 3.80–3.85 D.B.D. floor level, with 105 specimens associated with this level alone.

One hundred and fourteen of the dog specimens could be confidently assigned to an age class. All age ranges are present from foetal to aged adult, with 49% of the sample Adult/Subadult, 35% Juvenile and 16% Foetal/Newborn <12 Weeks. This follows the pattern identified in the 2004 house floor deposits, although there is in the 2006 sample a higher proportion of juvenile and slightly lower proportion of adult/sub-adult remains. As in the 2004 sample, very young juvenile, new born and foetal remains are strongly represented in the house floor deposits. This contrasts with the subfloor midden deposits where they are in very low frequency. The horizontal distribution of dog age classes in the 2006 house floor deposits is given in Table 22. Two units, N12-14/E18-20 and N18-20/E26-28, contained a higher than expected percentage of foetal or newborn specimens, while unit N18-20/E34-36 has a higher than expected percentage of juveniles.

Fifty-four of the dog specimens were assigned a visual inspection size class. Of these, 67% represent small dogs, 24% represent small/medium dogs and only 10% are clearly larger dogs. These percentages agree reasonably well with those obtained from the measured 2004 dog sample (Frederick et al. 2006). These figures suggest that a large proportion of the dogs present in the house floor deposits represent small dogs.

<u>Sea Mammal Taxa</u>

In the full house floor sample, sea mammal remains are somewhat more concentrated in units N12-14/E18-20 and N18-20/E18-20 (Table 23). There is a noticeable concentration of sea otter remains in N18-20/E34-36. There is a concentration of harbor seal remains in this unit as well. Among the other sea mammals, the northern fur seal remains are more concentrated in three units, N12-14/E18-20, N16-18/E18-20 and N18-20/E16-18, while the porpoise remains are more concentrated in four units, N14-16/E16-18, N16-18/E18-20, N18-20/E28-6-28 and N18-20/E34-36 and whale remains are concentrated in two units, N18-20/E18-20 and N18-20/E30-32. Northern sea lion remains are more concentrated than expected only in unit N16-18/E26-28.

These patterns do not all seem to hold for the single level sample 3.80–3.85 D.B.D. (Table 24). Here, unit N16-18/E18-20 has the greatest frequency of all sea mammal remains (NSP/NISP) while units N14-16/E16-18, N16-18/E18-20 and N18-20/E30-32 have concentrations of identified remains (NISP). In units N14-16/E16-18 and N18-20/E30-32 this is driven by a higher occurrence of whale remains and in N16-18/E18-20 by a concentration of fur seal. No rationale for these patterns is immediately apparent.

<u>Bird Taxa</u>

The sample sizes for bird fauna, as mentioned, are small with only one of the nine units producing more than 50 identified bird specimens. Taxa therefore have been grouped to try to even out small sample size anomalies (Table 25). Bird remains in general are much more frequently occurring in unit N18-20/E34-36 as mentioned above. This concentration is seen to be primarily shearwaters. Goose and duck, on the other hand,

Table 23. Horizontal distribution of sea mammal fauna, 2006 House 1 floor deposits to 4.15 D.B.D.

Taxa	Excavation Unit									Tot. %	NISP	Sample %
	N12-14 E18-20	N14-16 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36			
Sea Otter (%)	0 0	0 0	11 2	0 0	5 1	5 5	0 0	5 1	74 16	100	19	3
Northern Sea Lion (%)	17 6	7 8	10 5	10 6	12 4	14 29	14 11	0 0	17 8	101	42	6
Northern Fur Seal (%)	27 29	5 16	21 33	16 32	9 10	2 10	10 23	2 4	7 11	99	127	19
Harbour Seal (%)	18 6	8 8	12 6	5 3	8 3	3 5	15 11	12 6	20 9	101	40	6
Elephant Seal (%)	0 0	0 0	100 1	0 0	0 0	0 0	0 0	0 0	0 0	100	1	<1
Ottarid/Pinniped (%)	12 5	14 18	16 10	23 17	2 1	4 10	2 2	8 5	18 10	99	49	7
Porpoise Sp. (%)	12 13	11 37	17 26	7 14	15 15	4 24	13 28	3 5	17 24	99	123	18
Whale Sp. (%)	19 42	2 13	5 16	6 27	29 66	1 19	6 26	26 80	7 22	101	269	40
Total %	101	100	99	99	100	102	101	101	100			100
NISP	119	38	81	63	117	21	57	85	89		670	
Unit Sample %	18	6	12	9	17	3	9	13	13	100		

Table 24. Horizontal distribution of sea mammal fauna, 2006 House 1 floor deposit at 3.80–3.85 D.B.D.

Taxa	Excavation Unit												Total NISP	Sample Taxon%
	N12-14 E16-18	N12-14 E18-20	N14-16 E16-18	N14-16 E18-20	N16-18 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36		
Sea Otter	1	0	0	0	0	0	0	1	0	0	0	0	2	1
Northern Sea Lion	1	1	0	0	0	1	0	0	0	4	0	1	8	4
Northern Fur Seal	3	6	2	2	5	9	1	2	2	7	0	5	44	23
Harbour Seal	1	0	1	0	0	2	0	0	0	1	3	1	9	5
Elephant Seal	0	0	0	0	0	1	0	0	0	0	0	0	1	<1
Ottarid/Pinniped	1	0	0	5	6	4	1	1	0	1	2	1	22	12
Porpoise	8	4	3	3	2	2	1	3	1	1	0	4	32	17
Whale	0	8	20	9	3	5	0	0	0	1	23	1	70	37
Total NISP	15	19	26	19	16	24	3	7	3	15	28	13	188	99
Id'd Unit Sample %	8	10	14	10	9	13	2	4	2	8	15	7		102
Unid'd Sea Mam. NSP	53	56	16	47	40	93	7	39	5	19	46	46	467	
Total Sea Mam. NSP/NISP	68	75	42	66	56	117	10	46	8	34	74	59	655	
Total Sea Mam. Unit Sample %	10	11	6	10	9	18	2	7	1	5	11	9		99

Table 25. Horizontal distribution of bird fauna, 2006 House 1 floor deposits to 4.15 D.B.D.

Taxa	Excavation Unit									Tot. %	NISP	Sample %
	N12-14 E18-20	N14-16 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36			
Goose, Duck (%)	*5* 10	*8* 15	*7* 11	***11*** **30**	*9* 15	***16*** **29**	*8* 13	*5* 10	*31* 21	*100*	76	17
Loon, Grebe, Cormorant (%)	*12* 27	***15*** 35	*10* 20	*4* 15	*4* 8	*7* 14	*9* 17	*12* 28	*28* 23	*101*	92	21
Alcids (%)	*2* 5	*10* 20	*13* 24	*6* 19	***20*** **35**	*7* 14	*15* 26	***15*** **31**	*12* 9	*100*	83	19
Albatross, Shearwater, Fulmar etc. (%)	*8* 12	*9* 15	*6* 9	*6* *15*	*14* 19	*11* 17	*5* 6	*6* 10	***36*** **21**	*101*	66	15
Gull Kittiwake, Shorebirds (%)	*11* 22	*4* 8	*13* 22	*4* 11	*8* 13	*11* 21	***19*** **32**	*8* 15	*23* 16	*100*	79	18
Eagle, Hawk, Crow, Raven, Forest Birds (%)	***22*** **24**	*7* 8	*13* 13	*7* 11	*11* 10	*4* 5	*7* 6	*4* 5	*26* 11	*101*	46	10
Total %	100	101	99	101	100	100	100	99	101			
NISP	41	40	45	27	48	42	47	39	114		443	100
Unit Sample %	*9*	*9*	*10*	*6*	*11*	*9*	*11*	*9*	*26*	*100*		

are more frequently occurring than expected in units N18-20/E16-18 and N16-18/E26-28, while loons, grebes and cormorants are seemingly concentrated in unit N14-16/E16-18, and alcids in unit N18-20/E18-20 and N18-20/E30-32. Gulls etc are highest in unit N18-20/E26-28 and raptors, crows and forest birds more frequent in unit N12-14/E18-20. Each unit is different.

Some of the patterns seen in the full house floor deposits are more or less mirrored by the single level more extensive sample from D.B.D. 3.80–3.85 (Table 26). In these samples however, unit N18-20/E26-28 as well as N18-20/E34-36 is seen to have a concentration of bird remains in general. Overall, the sample sizes for bird remains in the single level are just too small even grouped into categories to be reliable.

Fish Taxa

Only the single level 3.80–3.85 D.B.D. was examined for the horizontal distribution of fish remains, with only ten rather than twelve units in the sample. As seen in Table 27, for this one level, dogfish, salmon, rockfish and hake are about equally abundant. Flatfish and greenling are also common. All other taxa are present in frequencies of 2% of the level sample or less. Two units, N12-14/E16-18 and N16-18/E18-20, contain 43% of the total fish sample. Units 18-20/E16-18, N18-20/E18-20 and N16-18/E26-28 all show lower frequencies of fish remains than expected. There does not seem to be a consistent explanation for these distributions.

In units N12-14/E16-18 and N16-18/E18-20 the concentration is formed primarily of dogfish, rockfish, hake and especially flatfish, but not salmon. Salmon, on the other hand, are concentrated in units N14-16/E18-20, N18-20/E30-32 and N18-20/E34-36. Greenling are also higher than expected in N18-20/E34-36. Dogfish and hake are also higher than expected in N14-16/E18-20. The tuna remains are concentrated in unit N14-16/E16-18. As with the bird remains, there is no immediately apparent reason for these patterns.

Summary of Horizontal Patterns Including 2004 Data

Few of the observed concentrations of fauna in the 2006 data, whether of general categories or of more specific groupings, form coherent patterns that could be interpreted as related to rank locations or specific activity areas. Comparison with artifact patterns may be more explanatory. Figures 11 to 15 look at the House 1 Floor samples of specifically identified bird and mammal from both 2004 and 2006 excavation units. The few general patterns that do seem to hold are summarized in the following paragraphs.

Table 26. Horizontal distribution of bird fauna, 2006 House 1 floor at 3.80–3.85 D.B.D.

Taxa	Excavation Unit N12-14 E16-18	N12-14 E18-20	N14-16 E16-18	N14-16 E18-20	N16-18 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18-20 E26-28	N18-20 E30-32	N18-20 E34-36	Total NISP	*Sample Taxon%*
Goose, Duck	1	0	1	0	1	2	1	2	1	4	2	7	22	*22*
Loon, Grebe, Cormorant	3	1	1	1	1	3	0	1	1	0	1	3	16	*16*
Alcids	0	0	1	0	0	6	2	2	2	3	1	0	17	*18*
Albatross, Shearwater	0	0	0	0	0	1	1	2	0	2	0	0	6	*6*
Gull, Kittiwake, Shorebird	1	1	1	2	2	2	0	0	2	10	1	3	25	*26*
Bald Eagle, Crow	1	3	2	0	1	2	0	1	1	0	0	0	11	*11*
Total NISP	6	5	6	3	5	16	4	8	7	19	5	13	97	
Id'd Unit Sample %	*6*	*5*	*6*	*3*	*5*	***17***	*4*	*8*	*7*	***20***	*5*	*13*		99
Unid'd Bird NSP	14	8	10	10	11	24	11	29	21	32	25	42	237	
Total Bird NISP/NSP	20	13	16	13	16	40	15	37	28	51	30	55	334	
Total Bird Unit Sample %	*6*	*4*	*5*	*4*	*5*	*12*	*4*	*11*	*9*	***15***	*9*	***16***		100

Table 27. Horizontal distribution of fish fauna, 2006 House 1 floor deposits at 3.80- 3.85 D.B.D.*

Taxa	Excavation Unit N12-14 E16-18	N12/ E18 *	N14-16 E16-18	N14-16 E18-20	N16-18 E16-18	N16-18 E18-20	N18-20 E16-18	N18-20 E18-20	N16-18 E26-28	N18/ E26*	N18-20 E30-32	N18-20 E34-36	Total NISP/NSP	Sample Taxon%
Dogfish	124		62	124	11	120	3	28	0		18	5	495	*15*
Skate	2		0	0	5	17	1	1	2		2	0	30	*1*
Ratfish	20		5	13	0	0	0	0	0		0	0	38	*1*
Flatfish	103		13	42	11	81	2	14	1		1	3	271	*8*
Herring	2		0	5	0	9	14	0	3		9	2	44	*1*
Salmon	10		8	223	9	16	27	29	58		270	113	563	*17*
Perch	22		12	10	10	15	1	6	0		1	0	78	*2*
Lingcod	15		4	8	6	9	2	4	4		1	1	54	*2*
Greenling	31		16	17	11	43	22	26	8		49	70	296	*9*
Gadid	6		1	15	8	28	0	1	0		4	0	63	*2*
Rockfish	215		66	95	60	243	21	23	6		6	16	751	*23*
Hake	123		66	139	25	190	14	5	0		0	3	565	*17*
Sculpin	1		1	0	0	3	2	1	7		1	12	29	*1*
Tuna	1		8	0	0	1	0	0	0		1	0	11	*<1*
Plainfin Midship-man	1		0	0	1	0	1	0	0		0	0	3	*<1*
Total NISP	676		262	491	157	775	110	138	92		364	225	3,294	*100*
Id'd Unit Sample %	*21*		*8*	*15*	*5*	***24***	*3*	*4*	*3*		*11*	*7*		*101*
Unid'd Fish NSP	773		164	382	222	765	181	247	245		516	158	3,651	
Tot. Fish NSP/NISP	1,449		428	873	379	1,540	291	385	337		880	383	6,945	
Total Fish Unit Sample %	*21*		6	13	5	22	4	6	5		13	5		100

* Fish not identified.

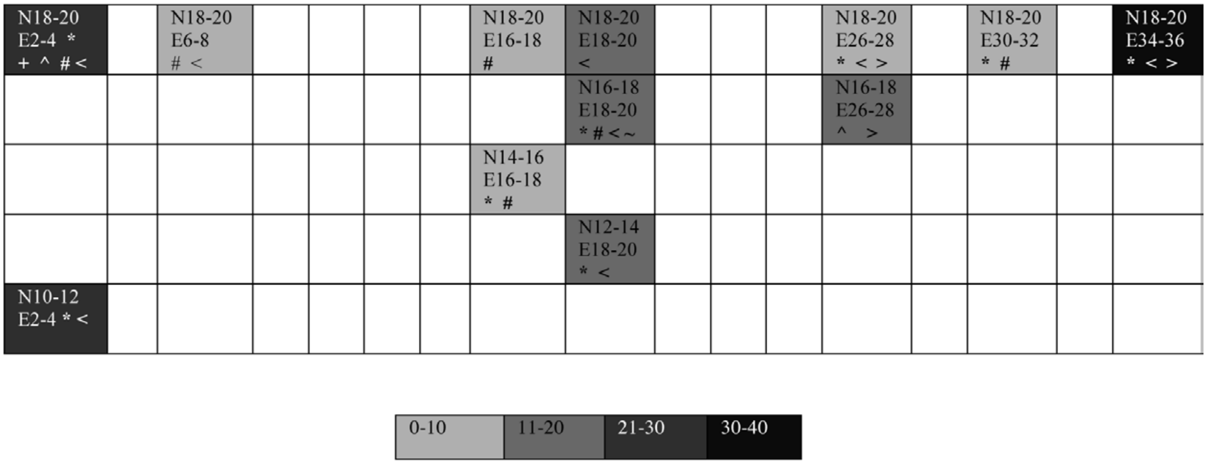


Figure 11. Identified land mammal NISP, 2004 and 2006 House 1 floor. A number of species are present in such small numbers that even their absence should be interpreted with caution. Elk are found in those units with a star (*), mink with a (#), marten with a(+), bear with a (^), river otter with a (<), raccoon with a (>) and beaver with a (~).

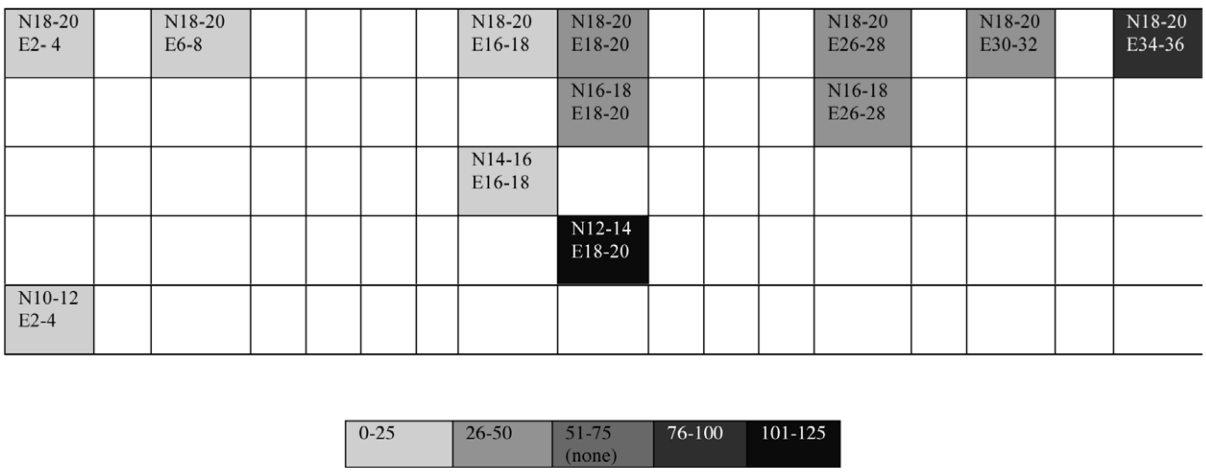


Figure 12. Commensal mammal NISP, 2004 and 2006 House 1 floor.

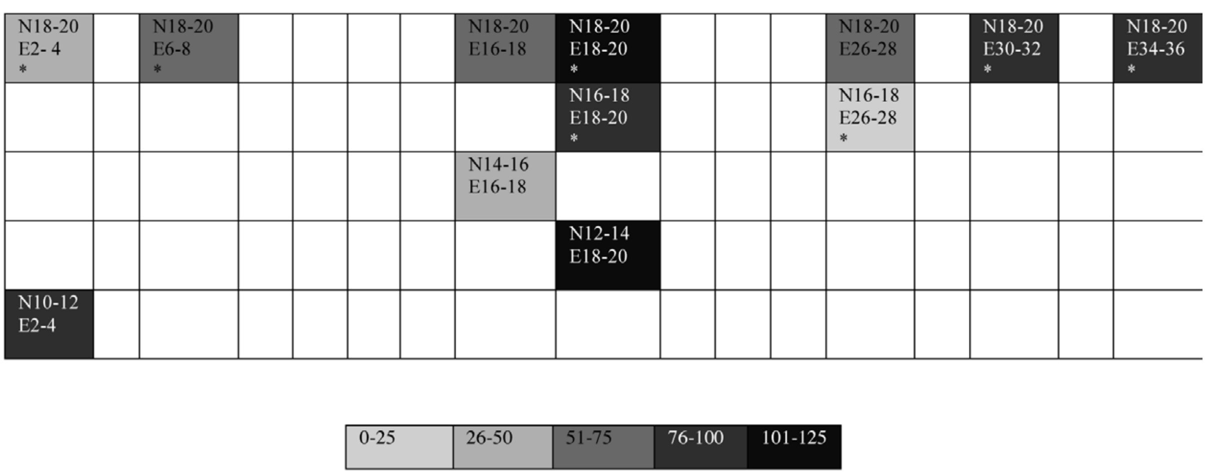


Figure 13. Identified sea mammal NISP, 2004 and 2006 House 1 floor. Sea otter is indicated by an (*).

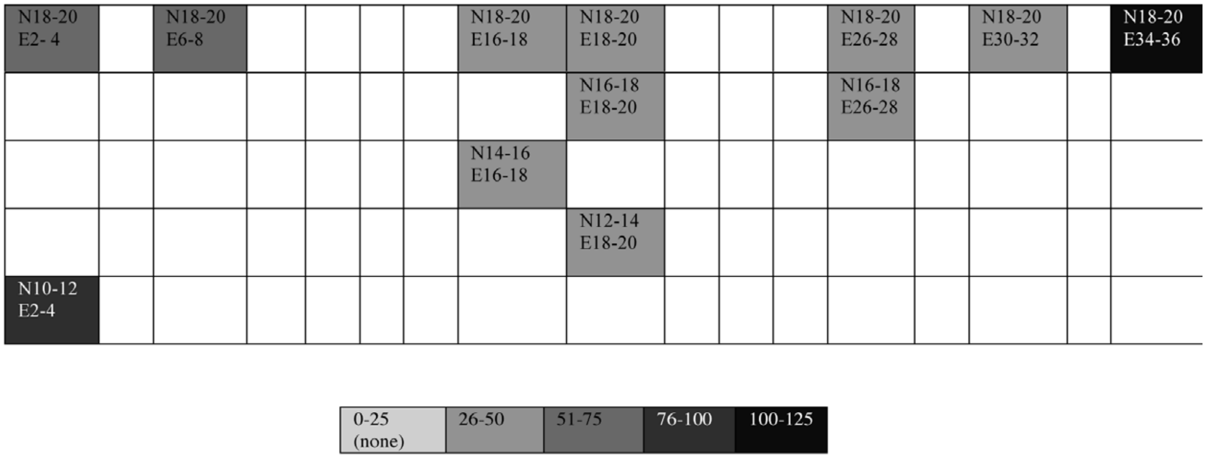


Figure 14. Identified bird NISP, 2004 and 2006 House 1 floor.

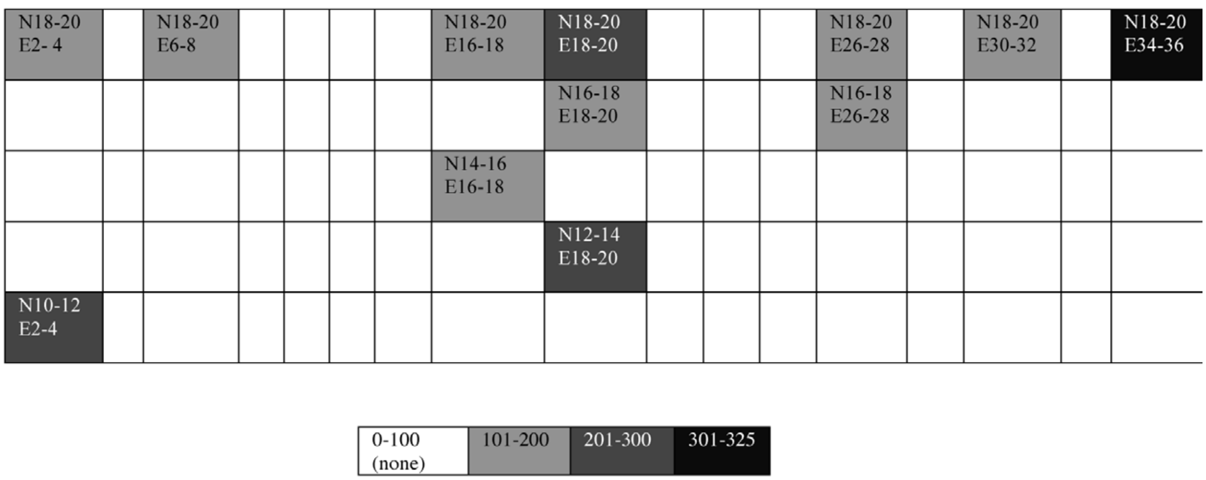


Figure 15. Identified bird and mammal NISP, 2004 and 2006 House 1 floor.

In general, there is a concentration of identified bird and mammal remains in those units at the periphery of the house, N18-20/E34-36, N12-14/E18-20 and N10-12/E2-4 (Fig. 15). The deposits in all three of these units may well contain layers that are actually more associated with house edge build-up than living floor. Units N18-20/E18-20 and N16-18/E18-20 are the only central units to contain a greater proportion of remains. These two units are also next to the main trench and hearth features (Fig. 4).

Identified land mammal remains are so few (NISP 182) that none of the "patterns" observed can be accepted uncritically. The main land mammal resource is deer, and their numbers swamp all other species. It was thought that the distribution of species that could be seen as high rank, such as elk, sea otter, mink, marten and bear, might show a pattern of co-concentration with a specific area of the house (Fig. 11). This is not clearly supported. Elk and mink remains are distributed throughout the units sampled. River otter, a more common species, is also found in all but two of the units. It is true, however, that only unit N18-20/E2-4 contains four of the rare land mammal species, elk, marten, mink and black bear (Frederick et al. 2006).

Identified bird remains are more common (NISP 646). Their distribution follows the general pattern, with most remains occurring in peripheral units, especially N18-20/E34-36 (Fig. 14). This concentration is formed mostly by shearwater remains. Of some interest is the greater than expected concentration of the combined category crow, eagle and forest bird in unit N12-14/E18-20 (Table 25), as this may support the interpretation that these deposits include samples from "outside" the house. Unit N10-12/E2-4 also contains a greater frequency of songbirds than the other two 2004 units and is similarly a peripheral unit (Frederick et al. 2006).

Commensal mammal remains (NISP 457) are essentially dog remains (Fig. 12). Dog remains are especially concentrated in unit N12-14/E18-20 and secondly in N18-20/E34-36. Again, these are the two peripheral units in the 2006 sample, but this pattern in not found in the 2004 sample, where dog remains are few in the peripheral units at the north west end of the house.

Identified sea mammal remains are the most frequently occurring of the mammal remains in the house floor deposits (NISP 866). While their distribution does follow the general pattern of more remains in the peripheral units, there is also a concentration of remains in the central units adjacent to the main hearth and trench features in the 2006 excavations (Fig. 13). In unit N18-20/E18-20 the concentration is primarily whale bone, remains which may be associated with the features or may be curated for manufactures. This might represent an activity area. The concentration in unit N12-14/E18-20 is primarily fur seal, while unit N18-20/E34-36 has a disproportionate amount of sea otter, porpoise and harbor seal (Table 23). Sea otter remains, which one might have associated with high rank, are found in seven of the units, two central, two at the northwest end of the house and three at the south eastern end of the house. They are not clearly associated with any one location.

Only the 2006 level 3.80–3.85 was presented for fish (Table 27). The areas of concentration here are different from those of the general bird and mammal patterns. Twenty -one and twenty-two percent of the fish sample in this level comes from units N12-14/E16-18 and N16-18/E18-20 respectively. These are not the units that see the highest concentrations of bird and mammal remains. The former is a peripheral unit but the latter is a central unit adjacent to the hearth and trench features. In both units, this concentration is produced by hake, rockfish, dogfish and flatfish remains. In contrast, salmon remains are more common in units N14-16/E18-20, N18-20/E30-32 and N18-20/E34-36. A rational for these patterns is not immediately apparent.

