PRE-COLONIAL STÓ:LŌ-COAST SALISH COMMUNITY ORGANIZATION: AN ARCHAEOLOGICAL STUDY

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

The Faculty of Graduate Studies

(ANTHROPOLOGY)

THE UNIVERSITY OF BRITISH COLUMBIA
(Vancouver)

February 2009

ABSTRACT

This study integrates settlement and community archaeology in investigating pre-colonial Stó:lō-Coast Salish community organization between 2,550-100 years before present (cal B.P.). Archaeological housepits provide a basic unit of analysis and proxy for households through which community organization manifests in relationships of form and arrangement among housepit settlements in the lower Fraser River Watershed of southwestern British Columbia. This study focuses on spatial and temporal data from 11 housepit settlements (114 housepits) in the upriver portion of the broader study area (mainland Gulf of Georgia Region). These settlements were mapped and tested as part of the Fraser Valley Archaeology Project (2003-2006).

The findings of this study suggest a trajectory of continuity and change in community organization among the Stó:lō-Coast Salish over the 2,500 years preceding European colonization. Shifts between heterarchical and hierarchical forms of social organization, and corporate to network modes of relations represent societal transformations that become expressed by about 550 cal B.P. Transformations of social structure and community organization are manifest as increasing variation in housepit sizes and settlement patterns, and the development of central arrangements in both intra- and inter-settlement patterns. In the Late Period (ca. 550-100 cal. B.P.), the largest and most complex settlements in the region, including the largest housepits, develop on islands and at central places or hubs in the region's communication system along the Fraser River. These complex sets of household relations within and between settlements represent an expansive form of community organization. Tracing this progression provides insight into the process of change among Stó:lō pithouse communities.

Societal change develops as a shift expressed first at a broad-based collective level between settlements, and then at a more discreet individual level between households. This process speaks to the development of communities formed within a complex political-economic system widely practiced throughout the region. This pattern survived the smallpox epidemic of the late 18th century and was maintained by the Stó:lō up to the Colonial Era. Administration of British assimilation policies (e.g., Indian Legislation) instituted after 1858 effectively disrupted but failed to completely replace deeply rooted expressions of Stó:lō community that developed during preceding millennia.

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GLOSSARY OF HALQ'EMÉYLEM TERMS

Halq'eméylem is the upriver dialect of the Halkomelem language spoken by the Stó:lō (Galloway 1993). Translations of the following terms used in this dissertation are, except as otherwise noted, derived from linguist Brent Galloway's (2004) *Dictionary of Upriver Halkomelem*.

S'ólh Téméxw - 'Our World' or 'Our Land'
Stó:lō - 'river' (with particular reference to the Fraser River); also "the River of Rivers" (as told to Charles Hill-Tout by a Stó:lō informant; Carlson 2003:55); this term is used in self-identification as 'People of the River' (Duff 1952; Carlson et al 2001; Carlson 2003).
s'iltexwáwtxw - plankhouse.
sqémél - pithouse.
si:yám - respected leader, chief, upper class person, boss, master (plural form *sí:yá:m*).
smelá:lh - wealthy, respected person, high class person; wealthy person who knows their history (Suttles 1987:12, 14 and Carlson 1997:90).
s'téxem - worthless person, someone who has forgotten their history (Suttles 1987:12, 14 and Carlson 1997:90).
skw'iyéth - slave.
Ts'elxwéyeqw - as far as you can go with a canoe (Elder Albert Louie in Oliver Wells 1987:160); the indigenous name of the Chilliwack River and people of the Chilliwack River watershed.
Yewal Siyá:m - highest ranking *siyá:m*; primary leader.

ACKNOWLEDGEMENTS

I first and foremost thank my Family, especially Lara, Kiah, and Sasha, for their support, encouragement, and patience. I also recognize my parents -- Peg and Jim, and my brothers, Chris and Steve.

I don't have enough thanks to offer Mike Blake, Dana Lepofsky, Bruce Miller, and David Pokotylo -- my committee members -- for the incredible amount of help, commentary, encouragement, commitment, and general camaraderie they provided throughout the course of my Ph.D. program.

I wish to acknowledge and thank a number of my colleagues, particularly Keith Carlson, Sonny McHalsie, Anthony Graesch, Bill Angelbeck, Jeanne Arnold, Mike Lenert, Sue Formosa, Kisha Supernant, Tracey Joe, and Tia Halstad for their friendship, input, and thought provoking discussion over the years.

R.G. Matson provided very helpful commentary on a draft of this dissertation, for which I am grateful. I thank Sue Formosa, who authored and co-authored a number of the maps included in this dissertation.

Herb and Helen Joe and their family, and Gwen Point provided what we might call general support for my well-being, for which I am indebted to them.

I received a huge amount of support and assistance from a large number of people associated in many different ways with the Fraser Valley Archaeology Project, through which nearly all of my fieldwork for this dissertation was carried out.

Support from the Stó:lō Tribal Council was provided by Grand Chief Clarence Pennier, President; likewise from the Stó:lō Nation by Chief Joe Hall, President. I am grateful for their interest in, enthusiasm for, and dedication to archaeology as a means of coming to better understand Stó:lō culture and history. I am also constantly inspired by their integrity, fortitude, and commitment to defending Stó:lō aboriginal rights and title, on behalf of their communities.

I thank the many Stó:lō Chiefs, Council members, Community members, and administrative staff who provided input, assistance, support, and approvals for various aspects of the Fraser Valley Archaeology Project, including: *Chawathil First Nation* - Chief Ron John and Councilors and Band Office staff-members Peter John, Tim Peters, Ruth Peters, and Monica Florence; also Barb and Larry Pete for hosting work at Sxwóxwiymelh which is situated on their CP lands; *Shxw'ow'hamel First Nation* - Darren Jones, Roger Andrews, Melanie Andrews, Dean Jones, Felix Jones, Darren's cousin Sean, and members of the Sí:yá:m Council between 2004-2005 for providing access and encouragement to investigate the settlements at both X̲elhálh and Shxw'ow'hamel; *Soowahlie First Nation* - prior Chief Larry Commodore and Grand Chief Doug Kelly and their respective Councils, including - in particular - Nelson Kahama; also Dan Bisaillon who helped us with the site clearing; *Scowlitz First Nation* - prior Chief John Pennier; also Allen Williams, and particularly Betty Charlie and Cliff Hall for their parental support and assistance in the field and boating us to Qithyil Island; *Skwah First Nation* = the late Chief Roy Mussel for allowing us to access and map Sqwa:la; *Chehalis First Nation* - Chief Willy Charlie, prior Chief Alex Paul, James Leon, and Gordon Mohs, in particular, for inviting to us to connect with his project and permitted our work at John Mack Slough and Hiqelem; *Seabird Island First Nation* - Elder and Grand Chief Archie Charles, June Harris, and Dwayne McNeil helped with logistics and access to their lands during the initial stages of the Project.

Field assistance was provided by Albert 'Sonny' McHalsie, Riley Lewis, Larry Commodore, Dennis Leon, Leeanna Rhodes, and Ian Franck of the Stó:lō Nation Treaty Deapartment // Research Department // Research and Resource Management Centre; Darren

Jones (Shxw'ow'hamel First Nation); Denise Douglas (Cheam First Nation); and the students of the SFU 2004 Archaeology Field School, and the UBC and SFU 2005 Field Schools, including:

2005 = (from UBC) Kisha Supernant (a very special thanks!), Nick Waber, Marnie Recker, Chris Marchant, Kate Jessup, Patricia Ormerod, and Adrian Sanders; (from SFU) Sonja Aagesen, Hannah Baker, Cinnebar Bertelsen, Melissa Blain, Debbie Castagner, Sandie Dielissen, Mathew Fladmark, Steve Hamm, Marina La Salle, Shana Morin, Amanda Palmer, Sarah Prien, John Sheppard, Chris Springer, Christine Wright, and Corylee Zanatta, as well as Ian McKechnie, Peter Locher, and Morgan Ritchie.

2004 = Meagan Cameron, Brendon Gray, Jarin Hutchinson, Jennifer Jones, Heather Livingstone, Jessica Ruskin, Craig Rust, and Sarah Swayze (from SFU) -- including all the administrative support staff at UBC and SFU who helped out with these fieldschools.

An enormous "thank you" goes to Stó:lō *Hihiyeqwals* Gerald George, Francis Phillips, and their assistants, and all those who helped out in the kitchen as cooks and otherwise helped in preparations for our Burnings - including Yvette John, Ida John, Nikki LaRock, Norma Gabriel, Tia Halstad, and Tracey Joe.

