

# CHAPTER 16

## Cultural Chronology and Spatial Lithic Analysis at DhRp-52

Emily Wilkerson

*Golder Associates Ltd.*

### Introduction

This chapter presents a summary of the stone tool assemblage analysis conducted for lithics recovered from multi-component pre-contact period archaeological site DhRp-52, located in the west Fraser Valley of B.C. (Wilkerson 2010a) (Figure 1). The site was excavated over a ten-month period in the years 2006 and 2007 as part of a salvage archaeology program related to the construction of the Golden Ears Bridge in Maple Ridge, B.C. Objectives of this analysis were to better understand site structure, identify changes in lithic technology through time, and determine how DhRp-52 fits the established local cultural chronology. This research is part of a larger, ongoing research project involving Katzie Development Corporation and the Katzie First Nation.



**Figure 1. Location of Site DhRp-52 near the confluence of the Pitt and Fraser Rivers in Maple Ridge, B.C. Google earth image 2016.**

Tools were assigned to an assemblage based on their temporal component affiliation, and to sub-assemblages on their spatial association within a temporal component (Odell 2003:4). Assemblages and sub-assemblages were compared and contrasted using univariate statistics, presence or absence comparisons and proportional comparisons. Analysis results indicate that some stone tools are good indices of lithic technological changes through time (and likely site use), but are only good markers for differences in how space was used in some temporal components. A

comparison of assemblages from DhRp-52 with those of similar age at Glenrose Cannery site (DhRr-6) and Crescent Beach site (DhRr-1) highlight the complexity and diversity of regional socio-economic organization in the Fraser Delta sub-region.

DhRp-52 is a large, important site located in the traditional territory of the Katzie First Nation in Maple Ridge. It dates to several periods in Northwest Coast culture history where regional variants remain poorly understood beyond the Gulf of Georgia region: the Old Cordilleran Culture (9000 to 5500 BP), the Charles Culture (5500 to 3500/3300 BP) and the Locarno Beach Phase (3500/3300 BP to 2400 BP) (Angelbeck 2009: 150; Mitchell 1990; Matson and Coupland 1995:81, 98-99, 156). Excavations at DhRp-52 revealed three stratigraphic components and the remains of several large structural features associated with middle and late site components. An earlier, sub-structural deposit lay in the deepest site component. The site also contains rare “wet-site” deposits that preserved a pre-contact period wapato patch and numerous organic artifacts not usually present in dry-site deposits. The structural deposits and extensive dry-site and wet-site deposits at DhRp-52 revealed significant information about early village formation, social organization, and the role of geophyte resource utilization during the Charles Culture and Locarno Beach Phase periods.

In order to better understand contextual differences and similarities in the site deposits using stone tools a lithic typology was created based on lithic morpho-functional traits. Spatial patterns of different tool types were evaluated by considering a series of hypotheses. The first hypothesis states that stone tool sub-assemblages differ between structural and non-structural occupation zones at the site. This is dependent on the assumption that structural zones have different patterns of tool use, storage, and discard than outside, non-structural zones. Although most studies that examine structure function tend to focus on floor sub-assemblages, DhRp-52 has no clearly discernable or firmly identified floors in its structural features.

Analysis of the stone tool types and their distribution within the site’s large feature and non-feature zones was a first step toward understanding the nature and function of these large features and their relationships with contemporary outside spaces. This analysis was

accomplished by assessing tool assemblages from inside and outside of structural zones with statistical analyses, presence/absence comparisons and proportional comparisons. There are four large structural features identified as structural zones in this analysis. Non-structural zones include all deposits lying outside structures that are assumed to be temporally associated with respective structural zones. Several special non-structural zones identified include one large bead-lined fire cracked rock-filled pit with unknown function, all wet site deposits, and non-shell midden deposits.

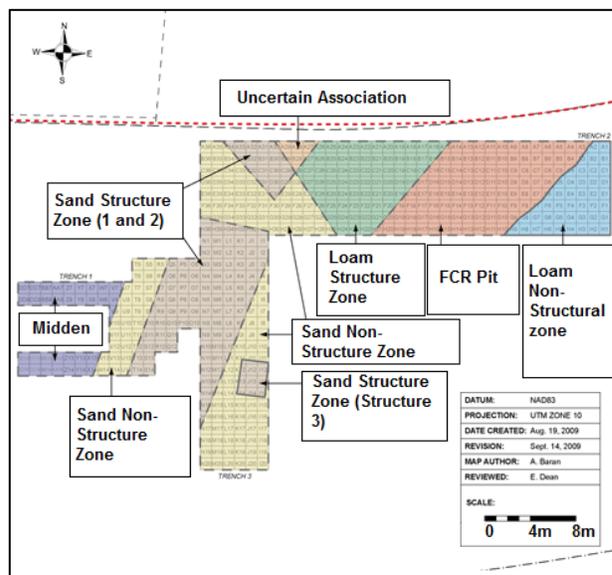
A second hypothesis evaluates formal and technological differences evident in stone tool assemblages through time that may reflect changes in the nature of site use through time. Three site components identified on the basis of their stratigraphic character and composition were analyzed and compared using chi-square tests and proportional comparisons of tool class distributions.