Conclusions

The vertebrate faunal remains from the level samples of the Huu7ii site clearly show changes through time in the subsistence patterns and activities of the site inhabitants. During the earliest occupation, the people are likely using the site throughout the year, perhaps continuously, exploiting a broad range of resources, with a focus on a range of fish and sea mammals, including whales, porpoise/dolphins and seals/sea lions, but a slightly greater emphasis on land mammals than in later times. The majority of bird, fish and mammal species taken suggest primarily an inshore focus, but the white-sided dolphin and whale remains clearly indicate their maritime capabilities and the importance of those species. Fish are the most frequently occurring species as represented by NSP/NISP. The range of species taken is broad, with greenling, rockfish, dogfish and salmon all important. Herring are also very important, based on the column sample data.

Between 3000 BP and 1500 BP there is a period of time when the sampled area of the site was not occupied. With the reoccupation around 1500 BP, there is apparent a more marine focus to the subsistence activities, with whales, porpoise/dolphins and seals/sea lions still important while fewer land mammals are taken, and a shift in the kinds of birds taken from waterfowl to more marine birds. The major focus of subsistence activities, however, remains on a range of fish species. Fish, especially hake and rockfish, are still the most frequently occurring fauna measured by NSP/NISP, while herring and anchovy are also important, based on the column sample data. There is a suggestion in the species present that this occupation may represent a stronger focus on summer residency, but other seasons are represented. It may also be that the greater frequency of hake and anchovy remains in the later layers of these deposits relates to environmental changes associated with broad climatic shifts and/or cyclical oceanic current shifts resulting in changes in water temperatures.

After about 800 BP, with the switch to the house floor deposits, there is a major shift in emphasis within the fish species taken, from the exploitation of a broad range of species to a much more concentrated focus on salmon, although herring, greenling and rockfish remain important. Fish are still the most frequently occurring vertebrate fauna, while sea mammals, including whales, porpoises/dolphins and seals/sea lions, remain important food and raw material resources. Sea otters are more frequently occurring, though still not abundant. A broader range of land mammal species are represented, including three species not found in the earlier deposits, although the actual numbers are low. There is also an increase in the quantity of bird remains, with the focus on marine and marine off-shore species. Spring through fall seasons are represented in the faunal remains, while winter occupation may be indicated by the salmon remains, if they represent preserved fish. The focus on salmon, together with the presence of elk, black bear and marten also suggests access to a wider territory of exploitation, either directly or through trade or kin relationships. It may also be that these changes relate to an increasingly complex association of rank within the society and territorial ownership.

Dog remains are found throughout the occupation of the site, being especially common in the oldest deposits and the house floor deposits. Puppies are especially well represented in the latter deposits. The majority of the dog remains that could be sized are from smaller dogs.

The hypothesized association of particular faunal concentrations within the House 1 Floor and ranked family locations within the house has not been clearly supported by the faunal data. While the presence at the western end of the house of the rare mammal species which might be associated with a high rank position is demonstrated, the actual numbers of remains are too small to give this pattern much confidence. The major concentrations of faunal remains are in fact found in peripheral units along the margins of the house depression. The exception to this pattern is found in the sea mammal remains, where there is a concentration in the central units associated with the hearth and trench features. This pattern may represent an activity area associated with the hearth areas, or the incorporation of whale remains in the features. It may be of interest that the dog remains are more commonly found in the eastern end of the house, but again an explanation for this pattern is not apparent.

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Appendix B: Zooarchaeological Analysis of the Indigenous Fishery at the Huu7ii Big House and Back Terrace, Huu-ay-aht Territory, Southwestern Vancouver Island

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Abstract

This paper describes how fish overwhelmingly dominates the animal bone assemblage from the examined column sample deposits at the Huu7ii village site, the named ancestral village of the Huu-ay-aht First Nation. Fish represent 99.9% of all identified bone specimens and are present in every examined litre of sediment indicating the importance of fish in the everyday life of site occupants. The bone assemblage is numerically dominated by Pacific herring, which vastly outnumbers the next most abundant fish: anchovy, salmon, hake, greenling, dogfish, and rockfish as well as two-dozen other fish taxa. I conduct a series of descriptive, quantitative, and graphical analyses that seek to interpret resource harvesting practices at the two examined portions of the site: a very large house (17 x 35 m) dating to the late-Holocene (ca. 1500–400 yr BP) and mid-Holocene midden deposits recovered on a raised beach terrace (ca. 5000–3000 yr BP).

Introduction

This paper describes the archaeology of the indigenous fishery at the Huu7ii Big House (House 1) and back terrace from the perspective of fine-screen analysis of 12 column samples. During 2004 and 2006, the author participated in the excavation and helped coordinate the recovery and analysis of column samples (small 'columns' of precisely excavated archaeological sediment, Figure 1). The goal of this research was to use this detailed recovery strategy to investigate how residents utilized fish over the past 5,000 years of human history represented at this large village site. Column sample excavation and analysis aimed to complement the analysis of larger vertebrate fauna recovered from excavation units that used larger ¼" mesh sizes (Frederick, this vol.). The principal advantage of column sampling is that it provides a much more accurate assessment of the relative proportion and actual number of fish, mammal, and bird bones present in the site deposits (e.g., Casteel 1976; McKechnie 2005; Nagaoka 1994; Stewart and Wigen 2003).

Methods

Column samples were recovered as contiguous bulk samples from the sidewalls of excavation units (Figure 1). Column sample level dimensions were 20 x 10 x 5 cm (1 litre of excavated matrix per individual level), with the exception of a column sample from the back terrace, which measured 20 x 20 x 5 cm (2 litres per level, see Table 1). Column samples were excavated in 5 cm arbitrary levels within which stratigraphically distinct layers were separated. Vertical elevations were referenced to an arbitrary datum elevation as well as recorded in depth increments below ground surface.

Due to the considerable effort required to process each recovered column sample level, not all excavated columns or column sample levels could be subject to comprehensive faunal identification. Twelve column samples, six from the 2004 excavations and six from the 2006 excavations were selected for zooarchaeological identification and analysis (Figures 2 and 3). These samples represent the greatest horizontal and vertical extent of the excavated deposits from House 1, which date to between approximately 1,500 and 400 years ago, and two areas of the older back terrace deposits, which date to between approximately 5,000 and 3,000 years ago (Figures 4 and 5).

Eight column samples were examined from separate areas of House 1; four span the length of occupation and known depth-range while the remaining four were collected from the upper 'house floor' portions of the deposits exposed during block excavations in 2006 (Figure 3). Two column samples were examined from two separate areas of the back terrace deposits (Figure 2). An additional

Figure 1. Excavating column samples from the sidewall of excavation units (left). Bulk sediment samples were removed in 5 cm levels, wet-screened through 1 mm mesh, and material larger than 1 mm saved. Vertebrate fauna larger than 2 mm was picked from the samples in the laboratory by supervised volunteers (centre and right).

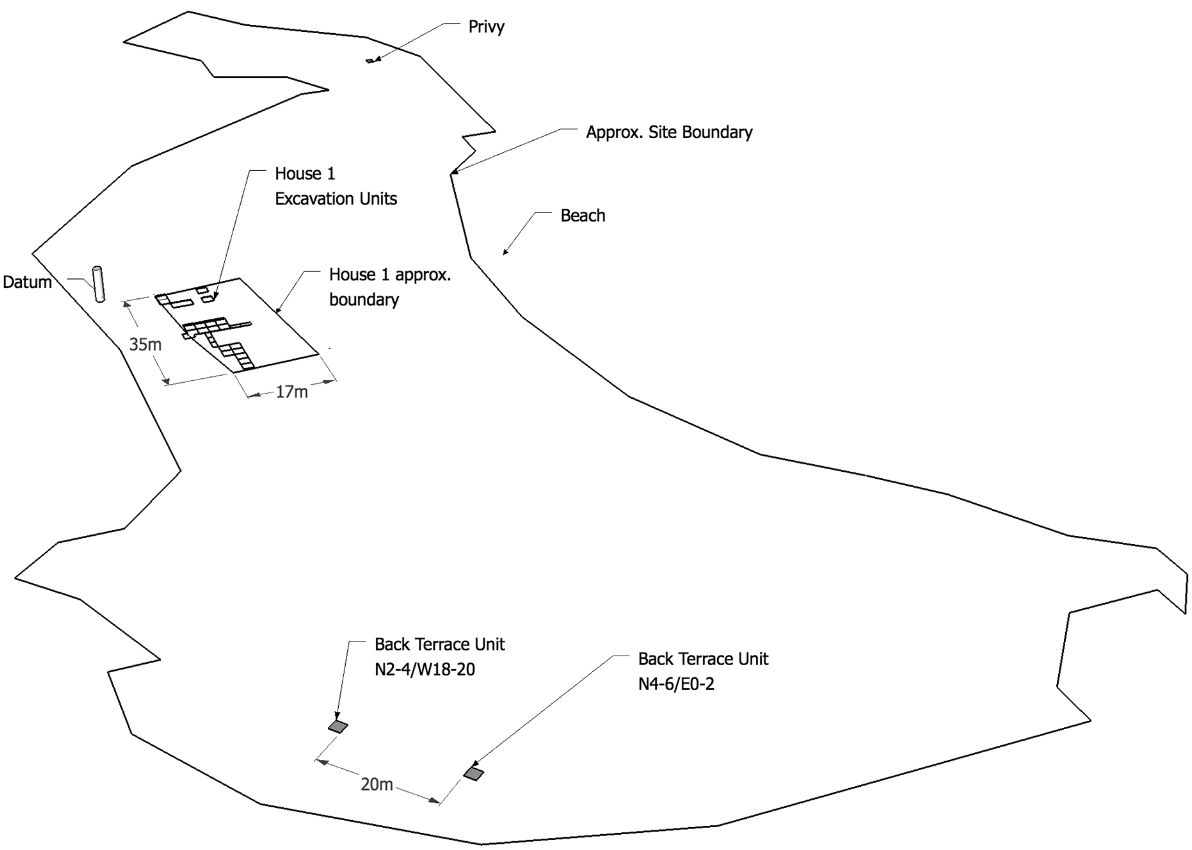


Figure 2. Perspective view of the Huu7ii village looking west showing the location and layout of the House 1 excavation units and the location of the back terrace units.

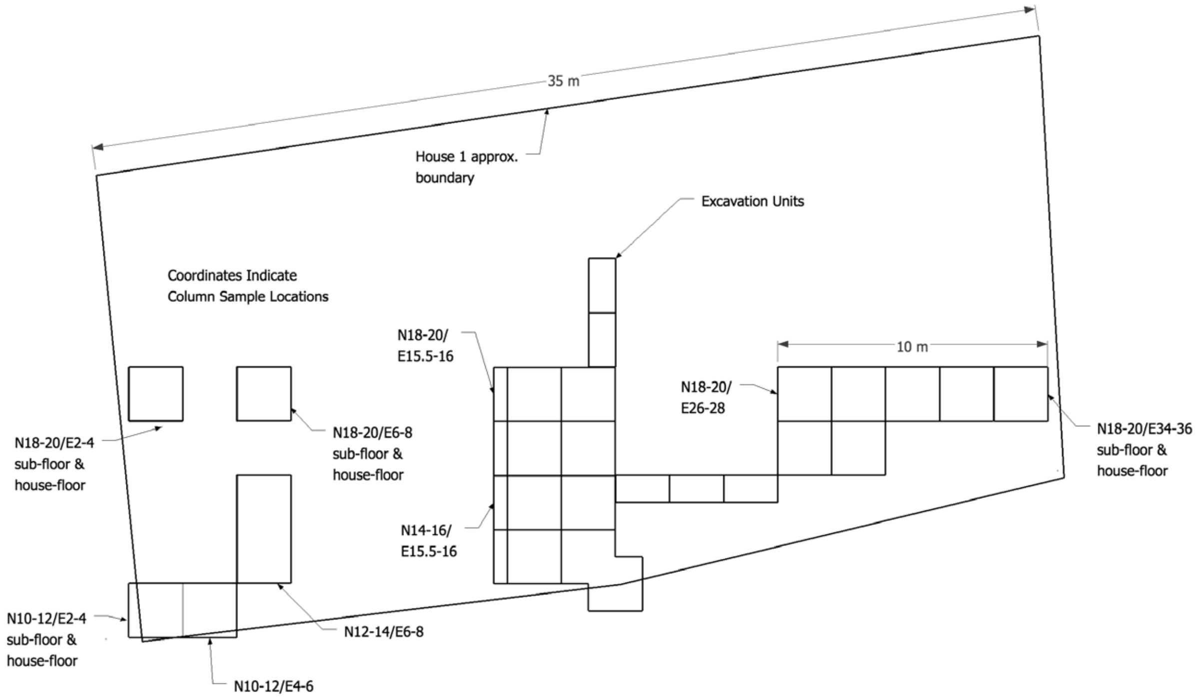


Figure 3. Plan view showing column samples locations recovered from the House 1 excavations. Large squares are 2 x 2 m excavation units and coordinates with arrows indicate the location of individual column samples.

Figure 4. Photo of column sample taken from the north wall of the back terrace unit (N4-6/E0-2) which has initial and terminal dates that span between 5,000 and 3,000 years ago.

Figure 5. Photo of column sample taken from the South wall of unit N18-20/E2-4. This excavation unit reached a depth of 230 cm below surface and has an initial date of approximately 1500 years BP.

column sample was obtained near the mouth of the creek on the northern and western portion of the site in 2004. This small assemblage was obtained from shell midden deposits encountered during the construction of the field camp privy.

Processing

Column samples were removed in 5-cm levels and wet-screened through 1-mm mesh. After each matrix sample had been wet-screened and had sufficient time to dry, sediments were passed through 2-mm mesh using nested geological brass sieves. Vertebrate fauna was systematically collected from 2-mm mesh in well-lit laboratory conditions by volunteer 'rockwashers' at the University of Victoria who graciously donated many evenings picking through these numerous samples (see Figure 1). Through their collective efforts, a large number of samples were processed, a task that would have taken an inordinate amount of time for a single person.

After processing was completed, shell, bone, rock, and charcoal constituents from individual samples were weighed and these data were entered into an *Excel* spreadsheet. Vertebrate fauna from each individual column sample was retained while the remaining sample constituents were placed back in the original sample bag. Processed non-vertebrate faunal samples were then delivered to the repository at the Royal BC Museum.

Identification

Vertebrate fauna was morphologically identified with the aid of a binocular dissecting microscope (6.3–40x) and the use of the comparative skeletal collection at the University of Victoria Zooarchaeology Laboratory. Identification data were recorded by skeletal element in a row and column database, noting relevant osteological, taphonomic, and provenience information. This database was then converted to a working spreadsheet and finally imported into a stable relational database (*FileMaker Pro*). With the exception of fish spines, ribs, branchials, scales, and gill-rakers, identification was attempted for all skeletal elements recognizable to species, genus or family level. Confidence codes were assigned to each examined specimen to indicate the certainty of identification (for criteria, see

Frederick and Crockford 2005). Briefly, specimens were considered 'identified' (NISP) if they could be confidently assigned to a taxonomic level of family, genus, or species. The remaining specimens were classified as unidentified fish, bird, mammal, or unidentifiable bone (NSP).

Considerable effort was taken to employ identical identification and quantification procedures for both column and unit sample fauna (i.e., Frederick, this vol.) including the use of the same comparative collection. However, some species level designations, such as distinguishing different species of greenling (*Hexagrammos* sp.) was attempted much less frequently in the column sample assemblage due to a lack of equivalent confidence between analysts.

Quantification

NISP – Number of Identified Specimens

The primary means of quantification used in this analysis as well as in the excavation unit assemblage (Frederick, this vol.) is the number of identified specimens (NISP). This measure represents the number of skeletal specimens that can be confidently identified to family, genus, or species. NISP is an indivisible quantitative measure fundamental to all zooarchaeological assemblages and is readily compared across archaeological contexts. NISP data are typically expressed in terms of the relative abundance (% frequency) of a particular item relative to all other identified specimens from a taxonomic class (e.g., herring is 81.3% of all identified fish remains). NISP does not include specimens that are only recognizable as 'fish,' which were designated as 'NSP' (see Table 1).

Ubiquity – Frequency of Occurrence

Ubiquity is an additional measure of abundance based on the presence or absence of items in a number of archaeological contexts. Ubiquity is calculated as the percentage of discrete contexts in which a certain taxon is found (frequency of occurrence). For example, herring can be considered 'ubiquitous' in the assemblage because this species is present in over 90% of the 168 examined column

Table 1. Column samples containing identified fish remains wet-screened through 2 mm mesh.

Column Sample	Ex. Date	Number of examined levels	Excavated Volume (Litres)*	Recovered Volume (Litres)*	Orig. wt. (kilograms)	Unid. Fish (NSP)	NISP fish	Total Fish	NISP/Litre (ex. Vol.)
N2-4/W18-20 Back terrace	2006	25	25.0	24.75	33.807	2,110	11,439	13,549	457.6
N4-6/E0-2 Back terrace	2004	17	34.0	42.25	51.821	2,061	5,920	7,981	174.1
N10-12/E2-4 W. wall	2004	19	19.0	24.3	25.063	3,855	2,928	6,783	154.1
N12-14/E6-8 S. wall	2004	12	12.0	16.25	16.802	1,320	1,086	2406	90.5
N18-20/E2-4 S. wall	2004	21	21.0	25.5	28.632	2,477	2,033	4,510	96.8
N18-20/E6-8 E. wall	2004	21	21.4	30.95	34.663	4,674	3,834	8,507	179.2
N10-12/E4-6 S. wall	2004	1	1.0	0.75	0.750	96	99	195	99.0
N14-16/ E15.5-16 E. wall	2006	6	6.0	8.65	9.075	875	855	1,730	142.5
N18-20/ E15.5-16 W. wall	2006	8	8.0	8.6	10.103	812	739	1,551	92.4
Privy Pit	2004	4	4	4.4	5.794	210	33	243	8.3
N18-20/E26-28 W. wall	2006	9	9.0	11.75	11.991	1073	717	1,790	79.7
N18-20/E34-36 E. wall	2006	25	25.0	32.5	36.338	4,185	2,795	6,980	111.8
Total		**N=168**	**185.4**	**230.65**	**264.839**	**23,748**	**32,492**	**56,225**	**175.2**

* Excavated volume is based on the dimensions of the excavation whereas 'recovered' volume is based on the volume of uncompacted sediment recovered and measured using water displacement.

samples levels at the site. Ubiquity is used here to supplement the interpretations of abundance as it is not dependant on the proportion of other species.

MNI – Minimum Number of Individuals

MNI is defined as the most commonly occurring, non-repeatable skeletal elements observed in a temporally distinct paleontological or archaeological context (Lyman 2008). There are several well-known methodological problems with MNI calculations (Grayson 1984; Lyman 2008). MNI estimates are ultimately *derived* from NISP data and are therefore cannot be used as an independent measure. The estimates produced by MNI calculations are particularly affected by how archaeological units of analysis (time periods and depositional events) are defined—the smaller the number of categories, the fewer individuals. Conversely, the larger number of analytical categories, the higher the minimum estimates, which also increase the probability that single individuals might be counted more than once.

Such uncertainty makes the use of MNI problematic, particularly for large mammals such as whales and seals whose large skeletal remains may be widely distributed in an archaeological context due to food sharing, differential butchery, transport, and consumption, as well as use of bone to make tools and or extract oil (e.g., Monks 2003). However, such factors are arguably much less likely for smaller-bodied fish that are much more likely to be redistributed and discarded as individual animals than larger-bodied animals would be.

The benefits to employing MNI estimates is the ability to translate numbers of bone elements to an estimate of the total number of animals represented in a given depositional context. Such a conversion allows for a more detailed comparative assessment of the relative contribution of individual animals, and may differ substantially from the %NISP estimate but is in no way a substitute for it. Given that the column sample faunal assemblage is comprised of small discrete volumes of spatially and temporally distinct deposits, I deemed it worthy of considering the use of MNI estimates for the column sample fish assemblage. A particular motivation was to address the notion that Pacific herring, the most abundant fish in the assemblage, might comprise a relatively less important role in the assemblage if faunal counts are converted to MNI.

Thus, I calculated fish MNI by using the most numerous non-repetitive elements present in an individual column sample level (1–2 litres of sediment). If many more repeatable elements such as vertebrae were present in a particular sample, I divided this count by the number of elements for particular fish taxa (e.g., 55 vertebrae per herring).

NISP and MNI Per Litre and Cubic Meter

In addition to NISP, ubiquity, and MNI, I also calculate the number of identified specimens per litre (NISP per litre) and the minimum number of individuals (MNI) per litre. These latter measures are derived from the combined excavated volume of individual column sample levels (e.g., 1 litre per 5 cm level) and are then scaled up to cubic meters (i.e., 1,000 litres). These measures provide an "absolute" measure of abundance as opposed to relative percentage data (where a change in the abundance of a particular taxon may reflect a change in the abundance of another species).

Importantly, these estimates do not account for variability within individual column level samples but rather are generated by dividing the total number of specimens by the total examined volume. As such, these precise estimates should be considered tentative but nevertheless distinct from relative percentage data. They are used here to supplement and strengthen the overall abundance estimates by providing another level of scrutiny in assessing the taxonomic composition and temporal trends in the assemblage.

Fish Size Estimations

To measure fish size, I used digital calipers (± 0.1 mm) to measure a select number of herring, greenling, rockfish, salmon, and hake skeletal elements. Estimating fish size is possible due to the predicable relationship between the dimension of individual bones and the length of individual fish (Casteel 1974). Here, I utilize published regression formulae for rockfish, greenling, and Irish lord (Orchard 2003) as well as two new formulae I developed for hake and herring (McKechnie 2010; McKechnie and Tollit n.d.). These regressions were based on comparative collections at the Zooarchaeology Lab at the University of Victoria and the National Marine Mammal Laboratory located in the NOAA Sand Point facility in Seattle, Washington.

To estimate fish length for herring, I measured the greatest anterior width of the 1st and 2nd vertebrae of herring (McKechnie and Tollit n.d.). For hake, I measured the width of the articular surface of the quadrate (McKechnie 2010). For salmon, I measured the greatest transverse diameter of whole

Table 2. Taxonomic list of identified fish, mammal, reptile and bird specimens (NISP) recovered in the examined column sample assemblage.

		Back Terrace	House 1	Total
Fish				
Pacific herring	*Clupea pallasi*	16,470	9,930	26,400
Anchovy	*Engraulis mordax*	347	1,519	1,866
Salmon	*Oncorhynchus* sp.	146	1,616	1,762
Greenling sp.	*Hexagrammos* sp.	184	527	711
Hake	*Merluccius productus*	3	637	640
Rockfish sp.	*Sebastes* sp.	61	276	337
Dogfish shark	*Squalus acanthias*	42	257	299
Perch sp.	Embiotocidae	64	26	90
Sablefish	*Anoplopoma fimbria*	1	64	65
Petrale sole	*Eopsetta jordani*		43	43
Flatfish sp.	Pleuronectiformes	2	25	27
Lingcod	*Ophiodon elongatus*	1	26	27
Ratfish	*Hydrolagus colliei*	5	18	23
Irish lord sp.	*Hemilepidotus* sp.	1	18	19
*Prickleback sp.	Stichaeidae	2	13	15
Pile perch	*Damalichthys vacca*	1	12	13
Sculpin sp.	Cottidae	1	11	12
Plainfin midshipman	*Porichthys notatus*		12	12
White-spotted greenling	*Hexagrammos stelleri*	7	2	9
Cabezon	*Scorpaenichthys marmoratus*		8	8
*Eulachon	*Thaleichthys pacificus*	6		6
*Clingfish sp.	Gobiesocidae	6		6
Herring/sardine	Clupeidae	3	3	6
Skate sp.	*Raja* sp. (unident.)		5	5
*Tomcod	*Microgadus proximus*		4	4
Halibut	*Hippoglossus stenolepis*	3	1	4
*Smelt sp.	Osmeridae		3	3
Pacific cod	*Gadus macrocephalus*		2	2
Red Irish lord	*Hemilepidotus hemilepidotus*	1	1	2
Buffalo sculpin	*Enophrys bison*		2	2
Gadid (not hake)	Gadidae, not hake		1	1
*Sand lance	*Ammodytes hexapterus*	1		1
*Capelin	*Mallotus villosus*		1	1
*Shiner perch	*Cymatogaster gracilis*	1		1
*Atka mackerel	*Pleurogrammus monopterygius*		1	1
Dover sole	*Microstomus pacificus*		1	1
Starry flounder	*Platichthys stellatus*		1	1
*Gunnel sp.	Pholididae		1	1
	Total NISP Fish = ***32,459*** (Back Terrace=17,359, House 1=15,067, Privy Pit=33)			
Marine Mammals				
Porpoise/Dolphin	Delphinidae/Phocoenidae		3	3
P. white-sided dolphin	*Lagenorhynchus obliquidens*		3	3
Whale sp.	Cetacea	1	1	2
Harbour porpoise	*Phocoena phocoena*		1	1
Harbour seal	*Phoca vitulina*		1	1
Fur seal	*Callorhinus ursinus*		1	1
Pinnepedia, sm	Pinnepedia		1	1
Dall's porpoise	*Phocoena dalli*		1	1
				Total NISP Marine Mammals = 13
Terrestrial Mammals				
Canid	Canis sp.		4	4
Rodent (vsm)	Rodentia (vsm)	2		2
*Vole sp.	*Microtus* sp.	1		1
Mouse/vole sp.	Rodentia (vsm)	1		1
Rodent (sm)	Rodentia (sm)	1		1
Deer sp.	*Odocoileus* sp.		1	1
*Shrew sp.	Soricidae		1	1
				Total NISP Terrestrial Mammals = 11
Domestic Mammals				
Domestic Dog	*Canis familiaris*		7	7
Reptiles				
*Unid. frog	Amphibian	1		1
Bird				
Duck (med)	Anatidae (med)		1	1
Grand Total (NISP)		**17,366**	**15,093**	**32,492****

* Taxa identified in the column sample assemblage but not in the excavation unit assemblage.

** Grand Total NISP includes 33 fish elements from the privy pit.

salmon vertebrae to attempt to distinguish salmon species from their relative size distribution (Cannon and Yang 2006).

Results

The examined assemblage contains a total of 32,492 identified specimens (NISP) and a total of 58,118 skeletal specimens (including unidentified fish, birds, mammals). This examined assemblage comes from 168 discrete column sample levels representing a total excavated volume of 185.4 litres. Vertebrate remains are present in every examined sample context.

Fish are the overwhelmingly dominant taxonomic group in the column assemblage. Fish represent 99.9% of the total identified assemblage (Table 1) and more than 99% of NISP in each of the 12 examined column samples (Figure 15). Mammal and bird specimens are significantly less abundant although they are frequently encountered in the column sample assemblage. The majority of mammal and bird specimens are small, unidentifiable fragments of what were much larger once-complete elements. The extremely low proportion of identifiable mammal and birds in the column sample assemblage stands in contrast to the excavation unit assemblage, which has a much larger assemblage of identified (NISP) mammalian and bird remains (Frederick, this vol.).