Expert boatsmen who provided logistical support for our fieldwork and field trips include Albert 'Sonny' McHalsie, Tim Peters Sr., Vince Malloway, Willy Charlie, and Clifford Hall. Chawathil First Nation hosted us graciously at their Telte-Yet Campground in Hope. Their fabulous Campground Hosts include Viola John, Sharon Blakeborough, Tanya Alex, Patrick Inyallie, and Robert Guiterrez.

I thank Jim Pike of the Provincial Archaeology Branch for administering to the permit for work at DiRi-48.

I also acknowledge the generous support and consultation provided to this project by the faculty and staff of the Department of Geomatics at BCIT. In particular, Bob Harrower and David Martens warrant huge thanks for making available their time, expertise and expensive, high tech equipment to the Fraser Valley Project. They provided us with a Leica 705R Total Station during the 2004 field season and three Leica 1200 GPS units and two Leica 705R Total Stations during the 2005 field season. These supplemented the Leica 705R and Garmin GPS unit provided by the Lab of Archaeology, at UBC and the Garmin 76S provided by Stó:lō Nation -- whom I also whole-heartedly thank. Jerry Maedel, Faculty of Forestry at UBC, provided guidance to the Fraser Valley Project regarding the use of ArcGis. I am grateful for the help provided by staff at CN Rail, especially for assisting with the georeferencing of our map data at X̲elhálh and Shxw'ow'hamel.

Funding to support my research was provided by SSHRC grants No. 752-2003-2318 (Ph.D. Graduate Fellowship) and No. 410-2003-1525 (Fraser Valley Archaeology Project). I take full responsibility for the presentation of all the data and figures, and all the interpretations and conclusions presented in this dissertation; any errors there-in are mine as well. My apologies if I happened to forget to mention anyone by name in providing my thanks; they are surely in my mind.

DEDICATION

I dedicate this dissertation to my to immediate family Lara, Kiah, and Sasha; those who I consider my extended family T'xwelátse, Naxaxalhts'i, Ey:lí:seleq, and Siyemches; and a few of my long-standing mentors Howard Winters, Eugene Boesch, Owen Lindauer, Knut Fladmark -- for their trust, patience, guidance, teaching, tolerance, humor, inspiration, and friendship.

CHAPTER I INTRODUCTION

This study explores the development of Stó:lō-Coast Salish community organization using archaeological data. I focus on house and settlement patterning in examining the long-term history of pre-colonial community formation among indigenous Stó:lō-Coast Salish peoples of the Pacific Northwest, British Columbia. Major themes of this case-study originate from issues currently faced by indigenous peoples worldwide struggling against colonial authorities and imposed political economic structures in efforts to recognize and gain legal recognition of their identities and communities (Cormaroff and Cormaroff 1991; Miller 2003; Tveskov 2007). These efforts center on defining the nature of inter- and intra-community structure and organizational relations of authority and power, particularly between indigenous communities and the state. Archaeology provides a unique way of developing a history of change connecting present and past forms of community organization among the Stó:lō-Coast Salish, more commonly discussed within ethnographic and historical perspectives.

Some Canadian Northwest Coast indigenous communities are currently exploring opportunities for returning to self-defined systems of governance and expressions of political economic authority by escaping the constraints of federal Indian Act control (Boxberger 1989; Harmon 1998; Harris 2002; Miller 2001, 2007; McHalsie 2007; Schaepe et al. 2008; Thornton 2001). Such efforts commonly aim to regain political economic authority as a means of regaining a level of self-determination unfettered by state determination, as they now define the meaning of 'Indian' in Canada. The Stó:lō are currently engaged in various types of negotiations with the federal and provincials governments over issues of governance, lands, and resources -- that is, the control of relations between people, places, and things. These 'control' relationships are central to this study as it explores relations of authority in pre-colonial Stó:lō-Coast Salish society over a 3,000 year period. This study links past and present in common anthropological themes and current aboriginal issues regarding indigenous community formation.

Past and present merge in a mix of disciplinary and cultural perspectives, sometimes rather awkwardly, in the attempts to define the future of relations between aboriginal communities and persistent colonial forces. A confluence of shared research interests by Northwest Coast indigenous peoples and anthropologists, particularly ethnographers and archaeologists, provides dynamic grounds for dialogue on issues of identity, governance, and inter-community relations. Notions of community pervade this dialogue. Amidst varied perspectives of legal, anthropological, bureaucratic, and lay-persons debates around these widely-affective issues, there remains no clear or single answer to the question of 'what constitutes a community?'

1.1 Community

A broad literature and range of perspectives has developed from the anthropological and sociological treatment of 'community' over the last sixty years (Anderson 1983; Bourdieu 1977; Cohen 1985; Delanty 2003; Habermas 1984, 1987; Murdock 1949; Redfield 1955; Tonnies 1963; Turner 1969; Wolf 1956). Definitions of community range from the fixed, determined, and bounded to the negotiated, imagined, symbolic, communicative, and porous relationships between people; from functional and organic to ideological and politically motivated entities. Communities are part of what make us human. They are uniquely human entities of communication and belonging (Delanty 2003). I define community within a political-economic framework as forming an integral part of, but not completely determining, the organization of society. Society is a larger entity and set of relations affected by the organization of political-economically based communities, but also informed by a wider range of interactions such as those established around language, warfare, and trade and exchange.

A primary assertion of this study is that political economic relations in small scale, pre-state societies affect the formation of communities, linking community with authority. The negotiation of power within a realm of political economy is a fundamental element of pre-state community formation and organization, developing around central figures of authority. I incorporate social theory from Pierre Bourdieu's *Outline of a Theory of Practice Theory* (1977) and William Roseberry's *Political Economy* (1989) in defining community within a political-economic context based on relations of power, linked to material remains of the past.

I treat 'community' as actively constructed and constituting a potentially wide-ranging set of political-economic relations stemming from households and extending to relations within and between settlements across a broad political-economic landscape. Community in this view is neither passively determined by environmental constraints nor intrinsically limited to an intra-settlement, face-to-face set of social interactions. Community organization is embedded in the physicality of the built cultural landscape. This study requires a theoretical framework that correlates material remains with socio-political relations. Developing social and political theory addressing community formation, and integrating community- and settlement-based archaeology are two central objectives of this thesis.

I recognize communication as a fundamental element of community organization (Delanty 2003; Habermas 1984, 1987); that interactions affecting community formation are not limited to the defined and bounded spaces of houses or settlements. This study examines networks of communication and transportation routes associated with precontact modes of travel throughout the region as a physical infrastructure affecting community formation (Ames 2002; Gorenflo and Bell 1991; Miller 1989a; Schaepe 1999, 2001a; Tromold 1991). I focus on these communicative aspects of the landscape in exploring community organization as expressed through intra- and inter-settlement patterning.

The term ‘community’ is a recent and still contested addition to the vocabulary of regular archaeological use (Canuto and Yeager 2000; Kolb and Snead 1997; MacEachern et al. 1989; Rogers and Smith 1995; Wills and Leonard 1994). How can archaeologists bring these disparate notions of community into their study of past forms of social organization based on material remains, and beyond that, is it necessary?.. why would they want to? Not only *can* ‘community’ be incorporated, but it *must* to be incorporated into archaeology.

Archaeologists must deal with *community* in addressing *power* and *political economy* as core processes affecting the development and change of social order. Discussions concerning the evolution of community organization and social structure extend far beyond the anthropology of the Coast Salish and Northwest Coast culture areas. Questions concerning the nature and evolution of political structures within small- and intermediate-scale, pre-state societies have a long history of treatment by researchers in contexts throughout the world, including: Arnold (1996a, 1996b, 2004) among the Chumash of southern California; Blake and Clark (1999) among the formative cultures of Coast Chiapas, Mexico; Hayden (1992, 2000) among the Stl’atl’imx of the British Columbia Plateau; Steponaitis (1978), Muller (1997), Mehrer (2000), and Pauketat (2000) among the Mississippian societies of the American Mid-West; Feinman, Lightfoot, and Upham (2000) and Redmond (1998) among the Puebloan communities of the American Southwest; Earle (1997) of the South Pacific Hawaiian islanders; and Carniero (1970) in the Andean region. This study aims to contribute to this dialogue.

1.2 Community and Settlement Archaeology

Bringing 'community' into archaeology adds political and social theory to a foundation of settlement archaeology defined nearly 40 years ago by Bruce Trigger (1967). Trigger (1967:151) defined 'settlement archaeology' as "*the study of societal relationships using archaeological data.*" Settlement archaeology has goals beyond culture history, requiring social theory. Social theory addresses synchronic (structural) and diachronic (developmental) aspects of cultural relationships (Schiffer 2000). It stands against understanding aspects of social relationships as traits within complexes of archaeological cultures. Cultural relations are, rather, understood as "functioning systems of economic, political, and affective relationships" (Trigger 1967:151). Trigger used the terms *system*, *network*, *ethnicity*, *social boundaries*, *identity*, and *community* in relation to settlement archaeology as a wide-ranging field of study. The definition of these terms remain relevant and contested within anthropology, archaeology, and in the reckoning of relations of power and authority, today, between Nation states and indigenous peoples around the world. An aspect of settlement archaeology adopted in this thesis is the aim of establishing a quantitative foundation supporting the application of social theory.