The third hypothesis evaluates whether the three components can be associated with defined Gulf of Georgia/Salish Sea culture-historic units (Table 1). Several radiocarbon dates indicate that site deposits span the Old Cordilleran Culture (9000 to 5500 BP), Charles Culture (5500 to 3500/3000 BP), and the Locarno Beach Phase (3500/3000 to 2400 BP). Comparisons of tool class proportions between DhRp-52, Glenrose Cannery (DgRr-6) site and the Crescent Beach (DgRr-1) site were made to compare temporal components between these sites and to gauge the degree of fit of the site components at DhRp-52 to known culture-historic units. Glenrose Cannery data are used for comparison because the site is well documented in published literature (Matson and Coupland 1995; Matson 1976) and has an established chronology with dates that span the Old Cordilleran Culture and Charles Culture periods. The Crescent Beach site is also considered because it contains a pithouse structure and has a large chipped-stone assemblage (Matson and Coupland 1995:160) thus is comparable site to DhRp-52.

**Table 1. Site zone temporal and spatial associations at DhRp-52.**

Matrix Deposit Type	Zones Associated With Matrix Deposit	Site Temporal Component and Overlap with Regional Chronology
Loam	Loam Non-Structural Zone (LNSZ), Loam Structural Zone (LSZ), FCR Pit, and Midden Zone.	Late Component: Late Charles Culture/Early Locarno Beach Phase
Sand	Sand Non-Structural Zone (SNSZ) and Sand Structural Zone (SSZ).	Middle Component: Old Cordilleran Culture/Charles Culture
Sub-Structural Sand	Sand Sub-Structural Zone (SSSZ).	Early Component: Old Cordilleran Culture

DhRp-52 is a significant site in the Lower Fraser River region of the Northwest Coast for two reasons. On one level, the range of site types investigated in the region has been limited, which has led to an incomplete understanding of lower Fraser River Valley culture history and how it inter-relates to larger Gulf of Georgia regional chronology. DhRp-52 is rich with a variety of data that allow us to fill some of those gaps in the current understanding and reconstruction of the regional chronology, including components dating to the Old Cordilleran Culture, Charles Culture, and Locarno Beach Phase. On a second level, archaeologists have limited archaeological data regarding riverine settlement and resource use in the region. The Fraser River Valley is an ecosystem that may have provided unique resources, such as wapato (*Sagittaria latifolia*), to riverine peoples (Lepofsky 2005:270). The preserved wapato patch and associated structures may allow archaeologists to more fully understand the relationships between different patterns of resource use and social organization during the Charles Culture period at an early time in history.



**Figure 2. Site Zones across the 'dry' aspect of the site. From Wilkerson (2010a).**

**Methods**

While DhRp-52 yielded a wide variety of informative data, some data was limited, minimally researched, or absent from site deposits. Faunal data was absent due to acidic soils and research on paleobotanical and geoarchaeological data was preliminary at the time of this analysis. Structure floors, which are important features for learning about construction, function and organization of dwellings and special purpose buildings (see Morin 2006; Schaepe 1998; Smith 2004), were not identified in the structural deposits. This is probably due to natural organic breakdown and high intensity bioturbation of matrix deposits. To overcome these limitations, the site was divided into several spatial and