Taxonomic Richness

Thirty-two unique fish taxa were recovered from the column sample assemblage (Table 2). Ten of these fish taxa as well as two small mammal taxa are not present in the excavation unit assemblage (Frederick, this vol.). These taxa are small-bodied and represent relatively minor proportions of the overall assemblage (denoted with asterisks in Table 2). It is notable that these 12 taxa were not identified in the excavation unit assemblage, as their small bones are likely to have passed through the larger mesh sizes used during field-based faunal recovery in ¼" mesh screens.

By contrast, the excavation unit assemblage contains the same number of fish taxa (n = 32) but includes 12 species that *were not identified* in the column sample assemblage[1]. These species also represent relatively minor components of the assemblage or were only identified to a genus level in the column sample assemblage (i.e., greenlings, perches, sculpins, and flatfish). Two of the largest species (sevengill shark and bluefin tuna) are rare in the site as a whole. Considering that the excavation unit assemblage is numerically larger and represents a dramatically larger examined volume (Frederick, this vol.), the absence of these in the column sample assemblage is relatively unsurprising. However, it is important to consider how such small proportions may indeed represent significant and sizable contribution to the fishery, especially considering the un-sampled portions of the site and the time depth of human occupation. The taxonomic richness of the assemblage are further discussed in the sampling effort section..

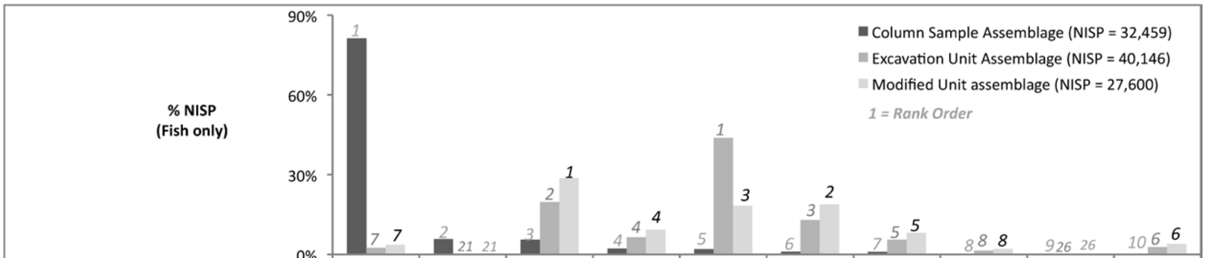
Contrasting the Column and Excavation Unit Assemblages

The analysis of vertebrate fauna from 2-mm mesh identified a similar suite of fish species as the ¼-inch excavation unit assemblage but resulted in a much greater recovery of small fish bones and thus a much greater number of bones per litre of examined volume. One of the interpretive consequences of such a shift is a dramatic change in the relative abundance of taxa present in the deposits. This shift has been widely observed by researchers working with fish assemblages throughout the Pacific (Casteel 1976; McKechnie 2005b; Nagaoka 1994; Partlow 2006; Stewart and Wigen 2003).

Figure 6 compares the relative percentage of the fine-screen column sample with the excavation unit assemblage, which illustrates the dramatic extent of the contrast. Notably, herring represent less than 4% of the excavation unit assemblage but they vastly outnumber all other fish in the column sample assemblage (81% NISP). This numerical dominance dramatically alters the percentage data for all other species and has vital consequences for interpreting subsistence and resource harvesting practices in the site as a whole.

Within the excavation unit assemblage, hake numerically dominate followed by salmon, rockfish, greenling, and dogfish (Figure 6). However, there was a single deposit containing several thousand hake specimens (a specific unit in the sub-floor deposits of House 1). As this does not adequately represent the overall composition of the unit assemblage (across space and time), fish from this particular deposit were subtracted and the percentage data recalculated (Frederick this vol.). Figure 6 illustrates this 'modified' total, indicat-

[1] Sevengill shark, Bluefin tuna, Great sculpin, Spinyhead sculpin, Striped seaperch, Rock greenling, Kelp greenling, Rock sole, English sole, Sand sole, and Pacific sanddab.



	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish	Dogfish	Perch sp.	Sablefish	Petrale sole
Column Sample Assemblage (NISP = 32,459)	81.3%	5.8%	5.5%	2.2%	2%	1%	0.9%	0.3%	0.2%	0.1%
Excavation Unit Assemblage (NISP = 40,146)	2.5%	0.02%	19.7%	6.4%	43.8%	12.9%	5.5%	1.4%	0.01%	2.7%
Modified Unit assemblage (NISP = 27,600)	3.6%	0.04%	28.6%	9.3%	18.3%	18.8%	8.1%	2.0%	0.01%	3.9%

Figure 6. Comparison between the relative abundance of fish remains in the column sample assemblage (2 mm mesh) and the excavation unit assemblage (¼-inch mesh) for the 10 most numerous taxa in the column assemblage. Numbered bars indicate rank order abundance.

ing that salmon are the most abundant fish taxon, followed by rockfish, hake, greenling and dogfish. Thus, while excavation unit assemblage provides invaluable perspective on the large-volume excavation, the collection strategy dramatically underrepresents the taxonomic abundance of small fish and thus fish in the site as a whole.

Abundance and Ubiquity

Figure 7 illustrates the overall composition of the column sample fish assemblage according to two analytically distinct measures of abundance (%NISP and %Ubiquity). It is interpretively significant that the relative abundance of fish specimens so closely corresponds to the rank-order sequence of ubiquity. This demonstrates that the most abundant taxa (%NISP) also occur very regularly in the deposit as a whole. Conversely, less numerous taxa occur very infrequently. There are, however, some notable exceptions, indicating that some taxa are present in high numbers in only a few contexts (e.g., hake) while others are consistently present in low numbers (e.g., rockfish). These similarities and differences provide critical insight into the spatial and temporal variability of these taxa in the examined assemblage and are discussed in more detail below. The overall similarity between these two measures provides a level of confidence that the taxonomic composition of the total assemblage is broadly representative and that the numerically dominant species are also likely to be the most abundant in small portions of the assemblage.

Taxonomic Composition

While a large number of fish taxa are present in the examined deposits (n = 32), the ten most numerous taxa represent more than 99% of the identified specimens while the remaining 22 taxa represent less than 1% of the combined total. This indicates that the bulk of the fishing activity focused on a limited number of species. In the following section, I discuss the ten most abundant and ubiquitous fish as shown in Figure 7. To more fully document the temporal and spatial changes, I also employ MNI measures as well as density measures (e.g., NISP per m^3) to further distinguish the characteristics of relative abundance (Figures 8 and 9).

<u>Herring</u>
The column sample vertebrate faunal assemblage from Huu7ii is dominated by herring, which represents 81.3% (NISP) of the total column sample fish assemblage (Figure 7). Similarly, herring is the most ubiquitously occurring species within the 168 column sample levels (90.5%). Herring is also the most numerous taxon as indicated by MNI calculations (Figure 12). The numerical abundance and consistent ubiquity values of herring reveals this species dominates the indigenous fishery at Huu7ii throughout the archaeologically examined period of human occupation. Herring is most dominant in the back terrace deposits (ca. 5,000–3,000 years ago), where herring represents 94.9% of NISP and 60% of MNI (Figure 8). Herring is less abundant but still dominates the House 1 assemblage in both the sub-floor and house-floor deposits (65% NISP and 25–28% MNI). Herring from the back terrace also exhibits a much higher NISP and MNI per m^3 than in the later House 1 deposits (Figure 9), strongly indicating that herring use and as a consequence, fish utilization was more intense than in the House 1 deposits. Despite these differences, the consistency of herring utilization (as most strongly indicated by ubiquity) indicates continuity

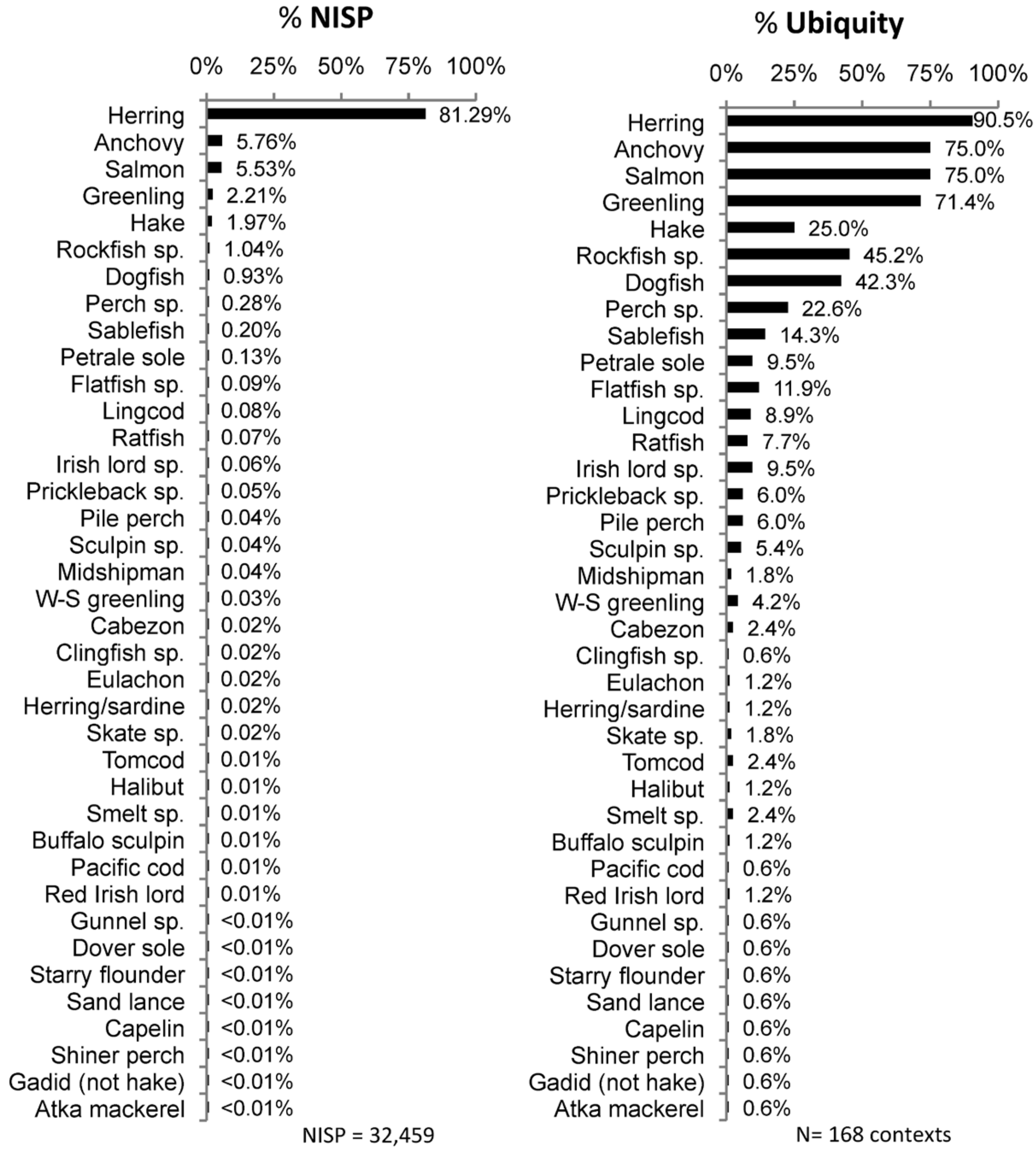
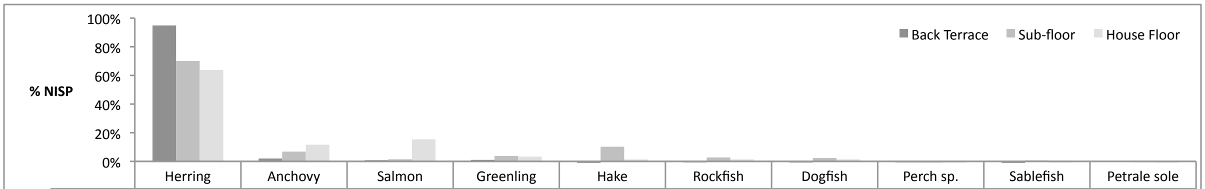


Figure 7. Taxonomic composition of the entire column sample fish assemblage according to two measures of abundance; 1) the relative percent of the number of identified specimens (%NISP) and 2) ubiquity (% occurrence in individual column levels). Taxa are shown in descending frequency according to %NISP with sample sizes indicated below bar charts.

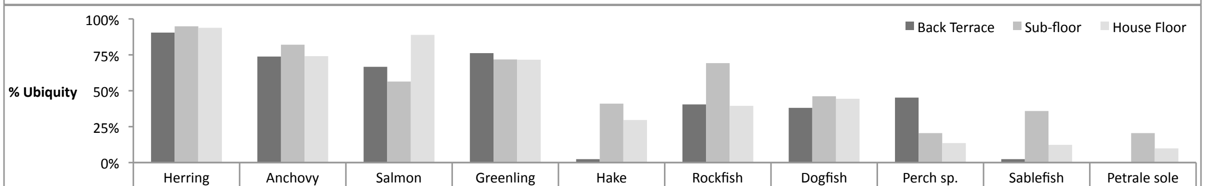
in cultural practice relating to herring throughout the examined history of occupation.

<u>Anchovy</u>

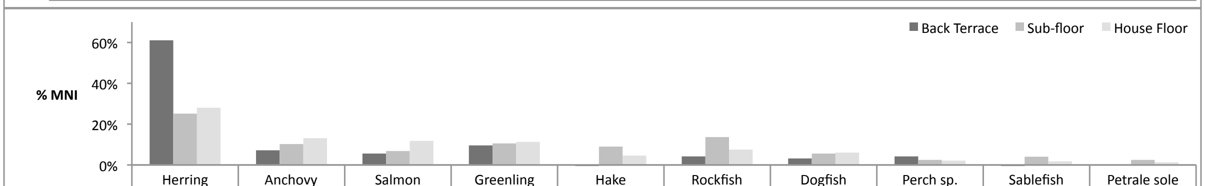
Anchovy are the second-most numerically abundant fish species recovered from the column sample assemblage (%NISP), yet represent only 5.8% of all identified specimens (Figure 7). Nevertheless, anchovy are tied with salmon as the second-most ubiquitous fish, occurring in 75% of all examined contexts (Figure 7). This indicates that even though anchovy (and salmon) are considerably less abundant than herring, they occur almost as regularly in the column sample assemblage. As estimated



	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish	Dogfish	Perch sp.	Sablefish	Petrale sole
Back Terrace	94.9%	2.0%	0.8%	1.1%	0.02%	0.4%	0.2%	0.4%	0.01%	0%
Sub-floor	70.1%	6.8%	1.4%	3.8%	10.2%	2.8%	2.3%	0.2%	0.7%	0.5%
House Floor	63.8%	11.6%	15.4%	3.3%	1.3%	1.4%	1.4%	0.2%	0.3%	0.2%

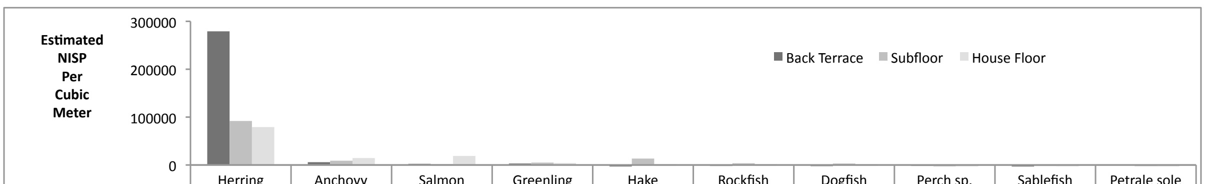


	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish	Dogfish	Perch sp.	Sablefish	Petrale sole
Back Terrace	90%	74%	67%	76%	2%	40%	38%	45%	2%	0%
Sub-floor	95%	82%	56%	72%	41%	69%	46%	21%	36%	21%
House Floor	94%	74%	89%	72%	30%	40%	44%	14%	12%	10%

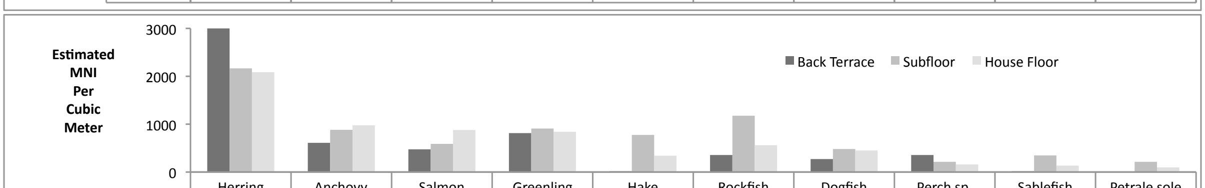


	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish	Dogfish	Perch sp.	Sablefish	Petrale sole
Back Terrace	61.1%	7.2%	5.6%	9.6%	0.2%	4.2%	3.2%	4.2%	0.2%	0%
Sub-floor	25.2%	10.2%	6.8%	10.6%	9%	13.7%	5.6%	2.5%	4%	2.5%
House Floor	28%	13.1%	11.8%	11.3%	4.6%	7.5%	6.1%	2.1%	1.8%	1.3%

Figure 8. Relative abundance over time for the ten most numerous fish taxa shown as percent of identified specimens (top), ubiquity (middle), and the estimated minimum number of individuals (bottom). Grouped bars represent fauna from the three temporally distinct deposits; the back terrace, sub-floor deposits, and the House 1 floor deposits.



	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish	Dogfish	Perch sp.	Sablefish	Petrale sole
Back Terrace	279153	5881	2475	3119	51	1034	712	1085	17	0
Subfloor	91898	8930	1898	4973	13396	3610	3075	241	963	668
House Floor	79183	14451	18841	4159	1659	1720	1732	207	341	220



	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish	Dogfish	Perch sp.	Sablefish	Petrale sole
Back Terrace	5186	610	475	814	17	356	271	356	17	0
Subfloor	2166	882	588	909	775	1176	481	214	348	214
House Floor	2085	976	878	841	341	561	451	159	134	98

Figure 9. The number of specimens (NISP) and minimum number of individuals (MNI) per cubic meter based on sampled volumes from the back terrace (59 litres), the subfloor (37.4 litres) and house floor assemblages (82 litres). Note: estimates are overly precise (extrapolations) but nevertheless give a n additional comparative basis for assessing change over time and differences between species.

by MNI, anchovy represents over 10% of the assemblage but its rank-order abundance drops from second to third using this measure (Figure 12).

Anchovy are sequentially more abundant over the three temporal periods, rising from a low 2% NISP in the in the back terrace assemblage to 6.8% in the sub-floor assemblage, to a high of 11.6% in house floor assemblage (Figure 8). Comparing the number of anchovy specimens (NISP) per cubic meter and individuals (MNI) per cubic meter indicates there is a similarly progressive increase in anchovy over time (Figure 9). As shown in Figure 8b, the ubiquity value of anchovy remains virtually the same over time, suggesting that this species was harvested consistently but became increasingly important relative to other fish.

Salmon

Salmon are the third-most numerically abundant taxon in the assemblage, representing 5.5% of the total NISP (Figure 7) and 8.8% of the total MNI (Figure 8). Salmon are also relatively ubiquitous in the examined assemblage indicating consistent use throughout the site deposits (70%). However, salmon are considerably more abundant in the House 1 deposits than in the back terrace based on NISP, ubiquity, and MNI, as well as NISP per m^3 and MNI per m^3. Within the House 1 deposits, salmon increase in abundance between the sub-floor and House floor deposits, reaching their highest abundance in the period just prior to site abandonment (ca. 400 years BP).

Greenling

The next most numerically abundant taxon is greenling, which represents only 2.2% of the total NISP but has a ubiquity value of 70% indicating it is found in low quantities but is regularly utilized (consistently present in most examined contexts). This circumstance appears to impact the MNI estimate for greenling, which shifts it to the second-most abundant fish in the assemblage (Figure 12). There is no discernable difference in the relative abundance and ubiquity of greenling over the three temporal periods represented at the site, suggesting this taxon remained consistently important throughout the occupation of Huu7ii.

Hake

While hake is the fifth-most numerically abundant fish in the column sample assemblage, it is significantly less ubiquitous than other abundant taxa. This indicates hake was not as consistently harvested over the 5,000-year period of occupation, but rather occurs much more frequently within a particular context or time frame (i.e., a portion of the House 1 deposits). This inference is strongly supported by the temporal trends in abundance where hake very rarely occur in the back terrace deposits but spike in abundance and ubiquity in the sub-floor deposits, only to drop in abundance within the house floor deposits (Figures 8 and 10).

As discussed for the excavation unit assemblage (Frederick, this vol.), there is an extremely high density of hake remains present in the lower portion of column N18-20/E6-8 from House 1 that disproportionately increases the calculated abundance for the total unit assemblage. In contrast to the very high abundance estimates for hake in the excavation unit assemblage, the column sample data indicate that this species represents not much more than 10% of the assemblage in the sub-floor deposits. Hake MNI estimates range from a low of 0.2% to a high of 9% in the sub-floor deposits (Figure 8).

Rockfish

Rockfish represent only slightly more than 1% of the total assemblage but are found in 45% of the examined column level samples (Figure 7) and comprise nearly 8% of the estimated MNI (Figure 12). Rockfish are considerably more abundant and ubiquitous in the sub-floor deposits than in either the back terrace or house-floor deposits indicating this taxon was utilized most intensively during this period (Figure 8).

It is noteworthy that rockfish are slightly less abundant than greenling in the column assemblage (Figure 6) but strongly outnumber greenling in the excavation unit assemblage (Fredrick, this vol.) This likely reflects a screen size bias favoring recovery of larger fish, whereas greenlings have a smaller size-range than rockfish at the Ts'ishaa village in the Broken Group (McKechnie 2005b:217). Similarly, greenling has a slightly smaller size range than rockfish in this assemblage (Figure 13).

Dogfish

Dogfish are the seventh-most abundant fish but are not particularly abundant in the column assemblage, representing less than 1% of total NISP (Figure 7). However, they do occur regularly throughout the examined occupational history as indicated by their consistent ubiquity (Figure 8). Dogfish abundance does not appear to change significantly over time but House 1 deposits have slightly higher frequencies relative to the back terrace (Figure 9).

Despite a low relative abundance, it is notable that dogfish cartilaginous sharks that have significantly fewer skeletal structures than bony fish, which would further diminish the potential importance of this taxon relative to others (Rick et al. 2002). However, dogfish do have highly distinctive and numerous vertebrae (ca. 100–110, Last et al. 2007), which in comparison with many other fish may help offset an otherwise sparse skeletal anatomy.

Perch
Perch is a taxonomic family level designation (Embiotocidae) referring to several species (e.g., pile perch, surf perch, shiner perch) that occur moderately frequently in the overall assemblage but represent small abundance values (Figures 7 and 12). Interestingly, perch progressively decrease in abundance over the three time periods among all relative abundance measures (%NISP, Ubiquity, %MNI) as well as absolute abundances as estimated by NISP and MNI per cubic meter (Figure 9). Thus, perch appear to be most regularly utilized in the back terrace deposits and progressively decrease over time.

Sablefish
Sablefish are long-lived fish that inhabit deep pelagic waters along the continental shelf edge (King et al. 2000). Sablefish occur moderately regularly in the column sample assemblage (14% ubiquity) but represent only 0.2% of the total assemblage (NISP). Sablefish is nearly absent in the back terrace but increases in the later sub-floor and house-floor deposits (Figure 8).

Based on visual comparison to mature fish in the UVic comparative collection, it appears the majority of the archaeological specimens are from small, juvenile-sized fish (King et al. 2000), which inhabit shallow inshore waters before maturation. The moderately frequent occurrence of juvenile-sized sablefish in the House 1 assemblage is consistent with the use of the nearshore water in the vicinity of site. However, additional measurements and metric comparison to known age specimens might improve understanding of where in the environment these fish were harvested.

Petrale Sole
In contrast to the noted ethnographic importance of halibut (e.g., Arima 1983), the most numerous 'flatfish' in the column assemblage is Petrale sole, a plate-sized flatfish that inhabits relatively deep-waters between 80 and 500 meters (DFO 1999). Petrale sole represent a small portion of the overall assemblage and exhibit a moderate ubiquity in the House 1 deposits but are absent from the back terrace column deposits (Figure 8). Petrale sole are also the most numerous flatfish identified in the excavation unit assemblage (Frederick, this vol.), considerably out-numbering all other flatfish including halibut.

Other Fish

As shown in Table 2 and Figure 7, a host of other fish taxa are present in the assemblage but occur in very low quantities relative to the ten most numerous taxa. However, although numerous identified fish taxa may appear 'unimportant' in this assemblage, this assumption id not warranted given the fact that this assemblage 1) comes from a very small portion of what is a much larger site, 2) may occur in greater frequency in these un-sampled areas, 3) derive from deposits representing several thousand years of human occupation, and 4) is only one of numerous large shell midden sites in Huu-ay-aht territory. Nevertheless, these small numbers of comparatively 'rare' taxa preclude a justifiable assessment of their abundance and history of use within this particular assemblage.

Notably, there is a relative paucity of halibut in the column and unit assemblages (Frederick, this vol.), a circumstance that is not uncommon in archaeological contexts on the Northwest Coast (Orchard and Wigen 2008). The relative lack of halibut appears to reflect differential processing of halibut (butchery on the beach and public distribution of meat) as well as the taphonomic effects of a lower bone density value for halibut relative to other fish (Smith et al. 2008). Culinary processing such as the use of halibut for soup is a common practice that likely contributes further to the relative paucity of halibut in the assemblage (Blackman 1990; de Laguna 1972:392–400).

There are some unique and relatively unexpected occurrences of taxa such as eulachon, a small oily smelt known to spawn in large rivers, as well as possible sardine in the back terrace and the House 1 deposits, indicating the potential presence of this southerly species that rarely occurs at this latitude (see Wright et al. 2005). However, it is notable that that some of these 'rare' taxa occur much more frequently in the excavation assemblage than would be expected based on screen size alone. For example, the number of rockfish, lingcod, cabezon, and Irish lords specimens are recovered in considerably larger numbers in the unit assemblage (Frederick, this vol.). While this is likely due in part to a strategy that preferentially recovers large visually distinctive bones, it also potentially reflects the spatially restricted sample of fish remains in the column sample assemblage relative to the spatially and volumetrically larger sample from the excavation units. For instance, at the completely sampled house floors at the Ozette village site, there are horizontally patterned concentrations of fish species in certain parts of the house floor (Huelsbeck 1981) that might be less likely to be captured in vertically oriented column sample deposits (see discussion in Gray 2008). Thus, it remains possible that those taxa that are rare in the column assemblage might appear comparatively more abundant if a larger spatial area was sampled.