Alternate models of authority and political-economy generating 'corporate,' 'network,' and 'heterarchical' models of political organization, however, remain largely unapplied within this debate -- and within broader application to the Northwest Coast (Crumley 2001; Feinman 2000, 2001; Feinman and Nicholas 2004; Haas 2001). These recent developments in social theory challenge social-evolutionary 'chiefdom' concepts that have persisted since emerging in the 1950s (Yoffee 1993). Emerging social and political theory helps integrate community and settlement archaeology.

The house, itself, is increasingly recognized as a basic medium and means by which households relate to one another, defining social relations, and affect community organization (e.g., Sobel 2006). Houses, for example, act as powerful influences on and of people in the course of their interactions, embodying symbolic capital as 'the material structure of political action' (Marshall 1989). I associate the construction of Stó:lō houses with the negotiation of relations of power and authority. Tracing political-economic relations archaeologically through the analysis of house features and settlement patterns provides insight into the formation of indigenous, pre-colonial communities among the Stó:lō.

1.3 Housepits: A Proxy to Political-Economic Relations and Community Formation

As a proxy for socio-political units associated with intra- and inter-settlement scales of relations, pithouses (i.e., in-ground houses) provide an ideal unit of analysis in investigating community formation. Hundreds of individual housepits (*sqémél*)[1] associated with at least 112 recorded settlements (as of 2005) mark the landscape of the mainland Gulf of Georgia Region with a record of in-ground house construction over 5,000 years old (Lepofsky et al. *in press*; Mason 1994; Schaepe 1998, 2001b, 2001c, 2003). I assume, as have many archaeologists engaged in household archaeology in the Northwest Coast and elsewhere, that these archaeological remains of houses correlate with household social units (Arnold 2004; Blanton 1994; Coupland 1988, 1996; Hayden and Cannon 1992; Lepofsky et al. 2000; Matson 1996, 2003a, 2003b; Price and Feinman 1995; Wilk and Rathje 1982; Schaepe 1998). Feinman (2000) and others (Feinman et al. 2000:453) identify house form and size as significant archaeological indicators of social organization among intermediate societies ranging from what they classify as 'corporate' to 'network' forms of social organization.

[1] *Sqémél* is the term for pithouse in the *halq'eméylem* language. See the Glossary of Halq'eméylem Terms for translations of all halq'eméylem terms used in this dissertation. I italicize all *halq'eméylem* terms except those used frequently, such as settlement names.

Drawing on the analysis of housepits in villages in the U.S. Southwest, Feinman et al. (2000:453) correlate variability in house size and form with status differences between household units and with a network form of social arrangement. Consistently large or homogenous house sizes within and between settlements suggests corporate organization. On the Northwest Coast, Ames (1995, 2006) identifies the importance of households in the study of social organization, equating households (Ames 1995:156) with the polity and noting that the investigation of the household is crucial to the investigation of status differentiation. Thus, housepits, as the remains of in-ground houses, represent an archaeological proxy for the investigation of household units and by extension, socio-political-economic organization.

Arnold (2004:173) suggests that "by tracking emergent hierarchical organization alongside this corporate network dimension, we may being to understand the evolution of pithouse communities." The archaeological remains of Stó:lō *sqémél* are an ideal archaeological subject matter for tracking community formation through time. Households represent a basic unit of interaction central to the process of community formation, particularly in light of their importance among the Stó:lō-Coast Salish. As Miller (2007:20) points out, "unlike the northern matrilineal tribe of the northern Northwest Coast culture region, the Coast Salish have no clan system, with the result that distribution of members of family groups is not clearly channeled. This fact points to the importance of examining individual, household, nuclear family, "family"… processes of affiliation." While households live together as basic residential family group, the political ties of those individuals may extend to members of other households in other settlements.

Most Northwest Coast household archaeology focuses on the remains of plankhouses (*s'iltexwáwtxw*) (Sobel et al. 2006). The Fraser Valley offers the rare opportunity on the Northwest Coast to benefit from exploring the remains of pithouses. In some cases, co-existent pithouses and plankhouses appear to have been built at the same settlement (Barnett 1955; Lepofsky et al. *in press*). I correlate residential families or households with housepits -- as opposed to other kinds of houses (e.g., surface-built plankhouses) that leave less tangible signatures and recognizable imprints in the ground -- and are thus easy to identify archaeologically. *Sqémél* represent the discrete living quarters of an individual household group. *S'iltexwáwtxw*, alternately, represent the collective living quarters of a large if not complete set of households occupying a settlement. The archaeological footprints of *s'iltexwáwtxw* do not reveal discrete household quarters from their surficial form, as do *sqémél*.

I regard *sqémél* as an external representation of household relations otherwise internalized within *s'iltexwáwtxw*. Housepits represent a more spatially discrete rendition of the social order found, also, within co-existent plankhouses. The same set of inhabitants occupied both forms of houses, perhaps seasonally or perhaps more regularly throughout the year.[2] Wealth is also a factor associated with the construction of *sqémél* in this region. Barnett (1955:55) states, "Not every family owned or had access to skameL (sic.) since its construction was costly. It was mainly used by the weak and the infirm who, once in, stayed there most of the time; others resorted to it only during the coldest periods. There was no general abandonment of the plank house." In settlements with co-existent *sqémél* and *s'iltexwáwtxw*, the occupation of *s'iltexwáwtxw* by a collective of extended families (Suttles 1992:214) is less spatially differentiated than the occupation of *sqémél* by more discrete household units (Mitchell and Donald 1988). Household organization is thus more readily visible, archaeologically, as expressions of relationships between *sqémél*.

Another benefit of housepits, representing households, is that they are visible on the landscape and easily plotted in space as a means of exploring settlement patterning. Housepits

[2] Multi-season occupation of sqémél is implied by Graesch (2006) as a result of his detailed investigation of housepits at Welqámex.

sizes are measurable and comparable in exploring household patterning. The material remains of their use and occupation often times provide the material required for determining their age and positioning them in time. *Sqémél*, thus, constitute the ideal proxy for looking at these potentially complex sets of relations across space and time.

1.4 Relations between Ethnography, Archaeology, and Stó:lō-Coast Salish Community Organization

"What is important is that settlement archaeology forces us to think through problems from a new angle -- that of social relations" (Trigger 1967:158). Trigger viewed settlement archaeology as an important bridge between archaeology and ethnography, with historic and ethnographic data serving as strong supports to settlement archaeology. This remains true in the application of a developing community archaeology (Marcus 2000). The broad temporal scope of this study -- spanning precontact and post-contact times -- bridges archaeological and ethnographic data sets and mediates the 'contact barrier' that commonly truncates the application of these disciplinary approaches to the investigation of Coast Salish society. This direct cross-over between realms of ethnography and archaeology brings up issues regarding in the relationship between disciplines and the use of ethnographic interpretations and models in this study.

1.4.1 Archaeology and the use of Ethnographic Interpretations and Models

Ethnographic research of the last two decades (Miller 2007) supports Wayne Suttles's declaration of "authority" (Suttles 1989:251) as one of most important topics in contemporary Coast Salish anthropology. Anthropologists, archaeologists, and ethnohistorians continue to engage in vigorous debate over leadership structure as manifest in the investigation and discussion of inter-community, socio-political relations among the Coast Salish and other aboriginal Northwest Coast societies (Ames 1995, 2001; Burley 1980; Carlson 2003; Martindale 2003; Miller 1997; Miller and Boxberger 1994; Mitchell 1983a, 1983b; Mitchell and Donald 1988; Schaepe 2006; Tollefson 1987).

The use of ethnographic analogy within archaeology is a long-standing tradition on the Northwest Coast, not without issue (Grier 2007). While there are exceptions (Coupland, Martindale, and Marsden 2001; Miller 2007; Moss and Wasson 1998), the relationship between ethnographers and archaeologists working in the Northwest Coast is seldom one of direct collaboration. Over the last 40 to 50 years, Northwest Coast anthropology has moved further away from a multi-field anthropological approach and achieved a significant degree of separation between anthropological sub-disciplines. Recent commentary rightfully draws attention to problems associated with ethnographic analogy in Coast Salish archaeology and suggests alternate ways of relating ethnographic and archaeological inquiry as parallel endeavors (Grier 2003, 2007).