**Table 2. Type of curation strategy tool groupings.**

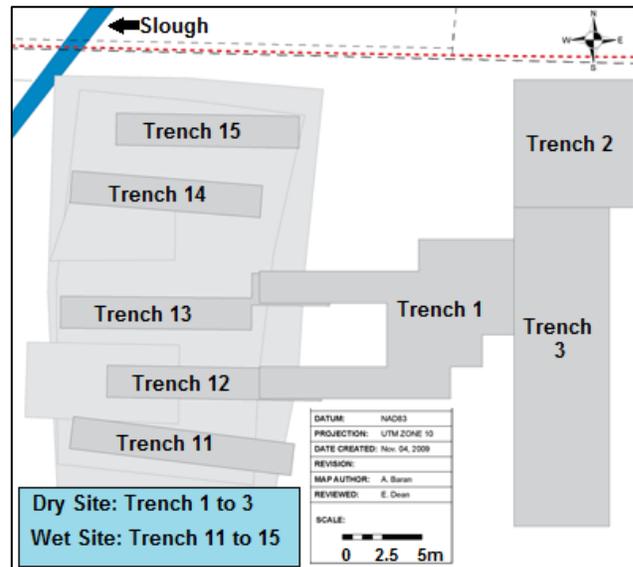
Type of Curation	Artifact class	Mobility strategy associations
<b>Expedient (Light Duty)</b>	Acute Angled Retouch Flakes	High proportions in lithic assemblages are often associated with low residential mobility sites (Parry and Kelly 1987).
	Steep Angled Retouch Flakes	
	Steep and Acute Angled Retouch Flakes	
	Edge Modification Present Flakes	
	Spall Tools with Retouch	
	Spall Tools without Retouch	
<b>Formed/ Curated</b>	Point	Associated with high residential mobility and activity specialization except where associated evidence suggests low residential mobility contexts. They may represent 'gearing-up' activities in such situations (Binford 1979).
	Unifacial Point	
	Biface	
	Point Preform	
	Chipped Slate Point	
	Curved Point	
	Combination Tool	
	Graver	
	Burin	
	Drill	
	Spokeshave	
Thumb Scraper		
<b>Heavy Duty</b>	Bifacial Chopper	Associated with early, high to moderate mobility contexts when found as large portions of site assemblages (Matson and Coupland 1995: 70-73).
	Unifacial Chopper	
	Hammer Stone	
	Anvil Stone	
<b>Ground Stone</b>	Pestle/Hand Maul	Associated with low residential mobility when found in large proportions of site assemblages (Prentiss and Kuijt 2004:53).
	Mortar Stone	
	Milling Stone	
	Grooved Stone	
<b>Abraders</b>	Unformed Abrader	Associated with low residential mobility when found in large proportions of site assemblages (Prentiss and Kuijt 2004: 53).
	Pebble Abrader	
	Grooved Abrader	
	Shaped Abrader	
<b>Slate</b>	Chipped Slate Knife	Associated with economic strategies that rely on marine-based subsistence resources, often as low residential mobility collector systems.
	Ground Slate Knife	
<b>Bipolar</b>	Wedge	Associated with material conservation activities, particularly in seasonally limited low mobility contexts (Hayden et al. 1996).
<b>Celt</b>	Celt	Associated with intensive wood working activities particularly in later period sites associated with low residential mobility.

temporal components or “site zones” that were grossly identified by considering variations in stratigraphic matrices, distributions of beads and fire-cracked rock (FCR), and relative depth (Figures 2 and 3). The typology developed for this study enabled classification of artifacts in meaningful ways that relayed information about lithic material use, manufacturing techniques, and tool morphology. Individual artifact classes were grouped together into a series of larger categories for comparison of tool assemblage diversity temporally and spatially across the site. Tools were grouped according to both functional and morphological characteristics and also according to technological strategies or “type of curation” (Tables 2 and

3). This exercise was anticipated to contribute to the overall knowledge concerning site use and structure. Comparisons between site DhRp-52, Glenrose Cannery, and the Crescent Beach site lithic assemblages were made to provide insights into how DhRp-52 fits within the larger and better understood Gulf of Georgia/Salish Sea regional chronology.

**Table 3. Comparison of relative abundance of lithic tool classes from DhRp-52 Early Component with Glenrose Cannery Old Cordilleran lithic assemblage.**

Artifact Class	Glenrose		DhRp-52	
	n	%	n	%
All Bifaces	20	4.52	35	18.71
Narrow Angled Unifaces (Acute Angled Retouch)	42	9.50	5	2.67
Notches and Denticulates (Spokeshaves)	2	0.45	2	1.06
Scrapers	56	12.66	5	2.67
Stone Wedges	2	0.45	0	0
Utilized Flakes	77	17.42	11	5.88
Miscellaneous Ground Stone	4	0.90	3	1.60
Abrasive Stones	3	0.68	34	18.18
Hammer Stones	34	7.69	30	16.04
Bifacial Choppers	41	9.27	18	9.63
Unifacial Choppers	94	21.27	43	22.99
Cortex Spalls	67	15.16	1	0.53
<b>Total</b>	<b>442</b>	<b>100</b>	<b>187</b>	<b>100</b>