Temporal Trends in the House 1 and Back Terrace Assemblages

<u>House 1 (ca. 1500–400 yr BP)</u>

To assess the temporal trends in fish use within the House 1 deposits, I plotted the relative abundance of three important fish taxa by individual column sample level (Figure 10). This analysis compares trends across the four column samples spanning the full depositional sequence of House 1 and utilizes both %NISP and NISP per litre values in order to evaluate if an increase in relative abundance is a simple consequence of an increase in another taxa.

Overall, there is strong similarity between %NISP and NISP per litre for the House 1 column samples, providing greater confidence that the observed trends are not spuriously caused by fluctuations in other taxa, but reflect actual changes in abundance. In some cases, however, the two sets of data (%NISP and NISP per litre) diverge, which allows further clarification for specific temporal periods. For example, the increasing NISP per litre for salmon in column sample N10-12/W2-4 does not match the decrease in salmon %NISP due to a particularly large increase in herring per litre (left column of Figure 10).

Secondly, there are distinct similarities in the temporal trends for specific taxa throughout the depositional sequence, suggesting that coherent change occurred in resource harvesting practices, with the most striking trends noted for hake and salmon. In particular, hake do not occur in either the lowest or in the highest column sample levels from House 1 but exhibit a dramatic spike in abundance in the middle portion of each of the examined column samples (both %NISP and NISP per litre, Figure 10). In the upper layers of the house floor deposit (later in time), there are dramatic increases in salmon abundance (relative percent and bones per litre), in contrast to the consistently low abundance values for salmon in the lower, earlier levels. The increase in salmon also occurs in the upper levels of the four column samples that span only the house floor portions of House 1 deposits.

The sudden and progressive increase in the relative abundance of salmon appears just after the period of intense use of hake (Figure 10), suggesting a long-term and spatially coherent shift in the focus of resource harvesting practice at a household level. Thus, despite the potential for spatial variability in a house deposit, this aspect of resource use appears to have shifted throughout the house deposit sometime after approximately 800 years ago.

In contrast to the dramatic shifts in the abundance of hake and salmon, the most numerous taxon in the assemblage, herring, shows progressive long-term fluctuations in abundance that range widely but relatively consistently over time. For instance, there are broad similarities in the trends in abundance between the four columns, with high abundances in both the lower levels and the upper levels. In contrast, there is a period of comparatively low herring abundance in the middle portion of the depositional sequence from House 1. Interestingly, this corresponds to the peak in hake abundance, suggesting that the number of herring per litre drops when hake reach their highest frequencies (Figure 10). Similar to herring, anchovy appear to exhibit broad temporal trends in the House 1 deposits with somewhat consistent increases in abundance when herring decrease in abundance.

<u>Back Terrace (ca. 5000–3000 yr BP)</u>

Herring consistently dominates the fish assemblage in both of the back terrace column samples, representing more than 94% of total NISP and more than 70% of NISP in individual levels in all but three of the 38 examined levels from the two columns (Figure 11). This consistently high percentage is similarly reflected in the number of herring per litre, which vastly outnumbers all other taxa throughout the depositional sequence. These consistent trends occur in physically separate deposits (20+ metres apart) that have overlapping age ranges, and therefore likely represent a deposit-wide pattern over a broad 2,000-year period, between 5,000 and 3,000 years ago.

Notably, the highest herring frequencies occur in the upper half of the deposits between 125 and 90 cm below the surface in both column samples (both %NISP and NISP per litre). This spike

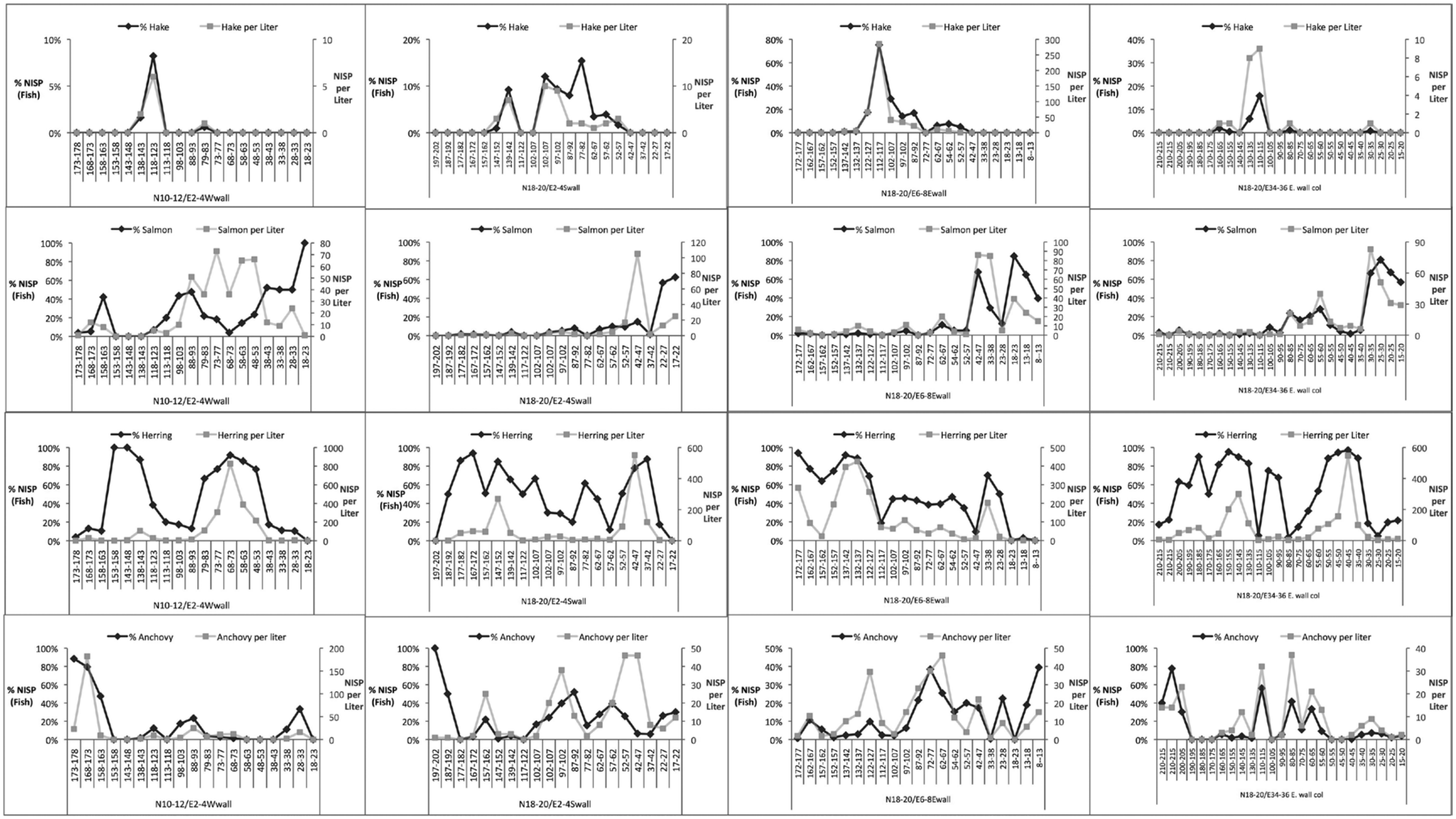


Figure 10. Temporal trends (left to right) in the abundance of four important fish taxa in four different areas of the House 1 deposits (top row–hake, upper middle–salmon, lower middle–herring, bottom-anchovy). Dark lines indicate the relative percent (%NISP) while the grey lines indicate absolute abundance (NISP/litre) and are plotted on a secondary vertical axis. The individual data points on the horizontal axis are 5-cm column sample levels shown in depths below ground surface. Note the different vertical scales. Interpretations of patterning: Hake suddenly occur in the middle portion of House 1 deposit but are then consistently absent. Salmon exhibit dramatic increases in abundance in the upper levels of all column samples after Hake spike in abundance. Herring exhibits broad fluctuations in abundance but is generally less abundant when hake is present. Anchovy abundance broadly fluctuates but exhibits its highest abundances when hake spikes in abundance.

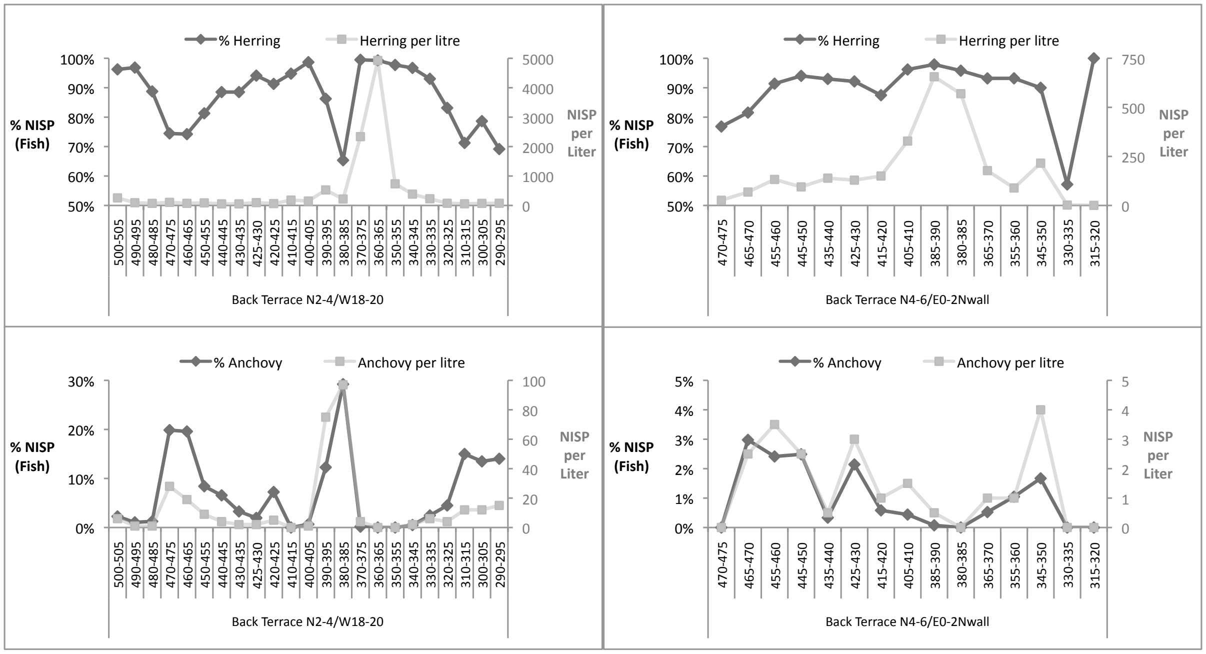


Figure 11. Herring and anchovy abundance in individual column sample levels from the two back terrace column samples. Dark lines indicate the relative percent (%NISP) while the grey lines indicate absolute abundance (NISP per litre) and are plotted on a secondary vertical axis. The individual data points on horizontal axis are 5-cm increments in depths below ground surface.

in abundance therefore appears to represent a deposit-wide period of particularly intense herring use. The most extreme case is a series of contiguous levels in column N2-4/W18-20, which culminates in a single 1-litre level containing nearly 5,000 individual herring bones, representing a minimum of 98 individual herring (approximately 15% of the entire fish assemblage). Observations by excavators recount a "crazy herring" layer in both excavation units where dense concentrations of herring were present across horizontal levels. Such high fish numbers suggests an intense collective effort focused on herring harvesting and processing, presumably over a number of seasons or over the course of a few human generations based on the presence of multiple 5 cm levels containing particularly high numbers of herring.

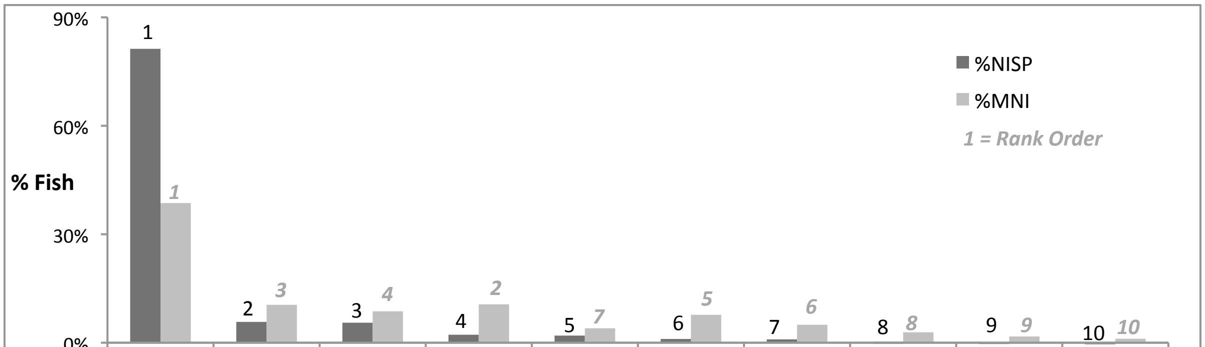
Both preceding and following this period of particularly intense herring use, herring progressively rises and drops in abundance over successive levels (among both %NISP and NISP per litre). This indicates progressive fluctuations in fishing effort that likely relates to a combination of 1) the abundance of herring in the environment, 2) local conditions conducive to herring spawning habitat, and most vitally 3) the collective social capacity and incentive to collect and process *that* many fish.

Anchovy are the second-most abundant fish species in the two back terrace column samples but are considerably less abundant than herring in all levels. Similar to herring, the back terrace column sample N2-4/W18-20 contains many times more anchovy remains than in column N4-6/W0-2, reflecting the comparatively greater number of fish in this deposit as well as a comparatively greater percentage of anchovy. Both columns contain higher frequencies of anchovy in the levels preceding the dramatic spike in herring, suggesting that inhabitants may have increased their use of anchovy when herring harvests were lower. Similar patterning was observed in the House 1 deposits. Both fish are high in oil content and were likely caught using similar methods (e.g., rakes, nets).

Collectively, the temporal trends in the abundance of the most numerous and ubiquitous taxa reflect active shifts in fishing practices between the deposition in the back terrace deposits and the creators of the House 1 deposits. The cultural and paleoenvironmental significance of these changes are discussed further in the discussion section.

NISP and MNI

Figure 12 contrasts the NISP and MNI values for the ten most abundant taxa in the entire column assemblage. As previously discussed, MNI is a



	Herring	Anchovy	Salmon	Greenling	Hake	Rockfish sp.	Dogfish	Perch sp.	Sablefish	Petrale sole
%NISP	81.3%	5.8%	5.5%	2.2%	2.0%	1.0%	0.9%	0.3%	0.2%	0.1%
%MNI	38.6%	10.5%	8.7%	10.6%	4.0%	7.7%	5.0%	2.9%	1.7%	1.1%

Figure 12. NISP and MNI data for the entire column sample assemblage. MNI represents the minimum number of individuals (%MNI) and is derived from NISP data. Rank orders for NISP and MNI listed as numbers above bars.

minimum estimate derived from the most numerous non-repetitive element in the individual column sample levels and is subject to numerous quantitative and thus interpretive uncertainties (Lyman 2008). Nevertheless, this derived measure of abundance further details the relative and rank order abundance of the top ten fish taxa.

Interestingly, conversion to MNI for the entire assemblage roughly halves the relative abundance of herring (dropping from 81% to 39%). As a result, the percentages of all other taxa increase accordingly (Figure 12). This implies that these other fish have a consistently greater contribution relative to herring than indicated by the NISP data alone. Conversion to MNI also shifts the rank order abundance for several of the 10 most abundant taxa. For example, greenling shifts from the fourth to the second most numerous fish (Figure 12). Conversely, the contribution of hake drops from the fifth to seventh rank despite an increase in %NISP. Overall, rank order abundance generally corresponds with the NISP data and no other taxa occur in the top ten, confirming the numerical importance of these ten taxa.

Fish Length Estimates

Fish length estimations were conducted on hake, herring, rockfish, and greenling using linear regression introduced previously. I also measured the greatest transverse width of salmon vertebrae to estimate the range of salmon species present in the deposits following Cannon and Yang (2006). Fish length data are shown in Figure 13 and salmon vertebrae measurements in Figure 14. The sample was limited by the presence of measurable elements and therefore represents only a small percentage of all identified specimens. These data are combined from all time periods as small sample sizes preclude temporal comparisons.

The majority of herring are estimated to be between 20 and 27 cm in length, indicating adult-sized (spawning-age) fish were the focus of harvesting based on comparison with studies conducted during the late 20th century (e.g., Hourston 1958; Tanasichuk 1997:2784). Visual inspection of the histogram for herring length (indicates a normal distribution with a central tendency between 22.5–25.0 cm in length. This suggests that aboriginal harvesters targeted herring when they aggregated in large schools of mature adults. The absence of herring smaller than 18 cm (approximately 2+ year old fish) suggests that juvenile schools were not targeted even though they are known to congregate in separate, smaller, more diffuse schools in bays and inlets (Hourston 1958).

As shown in Figure 13, the estimated size-range for hake is between 30 and 55 cm, indicating the exclusive presence of adult-sized fish that are well past spawning size (Benson et al. 2002). This suggests that the hake targeted by site occupants were not part of a year-round resident population that inhabit parts of southern BC (Benson et al. 2002) but are likely part of the California/Oregon migratory population whereby the largest individuals seasonally migrate north into southern British Columbia during the height of summer. As noted by several fishery researchers (Agostini et al. 2006; Benson et al. 2002; McFarlane et al. 2000), hake migration is strongly related to oceanographic shifts in climate whereby larger hake migrate further north during years with warm ocean temperatures. Thus the abundant presence of hake in the sub-floor deposits may indicate warmer ocean conditions when they occur in abundance (ca. 1500–800 years BP).

Rockfish and greenling length estimates suggest the majority of these two taxa are between 20 and 40 cm in length (Figure 13). The similar size distributions for both greenling and rockfish and the fact that they share rocky bottom kelp-bed associated habitats indicate they were harvested at the same time and likely using similar technologies. These size ranges are much smaller than fish caught in the modern sport fishery but are identical to the lengths reported for the late-Holocene deposits at the village of Ts'ishaa in the Broken Group Islands (McKechnie 2007c:218). This small size is conducive to a sustainable harvest strategy, which targets young smaller animals that have less reproductive capacity than older, larger fish that exert a disproportionate effect on the survivorship of larval offspring (Berkeley et al. 2004).

Salmon vertebrae measurements indicate a range of species present in the modest sample of whole vertebrae (Figure 14). The greatest proportion of vertebrae falls within the size-range of smaller species such as pink, sockeye, and coho, indicating a possible concentration on these taxa. However, this contrasts slightly with measurements taken on a slightly larger sample from the excavation units in 2004 (Frederick et al. 2006). A larger sample is needed to more fully document the salmon species represented and recent papers (i.e., Huber et al. 2011; Orchard and Szpak 2011)

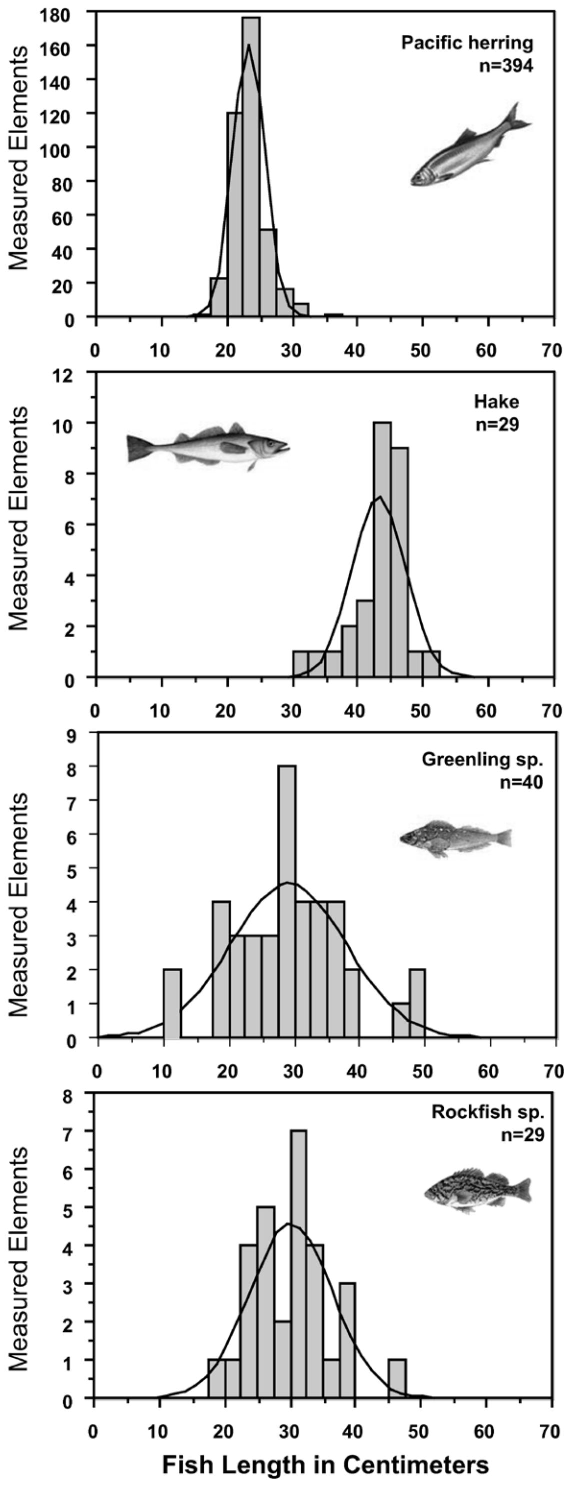


Figure 13. Histograms showing fish lengths measured elements of herring, hake, rockfish, and greenling. Herring is a fork length while the remaining are total lengths. Normal distribution curves shown over histograms. Note the large size of hake relative to other fish.

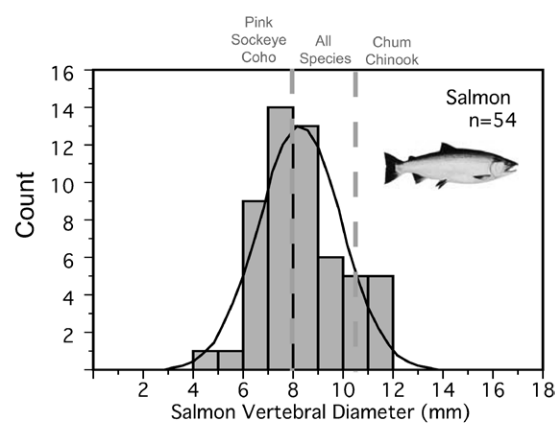


Figure 14. Measured salmon vertebrae from the column sample assemblage showing the size range for individual taxa as determined by Cannon and Yang (2006).

suggest that new metric and imaging approaches will yield useful insights.

Taphonomy, Formation Processes, and Sampling

Taphonomy, "the study of processes of preservation and how they affect information in the fossil record" (Behrensmeyer and Kidwell 1985:105), is a fundamental process that underlies the archaeological record (Schiffer 1987) and the archaeology of animal remains in particular (Gifford 1981; Lyman 1994). Researchers have noted that faunal assemblages may be altered, transformed, and/or contributed-to by non-human agents such as burrowing and scavenging animals and microbes (Erlandson and Moss 2001), as well as a host of physical processes such as soil chemistry and sea-level change (e.g., Linse 1992; Moss 1985; Stein 1984). Cultural practices such as butchery, transport, consumption, deposition, and re-deposition can also strongly condition the types and proportions of animal bones recovered in archaeological contexts (e.g., Monks 2003). In addition, it is critical to be aware that the results observed in a zooarchaeological analysis may reflect limitations of the sampling strategy rather than a purported observation of historical significance (Gray 2008; Thomas 1978).

To assess how factors other than past human agency may have conditioned the skeletal assemblage and to consider how this may constrain the interpretive possibilities of the assemblage, this section conducts analyses that explore how taphonomic and sampling factors may affect the assemblage and the strengths of the assemblage.

Identification Rates

The ratio between 'identified' (NISP) and 'unidentified' (NSP)[2] specimens in a faunal assemblage reflects variability in the degree of identifiability and fragmentation as well as an analyst's confidence in identification. To assess the potential relationship between identification and fragmentation, I examined the ratio of unidentifiable to identifiable remains for fish within the 12 column samples (Figure 16).

Each of the nine column samples from the House 1 deposits has a similar rate of fish identification (ranging between 40–50% of all fish specimens). This consistency in identification suggests fragmentation is similar within the House 1 deposits despite the potential for variability in a house floor.

In contrast, the two older back terrace column samples have much greater rates of identification (75–85%). This is a counterintuitive result as one might expect a much higher degree of fragmentation and lower identifiability in such an older deposit (ca. 5,000–3,000 yrs ago). However, in this case, the pattern of high identifiability is likely driven by the large numbers of identifiable herring remains in these two deposits (Figures 8 and 11). Regardless, the fact that larger numbers of small herring are abundantly present in these older deposits indicates excellent preservation conditions during that time.

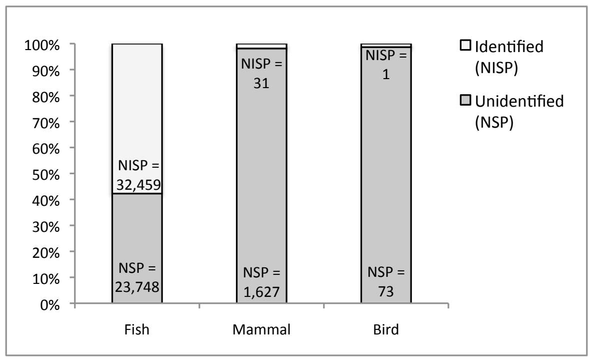


Figure 15. The identification rate for fish, mammals and birds in the column sample assemblage indicating the number of identified and unidentified specimens for each category.

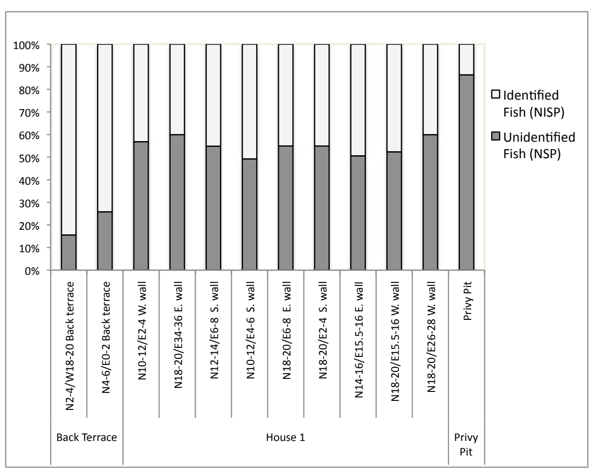


Figure 16. Identification rate for fish remains in the 12 examined column sample assemblages (site area is noted at bottom).