I advocate for connecting and developing inter-disciplinary relations, integrating archaeology and ethnography (as well as ethno-history and oral history). Integration, when possible, works toward achieving a more complete understanding of issues and questions shared between our sub-disciplines. Such integration provides a potential means of resolving issues that arise from the use of ethnographic interpretations as a basis of analogy in archaeology.

Ethnographic models can and do provide a useful basis for interpreting archaeological data. For example, I use Miller's (1989) definition of a corporate "family" group as a dynamic political unit that escapes the more conventional understanding of households as spatially bounded in the scope of their interaction and political affiliation. Grier (2003) incorporates the concept of a corporate family into his archaeological discussion of extra-household ties affecting Coast Salish interaction throughout the coastal Gulf of Georgia Region. Community relations radiate outward, particularly in light of the negotiation of family-corporate group relations from a foundation of household relations without inherent boundaries. This said, the application of ethnographic data and conclusions drawn from those data in archaeological interpretation require scrutiny. Small-pox epidemics and European colonial powers have in many ways affected the nature of Northwest Coast and Coast Salish societies over the last 150 years. The application of conclusions about Coast Salish authority, for example, drawn from ethnographic data applied back in time to describe socio-political organization 300, 500, or 1,500 years ago is highly suspect in light of post-contact effects on socio-political organization. The relationship between pre- and post-contact political organization among the indigenous peoples remains unclear.

At issue is the use of ethnographic analogy as accurately depicting a critical period in Stó:lō-Coast Salish pre-contact history that is poorly represented both ethnographically and archaeologically -- this being the post-Marpole period between 1,500 and 150 years ago. This 1,500 year period currently stands bridged, across the Gulf of Georgia Region, by the use of ethnographic analogy linking that period of the past with the ethnographic present as a static 'Developed Northwest Coast Culture' (Matson and Coupland 1995). I compare the results of ethnographic and archaeological data in reference to Wayne Suttles' (1987:125) 'village organization model' -- discussed below -- as a means of exploring the relationship between ethnographic and archaeological interpretation. The use of this model aids in understanding the relationship between ethnographic and archaeologically-based studies of authority, and as well as the process of community formation and change leading up to, and as affected by, European contact.

1.5 Defining Terms and Developing Questions about the Effects of the Colonial Period

A number of questions addressed in this study are embroiled in the events and impacts of the colonial period on indigenous Northwest Coast societies. Significant impacts on Stó:lō-Coast Salish peoples, specifically, resulted from colonial expansion into the Pacific Northwest in the late 1700s. The massive depopulating effects of the small-pox epidemic of 1782 (Carlson 1997a; Harris 1997, 2002; Lamb 1960), interaction with Hudson's Bay Company traders in the early 1800s (McLaughlin 1998), and the subsequent influence of British colonial authority following the gold rush of 1858 -- associated with the implementation of assimilation policy and reserve creation leading to the establishment of the Indian Act in 1876 (Harris 2002; Tenant 1998) -- all affected indigenous political-economic structures. Responses to the impacts of these events were surely accounted for by divergent motivations and organizational forces -- ranging from the internal and indigenous to the external and colonial. Colonial forces of the later 1800s consciously re-shaped the present day organization and relations of authority among the Stó:lō with the intent of minimizing their economic, socio-cultural, and political-economic structures, status, and access to capital (Boxberger 1989; Harmon 1998; Harris 2002). The British government employed an assimilation policy strategically targeting "aboriginal institutions and life patterns" (Thornton 2001:12). Stó:lō-Coast Salish reaction to colonial powers also affected their expressions of identity (Carlson 2003; Harmon 1998). I examine how present-day expressions of identity -- bound within relations of authority and community formation -- relate to those of the precontact past from which they emerged. These historic events provide a framework for defining precontact, pre-colonial, and colonial periods of time.

I use the term 'precontact' to describe that period of time preceding direct contact with Europeans, circa 1800. Thus, in precontact times before 1800, the Stó:lō had no direct contact with or influence by Europeans, although they were badly affected by a small-pox epidemic just prior to that point, circa 1782 (Harris 1997). Between 1800 and 1850, the Stó:lō developed direct relations with Europeans while yet acting, I maintain, within an indigenous framework of interaction and authority. I use the term 'pre-colonial' in reference to this period of time, preceding the subjugation of aboriginal peoples of British Columbia by British colonial administration and governance. I establish a cut-off point for the termination of the pre-colonial period at circa 1850, as supported by historians and cultural geographers familiar with the region (Carlson 1996; 2003; Duff 1965; Harris 1997; 2002). Shortly after 1850, Stó:lō governance and independence was overtaken by Colonial rule. The commencement of the colonial period in British Columbia is closely associated with its incorporation as a British colony in 1858. These three events define the basic temporal framework of my study.

Questions about the extent of the effects of contact and colonization underlie the anthropological investigation of Stó:lō-Coast Salish social organization. Anthropological interpretations of this issue, in turn, affect the definition of Stó:lō rights being negotiated in land claims currently taking place within the political and jural realms of Canada and British Columbia. Colonial governments consistently institute a 'local level authority' model within treaty and litigious environments as a means of limiting and narrowly defining the scope of indigenous peoples' rights and title. (e.g., the Vanderpeet decision of 1995). Communities are defined in narrow and bounded terms. These interpretations are extracted from anthropological interpretation such as Wilson Duff's (1952:85) assertion that Stó:lō settlements were of a small scale and rarely housed more than 50 people.

A central issue in this contest regards governance in the broader framework of indigenous-State relations. Tension in developing contemporary indigenous governance frameworks hinges on the relationship between the generally small-scale, spatially bounded, independent corporate units of the Indian Act-structured First Nations of today and the indigenous expressions of their political economic systems as they existed prior to contact. Central to addressing questions emerging from this issue is the relationship between ethnographic and archaeological perspectives on the topic of authority.

1.6 Ethnographic, Archaeological, and Ethnohistorical Discussions of Households, Villages, and Socio-Political Organization among Northwest Coast and Central Coast Salish Peoples

It is necessary to point out that political organization among aboriginal Northwest Coast societies has been only "skimpily and unsystematically treated" (Drucker 1983:86) in the anthropological literature and ethnographic documentation of the area; so too for the Coast Salish. I draw attention to what has, over the past century, become a prevalent although not unanimous anthropological voice and set of perspectives. A predominant voice generated from a review of numerous ethnographic works between the 1940s and 1990s tends to characterize the economic and political organization of traditional Northwest Coast-Coast Salish societies as limited to intra/inter-household and/or intra-village level developments. I reference these below. Consideration of a broader range of theoretical perspectives beyond that of the long-dominant and somewhat persistent culture-ecology (e.g., Earle 1997) is badly needed.

Jorgensen (1980) characterizes Northwest Coast tribes as engaging in hierarchical distributions, noting that "…the salient feature of the organization of distribution among Northwest Coast kinship groups were the *distributions* themselves. These were intra-village and inter-household affairs attending birth, naming, puberty, marriage, death... these distributions were among the principal mechanisms for local exchanges of goods… *Distributions which, more than likely, were expanded to an inter-village scale during the period of contact with Europeans became known by the Chinook jargon word 'potlatch'*.." (Jorgenson 1980:145; emphasis added). Jorgenson, like some Coast Salish ethnographers and ethnohistorians (Carlson 2001a; Suttles 1975; Tollefson 1987), takes interest in and applies ethnographic analogy to reconstructions of past population densities. Ethnographically based statements like Jorgenson's that "there is good reason to believe that Northwest Coast populations based solely on extraction could have been larger than those found at first white Contact" (Jorgenson 1980:162) are consistently voiced (e.g., Carlson 2001c). Archaeologists typically agree with this point (e.g., Ames and Maschner 1998; Huelsbeck 1988).

It is also generally understood across disciplines that ".. resources were abundant throughout these areas and watercraft and waterways were available to transport goods and people. People from many communities convened to eat vast quantities of food, and on the Northwest Coast enormous amounts of movable property were circulated" (Jorgenson 1980:162; see Ames 2004; Ames and Maschner 1998; Mitchell 1971; Schalk 1977; Suttles 1968a, 1968b). "*Yet*" states Jorgenson *"political and economic organizations capable of maintaining large populations never developed*" (ibid; emphasis added). The certainty and 'global' application of this statement as accurately describing highly diversified Northwest Coast peoples spanning thousands of years of cultural occupation and change is, to say the least, suspect. This statement re-phrased as a question - *did political and economic organizations capable of maintaining large populations develop [among the Stó:lō-Coast Salish]?* - resides at the heart of this study and relates directly to Suttles's reckoning of 'authority' as an issue central to Coast Salish anthropology.