**Figure 3. Plan view of ‘Wet’ zone of the site. From Wilkerson (2010a).**

**Analysis Results and Discussion**

**The Early Component (5700 to 5300 BP): Sub-Structural Sand Zone (SSSZ)**

Chi-square tests for DhRp-52 indicate that there is a significant association between temporal component and

lithic assemblage composition ( $\chi^2=169.488$ ,  $df=16$ ,  $p=.000$ , for grouped tool classes and  $\chi^2=149.239$ ,  $df=12$ ,  $p=.000$ , for type of curation). In particular, choppers and anvil stones dominate the Early Component (49.5% combined vs. 22.4% combined in the Middle Component and 13.4% in the Late Component). The Early Component from DhRp-52 was then compared with the Old Cordilleran component from the Glenrose Cannery site (Matson 1976: 289-291) to help determine if the two components had similar assemblages. Results indicate the two components share few similarities with respect to lithic tool proportions (Table 3).

higher proportions of abrasive stones and hammer stones (18.18% and 16.04% vs. 0.68% and 7.69%, DhRp-52 and Glenrose respectively). Their chopper proportions, however, are uncannily similar. The assemblage at Glenrose Cannery consists of 9.27% bifacial choppers and 21.27% unifacial choppers while the assemblage at DhRp-52 consists of 9.63% bifacial choppers and 22.99% unifacial choppers. Matson and Coupland (1995: 79 and 81) note that although pebble tools (choppers) are generally present in much higher frequencies at coastal sites than at inland sites they generally are present in higher proportions in Old Cordilleran sites (also sometimes referred to as the Pebble Tool Tradition) than in later cultural manifestations (Matson and Coupland 1995: 101-103). At DhRp-52, as with Glenrose Cannery, this trend is apparent. Choppers compose of 33.2% of the lithic tool assemblage at DhRp-52 in the Early Component and are only 12.9% in the Middle Component and 5.8% in the Late Component.

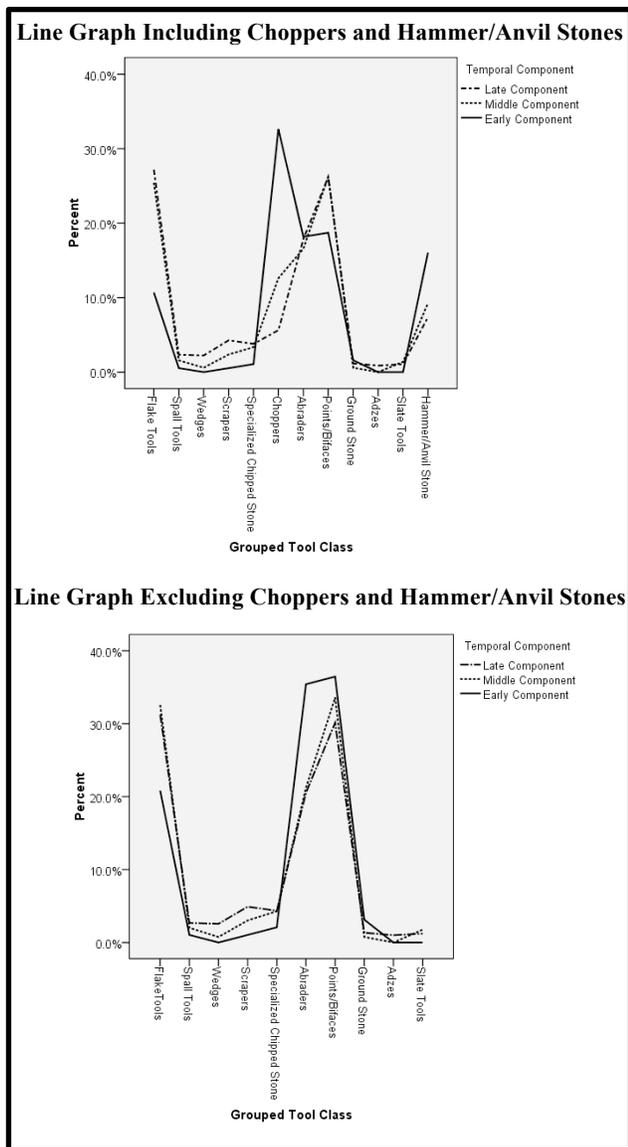
Old Cordilleran sites are associated with high residential mobility foragers (Matson and Coupland 1995: 81). Forager lithic tool assemblages are expected to have a small range of tools present and higher percentages of curated tools where tool stone material may not be readily available (Binford 1979). Since DhRp-52 had house structures present in later components, lithic tool grouped class proportions were examined more closely to determine if the Early Component assemblage at DhRp-52 fit well with theoretical conceptions of what a forager lithic assemblage should contain.

Heavy duty tools were excluded from analysis to address this question. When proportions of tools for the Early Component are compared, the proportion of expedient tools (flake tools, spall tools, etc.) is low, but bifaces increase from 18.7% to 36.5% (Figure 4).