[2] 'Identified' refers to specimens that can be assigned to taxonomic family, genus, or species whereas 'unidentified' refers to specimens that are only recognizable as fish (i.e., usually ribs, branchials, and/or fragmented bones).

The single column from the privy pit has a notably low rate of identification (15%) but also has the smallest assemblage size and examined volume of the 12 column samples. This undated sample is close to the modern shoreline, and in the context of regional sea level history and site formation processes, it likely dates to within the past 500 years.

Density of Recovered Fish Remains

Based on the total number of fish remains present in the column sample assemblage, there is an estimated density of 175,000 identifiable (NISP) fish bones per cubic meter (from 2 mm mesh). The identified assemblage from the temporally older and spatially distinct back terrace deposits (ca. 5000–3000 yr BP) has the greatest estimated density of 294 identifiable fish remains per litre while the younger House 1 deposits have an estimated 123 bones per litre. While these estimates do not incorporate the considerable variability among individual column sample levels, they nevertheless indicate the considerable scale and intensity of the fishery as archaeologically represented in the examined deposits.

The greater number of bones per cubic meter present in the older deposits demonstrates the excellent preservation conditions and indicates a comparatively more intensive fishery at the site during that time (Figure 17). Conversely, this may also indicate that house-floor and sub-floor deposits are not as conducive to the preservation of bone and/or are subject to differing depositional conditions (e.g., trampling and house cleaning).

To further investigate the absolute abundance of fish remains in the examined assemblage, I developed estimates for the number of individual fish per litre in the three temporally distinct deposits. Figure 17 indicates that the older back terrace deposits have the highest number of fish per litre, which is predominantly due to a greater number of herring overall as there are fewer other fish per litre in this deposit. Conversely, later in time in the subfloor and house-floor deposits, there is a substantial reduction in the number of herring per litre but an increase in the number of other fish, which appears stable during both periods (Figure 9).

Sampling Effort

To assess the relationship between taxonomic richness and sampling effort within the column sample assemblage (cf. Lepofsky and Lertzman 2005; Lyman and Ames 2004, 2007; Monks 2000), I created 'collectors curves' depicting the stepwise relationship between taxonomic richness and sampling intensity (Figures 18 and 19). These figures show the 'rate' at which new fish taxa are identified as new column levels are cumulatively added together (i.e., new taxa found in individual column levels).

Unsurprisingly, this analysis reveals that the greater number of identified specimens, the more fish taxa were identified. Importantly however, the 'rate' of novel identifications slows dramatically as sample size increases. For instance, Figure 18 illustrates that 30 fish species were identified when the sample size reached 15,000 specimens but an additional 15,000 specimens needed to be examined before two additional fish species were identified. Overall, this 'slowing' in the rate of identification indicates that the analysis passed a threshold whereby a larger sample size does not dramatically increase the number of new taxa.

Figure 19 compares the collector's curves for House 1 and the back terrace. This comparison reveals the similar level of sampling intensity in the two temporally distinct deposits. Both assemblages contain similar sample sizes and have reached relatively 'level' portions on the 'curve'. Interestingly, this comparison also indicates that a greater number of fish taxa are present in the House 1 assemblage (n = 29) than in the back terrace (n = 19) assemblage, even though the back terrace has a moderately larger sample size. The differences in the shape of these curve is likely due to the higher number of herring present in the back terrace but the overall differences in the number of taxa appears to indicate substantial differences in the use of fish in these different periods in time (an issue discussed elsewhere).

The observation that both assemblages appear to have passed the 'steepest' portion of the curve indicates that the level of sampling effort adequately encompasses the taxonomic richness of these deposits. That said, neither collector's curve appears to 'level out' entirely, indicating that new fish species will likely be identified if additional samples are examined. Thus, the assemblage has by no means been sampled to complete "redundancy" (Lyman and Ames 2004) but appears adequate for evaluating compositional differences between them due to both similar sample sizes and similarly shaped collector's curves.

Shellfish and the Preservation of Bone

There is a widely held observation in shell midden archaeology of an association between the presence of shellfish and the preservation of bones (Erland-

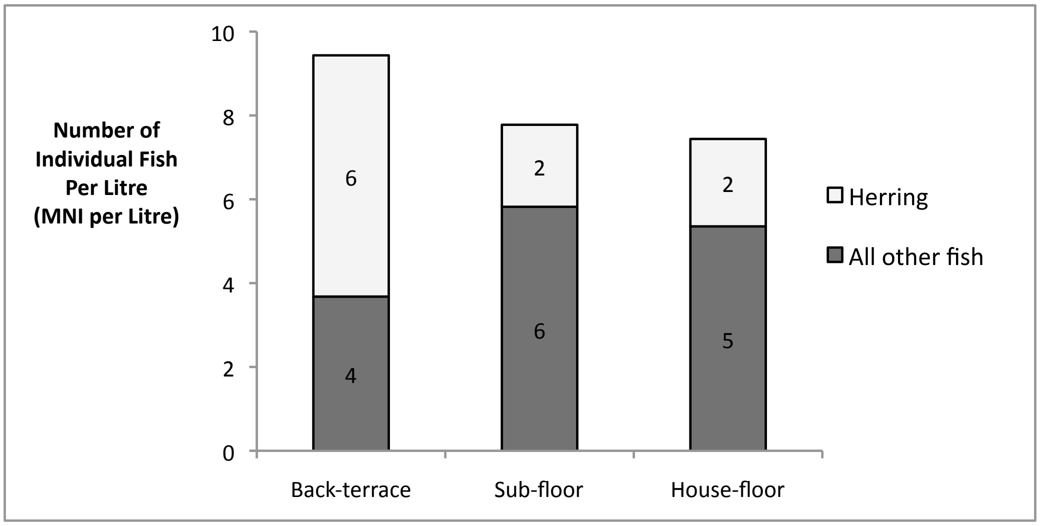


Figure 17. Estimated number of individual fish per litre (numbers have been rounded up) in the three temporally distinct deposits at Huu7ii. Numbers of herring and all other fish are based on the total number of individual fish divided by the total examined volume for each deposit.

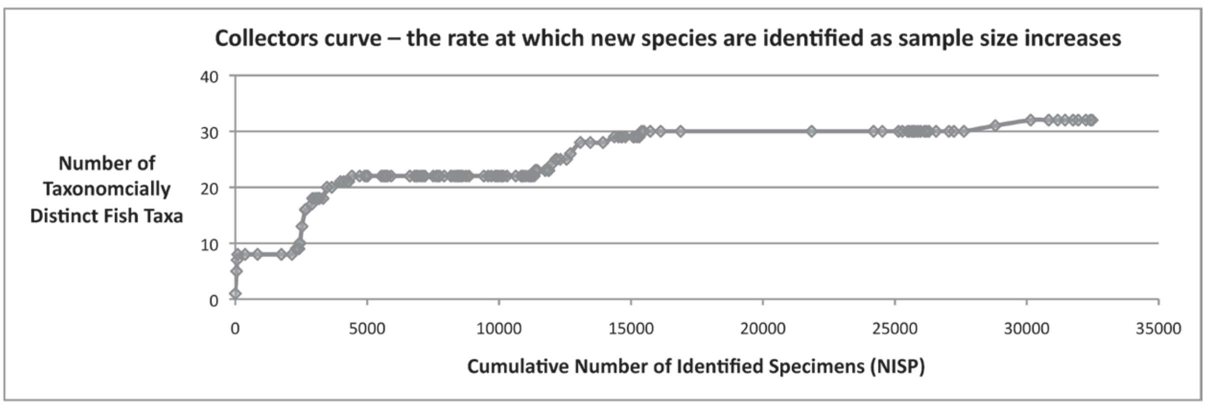


Figure 18. Collectors curve for taxonomic richness in the column sample assemblage depicting the linear relationship between the cumulative number of identified specimens and the number of new taxa present.

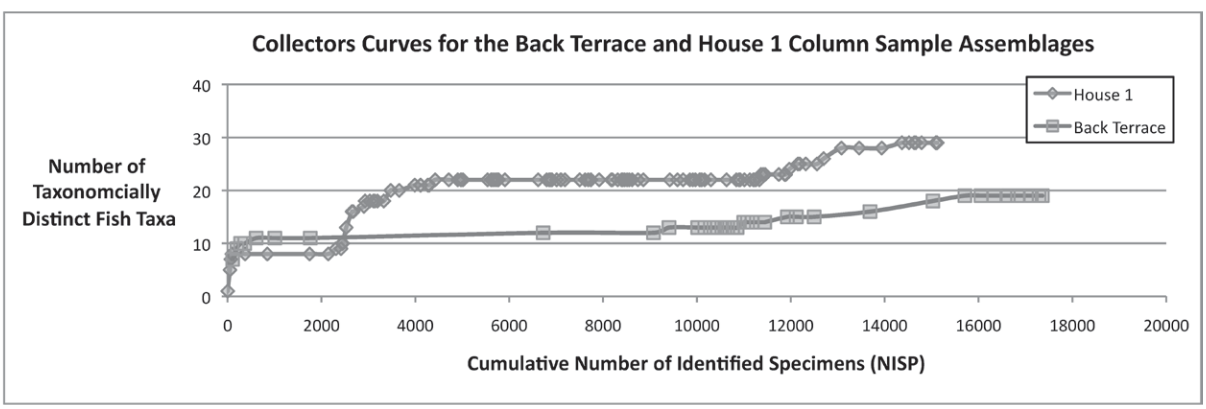


Figure 19. Collector's curve comparing the taxonomic richness of the House 1 and the back terrace assemblages.

son 2001; Linse 1992) whereby the deposition of shell creates alkaline conditions conducive to the preservation of bone. To assess whether this relationship has influenced the amount of bone present in the examined assemblage, I evaluated the strength of this relationship by using correlation between the weight of ¼" shell and the weight of 2 mm bone for 256 samples processed samples. However, I found no correlation between these variables for the assemblage as a whole but rather observed a very insignificant relationship with wildly varying amounts of bone and shell in individual column samples (Figure 20). I further examined this relationship within the back terrace, as these older deposits (ca. 3000–5000 BP) presumably might be more affected by such a relationship but again found no correlation. These results suggest that the presence of shell does not have a direct influence on the amount of bone present in individual levels and provides support for the interpretation that the deposition of bone is a function of cultural practices rather than an artifact of bone diagenesis.

However, this analysis does provide some support for a taphonomic distinction between the main village and the back terrace in that both shell and bone are found in a wider range of quantities per sample in the House 1 deposits relative to the back terrace (Figure 20). In particular, the maximum weight of ¼-inch shell per litre and the bone weight in grams per litre have lower values in the back terrace than House 1. This suggests that either the amount of shell and bone is less abundant in these older deposits or is subject to greater rates of fragmentation. However, this does not appear to be positively correlated with the preservation of bone.

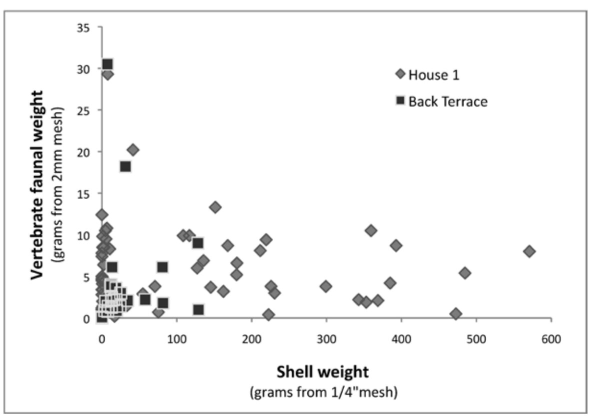


Figure 20. Scatterplot showing the non-linear relationship between the weight of bone per liter and the weight of shell per liter in individual column sample levels within the back terrace and the House 1 deposits (n = 256). Note the lack of a strong correlation overall but the comparatively higher range for shell and bone weight in the House 1 deposits.

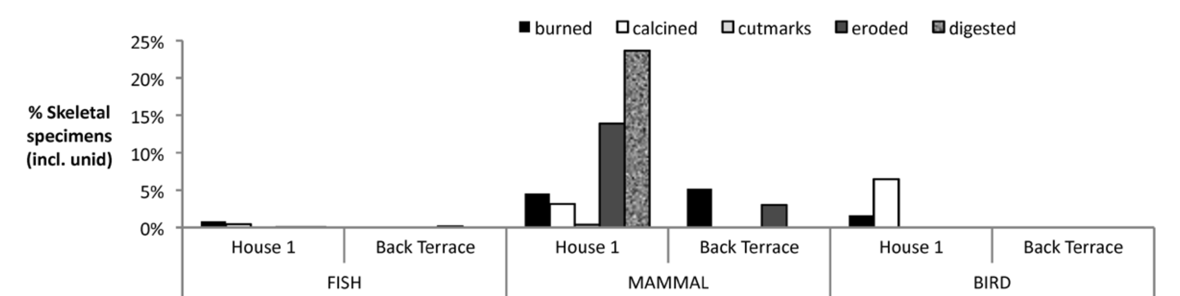
Condition of Bone Assemblage

Numerous skeletal specimens from the examined column sample assemblage show evidence of burning, erosion, cutmarks, and/or digestion. The frequencies of these alterations have implications for the preservation of the bone assemblage and for interpreting food preparation and bone disposal practices in the site as a whole.

Mammal bone specimens are the most frequently altered with a total of 45% of bone fragments from House 1 deposits and 8% of back terrace mammals being affected by either burning, erosion, cutmarks, and/or digestion (Figure 21). Bird bones are the second most frequently altered specimens with 8.1% from House 1 being affected while none of the bird from the back terrace appear altered. In contrast, very few fish remains show any evidence for burning or digestion, and no cutmarks were observed on fishbone.

The majority of burned mammal and bird bones consist of unidentifiable fragments of what were much larger skeletal elements and so appear disproportionately frequent relative to the much more numerous fish remains. The low frequency of taphonomic alterations on fish remains may be masked by their vulnerability to burning and digestion, as such bones might be much less likely to survive the digestive process (Jordan 1997). However, the assemblage does not lack fish bones and thus, such processes do not account for the exponentially more abundant fish in the assemblage.

Among the two examined areas of the site, the House 1 deposits contain considerably higher percentages of taphonomically altered bones as might be expected for deposition in a household context (e.g., cooking and consuming food). The large number of digested and eroded mammal bones indicate the influence of carnivore modification, most likely domestic dogs (*Canis familiaris*) that are abundant in the excavation units in both the back terrace and the House 1 assemblages (Frederick, this vol.). Gnawing and consumption of bone fragments (for grease and marrow) is a common canine activity and one that might have been conducive to temporarily removing some mammal bones from a floor surface. Comparatively few fish bones show evidence for digestion with the great-



	FISH		MAMMAL		BIRD	
	House 1	Back Terrace	House 1	Back Terrace	House 1	Back Terrace
burned	0.82%	0.06%	4.5%	5.2%	1.6%	0.00%
calcined	0.42%	0.02%	3.1%	0%	6.5%	0.00%
cutmarks	0%	0%	0.37%	0%	0%	0.00%
eroded	0.04%	0.15%	13.9%	3.0%	0%	0.00%
digested	0.05%	0%	23.6%	0%	0%	0.00%

Figure 21. Burning and other modifications to bone specimens in the column sample assemblage by fish, mammal, and bird categories. Calcined refers to highly burnt 'white' bones.

est frequencies for digestion occurring on salmon (0.6%) and then greenling (0.1%).

Bird and fish bones also show higher percentages of burning and calcification in the House 1 deposits, which likely reflects culinary processing and/or bone disposal practices. Notably, the highest rate of calcification was observed for birds in the House 1 deposits suggesting high-temperature burning may have been a preferred culinary method or bone disposal method. Among the fish, ratfish had the highest incidence of burning (34%) and this cartilaginous species lacks all skeletal structures except six teeth. Petrale sole was the second most frequently burnt and calcined fish (12%) followed by lingcod (10%), Irish lord (5%), greenling (3.5%), salmon (3.1%), and herring (0.8%). These frequencies suggest that roasting was a more common method of preparation among these taxa.

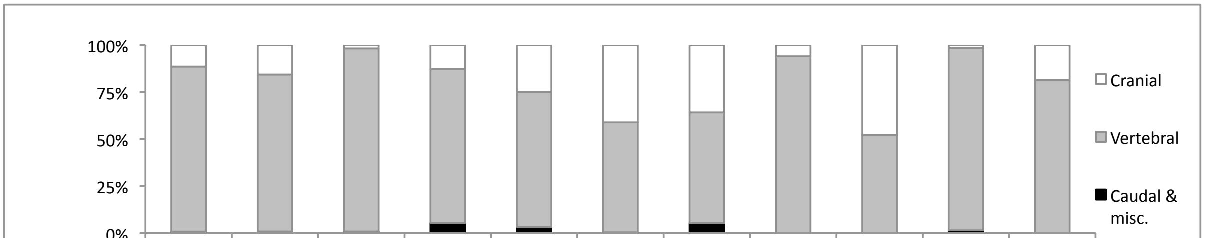
Cut marks are noted on a few mammal bone shaft fragments, all of which are too fragmentary to identify to a specific skeletal element let alone to species. These nevertheless indicate the use of sharp-edged tools in the butchery process. 'Chop marks' are noted on several mammal bones indicating direct percussion by a blunt object. In addition, several thin and warped 'chips' of mammal bone may reflect bone artifact production or carving detritus.

Collectively, this patterning suggests that the fish assemblage appears to be the least subject to destructive taphonomic factors and therefore most closely reflective of harvesting practices. In contrast, the highly fragmentary and rarely identifiable mammal remains from the column assemblage provide a much narrower view of the species utilized, but add considerable detail to the taphonomic dimension of mammal bones present in the fine screen column sample mesh.

Element Representation

The relative proportions of cranial, vertebral, and caudal elements for the ten most numerous fish taxa are depicted in Figure 22. There is broad consistency in that the greatest proportions of identified elements are vertebrae, followed by cranial and then caudal elements. Perch have the largest proportion of cranial elements but this is due in part to their numerous corn-kernel-like teeth that readily separate from the jaw structure, which over-represents the proportion of cranial elements. However, this is not the case for hake, rockfish, and greenling, where over 25% of elements are from crania, which is disproportionate to their skeletal anatomy (see Wigen 2005:90–92). These latter proportions may reflect the robusticity of these species' cranial elements and/or high discard rate of head bones for these species as opposed to additional culinary processing.

In contrast, salmon have one of the lowest proportions of cranial elements among the ten most numerous fish, as has been observed elsewhere in Barkley Sound (Frederick and Crockford 2005) and on the Northwest Coast (Matson 1992; Orchard 2009; Wigen and Stuki 1988; Wigen 2005:92; Wigen et al. 1990). It remains unclear whether this pattern is due to the differential transport or preservation, the fragility of salmon head bones, or the processing techniques such as boiling, smoking, or some taphonomic combina-



	Herring	Anchovy	Salmon	Salmon (w/o vert. frags.)	Greenling	Hake	Rockfish	Dogfish	Perch	Sablefish	Petrale sole
Cranial	11.4%	15.7%	1.8%	12.8%	25.0%	41.1%	35.8%	6.0%	47.8%	1.5%	18.6%
Vertebral	87.7%	83.4%	97.3%	81.8%	71.7%	58.4%	58.9%	94.0%	52.2%	96.9%	81.4%
Caudal & misc.	0.8%	0.9%	0.9%	5.4%	3.3%	0.5%	5.3%	0%	0%	1.5%	0%

Figure 22. Relative percent of cranial vertebral and caudal elements for the 10-most numerous fish in the column sample assemblage. The cranial category includes the neurocranium, dermocranium, suspensorium, hyoid arch, and branchial arch. Vertebral category also includes the pectoral and pelvic girdle. Caudal includes tail elements and miscellaneous elements.

tion thereof (Butler and Chatters 1994). However, the persistence of this pattern in the Huu7ii assemblage reaffirms this is as an intriguing and underexplored research question.

Notably however, fragmentary salmon vertebrae make up over 80% of all identified salmon remains in the assemblage whereas complete vertebrae only represent 5% of identified salmon. Salmon vertebrae are visually distinct from other fish remains due to their unique skeletal shape and texture that produces higher identification rates (Cannon 2000; Orchard 2009; Wigen and Stucki 1988). Thus, while the ubiquity of salmon throughout assemblage demonstrates it was regularly utilized, the high proportion of fragmentary vertebrae disproportionately contributes to an apparent lack of cranial elements. Therefore, Figure 22 also includes a second element ratio for salmon that excludes fragmentary vertebrae and correspondingly increases the proportion of cranial remains to nearly 13%.

Discussion and Interpretation

Sampling Adequacy

The column sample assemblage contains over 32,000 identified fish remains from 32 taxa collected from a number of temporally and spatially distinct contexts in House 1 and the back terrace. The most abundant taxa are also the most commonly occurring, indicating that the most numerous species are also the most widely utilized and thus of particular significance in interpreting the collective social and economic practices of the people who created these deposits.

What is much more challenging to interpret in the column sample assemblage are those 'rare' taxa that represent food gathering and consumption activities that may be particularly socially valued but occur comparatively infrequently (e.g., whales and whaling). As noted by Sahlins (2010), the social construction of "value" is often related to culturally defined notions of rarity or "alterity" (i.e., exoticness). He argues, "scarcity is largely a function of exchange-value rather than the other way around" (2010:380). In an archaeological context, this implies that rarely occuring items in an assemblage can have particular cultural significance, but that scarcity will often frustrate attempts to adequately interpret their role in a given archaeological context (Gray 2008). Another interpretive hazard is that such archaeologically rare items may also reflect spontaneously random occurrences which may have less interpretive significance than they sometimes receive, especially in comparison to more common yet perhaps more mundane elements of everyday life that are nonetheless vital to social and economic relations.

Whichever the case, the series of analyses presented in this paper indicate the column sample faunal assemblage is a robust sample, representing common and widespread food harvesting practices present in small volumes of closely examined cultural deposit. I focused on vertical 'columns' of sediment from multiple contexts to provide a strong basis for interpreting continuity and change over time, but recognize this approach is less conducive to understanding horizontal spatial patterning within a household context. However, in order to assess the more infrequent dimensions of social and cultural life an even larger sample size and a larger number of examined contexts is required. Fortunately, this is the case as the excavation unit assemblage (Frederick, this vol.) examined a much larger number of contexts and more rarely occurring taxa, revealing spatial patterning at a household scale discussed at length elsewhere in this volume.

Continuity in Resource Use

Although there is considerable dynamism in the composition and proportion of fish in individual column sample levels (Figure 10), there is also broad consistency and continuity across space and over time (Figures 7 and 8). The pervasiveness of fish remains in the site deposits reflects the importance of fish and fishing in the daily lives and social relations of the inhabitants of Huu7ii. Fishing targeted a wide range of species but intensively focused on a number of taxa. These are cultural patterns that indicate consistent and enduring connections between the site occupants and particular fish and the places from which they were harvested. Such information represents a vital and important aspect of how people created and sustained a community at this location for over five millennia.

The numerical dominance of herring, as indicated by multiple measures of zooarchaeological abundance over a 5,000-year period, is particularly significant to the interpretation of social and economic practices at Huu7ii. Herring represent an excellent winter and spring food, one that is rich in oil and could be mass harvested and stored, then consumed over extended periods (cf. Arima 1983; Hart et al. 1939; Jewitt 1807; McKechnie 2005a; Symlie 2004). Herring and herring roe were a form of wealth that could be traded and distributed widely in a village setting, between households, within families, at feasts, and with other Nations in Barkley Sound and beyond. Herring length estimates (Figure 13) indicate harvests concentrated on adult-sized fish that were likely caught in large schools prior to spawning. In summary, the dominance of herring in the column sample assemblage, both over time and consistently within small volumes of cultural deposit, reflects a particularly concentrated collective investment, focused on processing large numbers of fish for immediate consumption and long-term storage. Community members likely simultaneously harvested the other marine predators (birds and marine mammals) that also consume herring (Monks 1987) and thus the occurrence of herring likely was a highly anticipated and prepared for time of the year.

Of course, numerous other fish species are also regularly present in the assemblage and these additionally provide a basis for interpreting the persistent and everyday aspects of social, economic, and ecological relations at Huu7ii. In particular, anchovy and salmon are two taxa that represent similarly abundant contributions to the overall assemblage and are ubiquitously present, indicating highly regular use. Anchovy, as a small schooling fish, may have served as a supplement the comparatively more intensive harvest of herring. Salmon similarly occur in consistent but relatively low frequencies throughout the 5,000-year record but increase dramatically during the last 500 years of occupation (see discussion below). Greenling and rockfish are two non-migratory taxa that also consistently occur in the assemblage and could be readily obtained within the vicinity of the village at all times of the year. Numerous other fish species additionally played important roles in the daily lives of site inhabitants and further examination of these individual taxa is needed.

From a methodological standpoint, one of the intriguing consequences of calculating the minimum number of individual (MNI) fish in the fine-screened column sample assemblage is the considerable difference between the MNI and NISP values of herring. Herring are the most numerous fish according to both measures, but the NISP value for herring is more than twice as large as its MNI value (Figure 12). This suggests that even though herring represent more than 80% of total NISP, their nutritional contribution (according to MNI) may be equivalent to less numerous but individually larger fish such as salmon. However, this does not account for the uncertainty of MNI calculations (Lyman 2008) and the complexity of estimating 'meat weight', as well as how fish taxa (particularly salmon) change considerably in abundance over time. These estimates will remain under-resolved until additional analyses consider variability over time and space. However, the present analysis represents an important first step towards reconciling the difference between NISP and MNI data for small column sample assemblages.

Change in Resource Use

While there is a strongly expressed continuity in resource use within the Huu7ii fish assemblage, there are two particularly robust temporal changes in the abundance of fish in the House 1 deposits: 1) salmon increase dramatically during the last 500 years of occupation, reflecting a considerable shift from earlier periods and 2) hake occur in large numbers in the middle of the House 1 deposits (prior to ca. 700 BP) but are absent or have low frequencies during all other periods (Figure 10).

The shift towards increasing use of salmon indicates a broad cultural change in the social economy of House 1. This change may reflect an expansion of the political territory of the village, such as securing access to a productive salmon river from, or in cooperation with, another polity. This also may be a product of a more intensive fishery in the immediate vicinity of the village, such as the large troll-based sport fishery for salmon that currently operates off Kirby Point on Diana Island (1 km from the village). Alternatively but not exclusively, the sharp increase in salmon may additionally reflect progressively more favorable oceanographic conditions conducive to the intensification of salmon fishing at a community scale. A similar and contemporaneous trend has been observed at other archaeological sites in Barkley Sound, such as at the Ts'ishaa village in Tseshaht territory (McKechnie 2005a, 2007a; McMillan et al. 2008) and at Ma'acoah in Toquaht territory (Monks 2006), as well as elsewhere on the northern (Orchard and Clark 2005) and southern (Wigen 2005) Northwest Coast. These local and regional patterns may relate to large-scale climatic changes in the North Pacific that occurred after AD 1200 (Anderson et al. 2005; Finney et al. 2002; McKechnie et al. 2008). Future research will help identify the cultural, historical, and climatic circumstance that may be driving these trends. Of particular importance will be identifying the particular salmon species targeted during this period of increased salmon utilization. Further examination of salmon specimens from Huu7ii is warranted and new morphometric techniques (Huber et al. 2011; Orchard and Szpak 2011), as well as ancient DNA (Cannon and Yang 2006), have the potential to address this question of a period of dynamic change.