Archaeologically, 'cultural complexity' stands as a proxy for treating issues of 'authority.' Archaeologists have engaged in the investigation of the authority on the Northwest Coast for nearly four decades -- embedded within archaeological investigations of the development of social complexity. While numerous definitions of 'complexity' abound, Arnold's (1993:77) definition of 'complex' as 'hierarchical political organization on a multicommunity scale' is commonly accepted and applied in this field of study (see Matson 2003a:6). Arnold suggests a standardized definition of 'complex' (addressing political and social organization issues) as distinguishing "those societies possessing social and labor relationships in which leaders have sustained or on-demand control over non-kin labor [on a sustained basis] and social differentiation is hereditary" (Arnold 2000:78; 2004:180; see Ames 2001). 'Complexity' (1) "first and foremost means institutionalized control by some people over non-kin labor" and (2) "hereditary inequality and leadership" (Arnold 2000:93) meaning ascribed versus achieved status. Others view complexity as associated with property ownership, high population density, and political relations that extended beyond the residential kin-group (e.g., Jorgensen 1980).

Archaeologists generally agree that social stratification and ascribed or inherited social status are commonly recognized as achievements of indigenous peoples within the last 2,000-1,500 years, typified by the Marpole Period within the Gulf of George region (Ames and Maschner 1998; Matson and Coupland 1995). Some argue for its much earlier manifestation (Carlson 1996). Ames (2001) provides a strong argument for the emergence of slavery by 500 AD, though possibly manifesting earlier, associated with a Coast-wide shift in social relations. He positions slave labour as critical to the labour supply needed to support elite, corporate groups with ascribed status and ranked households, lineages, and villages that depended on the conversion of labour to wealth to prestige. This argument links to issues of indigenous authority as control over non-kin labour and hereditary social differentiation factor, also, in Arnold's (2000) definition of complexity. These changes in community formation appear archaeologically as changes in the expression of prestige and status display possibly linked to the development of a plank house-based potlatch-type interaction sphere which carried on into post-contact times.

I situate Jorgenson's work as a representative ethnographic voice in this discussion -- a compliment to the thoroughness and significance of his broad body of work and wide-ranging scope of analyses. Two other elements of Jorgenson's conclusions are important to present. He states,

> …the impressive force of private property… in shaping the size of local communities in otherwise heavily populated areas cannot be denied. *In the absence of more complex political centralization, property-owning communities were small and independent*" (ibid; emphasis added). Abundances of resources, either those that occurred in nature or those that were produced from farming, correlated positively with population density but not with political and economic organization. That is to say, predictable, storable, and abundant food supplies generated the highest population densities in western North America, *but these factors were not sufficient to generate complex and centralized political and economic organizations* (Jorgenson 1980:164; emphasis added).

Also, the general patterning of political organization indicates that,

> …the simplest and most numerically dominant political organization was the *residential kinship-group* that had no formal ties with any other group, even if several such kinship groups lived side by side in the same community (Jorgenson 1980:211; emphasis added).

These basic assertions are commonly though not always consistently represented in the work of many Northwest Coast-Coast Salish ethnographers of the last two centuries from Charles Hill-Tout (1895) to Wayne Suttles (1987) and beyond. Underhill (1945:174) summarizes the popular position among 19th and 20th century anthropologists that natives of the Puget Sound "had no idea of belonging to a large group beyond his own village of plank houses" and that political leadership was lodged within locally autonomous villages (if not at the household level) and that any higher level organization was a product of European contact. Tollefson provides a thorough list of references to 'classic' nineteenth and twentieth century Coast Salish ethnographic accounts broadly exemplifying these perspectives (Tollefson 1996:147) -- including Kroeber 1917:369; Ballad 1929:35; Spier 1936; Barnett 1938:119; Ray 1939:8-9;

Smith 1940, 1941:199-203, 1949:13, 1967:68; Collins 1950:334; Elmendorf 1960:308-313; Riley 1974:79; Drucker 1983:87; Onat 1984:89.

From the Northwest Coast anthropology of the 1980s emerged two significant works by Donald Mitchell (1983b) and Phillip Drucker (1983) focusing on the interplay between resources and settlement patterns, particularly among winter village aggregate groups. These studies mix ethnographic and archaeological data and perspectives. Drucker characterizes the Coast Salish as having no large, multi-local winter village groupings in their "less favorably situated upriver divisions" (Drucker 1983:93) farther from the Coast. Drucker concludes that "there were various large aggregations of local groups among some Northwest Coast divisions. They existed. But they were not political organizations. No authority base resided in such a grouping" (Drucker 1983:95) and local identity was retained by maintaining house-based autonomy (c.f. Carlson 2003).

Donald Mitchell, recognizing the seasonal movements and aggregations of villages of Central Northwest Coast-Coast Salish peoples, questions the nature of political structure and "how villages interacted when aggregated" (Mitchell 1983b:103). His examination of polities within the context of settlement structure is a significant theoretical application of settlement archaeology to the Northwest Coast. This study crosses-over between archaeological and ethnographic disciplines. Using minimal ethnographic sources (e.g., Barnett 1955), Mitchell defined three categories of settlement: camps, villages, and village aggregations. None of these settlement types are presumed occupied or maintained on a year-round basis, but rather seasonally and with a great deal of variation. Twenty village aggregations, located within an area including a number of regions are defined as occurring throughout all four seasons. Winter aggregations were most common among the Coast Salish, although only including the coastal Georgia Strait portion of the region, neglecting the upriver areas. Of Coast Salish village groupings, Mitchell states “Although harmony was sought… there was no formal supra-village political order” (Mitchell 1983b:103). The only apparent rationale for this statement comes from the line that “as if to underscore the absence of a polity, Barnett (1955:18-34) labeled those that joined these winter assemblies “ethnic divisions..” (ibid). Mitchell continues to expose his logic, stating:

> One would not expect a high order political organization to accompany any of the village aggregations. After all, what was needed was simply peaceful coexistence at some unusually productive resource locus or particularly desirable wintering location. No great feats of organization were necessary for employment of technology, for gaining access to the resources, for dividing up the resultant harvest, or for simply waiting out the winter. The constituent village units of an aggregation merely did, side by side, what other village units on the coast were doing in isolation. The only difference was the proximity of the village (Mitchell 1983b:104).

While recognizing ‘confederations’ among the Nuu-chah-nulth in which some autonomy was given up within village aggregates providing perhaps “an advantage in making war and keeping peace, and.. may even have encouraged a pooling of other important resources” (Mitchell 1983b:106), he concludes that “although most winter groups on the central Northwest Coast spent a least part of the year assembled with others, they did so with no significant reduction in their independence” (ibid.). Mitchell, thankfully and to his credit as a widely respected researcher, explicitly states his expectations about the nature of Coast Salish political relations (i.e., not expecting high order political organization). Positions such a Mitchell’s exemplify a predominant anthropological perception that persists today of aboriginal political organization on the Central Northwest Coast-Coast Salish area. My study calls into question the application of these interpretations to precontact political economic organization and relations among the Central Coast Salish.

I focus on the work of Wayne Suttles and Robert Elmendorf as providing the most well-developed models of Coast Salish social organization, testable using archaeological data. Wayne Suttles and Robert Elmendorf's perspectives on Coast Salish socio-political relations -- based on their culture-ecological view of networks and interaction -- are worth reviewing in some detail as their work remains influential in the use of ethnographic analogy in Coast Salish archaeology, itself heavily influenced by the culture-ecological movement of the 1970s. I focus on Suttles' (1958, 1987) 'village organization model' as a key influence on anthropological views of Coast Salish socio-economic organization (Figure 1.1).

Suttles' model typifies the organizational shape of Coast Salish village-based society (i.e., the 'village organization model') as an "inverted pear" (Suttles 1987:14) -- similar to West's (1945) 'diamond-shaped' social structure - describing a 'normally-shaped' social demographic in which no part of the population exhibits any significant socio-economical or socio-political distinction. Suggesting that the majority of individuals and families retain some form of 'high class' connection, Suttles situates social stratification in Coast Salish society as a phenomenon that was more imagined than real; no real socio-economic boundaries separated 'Leaders' from 'Good People.' Suttles asserts that local groups were of equal status (Suttles 1968a; 1987:41).