Generally, the early component at DhRp-52 fits well with expectations for forager lithic assemblages. Biface proportions are high and all lithic material was imported to the site. The primary difference between Gulf of Georgia and Lower Fraser Valley early period forager sites and contemporaneous sites in other culture areas in the Pacific Northwest is the presence of cobble choppers-which are heavy to transport. It is possible the people at DhRp-52 used canoes to transport necessary, heavier, stone materials, including material for choppers, with them to this location.

***The Middle Component (5300 to 4250 BP): Sand Structural Zone (SSZ) and Sand Non-Structural Zone (SNSZ)***

Unlike the Early Component, the Middle Component contains two zones; the Sand Structural Zone (SSZ) and the Sand Non-Structural Zone (SNSZ). The SSZ contained the partially excavated deposits of two rectangular domestic structures (Structure 1 and Structure 2), and one small structure of undetermined function (Structure 3). The SNSZ contains all contemporaneous deposits not associated with a structure or special feature (i.e. The Midden Zone, FCR Pit and Wet Site Zone). Chi-square tests indicate there is no statistically significant association between Sand zones and



**Figure 4. Line graphs of grouped tool classes by temporal components, with choppers and hammer/anvil stones included/excluded from assemblages.**

Glenrose Cannery has a much higher proportion of expedient tools than DhRp-52 (42.53% and 9.08%, respectively) and a somewhat lower proportion of bifaces (4.25% and 18.71%, respectively). DhRp-52 also has much

grouped tool classes ( $\chi^2=8.44$ ,  $df=7$ ,  $p=.295$ ) and Sand zones and type of curation ( $\chi^2=2.33$ ,  $df=4$ ,  $p=.675$ ). To further clarify the statistical tests between the SSZ and the SNSZ, a second test was calculated to see if statistically significant differences existed between Structures 1 and 2 since they had the most artifacts present ( $n=63$  and  $263$ , respectively). A chi-square test between the two structures and grouped tool classes also indicated no association ( $\chi^2=5.505$ ,  $df=6$ ,  $p=.481$ ). The presence/absence table below clearly illustrates the similarities with respect to lithic sub assemblages in each zone (Table 4).

**Table 4. Presence/absence of grouped tool classes by Sand Structures 1, 2, 3 & SNSZ.**

Grouped Tool Class	Structure Association				Total
	Sand Structure 1	Sand Structure 2	Sand Structure 3	Sand Non-Structure Zone (SNSZ)	
Flake Tools	●	●	●	●	129
Spall Tools	●	●	●	●	8
Wedges	●	○	○	●	3
Scrapers	●	●	○	●	12
Specialized Chipped Stone	●	●	○	●	17
Choppers	●	●	●	●	64
Abraders	●	●	●	●	82
Points/Bifaces	●	●	●	●	131
Ground Stone	○	●	●	○	3
Slate Tools	●	●	○	●	7
Hammer/Anvil Stone	●	●	○	●	47
<b>Total</b>	<b>63</b>	<b>263</b>	<b>19</b>	<b>158</b>	<b>503</b>

●=present, ○=absent

The Middle Component assemblage was compared with the Charles component at Glenrose Cannery (Matson 1976: 289-291). Important lithic indicators for the Charles Culture were observed at both sites, though some differences in tool class proportions are also present (Table 5). Choppers decrease in proportion at both sites, but are half as common at Glenrose Cannery when compared to DhRp-52. Ground stone tools first appear during the Charles Culture and are present at both sites.

**The Late Component (4100 to 3200 BP)**

The Late Component is clearly the most complex component at DhRp-52 and includes the Loam Structural Zone (LSZ), Loam Non-Structural Zone (LNSZ), Midden Zone, FCR pit and website deposits. A chi-square test determined there is a statistically significant association between the LSZ and LNSZ (site zones) and lithic grouped tool class ( $\chi^2=22.583$ ,  $df=9$ ,  $p=.007$ ), as well as a statistically significant association between the same zones and type of curation ( $\chi^2=14.274$ ,  $df=5$ ,  $p=.014$ ). Expedient (37.1%) and formal (37.5%) tools occurred in larger proportions in the LNSZ than in the LSZ (30.4% and 30.4%, respectively). Heavy duty tools (16.6%) and abraders

(18.4%) occur in greater proportions in the LSZ than in the LNSZ (7.5% and 13.8%, respectively). This may indicate that “gearing up” activities occurred more frequently in the LNSZ than in the LSZ. It is also possible that the high proportions of heavy duty tools and abraders represent stockpiling activities in the LSZ. More research related to feature organization is required to address these observed patterns. Celts are only present in the late component but counts across zones were too low for statistical testing.