The second particularly notable change in the abundance of fish in the column sample assemblage is the sharp increase in the abundance of hake throughout the House 1 deposits (Figure 10). While this trend is moderately observed at other sites in Barkley Sound (McKechnie 2007a:214), it appears to be much more strongly expressed at Huu7ii. This increase may reflect a local specialization, such as community access to particularly productive hake fishing locale. However, since hake are strongly influenced by marine climate (Agostini et al. 2006; Benson et al. 2002; McFarlane et al. 2000) and the length measurements suggest that primarily large migratory adults were harvested (rather than a local population in which a range of sizes would be expected), the occurrence of hake provides support to the interpretation of a period of warmer ocean conditions prior to AD 1200. It is also significant that the sharp increase in hake occurs prior to the increase in salmon, further suggesting that climatic factors may be influencing this cultural change.

Within the back terrace, the most notable temporal change is the higher abundance and higher numbers of herring per litre relative to the House 1 deposits (Figures 8 and 17), indicating fisheries were comparatively more intensive during this mid-Holocene occupation (ca. 5000–3000 BP). The progressive increase in the middle levels of both deposits suggest a particularly intensive peak in the utilization of herring followed by a progressive decline in the upper levels (Figure 11). A possible factor that might have contributed to the higher abundance of herring in the back terrace is the beach sand present beneath these cultural deposits that represent a former intertidal zone. This may have been an ideal habitat for herring spawning and a reason for intensive human use and settlement. These fine beach sands were likely deposited when sea levels were 3–4 m higher during the mid-Holocene (Friele and Hutchinson 1993) and contrast with the steep rocky intertidal storm beach that dominates the shoreline today. It is therefore possible that during the back terrace occupation, the intertidal zone may have been a herring spawning location and may even have included a fishtrap. Additional paleo-topographic reconstruction of this raised beach landform will help add substance to this interpretation.

Seasonality

The dominance of herring in the back terrace deposits may indicate a comparatively more seasonal use of the site during the period between 5,000 and 3,000 years ago. However, a year-round use of the site is indicated by the continuous deposition of shell midden sediments (Figure 4) and the occurrence of mammalian, bird, and fish species that are summer and fall seasonal indicators abundantly present in the back terrace excavation unit assemblage (Frederick, this vol.). In addition, the back terrace column samples also consistently contain anchovy and salmon that may have been more readily obtained in summer and fall, as well as herring that may have been used more readily in winter and spring. Later in time, during the House 1 occupation, the column sample assemblage contains a comparatively more 'even' distribution of fish taxa (Figure 8) as well as a greater number of fish taxa (Figure 19), suggesting an even more substantial degree of year-round occupation. This is also supported by the excavation unit assemblage.

An important consideration in determining the seasonality of archaeological faunal assemblages is that the assessment of seasonality is often based on the presence of 'indicator species' in a given depositional context (e.g., Ford 1989). However, a key question is how consistently these species occur: are they ubiquitous and abundant, or are occurrences rare and a thus a reflection of sampling intensity rather than site seasonality? This column sample assemblage provides important insight into this issue, as there are several fish taxa that are both abundant and ubiquitously occurring. Thus, their consistent presence across dozens of depositional contexts (i.e., multiple small temporal snapshots) may represent a more robust indication of seasonality than infrequently occurring but more seasonally diagnostic taxa.

Another key issue in the determination of seasonality is that species may occur over a broader range of seasons than is conventionally understood, especially considering the impact of 20th century industrial commercial exploitation of the marine environment. For instance, the consistent occurrence of adult herring in archaeological deposits on the Northwest Coast is often interpreted to mean that herring were targeted exclusively during the spring spawning season. However, this does not often encompass the range of variability on the coast, particularly relating to the period prior to herring spawning. A series of historic observations suggest that herring were harvested during a much longer period of the year. For instance, John Jewitt's (1807) journal recounting his two and a half years of captivity among the Mowachaht in Friendly Cove (120 km north of Barkley Sound) documents the consumption of herring and herring roe multiple times in all months of the year except July and August (McKechnie 2005a:103). Modern industrial herring fisheries conventionally began fishing for herring in October, well prior to the winter and spring spawning periods (Taylor 1955:111; Tester 1933:287; Mackinson 1999). Department of Fishery and Oceans records going back to the 1940s (DFO 2011) show herring spawn once regularly occurred as early as late January and early February on western Vancouver Island. These observations indicate that pre-industrial herring populations may be better characterized as a late fall and mid-winter food in addition to the spring spawning period. Moreover, the storability of herring would mean that it could be consumed for months afterwards and thus well into summer.

Similarly, anchovy is a species said to occur more frequently in summer as it is at the northern edge of its latitudinal range (DFO 2002). However, paleoecological analysis of fish scales recovered from a geological sediment core in nearby Effingham Inlet (~15 km north of Huu<u>7</u>ii) indicates that anchovy were the dominant fish in that particular inlet over the past 4,000 years (Wright et al. 2005:376), implying that anchovy are a resident non-migratory population and were likely available throughout much the year. The occurrence of salmon from multiple size ranges and species (Figure 14) suggests that this taxon could also have been harvested at multiple times of the year (spring through fall). Thus, rather than seeking to identify seasonal indicators, it is additionally important to consider the consistent utilization of species that are present during multiple seasons as a proxy for year-round site occupation.

Comparisons to Other Assemblages

The examined column sample assemblage can be compared with available precontact archaeological faunal assemblages in Huu-ay-aht territory and elsewhere in Barkley Sound. However, there are only three other sites within Huu-ay-aht territory where fine-screen fish remains (smaller than ¼-inch mesh) have been used. The nearby Huu-ay-aht village of Kiix7in (DeSh-1) contains a modest vertebrate assemblage (NISP = 700), in which herring are the most abundant fish (48% NISP fish), followed by salmon (22%) and greenling (16%) (Wigen 2003). Herring is considerably less abundant (18% NISP) but still the second most frequent fish in the small assemblage (NISP = 171) from the adjacent defensive site at Kiix7in (DeSh-2), which is dominated by greenling (49%) (Wigen 2003). An additional fine-screen assemblage (NISP = 187) from the Klanawa Rivermouth (DeSf-6), 20 km south of Cape Beale (McKechnie 2007c:9), is dominated by salmon and greenling and only contains a small percentage of herring (6% NISP).

Northwest of Huu<u>7</u>ii in the Broken Group Islands, herring are also dominant among the fish at the large Tseshaht village of Ts'ishaa (DfSi-16&17), followed by anchovy, rockfish, greenling, and salmon (McKechnie 2005a; McMillan et al. 2008). Herring is similarly the most abundant fish (58%) in a small (NISP = 151) column sample assemblage from a defensive site on Clarke Island (DfSi-26) in close proximity to Ts'ishaa (McKechnie 2007b:29) and is overwhelmingly dominant (85%) in an assemblage from Dodd Island in a protected portion of the Broken Group Islands (Wigen 2009).

Two fine-screened assemblages from Ucluelet Harbour in western Barkley Sound, Little Beach (DfSj-100) (Wigen 2008) and Ittatsoo North (Brolly and Pegg 1998:167), have identically high abundance values for herring (79% of NISP). The fish identified from Ma'acoah (Monks 2006) in Toquaht territory and Shoemaker Bay at the head of Alberni Inlet (Calvert and Crockford 1982) are not directly comparable to the Huu7ii column assemblage as these excavations did not utilize column sample recovery methods. However, it is notable that these ¼" assemblages contain only a negligible number of hake specimens, which further indicates the uniqueness of the Huu7ii assemblage. However, all sites appear to have significant frequencies of rockfish, greenling, and salmon and a host of other taxa that speak to the common utilization of these fish in other archaeological contexts. Grasping the variability will require considerably more analysis to fully synthesize and assess the spatial and temporal variability.

Conclusions

This study has explored the archaeological expression of vertebrate faunal remains, particularly fish, from the ancestral village site of Huu7ii. I analyzed over 58,000 vertebrate specimens containing over 32,000 identified remains from 12 column samples representing 168 depositional contexts spanning 5,000 years of human occupation. Fish bones were the most numerous and commonly encountered vertebrate elements, followed distantly by mammals and birds. Herring was the most numerous and consistently present fish species, followed distantly by anchovy, salmon, greenling and a host of other taxa. I analyzed these frequencies using multiple measures of abundance and argue they reflect cultural, social, and economic relations within the village.

Collectively, these site specific and regional patterns indicate the vital importance of herring in indigenous precontact fisheries in Barkley Sound and have broader significance for interpreting the archaeological history of fishing on the Northwest Coast. The column sample assemblage from Huu7ii further confirms that small fish are grossly under-represented using conventional recovery techniques, which contributes to the under-recognized role of herring relative to the more well-known and disproportionately emphasized taxa such as salmon (cf. Coupland et al. 2010; Monks 1987). A long-standing gap in understanding is the lack of column sample analysis, which is widely recognized to offer the most precise determination of the relative abundance of fish. A full-scale comparison of the temporal and spatial variability is ongoing and will yield more detailed insights into the regional character and intensity of ancient Nuu-chah-nulth fishing practices.

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Appendix C: Ancient DNA Analysis of Whale Bones from Huu7ii

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In this study, we applied ancient DNA analysis for species identification to 101 bone samples excavated from Huu7ii, an ancient Nuu-chah-nulth village site in Barkley Sound, western Vancouver Island, in 2004 and 2006. The samples were taken at the Pacific ID laboratory at the University of Victoria in January 2008 and analysed at the ancient DNA facility in the Department of Archaeology at Simon Fraser University, Burnaby, British Columbia during 2008. The collected samples had been morphologically examined at the Pacific ID laboratory, although the fragmented state of most examples did not allow an identification beyond cetacean. The ages ranged from 550–330 BP to 1560–1320 BP based on ^{14}C dating (Frederick et al. 2006).

Barkley Sound is situated along a modern, and probably ancient, whale migration route between Alaska and California/Hawaii. Humpback (*Megaptera novaeangliae*), grey (*Eschrichtius robustus*) and killer whales (*Orcinus orca*) frequently come into the sound, while some pods are known to be resident to the region. The sound has been the territory of Nuu-chah-nulth cultural groups for at least 2000 years (McMillan 1998, 1999). The Nuu-chah-nulth were famed as whalers; along with their Makah relatives to the south, they were the only Northwest Coast peoples to set out on active whaling pursuits. The importance of whaling is highlighted in their oral tradition, rituals, and everyday life (e.g., Sapir et al. 2004).

Whaling was a prestigious undertaking and only a chief could conduct a hunt. The ethnographic record for the Nuu-chah-nulth contains numerous references to whaling and the preparations prior to such an event (Drucker 1951; McMillan 1999; Monks et al. 2001; Sapir et al. 2004). The whaler needed to be prepared by spring, so he would be ready when the whales came. This included material and spiritual preparation (Kirk 1986). According to their beliefs, the hunted whale only allowed the whaler to take it if the whaler was worthy. In the hunt, a whaler and his crew paddled out in a large canoe to get close to the whale, hand-thrust a harpoon into the animal, played out a line attached to the harpoon head that held large floats to buoy and tire the whale, and manoeuvred the dead or dying animal back to the beach near their village. The success of the hunt depended on size and strength of the animal, as well as the capability of the whaler. Humpback whales are relatively slow swimmers and tend to be rather docile, whereas grey whales can be aggressive and more dangerous to hunt (Banfield 1974).

Not every targeted whale was eventually brought to the beach; many were lost at sea. If the hunt was successful, the meat and blubber were distributed by the whaler, according to specific rules related to status and kinship. The saddle, which included the dorsal fin, belonged to the successful whaler and was set up for ritual display. After the initial distribution, any meat and blubber left on the beach was free for anyone to take. Whales that became stranded on a beach generally belonged to the chief whose territory encompassed the beach, although occasional conflicts over drift whales are recorded (Monks et al. 2001; Mulville 2005; McMillan 1999).

Although butchering occurred on the beach, some bones with meat or blubber attached may have been transported into the village, eventually ending up in the midden (Mulville 2005). Additional whale elements were brought onto the site for oil extraction (Monks 2005). Other bones, including skulls, mandibles, and vertebrae, were stacked as trophies or displays of whaling prowess. Many whale bones in the site, however, were taken there as raw material for the manufacture of a wide range of everyday objects. The number of identifiable bones using standard zooarchaeological methods is thus very limited. Finally, it is hard to identify hunted versus drift whales in the archaeological record. Direct evidence for hunting includes embedded portions of mussel shell cutting blades from the harpoon heads, as is reported for other excavated Barkley Sound sites (McMillan and St. Claire 2005; Monks et al. 2001), or other directly associated whaling gear, which generally only survives in water-saturated sites (Kirk 1986; Mulville 2005). Apart from the basic species identification, this study also investigates whether genetic analysis can be used as a direct line of evidence to detect active whaling in the archaeological record.

Materials and Methods

Samples were selected from skeletal remains that were morphologically identified as cetacean or whale. All samples used in this study came from within the House 1 platform in the village portion of the site (none came from the earlier component on the higher terrace behind the village area). Each sample was photographed and a 1.5 g piece was cut using a hacksaw. To prevent cross-sample contamination, a new blade was used to cut each sample. The work surface and tools were bleached after handling each sample. Samples were then transferred to the ancient DNA facility in the Department of Archaeology. Bones were decontaminated using the laboratory protocol developed by Yang et al. (1998, 2003). Due to the rough and porous surface of the bones, the outer layer was not removed using sandpaper prior to decontamination. Instead, the length of time the samples remained in the decontamination solution was increased. Samples were placed in 50 ml tubes and submerged in 10 ml of 100% commercial bleach for 8–10 minutes and then rinsed twice with ultrapure water to remove any bleach residual. Following this, the samples were treated with 1N HCl for one minute and then neutralised using 1N NaOH. Samples were then rinsed once in ultra pure water, and soaked in water for about five minutes. Finally, samples were UV-irradiated for 30 minutes, then flipped over and irradiated for another 30 minutes. After the irradiation, the bones were crushed and stored in 15 ml tubes at –20˚C.

For DNA extraction, the modified silica-spin-column method (Yang et al. 1998) was used. Approximately 0.4 g to 0.6 g of the crushed bone was transferred into a new 15 ml tube and incubated overnight in 4 ml of lysis buffer (0.5M EDTA ph 8.0; 0.5% SDS; 0.5 mg/ml proteinase K) at 50˚C. On the following day, samples were spun and 3.5 ml of the supernatant was concentrated to 80–100 μl using 30k Amicon filters (Millipore). Samples were then purified using Quiaquick spin columns (Quiagen, Hilden, Germany), and 100 μl of elution buffer was used to remove the DNA from the spin column. This step was repeated and both eluted solutions were stored at –20˚C for PCR amplification.

To identify the species of the sample, a PCR was carried out using primers targeting a region of the cytochrome b gene. Cytochrome b is a conservative gene which is commonly used for species identification. A 30 μl PCR reaction was set up containing 1.5x buffer, 2mM $MgCL_2$, 0.2mM dNTP, 1 mg/mL BSA, 0.3μM of each primer, 2.5U AmpliTaq Gold, and 5 μl DNA sample. PCR amplification was carried out in an Eppendorf™ Mastercycler Personal with an initial 10 minute denaturing period at 95˚C, followed by 60 cycles of 95˚C for 30 seconds (denaturation), 54˚C for 45 seconds (annealing), and 70˚C for 45 seconds (extension) for 60 cycles, with a final extension of seven minutes at 70˚C. A 2% agarose gel was used to visualize the outcome of the reaction.

Positive PCR reactions were purified using a Quiaquick purification column (Qiagen, Hilden, Germany) following the manufacturer's manual. Samples were sequenced at Macrogen Ltd in Seoul, South Korea. Results were visually edited and species identification was confirmed using the NCBI database tool BLASTn and phylogenetic analysis of other close-related species. All humpback whale samples were also confirmed using another DNA marker (D-loop), resulting in no discrepancy of species identity.

Results and Discussion

Table 1 shows the results from the DNA species identification using cytochrome b. The retrieval rate of analysable DNA at Huu<u>7</u>ii was 85%, which is a good result for ancient DNA analysis. The 101 analysed samples from Huu<u>7</u>ii returned four whale species: humpback, grey, finback, and right. Humpback whale is the most common species identi-

Table 1: Species ID summary of the analysed Huu<u>7</u>ii samples based on ancient DNA.

Species	N	%*
Humpback Whale *(Megaptera novaeangliae)*	70	83.33
Grey Whale *(Eschrichtius robustus)*	11	13.09
Finback Whale *(Balaeonoptera physalus)*	2	2.38
Right Whale *(Eubalaena japonica)*	1	1.19
No species ID	17	(N.A.)
Total	***101***	***99.99***

* % out of all identified bones

fied in this assemblage. The difference between humpback whale and the next leading species (grey whale) is considerable. A similar result has been found for the analysis of whale remains from Ts'ishaa, on Benson Island in Barkley Sound. The sites of T'ukw'aa and Ch'uumat'a, at the western edge of the sound, also had a very similar pattern of whale species present, although that analysis was based on visible morphology rather than DNA (Monks et al. 2001). The fact that all these sites have similar proportions of whale remains, with humpbacks the dominant species, distantly followed by greys, suggests that this is a general pattern in Barkley Sound. Additionally, the similar species distribution supports the assumption that this analysis is based on an unbiased, random collection of samples.

Table 2 shows the distribution of identified whale species by excavation unit. These include units excavated in both field seasons and that extend across the entire excavated portion of the investigated house platform at Huu7ii. This distribution shows that humpback whale remains, for example, were not concentrated in one area but were found across the House 1 deposits.

There is no direct evidence of hunting activity, such as embedded portions of mussel shell harpoon heads, in the skeletal assemblage, so we cannot simply assume that the whale remains resulted from active hunting. Other explanations must be explored. All the identified species are found in shelf edge and coastal waters in the region. However, grey whales swim closer to the shore and frequent coastal waters more often than humpback whales, making grey whales theoretically more likely to be stranded on the beach. If this were the case, we might anticipate a higher proportion of grey whales in the skeletal assemblage. The alternative explanation, that this assemblage is based on the preferential hunting of humpback whales, is more consistent with the observed dominance of humpback whale elements in the assemblage. Ethnographic accounts for the Barkley Sound region state that both humpback and grey whales were hunted but that humpbacks were present in the sound for much of the year, unlike the migratory greys (Sapir et al. 2004). Grey whales are also faster and more aggressive than humpbacks, making them harder to hunt. The fact that the species distribution is so uneven, with humpback whales predominating, suggests that humpbacks were the preferred target and that this assemblage reflects hunting activity.

This research is an example of how ancient DNA can help when the usual zooarchaeological methods fail due to the fragmented nature of the material, as was the case in this study. Genetic data become more accessible and more meaningful in combination with archaeological and ethnographic knowledge, with multiple lines of evidence coming together to allow for a more complete interpretation.

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Table 2: Species identification by excavation unit.

	Humpback Whale	Grey Whale	Finback Whale	Right Whale	no ID	Samples analyzed
N12-14 E18-20	1					1
N14-16 E16-18	1				1	2
N16-18 E26-28	2	1			1	4
N18-20 E16-18	8					8
N18-20 E30-32	6	2	1			9
N18-20 E34-36	10	2		1	3	16
N10-12 E2-4	14	1			4	19
N12-14 E6-8					1	1
N18-20 E2-4	13	2	1		5	21
N18-20 E6-8	15	3			2	20
Total	***70***	***11***	***2***	***1***	***17***	***101***

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Appendix D:
Invertebrate Fauna Analysis – Huu7ii Village, Diana Island, Barkley Sound

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Introduction

A representative sample of marine invertebrate remains from the village of Huu7ii (DfSh-7) was examined for purposes of identification, quantification, and dietary/ecological information. The shell materials were recovered from two sediment column samples taken from two areas investigated in 2004. The two tested areas comprise deep stratified cultural deposits dating to the late (House 1) and middle (back terrace) Holocene periods.

The Assemblage Samples

The two sediment columns were recovered from the north wall of Unit N4-6/E0-2, associated with a cultural occupation area on a back elevated terrace landform, and the west wall of Unit N10-12/E2-4 in House 1. A total of 20 bulk samples were examined: ten from each column. The assemblage represents a sampling fraction by volume ranging between 25% (Unit N4-6/E0-2) and 33% (Unit N10-12/E2-4). Over 24 litres of bulk sediments were investigated, with samples varying between 1.0 litre and 2.5 litres in volume (Table 1). The invertebrate fauna assemblages described and analysed in this report consist of shell specimens recovered from bulk column samples passed through 6.4 mm (¼") and 3.2 mm (⅛") meshes.

Results

Over 3.4 kg of marine shellfish remains were examined from the two column samples: 1813.3 g (53%) from Unit N4-6/E0-2 and 1606.2 g (47%) from Unit N10-12/E2-4. Thirteen different shellfish taxa were identified to species, genera, or family suborder level. The assemblage comprised five different bivalves, three marine snails, two barnacle taxa, one species of sea urchin, one chiton, and Northern abalone (Table 2).

Bivalves make up 96% of the total shellfish assemblage by weight, obscuring the contributions of the other smaller and lighter mollusc taxa. Bivalve umbone counts and weights indicate that mussel (*Mytilus californianus, Mytilus* sp.) is the most abundant identified bivalve species present in both the early and late shell assemblages. On average,

Table 1. Huu7ii shellfish column sample and volume data.

Column Sample	# of Bulk Samples Examined	Examined Sample Volume (L)	Bulk Sample Sizes (L)	# of Bulk Samples Excavated	Column Stratigraphic Layers Examined	Vertical Depth of Column (m dbs)	Analytical Sample Wt (g)
N4-6/E0-2	10	14.5	6–1 3–2 1–2.5	41	3 (B, C, D)	0.15–2.20	1813.3
N10-12/E2-4	10	10.0	10–1	33	4 (A, C, D, E)	0.18–1.83	1606.2

Table 2. List of identified shell taxa from Huu7ii, site DfSh-7, Diana Island.

California mussel *Mytilus californianus*	Channeled dogwinkle *Nucella canaliculata*
Butter clam *Saxidomus gigantea*	Frilled dogwinkle *Nucella lamellosa*
Native little-neck clam *Protothaca staminea*	Black turban snail *Tegula funebralis*
c.f. Basket cockle *Clinocardium nuttallii*	Barnacle *Archaeobalanidae/Balanidae*
Nestling saxicave clam *Hiatella* sp.	Gooseneck barnacle *Pollicipes polymerus*
Black katy chiton *Katharina tunicate*	Northern abalone *Haliatis kamtschatkana*
Purple sea urchin *Strongylocentrotus purpuratus*	

Table 3. Relative frequencies of 2004 Huu7ii column shell weight data by major shell groups (>3.0 mm mesh).

Late Cultural Component – House 1 Column Sample Unit N10-12/E2-4					
Layer	**A**	**C**	**D**	**E**	**Totals**
Major Shell Group	**%**	**%**	**%**	**%**	**%**
Mussel	56.5	94.5	99.9	99.9	94.3
Clam & Cockle	33.9	1.4		<0.1	1.6
Marine Snail	2.4	0.1	0.0	0.0	0.1
Abalone	0.0	0.4	0.0	0.0	0.4
Chiton	0.0	<0.1	0.0	0.0	<0.1
Sea Urchin	0.0	<0.1	0.0	0.0	<0.1
Barnacle	7.3	3.3	<0.1	0.0	3.3
Unid Shell	<0.1	0.3	<0.1	<0.1	0.3
Shell Totals 100%	**12.4 g**	**1560.6 g**	**0.8 g**	**32.4 g**	**1602.2 g**
Early Cultural Component – Back Ridge Column Sample Unit N4-6/E0-2					
Layer	**B**	**C**	**D**		**Totals**
Major Shell Group	**%**	**%**	**%**		**%**
Mussel	95.6	97.5	94.6		96.5
Clam & Cockle	0.0	0.5	0.0		0.3
Marine Snail	0.0	0.2	1.2		0.6
Abalone	0.0	0	0.1		<0.1
Chiton	0.0	0	0.1		<0.1
Sea Urchin	0.0	0	0.4		0.2
Barnacle	3.0	1.3	3.4		2.1
Unid Shell	1.5	0.4	0.2		0.4
Shell Totals 100%	**13.5 g**	**1157.2 g**	**642.6 g**		**1813.3 g**

mussel comprises 95.4% of the Bivalve Group by weight (Table 3).

California mussel (*Mytilus californianus*) represents the only identifiable *Mytilus* taxon. Although larger quantities of indeterminate *Mytilus* sp. (<2 mm thick) were encountered, they were interpreted as being the smaller, broken valve fragments of the California mussel. No other mussel species, such as the foolish mussel (*Mytilus trossulus*), were observed.

Shell data (umbone counts, weight) suggest that the site occupants placed a much lesser focus on the consumption of other bivalve species during both the late and earlier cultural components. Butter, native littleneck, and nestling saxicave clams are present, but in limited numbers—representing less than 0.1% and 0.4% of bivalve weights in the early and late components, respectively. The nestling saxicave clam was probably not a source of food, but likely entered the site in an inadvertent or accidental manner. Indeterminate clams, a category consisting of broken, unidentifiable valve and uncharacteristic hinge fragments most likely belonging to butter and possibly horse clams, are more plentiful. Indeterminate clams make up 0.3% (early component) and 1.3% (late component) of the Bivalve Group by weight.

The second most abundant shell group in the two assemblages is barnacle. This group contributes 2.1% and 3.3% to the early and late assemblage shell weights, respectively. Two different barnacle taxa were identified: acorn (comprising species of the *Archaeobalanidae* and *Balanidae* families) and goose (*Pollicipes polymerus*) barnacles. Although acorn barnacle specimens in the two assemblages were not identified or quantified to the genus- or species-levels, observed species did include thatched (*Balanus coriosus*), common (*Balanus glandula*), and giant (*Balanus nubilus*) barnacles. The acorn barnacles are more common that the goose barnacle. Acorn barnacles are present in all early component Unit N4-6/E0-2 sediment layers, and in all but one (basal sediment layer E) in late component House 1 Unit N10-12/E2-4. The goose barnacle is more frequent in the early component unit, comprising 2.9% of the Barnacle Group by weight.