Elmendorf and Suttles both minimize the existence of classes in Coast Salish society beyond a basic 'free-slave' dichotomy. Elmendorf dismisses references of indigenous Coast Salish terms for 'classes' describing a continuum of 'high' (i.e., 'Leaders' and 'Good People') to 'low' (i.e., 'Worthless People') freeman (Figure 1.1; Suttles 1958, 1987:12; also Carlson 1997b:89-90) as "an apparent discrepancy between ideal and actual social distinctions" (Elmendorf 1971:368). Elmendorf states that, rather than representing real class differences

“..ranking of individuals and ranking of groups.. were probably general features of Northwest Coast social structure” (Elmendorf 1971:362), with high rank positively correlated to participation in inter-village activities. “If so, then the relations of ranked statuses within each local community can only be understood through analysis of the total set of intercommunity relations…” from which he presents the hypothesis that, “Coast Salish social rank within village communities depended upon a total set of intercommunity relations within a network specific to each community” (Elmendorf 1971:363). I incorporate Suttles’ model as a fundamental element of this study, comparing his ethnographic results with those derived from this archaeological study of community formation.

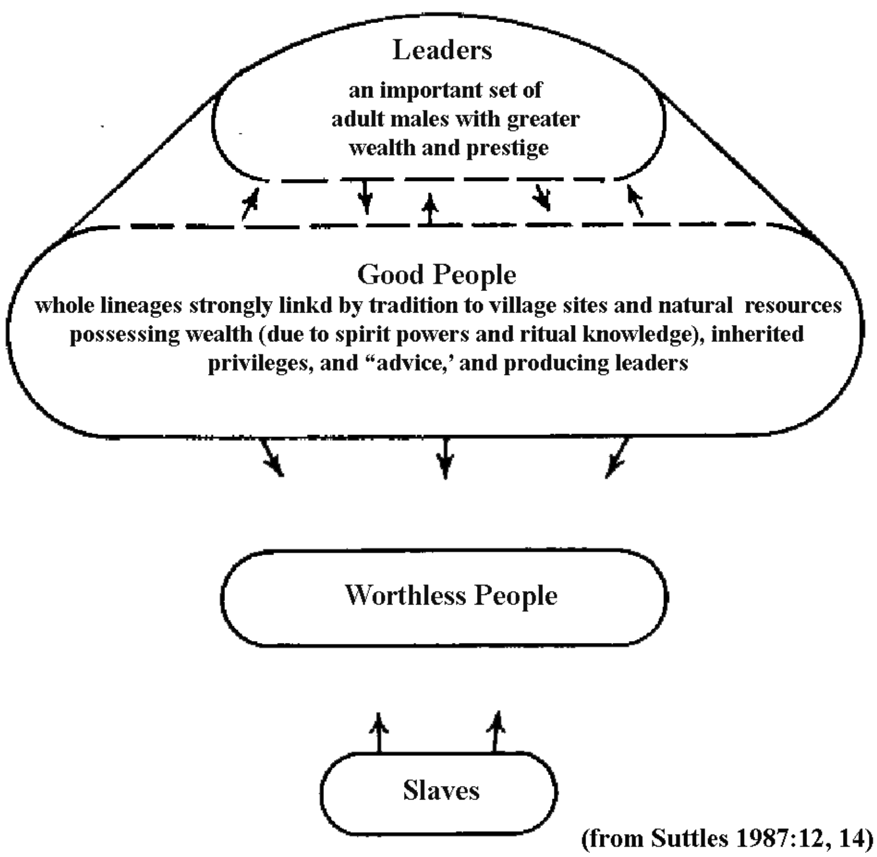

Figure 1.1. Wayne Suttles’ Coast Salish ‘Village Organization Model’ of stratification in a Coast Salish community.

In the 1974 post-script to his 1958 article describing Coast Salish social classes Suttles loosens the ties of Coast Salish social organization, citing extreme inter-village movement and flexibility, to the extent that he suggests avoiding the term 'community.' Suttles states that "since it [i.e., 'community'] often implies a social unit with a high degree of social cohesiveness, in-group feeling, internal social control, and so forth, the Central Coast Salish village may not have been such a unit. "Village" or simply "settlement" would be more appropriate, since these terms are more neutral in what they imply about social cohesion.." (Suttles 1987:14). I suggest that Suttles's view, like Elmendorf's, of Coast Salish society as a "social network with no clear boundaries" (Suttles 1960:17) was far ahead of its time and is better accommodated within more recent anthropological and archaeological discussion and definitions of 'community,' interaction, and political economy (e.g., Anderson 1983; Bourdieu 1977; Canuto and Yeager 2000; Roseberry 1988).

Suttles' comments on community could be linked into Anderson's (1983) concept of an 'imagined' community. While the extensive networks of bi-laterally reckoned Coast Salish genealogies may have connected many people to some upper class relative, not all of those people enjoyed the rights and privileges of those that *were*, versus those that *imagined themselves* to be, of name-carrying upper class status. Typically each village had only one ancestral name linked to its origin signifying 'the man in charge of the resources' (Suttles 1987:21), thereby creating a significant imbalance between the number of possible and the actual name carriers. Demand was greater than the supply. Significant competition surrounded the acquisition and inheritance of high status names, and the rights carried with them, including the ownership of resource sites such as fishing rocks and reckoning of access to resources such as salmon.

Suttles's earlier work describes Coast Salish communities or villages as sufficiently bounded to accommodate social stratification within the arrangement of houses. "The lower class often occupied separate houses in its own section of the community or in a location sufficiently separate so that it might be regarded as a lower class community subservient to an upper class" (Suttles 1960; 1987:17). He also notes differences in rights and privileges between upper and the lower class families (Suttles 1960). Suttles states that high status is directly linked to the production of resources. This assertion links to the inter-household and inter-village production-based 'task groups' forming Bruce Miller's (1989) 'family corporate groups' discussed below and implying, perhaps, a level of complexity beyond what Suttles recognized at the time.

Anthropological developments in post-1970s Coast Salish ethnography diverge from Suttles and Elmendorf in their understanding of 'interaction' as limited in scope to intervillage ties of affines within a culture-ecological (i.e., economic focused) model of spatially and temporally clumped resources (e.g., Suttles 1960, 1961, 1968). The emergence of new theoretical perspectives in the 1980s and afterwards served to augment, affect, and build on the anthropological understandings of Northwest Coast-Coast Salish community organization. Consideration of interaction between corporate groups and households extending beyond affinal ties to include 'family corporate group' structures (Mooney 1974; Miller 1989b) affects notions of 'community' among the Coast Salish. Miller's (1989b) 'family corporate group structure' connects directly with archaeological concepts of complexity expressed by Arnold (1996a) as existing beyond intra-household and immediate kin-based relationships. Founded on working cooperatives comprised of non-kin cohorts, Miller's social unit moves toward recognizing the centralized control of non-kin labour for the life-span of each corporate family working group -- the maintenance of which was both competitive and political.

In a recent work, I employ Miller's concept as a key factor explaining the linkages between settlements. Such linkages may be expressed archaeologically, for example, as within an inter-village network of defensive fortifications in the lower Fraser Canyon (Schaepe 2006). Additional ethnographic support for inter-settlement class differences is provided by Haeberlin and Gunther (1930:58). Barnett (1955:19, 21, 23, 32-33) describes the importance of house size and placement in the arrangement of houses within a settlement, adding substance to the social-spatial relationships hinted at above. These descriptions are analogous to the expression of status in a pattern of centrality expressed in the sizes and spatial arrangement of houses on an intra-village scale. They also allude to a network of inter-settlement relations expressed similarly as social-spatial patterns based on centrality. Both of these sets of ethnographic descriptions hint at a social-spatial model of inter-household and inter-community arrangements with centrality and spatial distance factoring significantly into socio-political relations. This field of social-spatial relations was later developed by Kathleen Mooney (1976, 1979) and by Bruce Miller (1989) using quantitative methods to measure centrality in socio-economic and political relations among the Coast Salish.

A theoretical shift among late 1980s and early 1990s post-modernists worked toward achieving an emic understanding of culture involving human agency, breaking away from the culture-ecological paradigm of their predecessors. Bierwert (1986), Miller (1989), Boxberger (1989), and Miller (1999) were leaders in embarking on this new path. Focusing on the Stó:lō, Bierwert (1986) covers a wide range of topics including spatial maps, settlement layout, longhouse layout, and directional orientation. In comparison with Suttles's environmental approach, she integrates culture and environment within a dynamic process of learning and thinking, as a reproductive (i.e., economic) process. This shift moves away from the paradigm of understanding based on a 'separate' ecological base that has so profoundly the affected the anthropological and archaeological views of social development among Northwest Coast societies including views of authority and community organization (Schalk 1977). "Oral history" she states, "is open to redefinition of the salient links with the past. The process of interpretation does not quit" (Bierwert 1986:429), bringing dynamism to the traditionally static notion of 'traditional' community or society previously sought after within 'memory anthropology' -- also providing a counterpoint to those who subsume the formation of aboriginal identity entirely within colonial experience (Oliver 2006).