Chi-square tests on the FCR Pit, Midden Zone and Wet Site determined there is a statistically significant association between these three zones and tool classes ( $\chi^2=66.819$ ,  $df=18$ ,  $p=.000$ ), indicating these zones were used in differently. Celts and ground slate tools also occur in all three of these zones.

**Table 5. Middle Component and Glenrose Cannery Charles Culture lithic tool comparisons.**

Artifact Class	Glenrose Cannery		DhRp-52	
	n	%	n	%
All Chipped Bifaces	52	12.80	133	27.25
Ground Stone Bifaces	4	0.98	0	n/a
Ground Slate Knife	0	n/a	2	0.41
Retouched Flakes	128	31.52	64	13.11
Notches and Denticulates (Spokeshaves)	4	0.98	3	0.61
Scrapers	57	14.03	34	6.96
Stone Wedges	4	0.98	3	0.61
Utilized Flakes	82	20.19	43	8.81
Miscellaneous Ground Stone	8	1.97	3	0.61
Abrasive Stones	18	4.43	84	17.21
Hammer Stones	14	3.44	47	9.63
Bifacial Choppers	8	1.97	27	5.53
Unifacial Choppers	15	3.69	37	7.58
Cortex Spalls	12	2.95	8	1.63
<b>Total</b>	<b>406</b>	<b>100</b>	<b>488</b>	<b>100</b>

Late Component tool proportions were compared with those from the Locarno Beach component at Crescent Beach (Matson and Coupland 1995: 160) (Table 6). The DhRp-52 Late Component assemblage has more diagnostic tools for the Locarno Beach Phase than the Crescent Beach site. DhRp-52 has a greater occurrence of ground stone and wedges, and a lower occurrence of choppers. The assemblage at Crescent Beach lacks ground slate knives, spokeshaves, scrapers, utilized flakes, miscellaneous ground stone, and cortex spalls. Both sites have similar proportions of hammer stones, celts, and abraders. They differ in that the Crescent Beach assemblage has higher proportions of retouched flakes, wedges, and choppers, DhRp-52 has a higher proportion of bifaces and a more diversified chipped-stone assemblage.

**Preliminary Site Interpretations**

Occupations at DhRp-52 are divided into the Early Component (5700 to 5300 BP), the Middle Component (5300 to 4250 BP) and the Late Component (4100 to 3200 BP) (Figure 5). The Early Component likely represents establishment of a temporary resource extraction site and the data analysis in this study support the conclusion this component was a forager site. It is unknown if wapato was associated with this Early Component but if so, this component may represent the discovery of this resource at this location, which may subsequently have led to repeated intensive use in later times.

**Table 6. Late Component and Crescent Beach Locarno Beach lithic tool comparisons.**

Artifact Class	Crescent Beach		DhRp-52	
	n	%	n	%
All Chipped Bifaces	21	19.27	270	26.89
Ground Slate Knife	0	n/a	8	0.80
Retouched Flakes	39	35.78	125	12.45
Notches And Denticulates (Spokeshaves)	0	n/a	10	1.00
Scrapers	0	n/a	96	9.56
Stone Wedges	5	4.59	23	2.29
Utilized Flakes	0	n/a	99	9.86
Miscellaneous Ground Stone	0	n/a	22	2.19
Abrasive Stones	16	14.68	184	18.33
Hammer Stones	9	8.26	76	7.57
Choppers	17	15.60	58	5.77
Cortex Spalls	0	n/a	24	2.39
Celts	2	1.83	9	0.90
<b>Total</b>	<b>109</b>	<b>100</b>	<b>1004</b>	<b>100</b>

The Middle Component assemblage represents a change in primary site use from the Early Component. Presence of permanent residential structures and differences in tool proportions between the Early Component and the Middle Component support this observation. The absence of statistically significance associations between lithic tools and zone association within this component also provide some interesting insight into household and social organization. Lithic tool data suggest that areas of the site were not being partitioned or designated for particular activities. Radiocarbon dating results indicate these structures may have been used contemporaneously and it is possible they may represent the occurrence of multiple families building multiple structures simultaneously to establish a small village.

Tools and tool stone materials commonly associated with social status or rank are also absent in this component. The statistically even distributions of lithic tools, presence of multiple permanent structures, and the absence of tools and materials commonly associated with social stratification, attest that small villages may have been constructed in the Fraser River Valley where social organization may not have

been as stratified as suggested in the later Marpole Phase or during ethnographic times (Matson and Coupland 1995), indicating that rigorously ranked societies may not be a prerequisite for construction and maintenance of permanent structures and/or villages. More research is required to properly address these concerns as social stratification or ranking may not always manifest itself materially in the record.