The remaining identified shell groups (Marine Snail, Chiton, Sea Urchin, and Abalone) are present, but consist of a limited number of species and contribute only 0.6% or less by group weight. The Marine Snail Group contains three identified gastropod taxa: two types of dogwinkles (*Nucella canaliculata*, *Nucella lamellosa*) and the black turban snail (*Tegula funebralis*). A small number of snail opercula were recovered, possibly having been harvested from the red turban snail (*Astrea gibberosa*). Sea urchin was recovered in both units—but was more frequent in the back ridge unit. Purple sea urchin (*Strongylocentrotus purpuratus*) represents the only identified sea urchin species. Black katy chiton (*Katharina tunicata*) and Northern abalone (*Haliotis kamtschatkana)* are also present. These two univalves were observed in only one stratigraphic layer per column sample.

Finally, Unidentified Shell was recovered in all sediment layers throughout the two assemblages. These materials occur in all column levels except for one in Unit N10-12/E2-4 and two in Unit N4-6/E0-2. This category consists of broken and eroded shell fragments that could not be assigned to a genus or family with confidence. Items within this group comprise extremely eroded mollusc valve fragments and possibly small pieces of snail and barnacle probably crushed during site occupation or broken during transport from the field to the lab.

Unit N10-12/E2-4 Column Sample

Of the 1606.2 g of shellfish remains examined in this assemblage, 99.7% were identified to species, genus, or family (Table 4). The assemblage was collected from a single 20- by 10- by 165-cm-deep vertical sediment column positioned close to the south end of the west wall of Excavation Unit N10-12/E2-4. This portion of the unit is interpreted to be immediately 'outside' the rear southwest corner of House 1 in the central part of the village (Frederick et al. 2006:33). Two radiocarbon dates provide age estimates of 540 to 1280 calibrated years BP for deposits in this unit.

The column sample intersected six stratigraphic layers (A, B, C, D, E, F), however sediment levels from two layers (B, F) were not examined due to their lack of shell content. Ten of 33 5-cm thick bulk samples were examined (33% sampling fraction by volume). The number of column levels recovered from each soil layer varied pending layer thickness and context (i.e., bulk samples comprising sediments from two different layers were not examined). The ten column bulk samples examined in Unit N10-12/E2-4 included: Layer A = Level 1; Layer C = Levels 5, 7, 9, 11, 17; Layer D = Levels 19, 20; and Layer E = Levels 22, 23. Layer C is the thickest stratigraphic layer in the unit (~80 cm), encompassing 97.2% of the total assemblage shellfish weight (Table 4).

Twelve species of bivalve and univalve molluscs, chitons, barnacles, and sea urchins were identified in Column N10-12/E2-4. Significant major shell groups include Bivalves (95.9%) and Barnacles (3.3%). The other major shell groups, Marine Snail, Chiton, Sea Urchin, and Abalone, contribute less than 0.5% of the sample by weight, individually.

Mussel (*Mytilus*) is the most frequent species in the assemblage's Bivalve Group—comprising 98.3% of the group by weight. Almost half of the mussel identified is California mussel (*Mytilus californianus*); the other half consists of small, thin fragmented *Mytilus* sp. measuring less than 2 mm thick. It is suggested here that all examined mussel remains are most likely California mussel, particularly in view that the site is located in an exposed, outside environment, and that no other mussel species (i.e., foolish/bay mussel) were identified in the assemblage. Layer recovery rates for mussel ranged between 56.5% (upper Layer A) and 99.9% (lower Layers D, E). Although shellfish samples from three of four soil layers are very small (ranging between <0.1% and 2.0% of the assemblage by weight), preliminary stratigraphic data for this unit suggests a possible decrease in the exploitation of mussel through time.

Clams are present in the N10-12/E2-4 column sample but only in small quantities (1.7% of Bivalve Group weight). Three clam taxa identified include butter (*Saxidomus gigantea*), native littleneck (*Protothaca staminea*), and nestling saxicave (*Hiatella* sp.). The three species are present in only two of the four layers examined (upper Layer A and C). Butter and native littleneck clams represent the most common clam species. Whilst both comprise 0.2% of the Bivalve Group by weight, umbo counts for the two taxa totalled only six: two native little-neck clam and four butter clam. The nestling saxicave clam (<0.1% of Bivalve Group weight) was limited to six valves in Layer C only. This small species was not likely gathered for human consumption. Unidentified clam represents the most abundant clam material, contributing to 1.3% of the Bivalve Group by weight. These materials, likely comprising eroded and fragmented valves of the butter clam and possible horse clam, were found in all layers but lower D and E.

Barnacle represents the second most abundant shell group in this column assemblage. *Archaeobalanidae* and *Balanidae* materials are the most common,

Table 4. Relative frequencies by weight of shellfish remains within major shell groups—Column N10-12/E2-4 (>3 mm mesh).

	Layer A TOTALS	Layer C TOTALS	Layer D TOTALS	Layer E TOTALS	Assemblage TOTAL	GROUP %
BIVALVES						
California mussel	2.5	736.1	0.2	9.1	747.9	48.5%
Indeterminate mussel sp. (<2mm thick)	4.5	738.2	0.6	23.3	766.6	49.8%
Butter clam	2.6	<0.1			2.6	0.2%
Native little-neck clam	0.3	2.4			2.7	0.2%
Nestling saxicave clam		0.4			0.4	<0.1%
Unidentified clam species	1.3	19.0			20.3	1.3%
Bivalve Group Wt Total (100%)	**11.2 g**	**1496.1 g**	**0.8 g**	**32.4 g**	**1540.5 g**	**100.0%**
% of Layer Wt Data	**90.4%**	**95.9%**	**100.0%**	**100.0%**	**95.9%**	
MARINE SNAILS						
Channeled dogwinkle		0.3			0.3	25.0%
Frilled dogwinke	0.3	0.5			0.8	66.7%
Purple/black Turban-snail		<0.1			<0.1	0.0%
Indeterminate marine snail		0.1			0.1	8.3%
Marine snail operculum				<0.1	<0.1	<0.1%
Marine Snail Group Wt Total (100%)	**0.3 g**	**0.9 g**	**0.0 g**	**<0.1 g**	**1.2 g**	**100.0%**
% of Layer Wt Data	**2.4%**	**0.1%**	**0.0%**	**<0.1%**	**0.1%**	
BARNACLES						
Acorn barnacle sp.	0.9	52.0	<0.1		52.9	100.0%
Goose Barnacle		<0.1			<0.1	<0.1%
Barnacle Group Wt Total (100%)	**0.9 g**	**52.0 g**	**<0.1 g**	**0.0 g**	**52.9 g**	**100.0%**
% of Layer Wt Data	**7.3%**	**3.3%**	**<0.1%**	**0.0%**	**3.3%**	
CHITONS						
Black katy chiton		0.3			0.3	75.0%
Indeterminate chiton sp.		0.1			0.1	25.0%
Chiton Group Wt Total (100%)	**0.0 g**	**0.4 g**	**0.0 g**	**0.0 g**	**0.4 g**	**100.0%**
% of Layer Wt Data	**0.0%**	**<0.1%**	**0.0%**	**0.0%**	**<0.1%**	
SEA URCHINS						
Purple sea urchin		<0.1			<0.1	<0.1%
Indeterminate sea urchin		0.7			0.7	100.0%
Sea Urchin Group Wt Total (100%)	**0.0**	**0.7 g**	**0.0 g**	**0.0 g**	**0.7 g**	**100.0%**
% of Layer Wt Data	**0.0%**	**<0.1%**	**0.0%**	**0.0%**	**<0.1%**	
ABALONE						
Northern abalone		6.4			6.4	100.0%
Abalone Group Wt Total (100%)	**0.0**	**6.4 g**	**0.0 g**	**0.0 g**	**6.4 g**	**100.0%**
% of Layer Wt Data	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.4%**	
Unidentified Shell	<0.1 g	4.1 g	<0.1 g	<0.1 g	4.1 g	100.0%
% of Layer Wt Data	**<0.1%**	**0.3%**	**<0.1%**	**<0.1%**	**0.3%**	
TOTAL MARINE SHELL WT (g)	12.4 g	1560.6 g	0.8 g	32.4 g	1606.2 g	0.3%
Layer % of Assembage	**0.8%**	**97.2%**	**<0.1%**	**2.0%**	**100.0%**	

making up over 99.9% of the group by weight. Two dominant species belonging to these families include giant (*Balanus nubilus*) and thatched (*B. cariosus*) acorn barnacles. Traces of the gooseneck barnacle (*Pollicipes polymerus*) were found in Layer C only.

Abalone is the third largest major shell group. Northern abalone (*Haliotis kamtschatkana*) is present in Layer C only. Interestingly, traces of limpet, a relative of the abalone, were not observed in the Unit 10-12/E2-4 column sample.

Three species of marine gastrapods are found in the assemblage's Marine Snail Group sample. The frilled dogwinkle (*Nucella lamellosa*) is the most abundant, encompassing 66.7% of the group by weight. Smaller amounts of channelled dogwinkle (*Nucella canaliculata*) and black turban snail (*Tegula funebralis*) were also found in Layer C. The frilled dogwinkle represents the only snail found in Layer A, all three species were recovered in Layer C. The operculum of a marine snail was recovered in Layer E. This specimen likely belongs to the red turban snail (*Artrea gibberosa*), and if so, it represents the only evidence for the taxon in the column sample.

Only one species of chiton is present in Column N10-12/E2-4: the black katy chiton (*Katharina tunicata*). This species and an indeterminate chiton are present in Layer C only. The only identified sea urchin species is the purple sea urchin (*S. purpuratus*). Indeterminate sea urchins (*Stronglycentrotus* sp.) however dominate the Sea Urchins Group (99.9%). Both were recovered in Layer C only. The indeterminate sea urchin remains are grey in colour and unidentifiable to species. As the meat or gonads of the sea urchin were eaten raw, discolouration of the sea urchin remains likely represents post-harvesting modification (burning by fire).

Unit N4-6/E0-2 Column Sample

A total of 1813.3 g of shellfish remains were examined and analysed from the Unit 4-6/E0-2 column sample (Table 5), 99.6% of which were identified to species, genus, or family levels. The vertical column sample measured 20 by 10 cm by 205 cm deep. It was collected from the west portion of the unit's north wall. The contiguous 2-x-2-m unit was excavated in a flat area toward the back of an elevated terrace landform at the rear of the site, approximately 100 m southeast of House 1. Two radiocarbon date estimates indicate these deposits range between 3320 to 4980 calibrated years BP—a time of higher relative sea levels.

This column sample intersected three separate soil layers, commencing in upper Layer B and proceeding downwards through layers C and D. Lower Layer D, a grey ash with burned shell mixed with sand, was the thickest sediment layer in the unit. It made up approximately half of the 2.0+ m deep stratigraphic profile and half of the bulk samples, yet only encompassed 35.4% of the total shellfish assemblage by weight (Table 5).

Ten of 41 5-cm-thick bulk samples from the column were examined (25% sampling fraction by volume). As in the Late Component column (Unit 10-12/E2-4), the number of bulk samples examined was influenced by layer thickness. The 10 bulk samples examined in Unit N4-6/E0-2 column included: Layer B = Levels 4, 7; Layer C = Levels 10, 14, 16; and Layer D = Levels 22, 26, 29, 32, and 34).

Ten shell species were identified in the unit's column sample. Bivalves and barnacles represent the dominant shell groups, contributing 96.8% and 2.1% of the column assemblage by weight, respectively. The remaining groups (Marine Snail, Chiton, Sea Urchin, and Abalone) contribute less than 0.6% of the sample by weight, individually.

As is the case in the column sample from House 1, mussel is the chief shell species found in this early assemblage: 96.5% of the total shell assemblage and 99.6% of the Bivalve Group, by weight. Only a quarter of the mussel was identified as California mussel, the remainder consists of fragmented *Mytilus* sp. measuring less than 2 mm thick. Again, it is safe to suggest that all examined mussel remains are likely those of California mussel as no other mussel species was observed. The relative proportions of mussel for each of the three sediment layers are consistently high, ranging between 94.6% (Layer D) and 97.5% (Layer C) of the assemblage by weight.

Clams and cockles are rare in this Early Component column sample. These shells make up only 0.3% of the whole assemblage by weight, less than that found in the Later Component column sample (1.6%). Only two species were identified, native littleneck clam and probable basket cockle. Unidentified clam represents the most abundant clam material observed. These shell remains likely represent eroded and fragmented valves of the butter clam and/or horse clam. A high proportion of the unidentified clam was recovered in Layer C.

The second most abundant shell group is this column sample is the Barnacle Group. Two species are present in the assemblage, *Archaeobalanidae/Balanidae* family and gooseneck barnacle (*Pollicipes polymerus*). The former were not sorted by species, but were dominated by both giant and thatched acorn barnarcles. *Archaeobalanidae/Balanidae* materials are present in all three layers and contribute 97.1% of the Barnacle Group. Only traces of goose barnacle were observed in Layers B and C.

The third dominant shell group are Marine Snails, contributing 0.6% of the assemblage shell weight. Higher measures (ten-fold) of marine snails are found in this early assemblage sample than those from the more recent sample from Unit N10-12/E2-4. Only two snail species were observed, the

Table 5. Relative frequencies by weight of shellfish remains within major shell groups—Unit N4-6/E0-2 (>3 mm mesh).

	Layer B TOTALS	Layer C TOTALS	Layer D TOTALS	Assemblage Totals and %	Shell Group Wt %
BIVALVES					
California mussel	3.6	271.1	137.9	412.6	23.5%
Indeterminate mussel sp.(<2mm thick)	9.3	857.2	470.2	1336.7	76.1%
Indeterminate cockle			<0.1	<0.1	<0.1%
Native little-neck clam		0.2	<0.1	0.2	<0.1%
Unidentified clam species		5.7	0.3	6.0	0.3%
Bivalve Group Wt Total (100%) and % of Layer Wt Data	**12.9 g (95.6%)**	**1134.2 g (98.0%)**	**608.4 g (94.6%)**	**1755.5 g (96.8%)**	**100.0%**
MARINE SNAILS					
Channeled dogwinkle		0.5	<0.1	0.5	5.0%
Frilled dogwinkle		1.7	7.0	8.7	87.0%
Indeterminate marine snail		<0.1	0.4	0.4	4.0%
Marine snail operculum		0.4	<0.1	0.4	4.0%
Marine Snail Group Wt Total (100%) and % of Layer Wt Data	**0.0 g (0.0%)**	**2.6 g (0.2%)**	**7.4 g (1.2%)**	**10.0 g (0.6%)**	**100.0%**
BARNACLES					
Acorn barnacle sp	0.4	15.2	20.7	36.3	97.1%
Goose Barnacle		<0.1	1.1	1.1	2.9%
Barnacle Group Wt Total (100%) and % of Layer Wt Data	**0.4 g (3.0%)**	**15.2 g (1.3%)**	**21.8 g (3.4%)**	**37.4 g (2.1%)**	**100.0%**
CHITONS					
Black katy chiton			0.4	0.4	100.0%
Chiton Group Wt Total (1005) and % of Layer Wt Data	**0.0 g (0.0%)**	**0.0 g (0.0%)**	**0.4 g (0.1%)**	**0.4 g (<0.1%)**	**100.0%**
SEA URCHINS					
Purple sea urchin		0.4	0.9	1.3	41.9%
Indeterminate sea urchin			1.8	1.8	58.1%
Sea Urchin Group Wt Total (100%) and % of Layer Wt Data	**0.0 g (0.0%)**	**0.4 g (<0.1%)**	**2.7 g (0.4%)**	**3.1 g (0.2%)**	**100.0%**
ABALONE					
Northern abalone		,	0.4	0.4	100.0%
Abalone Group Wt Total (100%) and % of Layer Wt Data	**0.0 g (0.0%)**	**0.0 g (0.0%)**	**0.4 g (0.1%)**	**0.4 g (<0.1%)**	**100.0%**
Unidentified Shell	**0.2 g (1.5%)**	**4.8 g (0.4%)**	**1.5 g (23.1%)**	**6.5 g (0.4%)**	**100.0%**
Total Layer Shell Wt And % of Shell Assemblage	**13.5 g (1.5%)**	**1157.2 g (63.8%)**	**642.6 g (0.2%)**	**1813.3 g**	

frilled dogwinkle and the channeled dogwinkle. The frilled dogwinkle is the most abundant snail, making up 87% of the Marine Snail Group by weight. A small number of snail operculi were found and likely reveal evidence for the red turban snail.

The remaining shell groups, Chiton, Sea Urchin, and Abalone, contribute less than 0.2% of the assemblage sample weight, combined. Identified species include: black katy chiton, Northern abalone, and purple sea urchin. The black katy chiton and Northern abalone were recovered from lower Layer D only. Grey-coloured sea urchin specimens were also recovered in only Layer D. As mentioned above, these discoloured sea urchin remains probably represent specimens that have been subjected to heat.

Shell Modification

Burnt shell is abundant throughout both Huu7ii column samples. Commonly found at Northwest Coast midden sites, this type of modification is indicative of food processing and preparation activities. California mussel yielded the highest quantity of burnt shell and is present in almost all bulk samples. Ethnographic information relates that California mussel was not traditionally eaten raw by the Nuu-chah-nulth peoples, but instead was roasted, steamed, or boiled (Ellis and Swan 1981). Evidence for the heating of barnacles was also observed and included both acorn and gooseneck species. Both barnacle species were roasted or steamed before consumption (Ellis and Swan 1981). Grey-coloured sea urchin spines were also recovered. As the meat or gonads of this species was eaten raw, the discolouration of these remains most likely represent discarded food refuse and post-consumption roasting.

Discussion and Conclusions

Examined invertebrate remains from Huu7ii indicate a dietary focus by the site occupants on the consumption of shell species inhabiting local, exposed rocky shores. California mussel, one of the most abundant shell foods found in Barkley Sound, proved to be the most favoured shell species exploited during both "late" (330–1280 cal yr BP) and "early" (3320–4980 cal yr BP) occupation periods. Further archaeological sampling is warranted to determine whether this subsistence pattern continued through a "middle" cultural component. Smaller amounts of other rocky shore species (barnacle, gastrapods, chitons, sea urchins, and abalone) were also harvested.

Interestingly, the Huu7ii subsistence pattern suggests a lack in the utilisation of bivalves from semi-exposed and protected sediment beaches (for example, butter, horse, and native little-neck clams and the basket cockle). Preliminary sampling revealed that the quantity of sediment beach shell foods consumed at Huu7ii (clam/cockle range = 0.3% to 1.6%) differs from those assemblages examined at other pre-contact Nuu-chah-nulth village sites in Barkley Sound. Dietary data shows that sediment beach bivalve consumption values at Huu7ii fall within the lower levels of those recorded for nearby Ts'ishaa on Benson Island (clam and cockle range = 1.3% to 4.3%) and is significantly lower than those documented at nearby Kiix7in (clam and cockle range 9.9%–15.7%) (Sumpter 2005, 2006).

An examination of marine shell taxanomic richness over time shows little change in species diversity between the early and late cultural components. Preliminary data show at least 13 different shellfish species were harvested at Huu7ii. Analyses of shell assemblages from other village sites in Barkley Sound reveal higher species utilisation at nearby Kiix7in (17 species) and Ts'ishaa (53 species). The lack of change in species breadth at Huu7ii over time may be a sign that a variety of behavioural variables were influencing shell harvesting choices. Such behavioural factors may have included: specialised resource exploitation and/or habitat use, restricted access or shell gathering rights at local shores and beaches, and seasonality (i.e., winter village use only). Statistical and environmental studies coupled with additional archaeological investigations at Huu7ii may help to clarify such observations.

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Appendix E:
Rooted in the Past: Paleoethnobotany of Huu7ii

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Introduction

Archaeological data offer insights into the mechanisms of cultural change in indigenous populations along the Pacific coast of North America. Long associated with environmental shifts, some of these changes were sufficiently extensive to bring about the abandonment of villages that had been occupied for thousands of years. Understanding social and economic systems among ancient populations is integral to interpreting complex patterns of cultural change and stasis. Archaeologists working along the western coast of North America analyze artifact assemblages, site locations, features, and faunal remains to investigate cultural sequences. However, data about plant remains have not typically been part of these studies, despite the region's rich ethnographic record of plant use and the development of new technologies for examining such use in the past (Lepofsky et al. 2001; Lepofsky and Lyons 2003; Turner 1995, 2003). Ignoring botanical remains in archaeological studies results in the loss of their potential contributions to the understanding of past cultural patterns (Bonzanni 1997; Pennington and Weber 2004).

Paleoethnobotanical research at Huu7ii was designed to address the archaeological history of plant use at a shell midden site on Diana Island, in Barkley Sound on western Vancouver Island. Plant remains recovered from samples collected at Huu7ii (DfSh-7), an ancient Huu-ay-aht village, were examined in order to describe the taxonomic composition of edible, medicinal and other plants recovered from spatially and temporally distinct areas of the site. Sample collection occurred during major archaeological excavations, sponsored by the Huu-ay-aht First Nation, in 2004 and 2006. Subsurface and radiocarbon testing at the site indicates that the cultural assemblages preserved in shell midden extend from several centimetres below the ground surface to a depth of over three meters, reflecting thousands of years of human activity.

The proposed research into the paleoethnobotanical record of DfSh-7 included evaluating the depositional and environmental preservation history of the assemblage by examination of evidence of plant use at a variety of spatial and temporal scales. Research was designed to identify periods of change and continuity in the use of plant taxa throughout the site. Results would be used to inform attempts to characterize changes observed in the archaeological record by linking them to community-level changes in the use of the site at different points in time. Recovery and examination of plant materials, in conjunction with the analyses of the artifact and faunal assemblages, could provide a fuller picture of this ancient village of the Huu-ay-aht people, which was abandoned about 400 years ago after several millennia of occupation.

Previous Work

This project is within the traditional territory of the Huu-ay-aht First Nation in eastern Barkley Sound. One hundred and forty-two archaeological sites have been recorded within a 9 km radius of Huu7ii, including habitation sites, defensive sites, and resource extraction sites, according to the British Columbia Archaeology Branch's Remote Access to Archaeological Data (RAAD) database. Many of these sites, including Huu7ii, were identified during the Ohiaht (Huu-ay-aht) Ethnoarchaeological Project (Williamson and Mackie 1984). Although significant archaeological research has taken place in Barkley Sound (Inglis and Haggarty 1986; McKechnie 2005; McMillan 1999; McMillan and St. Claire 2005), the Huu7ii Project was the first large-scale excavation in Huu-ay-aht traditional territory.

No paleoethnobotanical studies have been completed for the Barkley Sound region to date. Elsewhere along the Northwest Coast, however, paleoethnobotanical research at a few archaeological sites has returned interesting results along with indications of areas where additional research is needed (Lepofsky and Lyons 2003; Lepofsky et al. 2000, 2001; Losey et al. 2003; Lyons and Orchard 2007; Martindale and Jurakic 2004). Lyons and Orchard (2007:28) describe the current state of paleoethnobotanical research along the Northwest Coast as "a relatively young field that is in the process of developing methodological conventions and establishing the range and sophistication of questions that can be asked of the data."

Paleoethnobotanical Analysis

Several sources of bias pertain to the paleoethnobotanical record. Depositional bias must necessarily be considered at all archaeological sites. Resources are usually gathered some distance away from habitation features. Some utilized plants, such as trail foods, never make it into the archaeological record. This type of bias represents a non-random data loss for which there is no correction (Pearsall 2000:244–245).

Differential preservation of botanical macroremains after deposition is the greatest concern for data interpretation. Macroremains are those that can be seen with the unaided eye or under minimal magnification. Taphonomy plays a large role in which questions can usefully be asked of paleobotanical remains. Taphonomic processes described by Schiffer (1987) have comprised the major framework for paleoethnobotanists, who have focused specifically on carbonized plant parts, especially seeds (Krebs 1989; Lyons and Orchard 2007; Pearsall 2000; Pennington and Weber 2004). Charring or carbonization renders plant remains unsusceptible to microbial activity, leaving mechanical processes as the only threat to survival in the archaeological record.

The most common preservation situation is that only material that was accidentally or purposely burned is preserved. Since fuel plants and food plants that require cooking or heating are more likely to become charred, they are more likely to preserve in archaeological contexts. The factors affecting likelihood of preservation are non-random since certain types of remains are always more likely to become accidentally charred and preserved than others. Although it is not possible to prevent differential preservation, its effects can be mitigated in interpretation by considering this "preservation factor" (Pearsall 2000:244–245).

Since most macroremains are preserved through human activity that led to charring, they often play a central role in interpreting the plant component of diet and the interrelationship between people and plants. Charred remains, though more plentiful and better preserved than uncharred plant materials, tend to be more difficult to identify since charring can distort the shape and size of some seeds (Johannessen 1988; Pearsall 2000:501–504). Krebs (1989), Lyons and Orchard (2007), and Pearsall (2000) further suggest that uncarbonized plant materials are subject to a variety of preservational challenges. Moisture, soil pH, temperature, insect and rodent activity, bacteria, fungi and various other factors can differentially preserve uncharred remains. For this reason, many researchers have not expected uncharred remains to persist in an archaeological context (Lepofsky 2004:376). However, recent studies on the Northwest Coast have demonstrated that uncarbonized materials, especially seeds, do preserve, even in the absence of extraordinary circumstances of preservation such as waterlogging, freezing or highly arid conditions (Cybulski 1992; Losey et al. 2003; Martindale and Jurakic 2004).

Paleoethnobotanical investigations at three Haida shell midden sites (Lyons and Orchard 2007) provide valuable information regarding taphonomic processes which encourage or discourage preservation of both charred and uncharred plant remains, especially seeds. Results proved that uncarbonized seeds and needles can persist for long periods in archaeological contexts within shell middens. A major concern when considering uncharred seeds and other plant remains, however, is whether they were deposited culturally or naturally. The authors suggest this new information indicates that the status of uncharred seeds in midden formations requires further investigation to address their presence and their usefulness as economic indicators (Lyons and Orchard 2007:42–45).

Identification of botanical remains in archaeological sites has contributed substantially to our knowledge of human activities through time. Charred, desiccated, or waterlogged wood, wild plant seeds, fruit pips, nut shells and cultivated plants are among the macroremains that are most frequently recovered. Once these remains are collected and analyzed, the data may be used to reconstruct or interpret land-use patterns, including plant foraging or plant production; patterns of plant utilization; trade practices and diet; and environmental changes brought about by human or climatic influences (Bryant and Dering 2000:424; Pearsall 2000:11; Johannessen 1988).

One further area of interest related to paleoethnobotanical research is a perceived gender bias in archaeology. Since animal remains are the result of hunting and fishing, activities that have traditionally been attributed to males, it is possible that plant remains, which have traditionally been viewed as the result of women's work, have lacked study due to a gender gap exhibited throughout decades of archaeological investigation (Adovasio et al. 2007;

Brumbach and Jarvenpa 2007; Nelson 2006). Although the gender gap in archaeological work has been closing in recent years, new avenues and methods of inquiry are required in order to fully understand the contribution that women, and plant materials, made to indigenous lifeways. The use of various parts of trees for food, clothing, basketry, tools, twine, fishing nets, housing and other daily requirements is only one example of intensive plant use. Paleoethnobotanical research is likely to provide additional insights into "women's work," and thus division of household labour and resource exploitation, along the Northwest Coast.