The physical location of houses and settlements within and between communities is likely to maintain multiple meanings, simultaneously, and be affected by the on-going negotiation of power and agency. The landscape of settlement patterns, itself, takes on meaning as a topologic landscape of meaning. The topologic aspect of relations between houses and settlements -- involving the construction and conveyance of knowledge attached to the meaning of things -- delivers us squarely into a discussion of community founded in Bourdieu's (1977) *Practice Theory* and Roseberry's *Political Economy* (1989).

Jay Miller's (1999) 'anchored radiance' model, when viewed apart from the broader, religion-dominated 'Shamanic Odyssey' in which it is presented, provides an integration of people, place, and power -- spiritually, economically, and politically -- among the household and settlement patterning of the Skagit-Coast Salish. Miller builds on the work of Sally Snyder (1964) and Bierwert (1986) in remodeling a topological version of Smith's (1940) topographic 'watershed-based systems' of social relations. "Within each watershed, group alliances became more expansive in terms of (a) hearth mates eating together, (b) households of all residents, (c) birthright locals - those born there in contrast to in-laws, visitors, and foreigners, (d) settlements and resorts, (e) community networks, (f) tributary drainages, and (g) the entire drainage" (Miller 1999:19). Culturally, these units, increasing in size, included notions of person (combining body, mind, and soul with spirit allies); of house (including what he refers to as ‘hearthers’ -- those who share hearths in their residence -- locals, and distant kin); of canoe (transport across time and space, distinguished as forest, prairie, river, or sea); and of world (the drainage linked both to residential immortals and to more remote peoples and places through marriage, ritual, and trade).

Major nodes in this overall system were cedar plank houses located along the shore near spots rich in local resources. Beyond the ‘house node’ were at least three concentric rings occupied by allies, by competitors for regional status, and by strangers -- working within a social-spatial distance model of networks and interaction. By prudently using locally ‘anchored’ resources, a household could add to its regional ‘radiance.’ The crux of the entire system and the basic reason for gathering people together was the display of bonds with particular immortal powers (Miller 1999:19-21).

Miller supposes a settlement hierarchy with the largest settlements (i.e., towns) associated with these interactive hubs, radiating spatially outward up attached drainage systems and diminishing in size (i.e., villages and hamlets). Prestige and status were attained by engaging in ‘social networks’ beyond one’s own community -- as described by Suttles and Elmendorf (see Kennedy 1995). Social ranking is considered by Miller as a regional matter (Miller 1999:90), with class sometimes assigned at a community level. Miller, like Bierwert, recognizes ideation and social ranking within ‘social-spatial’ settlement patterns. Miller’s model, incorporating political economy, is useful and can be translated into a framework that can be examined archaeologically through the quantification and analysis of house and settlement sizes through time and space. An application of Jay Miller’s settlement hierarchy model to the Stó:lō is presented in *A Stó:lō-Coast Salish Historical Atlas* (Carlson 2001a:24-26).

In recent work, ethno-historian Keith Carlson (2003) identifies the lower Fraser River system of the Stó:lō -- between the lower Fraser River Canyon and the Fraser Delta -- as unparalleled in the social-geography of the Coast Salish world in its capacity to support inter-tribal and inter-watershed transportation and communication. Carlson identifies the lower Fraser Canyon as a particularly important centre of exchange between the local, salmon rich inhabitants, and those from elsewhere - 'strangers' from which economic profit could be drawn and exchanged into social -- and I would add *symbolic* and *political* -- capital. Importance is placed on travel and relations *between* settlements and watersheds and the control of both resources and communication by individuals of high status. These relations were primarily acted out upon the avenues of transportation and communication specific to the region (Schaepe 2001a). Relations between high and low class are characterized by extra-local versus local levels of access and privilege; controlling access and knowledge versus being subject to control; the pursuit of prestige versus that of survival.

Carlson's view of Stó:lō community as a highly complex series of nested networks leads, again, to a social-spatial model of households and communities with differences of status and wealth expressed in spatial terms. Recognizing these relationships requires a broad view of the settlement landscape. These later views of Coast Salish ethnographers and ethnohistorians have not been taken into consideration in the common application of ethnographic analogy used by Northwest Coast archaeologists -- generally still using a Suttles-founded, culture-ecology based set of interpretations guiding our understanding of Coast Salish community organization.

The application of the 'local village' or 'local political unit' model long held in Northwest Coast ethnographic literature cannot be summarily projected into the precontact past. Within this objection I accept the use of ethnographic models in interpreting archaeological data providing insight into precontact social organization. Network and communication theory are indeed relevant and useful to Coast Salish-Northwest Coast archaeological pursuits (Miller 2007). The interpretation of archaeological data in this work relies on such ethnographic models, independent of and in comparison to ethnographic data. The crux of this objection resides in questions about the 'fit' of those ethnographic data entered into these models and the products of interpretation as representing precontact, and particularly pre-colonial, forms of socio-political arrangements. It is necessary to critically evaluate and differentiate between the content of ethnographic conclusions and the particular models developed by ethnographers.

1.7 Defining the Study Area - the Mainland Gulf of Georgia Region

Donald Mitchell (1971) recognized the unique interrelationships between the natural and cultural attributes of the Gulf of Georgia Region that support the use of the term 'landscape' in current anthropological meaning (Ashmore and Knapp 1999). The mainland Gulf of Georgia Region is a 'landscape' coincident with the lower Fraser River Watershed of southwestern British Columbia and northern Washington State. This landscape is unique in at least three critical ways compared with other major watersheds and regions of the Northwest Coast. First, the area is associated with multiple, large, closely connected watersheds joined by an extensive intra-regional network of transportation and communication leading, via the *stó:lō* (river; Fraser River), to the Georgia Strait-Coast Salish Sea. Secondly, the region is home to a range of abundant oceanic, deltaic, riverine, and montane-based resources. Lastly, unique ecological qualities support highly effective 'wind dry' salmon processing and storage techniques factoring into abundant economic opportunities for trade and exchange. This region is ideally suited to the objectives of this study.

The abundant resources of this environment play a significant role that cannot be underplayed in examining the economic, social, and political development of the Stó:lō, as distinct from their Coast Salish and other Coastal neighbors. The region's surrounding oceanic, deltaic, riverine, and montane environments provide year-round access to diverse and plentiful localized resources available for harvesting within a predictable and reliable scheduling of yearly activities (Lepofsky et al. 2005). As a fishery, the Fraser River stands out as the largest salmon-bearing river in the world, traditionally rivaled only by the Columbia River (Northcote and Larkin 1989). The lower Fraser Canyon provides access to the largest and most important traditional aboriginal salmon fishery north of the Columbia. The meteorological characteristics of the lower Fraser River Canyon permit the rapid and reliable wind-dry processing of salmon suitable for long-term storage.

The mainland Gulf of Georgia region is distinguished by the Fraser River as a central waterway and artery of transportation and communication within a watershed system unlike any other on the Northwest Coast. Within the lower 150 km stretch of the lower Fraser River Watershed are approximately 17 major tributary rivers and watersheds. Most of the other Coastal regions represent the individual watershed systems with fewer and smaller tributary systems (e.g., Skagit River; Skeena River). Stó:lō-Coast Salish peoples have a long-term history of extensive interaction geographically connected to the Gulf of Georgia Region, extending from the lower Fraser River Canyon, downriver to through the Delta, and across the Georgia Strait to include southeastern Vancouver Island (Burley 1980; Grier 2003; Pratt 1992).

The socio-cultural and environmental attributes of the lower Fraser River Watershed define this area as a central place of longstanding regional interaction among the Stó:lō-Coast Salish. The network of tributary rivers and watersheds connected by the lower Fraser River -- supporting extensive networks of communication and transportation -- forms a geo-social/political structure well suited to the investigation of community formation through time.

The archaeological and social-spatial ingredients required of this study are provided by the geo-cultural attributes of this region.

The long-term *in situ* development of cultural traditions and interactive relations among and between the Stó:lō and their Halkomelem / Coast Salish neighbors also provides an ideal context for investigating community formation. The long-standing maintenance of this network of relations is supported linguistically by the distribution of Island, Downriver, and Upriver dialects of the Halkomelem language family (Galloway 1993; Smith 2001; Suttles 1990).

The long-term interaction among Stó:lō-Coast Salish peoples of the Gulf of Georgia Region can be demonstrated archaeologically. Common ancestral material relations are recognizable as the 'Charles Culture' -- more accurately reiterated in archaeological terms as the 'Charles Horizon' -- signifying the widespread distribution of similar archaeological features and artifacts throughout the region between 5,500-3,500 years ago (Borden 1975; Carlson 1994; Pratt 1992). The archaeological record provides evidence of significant trade and exchange among these Coast Salish peoples throughout pre-contact history (Blake 2004; Brown et al. 2008; Carlson 1994; Carlson 1996; Clark 2000; Grier 2003; Lepofsky et al. 2000; Mitchell 1963). The ethnographic record and contemporary history account for a continuity of interaction among and between Stó:lō-Coast Salish peoples (Carlson et al. 2001; Duff 1952; Elmendorf 1971; Pennier 2002; Suttles 1987, 1990). Archaeologists generally agree on a process of long-term *in situ* cultural development in the region since, if not preceding, the Charles 'Horizon' of approximately 5,000 years ago (Burley 1980; Clark 2000; Mitchell 1971; Matson 1976).