Although it is difficult to determine if the Middle Component structures were used for domestic use, ceremonial use, a combination of both, etc. (see Schaepe 1998), the larger two likely represent domestic structures rather than non-domestic use structures (see Morin 2006). Floor deposits are relatively deep, suggesting a long period of use, and also contain a wide variety of artifact types which suggest these structures did not have a specialized purpose. Smaller Structure 3, is also difficult to interpret but it was not as intensively used as the two residential larger structures. Although it does have a smaller range of artifacts in its floor deposits, it also has the least number of artifacts in its deposits. It is likely this structure represents a special-use structure, such as a storage shed or workshop.

Date BP	Lower Fraser Valley/ Gulf of Georgia Chronology	DhRp-52 Chronology
2500	<b>Locarno Beach Phase (2400-3500/3300 BP)</b> Labrets, pithouses (single family), celts, salmon-based storage economy, presence of special use sites, beads in burials.	<b>Late Component (3200-4100 BP) (Loam)</b> Pithouse, wapato, labrets, celts, large quantity of beads not associated with burials.
3000		
3500		
4000	<b>Charles Culture (3500/3300-5500 BP)</b> Small rectangular and circular semi-subterranean structures, large quantities of beads associated with burials, ground stone technology, no evidence of storage.	<b>Middle Component (4250-5300 BP) (Sand)</b> Large rectangular houses (multifamily), no beads, no labrets, no celts, mostly chipped stone tools.
4500		
5000		
5500	<b>Old Cordilleran Culture (5500-9000 BP)</b> Abundant cobble choppers, mostly found inland, large scale mammal hunting adaptation, high mobility, no residential permanency.	<b>Early Component (5300-5700 BP) (Sub-Structural Sand) *</b>  * No beads, No Structures and Abundance of Choppers
6000		
6500-9000+		

**Figure 5. Lower Fraser Valley/Gulf of Georgia (Salish Sea) and DhRp-52 Chronology.**

Regardless of structure function, it is clear that people were well established on the landscape at some locations during the onset of the Charles Culture. Schaepe (1998) and Mason (1994) have presented evidence for permanent residential structures and small villages during this time within the region. The paucity of sites containing evidence for permanent structures in the Gulf of Georgia region during the Charles Culture could merely be due to sampling error. Today, DhRp-52 is located relatively far away from the current position of the Fraser River, however, by 5000 BP Katzie Slough and its tributaries allowed inhabitants access to major riverine resources for various subsistence items, especially wapato. Waterways provided easy transportation of resources which would have would have

allowed more intensive settlement in this location. If such was the case at DhRp-52, then around 5000 BP, many other early sites associated with permanent structures may be found further away from the current position of the river within the Lower Fraser River Valley region.

The chronology of the Late Component at DhRp-52 overlaps with the late Charles Culture and Locarno Beach Phase (Figure 5). This deposit indicates a change in site use from the previous Middle Component, as reflected by changes in tool proportions and lithic material types. Several other lines of evidence support a change in site use from the previous component (Hoffmann *et al.* 2010; Wilkerson and Baran 2013; Wilkerson 2010b). Approximately 98% of the stone disc beads (n~100,000) were recovered from the Late Component. The remaining 2% likely fell into units during excavation, were affected by bioturbation, and descended into lower components through some intrusive activities imposed from the Loam occupation inhabitants. Many decorative items such as labrets and earspools were also recovered in the Late Component and were absent from earlier components. The association of the large FCR Pit feature and the Midden Zone with the Late Component occupations, and the sometimes ambiguous boundaries of the Loam Structural Zone attest to changes in site use, and greater intensity of site use, when compared to earlier components.

Site activity area layout and organization had become more partitioned than in the previous component, as suggested by chi-square test results, but due to intensity of site use, or lack of activity area partitioning often expected in later Marpole times, these statistical results demonstrated a weak association between tools and Loam zones. Several organic rich matrices and FCR density may delineate a series of processing features or roasting pits within the FCR Pit zone, which may indicate this area was used for similar purposes during the entire occupation(s) of the Late Component. The Wet Site zone is mostly associated with the upper Late Component of the dry site, although several radiocarbon dated wapato suggest that it was being exploited during the earlier Middle Component.

Generally, it appears that the Late Component represents a period of higher intensity occupation and site-use, the appearance of social stratification based on the presence of beads and labrets, a possible ceremonial component to the site based on the widespread distribution of stone disc beads in this component, construction of permanent habitation structures, and intensive use of localized resources especially wapato. The Late Component also represents the final intensive occupation of the site during pre-contact times. The site appears to have been abandoned around 3000 BP which may have been due to changing environmental and socio-economic conditions. Changes in the course of the Fraser River, sea level, and mid-Holocene climate, (see Moss *et al.* 2007), may have lessened the importance of this location for maintaining a large settlement or village.