It is noteworthy that when I asked my students in two Archaeology 240 Lab sections at the University of Victoria whether they thought "men's work" or "women's work" would be most obviously represented in typical shell midden deposits, all 35 students replied that "men's work" would be more apparent because stone tools for hunting and large faunal remains are preferentially preserved. Not one student recognised that the shells themselves, which comprise the largest volume of cultural remains at midden sites, are the residue of shellfish gathering, long ethnographically attributed as "women's work."

Previous paleoethnobotanical research noted above indicated that the matrix and column samples collected at Huu7ii could contain macrobotanical remains. Many of the Huu7ii matrix samples had been specifically collected from hearths and other burnt contexts, increasing the likelihood that charred materials could be present. Any recovered plant remains could be identified and analysed, providing data that may, when interpreted, suggest valuable information about ancient populations. Paleoethnobotanical research on the Huu7ii samples could potentially add to discussions concerning cultural change versus stasis, economic diversity of populations at Huu7ii along with mobility versus sedentism, regional land use patterns, possible local environmental fluctuations during the period of occupation, and differential preservation of paleoethnobotanical materials due to taphonomic processes in shell midden sites.

Data Collection

Thirty-three 1- to 3-litre bulk samples of cultural deposits and many random column samples of similar volume were collected during the 2006 excavation, along with nine samples from 2004. All came from within the outline of the largest house platform evident on the site surface. Two general contexts within identified house floors were selected from which to collect samples: in random spatial locations and in locations adjacent to identified hearths. Both were collected at varying depths below the ground surface in order to place them in a temporal framework. This sampling strategy was designed to provide information relevant to the stated objectives of identifying spatial and temporal distribution of plant materials within the excavated house and identifying any differential preservation of botanical materials deposited adjacent to hearths.

In addition, samples were collected from two 2 x 2 m excavation units on a raised terrace inland from the village site. Previous archaeological testing in Barkley Sound indicates that cultural deposits on similar raised terraces behind the main village areas represent earlier occupations at times of higher sea levels (McMillan 2003; McMillan and St. Claire 2005). It was hoped that botanical samples collected from this area would, in part, help to confirm environmental fluctuations indicated in these previous studies.

Methodology

General methodology, including sampling strategy, retrieval of botanical remains from samples, and analysis of recovered materials, adhered to that suggested in scientific literature related to archaeological research on plant remains (e.g., Bryant 2000; Bryant and Dering 2000; Hastorf 1999; Hastorf and Popper 1988; Krebs 1989; Lennstrom and Hastorf 1995; Pearsall 2000). Attempts were made to recover botanical materials from 27 samples through standard flotation methods (Bryant 2000:216–218; Pearsall 2000:29–44) using nesting circular reservoirs with 1.0 mm and 0.21 mm mesh bottoms in a 77 litre container of water. Samples were poured slowly into the reservoir, allowing lighter materials, known as the light fraction, to float to the top, where they can be collected with a hand sieve. Heavier materials, called the heavy fraction, collect in the bottom of the reservoir screen. Both charred and uncharred whole seeds tend to occur in the heavy fraction, while partial seeds often float. All materials collected in the screens and in the hand sieve were subsequently sorted for analysis. Microscopes were used for examination of materials in an attempt to identify particles such as seeds, spores, or other small remains.

The efficacy of manual flotation depends heavily on the skill and consistency of the operators. Flotation was conducted using a standard procedure for processing the samples to ensure consistency. The same person floated all samples to avoid variation due to differences in operator expertise (Hosch and Zibulski 2003:849–850). Samples were floated and dried only once to avoid deterioration due to repeated washing. All recovered materials were dried indoors under controlled temperatures to avoid degradation of botanicals by sunlight and heat (Pearsall 2000:42–43).

Prior to processing any samples, a test for flotation recovery rates similar to that suggested by Pearsall (2000:93–94) was performed. In order to test recovery rates, 50 charred poppy seeds were added to 0.5 litre of sterile potting soil. The test samples were processed as if they were from an archaeological context. Recovered seeds were counted and examined to determine whether loss or damage has occurred and whether any procedures need modification prior to examination of actual samples. Three separate tests were performed, resulting in the recovery of 45, 43, and 46 whole poppy seeds, with partial/broken seeds identifiable in each test. All whole seeds were contained in the heavy fraction. As the tests confirmed methodological efficacy for recovery of botanical remains, flotation of Huu7ii samples was initiated as described. The procedures for recovery of macrobotanical remains follow those listed by Pearsall (2000:32–33).

Processing Samples (Adapted for one person acting as "agitator" and "pourer")

1. Ensure equipment is clean and the flotation tank has settled and is free of debris. Add water to tank if necessary.
2. Organize soil samples to be processed:
   a. Check that soil sample is easily friable, break up any lumps of soil.
   b. Do not soak soil prior to flotation, even if soil is hardened into lumps, as soaking often destroys delicate samples.
3. Assemble all materials for processing on a table with the flotation tank set up beside it. Include the following:
   a. Indelible pen for labelling
   b. Waterproof paper and pencils for bag labels as backups
   c. Newspaper for heavy fraction samples and muslin for light fraction samples
   d. Clipboard and Flotation Forms
   e. Measuring device
   f. Drying rack (set up in advance in secluded area)
   g. Flats for storing heavy fraction
4. Select a sample and fill out provenience information on Flotation Form. Ensure you have the whole sample (some are only 1 L but some are 3 L).
5. Label the muslin cloth and newspaper with sample name (e.g., E17 N10 Level 130–140).
6. Measure 0.5 litre of soil to be floated using a graduated measuring cup and enter information on form.
7. Spread out muslin cloth for light fractions and newspaper for heavy fractions on table.
8. The "agitator" immerses the flotation bucket to about half its depth in the flotation tank and begins agitation. Agitation should be in circular motion, with the bucket held level, turning clockwise 90°, then counter clockwise 90°.
9. The "pourer" now slowly pours ONLY 0.5 litre of the sample into the flotation bucket, while continuing agitation. The remainder of the sample must be retained for possible additional testing.
10. When most of the soil has worked through the bucket, the "agitator" stops agitating and drops the bucket down so that the water is within 5 cm of the top and scoops the botanical material floating on the surface with the hand sieve.
    a. Scooping is done in S curves over the surface with the scoop help upright pushing as well as scooping the remains.
    b. The scoop is emptied by rapping the hand sieve on the muslin.
    c. Repeat until most floating material is removed.
    d. If scooping is delayed the bucket must be agitated to keep anything from being carried out the bottom of the screen.
11. The "agitator" raises the buck to agitation level and resumes agitation again. Repeat Step 10 until negligible material rises to the surface.
12. A series of shallow scoops are done when the sample is almost complete. The agitator raises the bucket in and out of the water, forcing semi buoyant material to rise just off the screen, then scoops these materials up. Repeat until no charcoal or material remains.
13. The 'agitator" consolidates the heavy fraction. Dip the bucket in and out of the water at a slight angle, concentrating material on the screen at on end. Empty the consolidated material on the newspaper by tapping the bucket out and remove any stray pieces gently by hand.
14. Carefully gather up the edges of the muslin cloth containing the light fraction and hang

to dry on the rack. Ensue the cloth is labelled with the sample name. Carefully fold over the newspaper with the heavy fraction and stack in flats. Ensure the newspaper is labelled with the sample name.
15. Note on the Flotation Form:
    a. Observation or complications during processing
    b. Estimate of charcoal and seed abundance
    c. Remark on what is present in heavy fraction
16. Ensure the flotation bucket and hand sieve are clean before beginning a new sample. If silt and/or other floating materials are visible, use the back-up tank. Carry on with next sample.

Post-Processing Organization

1. Put dry samples into permanent storage containers as appropriate: vials, baby food jars, plastic or paper bags etc., with provenience checked and transferred. Ensure ALL SAMPLES are COMPLETELY DRY to avoid bacteria growth.
2. Place a copy of the Flotation Form with the dry samples and an additional copy in the file folder.

Portions of selected samples were put aside prior to processing as described above in case additional testing was required.

Identification of Macrobotanical Remains/Data Analysis

Comparative collections available for identification include the British Columbia Seed Collection housed at the Royal BC Museum plus the British Columbia Seed Collection and the Archaeological Seed Collection housed at Simon Fraser University. The United States Department of Agriculture's National Resources Conservation Service hosts a complete plant database for the U.S. and Canada, as well as for many other countries and areas (http://plants.usda.gov/index.html). The website includes excellent quality macro photos of seeds, shoots, needles, berries and other plant parts, providing useful comparisons to assist in identifying taxa.

Data from samples associated with features could be compared to those distinct from features to facilitate identification of which plants may have been used for food, medicine, artifact manufacture and other purposes. Areas of food preparation and other plant-related activities may be indicated by the spatial data obtained across the site. Studies suggest that charred plant remains may preserve better through time than non-charred (Lepofsky et al. 2001; Pennington and Weber 2004). Differential preservation would be examined in relation to proximity of the samples to identified hearths or other features which would indicate presence or absence of charring. The described sampling strategy would also assist in determination of which taxa are culturally relevant as opposed to those that are naturally deposited.

Data from both selected and random areas of identified house floors would be compared to facilitate identification of which plants were used for food, medicine, artifact manufacture and other purposes. Data collected from the terrace located inland from the main village would have been compared to that gleaned from samples taken from house deposits in order to assess changes in the vegetation regime of the island due to climatic fluctuations and human activities.

The proposed analysis strategy focused on qualitative identification, which reflects presence versus absence of botanical remains, rather than quantitative comparison of macroremains. Such qualitative analysis may potentially provide important information. If plants which do not grow at Huu7ii or on nearby islands are present in the archaeological record in association with locally collected botanical materials, that information may provide insight into seasonal population movements, diet and subsistence practices, patterns of trade, and past environmental/vegetative regimes. Although seasonality of occupation is most commonly assessed through study of faunal remains, plotting of plants recovered by seasonal and locational availability may also indicate the season of occupation or provide evidence for year-round use (Kristensen et al. 2009; Pearsall 2000:191–192). Ethnographic studies report that some plant foods were less valued than others (Turner 1995); the presence of such marginal resources in the archaeological record may indicate times of climatic shift or other cultural or environmental issues that would prevent utilization of preferred foods.

Results

No botanical materials other than varying size particles of charcoal were recovered by using the standard methodology described above. Microscopic pieces of charcoal were not collected for analysis because large pieces were recovered during excavation. The potting soil test samples containing charred poppy seeds indicated that the methodology used would recover botanical remains similar to those expected in archaeological contexts. Since none were identified in the actual samples from Huu7ii, it is highly likely that none remain in these deposits due to factors of preservation. To test this idea, the results from Huu7ii were compared to those from the Park Farm Site (DhRq-22), in the Fraser Valley at Pitt Meadows, where numerous paleoethnobotanical remains were collected.

Samples from the Park Farm Site were examined for botanical remains by a team of archaeologists, including this author, in 2009. Exactly the same flotation methodology was used for Park Farm and for the Huu7ii samples. Results from the Park Farm research, presented by Kristensen et al. (2009:31–32), are repeated, in part, below:

> Samples for paleoethnobotanical examination were collected from various features including hearths, clay lined pits, pits and living floors across DgRq 22 … Of the 47 samples selected for examination, most were associated with charred soils, fire modified rock, charcoal, burned bone or other similar contexts. In order to create a control baseline for ubiquitous plant materials, the remainder were chosen from archaeological contexts that were not directly associated with any features … The average thickness of intact archaeological deposits from which the samples were collected is approximately 47 cm and represents a timeframe of 3,900 to 4,840 years before present … Botanical materials were recovered in all samples through standard flotation methods (Bryant 2000; Pearsall 2000) using a circular reservoir with a 1.6 mm mesh bottom in a 77 l container of water.

In addition to various seeds, paleoethnobotanical analysis at the Park Farm site led to the recovery of numerous black, spherical, microscopic spores identified as coming from weedy, invasive plants, including bracken fern (*Pteridium aquilinum*). The fresh shoots and the rhizomes of the bracken fern were common foods on the Northwest Coast (Turner 1995). In addition, fern leaves were used to cover fire-heated stones in earth ovens and for steaming foods (Barnett 1955). However, these spores can be accidentally introduced to the archaeobotanical record by various methods such as natural transfer from wind and rain or human transfer on clothing and feet (Kristensen et al. 2009:200). As a result, these decay-resistant spores may occur almost ubiquitously in deposits containing botanical remains.

Archaeobotanical remains, especially spores, were recovered at the Park Farm site in levels radiocarbon dated to as early as 4230 ± 40 cal BP (Kristensen et al. 2009:Appendix P). Since no seeds or spores were recovered from the Huu7ii samples, despite the use of the same techniques of analysis, differential preservation of organics between the two sites seems likely. Differences in acidity versus alkalinity in the site deposits may be the key factor. The Park Farm samples tested acidic, with all but one (at pH 5.5) providing pH values of 6.0 (Spurgeon 1994:100). In contrast, all pH values for the Huu7ii samples measured 8.0, which is alkaline to about the same degree as sea water.

As mentioned, only half of each Huu7ii sample was floated using the methodology described above. The remainders were retained in case further examination was needed. In order to rule out the possibility that extant botanical remains were destroyed during the flotation process, 0.5 litres of the remainder of each sample was intensively examined. Methodology consisted of placing two tablespoons of matrix into a small hexagonal lab dish, then removing large identifiable particles (e.g., lithic clasts, shell fragments, lumps of charcoal, etc.). Small amounts of water were gently added until the matrix was covered and particles began to float. All contents of each tray were closely examined under a microscope, with cloudy water removed through a fine sieve and fresh water added until all constituents were clearly visible. Matrix elements were removed from the dish after examination to provide better visibility of remaining particles. Even after this thorough examination, no archaeobotanical remains other than charcoal were identified.

Discussion

Paleoethnobotanical recovery, identification, analysis, and interpretation have the potential to offer new avenues of inquiry into economic systems, societal change, environmental reconstruction, and gender issues. The matrix and column samples collected during archaeological excavation at Huu7ii (DfSh-7) presented an opportunity for such paleoethnobotanical research. Much of the site analysis has been completed, providing strong spatial and temporal frameworks to help situate additional information. Analysis of the faunal assemblage, shellfish remains, artifacts, features and other data are reported elsewhere in this volume.

It was hoped that a paleoethnobotanical analysis could have been integrated with these other lines of inquiry to provide a fuller understanding of Huu-ay-aht diet, land use, and social organization. Unfortunately, these goals were frustrated by the lack of preserved macrobotanical remains in the Huu7ii deposits.

Although no paleoethnobotanical remains were recovered from the Huu7ii matrix and column samples, examination of the sediments provides direction for future research. It is postulated that alkaline versus acidic soil pH has contributed to differential preservation of botanical remains. Further research comparing and contrasting archaeobotanical assemblages from inland versus midden sites may inform this hypothesis.

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Appendix F: Paleoecological Analysis of Late-Holocene Pollen Records from the Huu7ii Bog, Diana Island, B.C.

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Introduction

The interaction among climate, landscapes, and people is intrinsically woven through millennia. On the west coast of Canada, First Nations people have occupied the land since the ice retreated at the end of the Fraser glaciation. Abundant maritime resources and impressive timber such as western redcedar provided the resources necessary for a complex and thriving society. With this said, the west coast of Canada is a dynamic place where earthquakes have been common and relative sea levels have fluctuated as a result of retreating glaciers and tectonic activity. Understanding the interplay of people and the landscape is critical to both ecological and archaeological researchers as very few landscapes evolve without some level of human influence (Vale 2002).

Coastal British Columbia-based research integrating paleoecological analysis with archaeological investigation has been shown to be a useful method when interpreting the interplay between natural and human-induced environmental change (Hebda et al. 2005; Lacourse et al. 2007). The relationship between humans and the landscape has also been observed in paleoenvironmental studies that investigated climate change and fire history (Pellatt et al. 2001, 2007). This paper presents preliminary paleoecological results related to an archaeological investigation at the site of Huu7ii, on Diana Island in the Deer Group Islands of Barkley Sound, on the west coast of Vancouver Island. The results of archaeological investigation reveal two periods of occupation: about 4800 to 2900 cal BP and 1500 to 400 cal BP based on radiocarbon dating of organic materials from site sediments. It was felt that an understanding of the paleoecology of the site would help elucidate the environmental conditions of the island during these periods of occupation. Pollen analysis on a radiocarbon-dated peat core was undertaken in order to achieve this goal. The results are reported below.

Study Site

A Livingstone piston corer was used to recover pollen assemblages representative of local forest conditions from a small bog behind the archaeological site of Huu7ii on Diana Island. This low swampy area was situated immediately inland from the raised terrace at the back of the site near its eastern end (see site map in the main body of this report). The raised terrace contained the early component archaeological materials from Huu7ii, which significantly predate those recovered from the house row along the front of the site. Behind this raised terrace, the low area that contains the bog extends eastward to the rocky coastline of Diana Island, suggesting that at one time this was a salt water channel providing access to this portion of the Huu7ii site. The core from the bog consists of peat for a length of 65 cm. At the base of the peat the corer encountered gravel, presumably from an early beach that existed when this area was an open marine channel.

Huu7ii is situated in the temperate Coastal Western Hemlock biogeoclimatic zone (Mudry and Green 1976), which consists of temperate forest dominated by *Tsuga heterophylla* (western hemlock) and *Thuja plicata* (western redcedar). Average annual precipitation exceeds 300 cm per year, mostly in the form of rain (Mudry and Green 1976). Temperatures are moderated by the oceanic influence, with cool summers and mild winters (mean monthly temperatures range between 5 and 14°C; Mudry and Green 1976).

Methods

Pollen Analysis

One-millilitre subsamples from the Huu7ii peat core were removed at selected intervals to be processed for pollen. Volumes were determined by displacement in water, using a 10 ml graduated cylinder, and a known concentration of marker spores (10,679 ± 191 *Lycopodium* – Batch # 938934) was added to the subsamples before processing. The pollen extraction protocols followed those suggested in Berglund and Ralska-Jasiewiczowa (1986). Identification of pollen and spores was aided by published keys (McAndrews et al. 1973; Moore et al. 1991). Routine counting was carried out using a Leitz DMRBE binocular compound microscope at 400X magnification, and critical identifications were made under oil immersion at 1000X. A simplified pollen diagram was constructed using a basic pollen sum composed of terrestrial pollen (Fig. 1). Zonation is based on a dendrogram produced by the clustering routine CONISS in the TILIAGRAPH program.

AMS radiocarbon dating of peat at the base of the core provided a conventional age of 3490 ± 50 BP (3530 ± 50 BP measured age; 3890 to 3640 cal BP [1940 to 1690 cal BC] at 2 sigma; Beta-242279). Linear interpolation of sediment age is based on the depth of the core and the basal 3530 ± 50 BP radiocarbon date.

Results

Pollen Zone I (3530 BP to 2430 BP; 65 to 45 cm)

This pollen zone consists of two samples and is dominated by *Tsuga heterophylla*, *Picea*, and *Alnus rubra*. These pollen types are typical of a temperate western hemlock dominated ecosystem representative of the study site. Herbaceous species are lower in numbers than in the following zone.

Pollen Zone II (2430 to 1350 BP; 45 to 25 cm)

This pollen zone experiences a decline then recovery of *Tsuga heterophylla* pollen and the beginning of a *Picea* decline. *Alnus rubra* begins to increase and shrubs and herbaceous pollen types appear (Cyperaceae, *Salix,* Rosaceae, *Rubus,* and *Sparganium/Typha*) or increase (Poaceae, Cyperaceae, and Rosaceae). There is also an increase in *Sphagnum* moss spores.

Pollen Zone III (1350 BP to Present; 25 to 0 cm)

Pollen Zone III displays an increase in *Tsuga heterophylla* and decrease in *Picea*, an overall decrease in shrubs and herbaceous plants, an increase in Filicales and *Polypodium,* and a decrease in *Sphagnum*.

Discussion

The vegetation history based on pollen analysis displays three zones over the past 3500 years (Fig. 1). The changes reflect a shift from a closed western hemlock dominated forest in Zone I to what appears to reflect increasing wetland/bog and herbaceous pollen types in Zone II, from 2430 BP to 1350 BP, likely reflecting local bog development in the low lying depression adjacent to the archaeological site. Zone III displays a decrease in wetland/bog pollen types (Cyperaceae, *Sphagnum*, *Salix*, and Rosaceae) and shows an increase in spores such as Filicales and Polypodium. Many of the herbaceous species and some shrubs also decreased during this zone, possibly due to increased human land use reducing local forest understory vegetation.

The peat core, with the AMS radiocarbon date of 3530 ± 50 BP at the base, is underlain by gravel that presumably marks a former beach. Similar old beach gravels underlie the archaeological deposits. This would indicate that prior to ca. 3500 BP conditions were not favourable for bog development, presumably due to regular inundation by seawater. A marine channel likely existed at this time of higher relative sea level, providing direct canoe access to what is today the furthest inland portion of the archaeological site. As the relative sea level dropped and marine inundation of the area ceased to occur, the former channel experienced a transition to a bog/wetland environment.

McMillan and colleagues (see main report) analysed the archaeological deposits from the raised terrace at the back of the Huu7ii site, adjacent to the bog cored for the pollen analysis. Six radiocarbon dates from excavated wood charcoal were analysed. The calibrated radiocarbon ages range from approximately 4800 BP at a location just above the sterile old beach gravels at the base of the archaeological deposit to 2900 BP near the surface. The dates correspond well with Zone I of the pollen diagram.

A later period of occupation is documented by archaeological excavation at the front of the site, within the outline of House 1, the largest house platform in a row of houses evident on the site surface. Nineteen radiocarbon dates were analysed from excavated wood charcoal. The calibrated radiocarbon ages range from 1500 to 400 cal BP, corresponding well to Zone III of the pollen record.

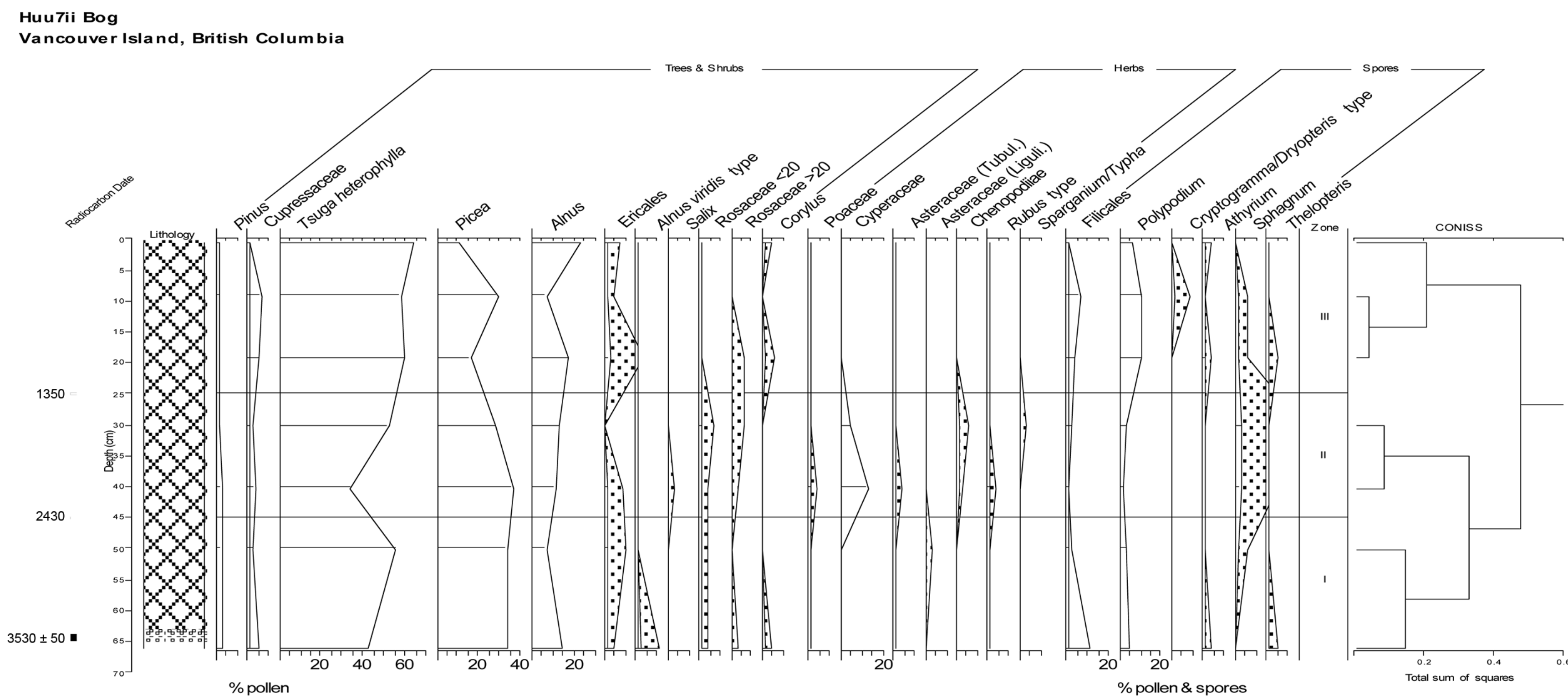

Figure 1. Percentage pollen diagram for the Huu7ii bog study site. Stipple represents 10X exaggeration curve. Zones are based on constrained cluster analysis.

Conclusion

A close relation is observed between the pollen zones for the Huu7ii bog site and the periods of occupation documented by archaeological research (McMillan, pers. comm.). Pollen analysis indicates that an increase in freshwater wetland and bog species developed in the channel as inundation, likely by seawater, ceased as relative sea levels dropped. The archaeological investigation did not reveal evidence of continuous occupation and it seems quite likely that there was a significant hiatus at the site between the two clusters of dates. Pollen Zone 1 corresponds to the earliest occupation at the back of the present day site, corresponding to a time of higher relative sea levels. Pollen Zone II may well have been a period when the site was not in use, as indicated by an increase in herbaceous plants and bog species. Pollen Zone III corresponds nicely with the main period of occupation, in which the houses evident today by the row of surface platforms along the front of the site were inhabited. The latter period would have involved fairly large-scale clearing of any trees on this part of the site. Increased alder and decreased western redcedar and spruce with increased Ericales (likely salal or red huckleberry), Filicales and *Polypodium* spores indicate tree removal and a more open environment. Further radiometric dating, plant macrofossil analysis, and confirmation of basal marine sediments should be undertaken to strengthen the inferences made from the pollen record at this site.

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