## Conclusions and Directions for Future Research

The primary objectives of this study were to analyze the DhRp-52 lithic tool assemblages and sub-assemblages to better understand functional relationships between different site zone contexts, the changing nature of the purpose and intensity of site through time, to determine if three temporal components existed at the site as suspected, and to better understand how these considerations fit into the currently established regional Gulf of Georgia chronology. This was accomplished by isolating and examining differences and similarities between tool sub-assemblages and assemblages from structural zones, non-structural zones, Midden, the FCR Pit, Wet Site, and temporal components at DhRp-52. The analyses demonstrated that the some parts of the site (the Loam Structural and Loam Non-Structural Zones, the FCR Pit, the Midden Zone, the Wet Site, and the Sub-Structural Sand Matrices) can be differentiated functionally and contextually through lithic tool assemblage context and organization, while others (the Sand Structural and Sand Non-Structural Zones and individual sand structures) cannot. The results also indicate lithic assemblages can provide insight into both logistical mobility strategies and cultural historic associations at DhRp-52 and provide useful observations about the long history of occupation and gradual change over time at the site.

DhRp-52 was occupied over a span of approximately 2500 years and analysis of lithic tool assemblages confirmed the presence of three distinctive temporal components. Differences in tool assemblages between the components reflect that the site has been used in different ways over time. The lithic assemblage from the earliest component indicates a focus on producing and using a formalized tool kit commonly associated with mobile hunter-gatherers. This assemblage represents the earliest uses of the site and likely the exploitation of important and accessible food resources that would later allow intensive settlement in this location.

The lithic assemblage from the Middle Component indicates a more sedentary subsistence and settlement strategy. This component contained a wide range of tool classes and demonstrates important shifts in technology commonly associated with settlement sites, such as an increase in expedient technology. Multiple, contemporaneous, well-defined, large, residential structures also indicates that DhRp-52 was intensively used during this component. Unfortunately, tool sub-assemblages were not helpful in differentiating boundaries of different structures and their contemporaneous, non-structural areas. This may indicate that although social stratification may have been present at DhRp-52 during this time, lithic tools may not be good indices for identifying specific site partitioning relating to areas designated for different functional and spiritual activities. The wide variety of stone tools within structures also suggest that they were probably not special-use structures, (e.g., workshops, storage sheds, spiritual buildings), but rather were probably domestic structures associated with a variety of activities involving stone tools that would have taken place within these houses.

Lithic tool sub-assemblages from the Late Component were helpful at differentiating site spatial components and for demonstrating that site use had changed most significantly since the earliest component, but only subtle differences exist between this component and the Middle Component. The addition of celts and quartz crystal tools are some obvious differences between the Late Component and the two earlier components but the relative proportions of other grouped tool classes are very similar between the Late and the Middle Components. Site occupation and adjacent resource use were more intensive during this component, as inferred by the fuzzy spatial boundaries of components, the Midden Zone, and the FCR Pit. The tool sub-assemblages also indicates that during the Late Component, the site continued to be used as a settlement location, possibly seasonal, rather than a special use area, camp, or high residential mobility site.

Comparison between the Glenrose Cannery site's Old Cordilleran, Charles Culture components and Crescent Beach site's Locarno Beach Phase components with DhRp-52's Early, Middle, and Late Components confirms some affiliation with the larger regional chronology, but differences between these three sites and their tool assemblages are quite notable. These differences may be due to a variety of factors, such as site location, context, or duration of use, but until a larger sample of sites similar to DhRp-52 are investigated in the region, it will be difficult to determine exactly how DhRp-52 fits with the established Gulf of Georgia culture history and chronology.

The overall archaeological and cultural importance of DhRp-52 is clear. Its contribution to our understanding of regional chronology has broadened our understanding of how people settled and sustained themselves in this locality.

The site also adds to our knowledge of how people were occupying and using the region during Charles Culture times. Schaepe (1998) suggests that small village aggregation began during this time, and evidence from DhRp-52 supports this. Clearly more detailed archaeological sampling needs to be undertaken at sites in various environmental contexts away from the Fraser River and in deeper deposits to fill these sampling gaps. Often, such sites are a challenge to locate as much of the intact cultural deposits were located well below traditional shovel testing depth (i.e., 1.25 m below surface). Archaeological impact assessments and mitigation excavation programs associated with commercial and residential development in the Fraser River Valley will eventually encounter more sites of this age. Future programs should consider questions related intensive resource processing, especially wapato in the Fraser Valley, implement critical evaluations of structure types and purposes, and encourage the use of statistical analysis quantify and confirm observed behavioral patterns in the archaeological record.

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