My study area begins at the Fraser River Delta and extends approximately 240 km eastward and northward along the Fraser River to a point including the lower Fraser River Canyon, about eight kilometers north of the town of Yale, B.C. -- the eastern edge of the region marking the transition, culturally and environmentally, from the coast to the interior. Mitchell (1971) recognized the lower Fraser River Watershed as an element of the Gulf of Georgia Region -- a unique natural, ethnographic, and archaeological region (Figure 1.2). This area can be sub-divided into five interconnected though geographically and environmentally distinct locales.

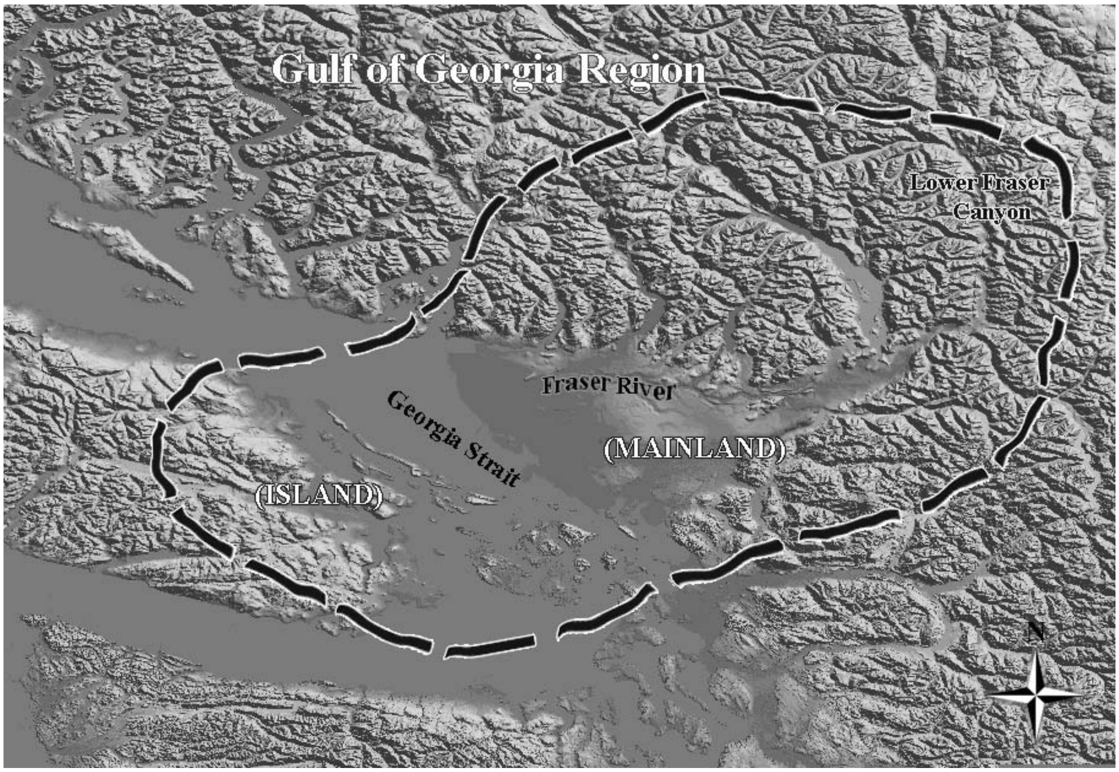

Figure 1.2 The Gulf of Georgia Region within the Central Coast Salish Culture Area.

Moving downriver from east to west, the lower Fraser River Watershed includes the lower Fraser Canyon (the Canyon), Upper Fraser Valley, Central Fraser Valley, Lower Fraser Valley, and Fraser Delta (Figure 1.3). Each sub-section of this region has slightly different characteristics creating a spectrum of differences from east to west such that the environments of the two geographic extremes -- the Canyon and the Delta -- are very different from one another. The eastern extent of the region, at the upriver limit of the Canyon, defines the connective edge between Coastal and Interior Salish peoples.

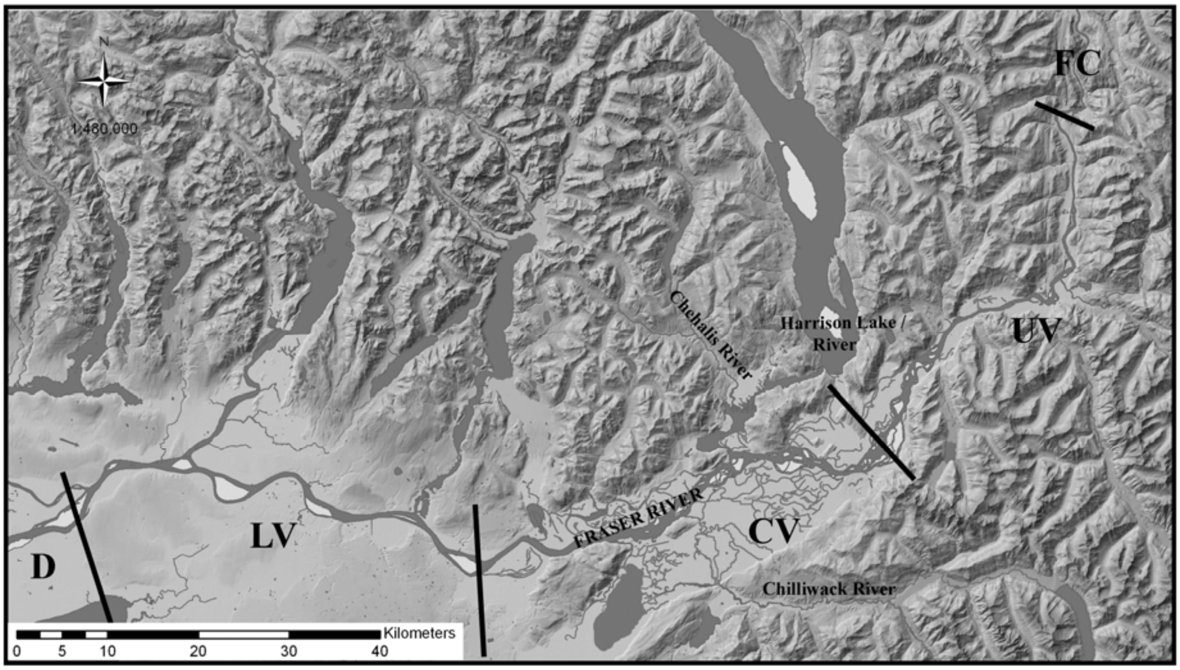

Figure 1.3. Geographic sub-sections of the Mainland Gulf of Georgia Region / lower Fraser River Watershed; FC = lower Fraser Canyon; UV = Upper Fraser Valley; CV = Central Fraser Valley; LV = Lower Fraser Valley; and D = Fraser Delta (Lepofsky, Schaepe, and Blake 2006).

I use those geographic definitions developed by Lepofsky, Schaepe, and Blake (2006) as most accurate and effective at incorporating indigenous Stó:lō perspectives describing the physical characteristics of the region's land base and waterways (Figure 1.3). The lower Fraser River Watershed is shaped like funnel, with its constricted neck representing the Canyon, to the east, and its flared opening beginning in the Central Fraser Valley and opening to the sea at the western margin of the Fraser Delta. The Fraser River flows southward from the Interior through the steep-sided rocky gorge that is the Canyon. The river is navigable from the ocean to the abrupt entrance (i.e., downstream end) of the Canyon, above which seasonal rapids restrict access. The traditional mode of transportation changes from consistently river-based to a more mixed form of river- and land-based travel upriver of the entrance to Canyon. From that point, the river flows through the Upper Valley which remains a narrow though heavily forested valley; after abruptly turning west (near the 'UV' label in Figure 1.3) it levels and widens as it grades into the Central Valley.

Through the Central Valley, the floodplain broadens significantly and is braided with many intertwining river and slough channels past the town of Chilliwack to the western toe of Sumas Mountain. At this point, the Cascade Mountains to the south give way to a broad coastal plain (the Puget lowlands) with Coast Mountains to the north continuing to bound the Lower Fraser Valley, through which the river flows in a more singular channel forming an estuarine environment affected by tidal waters of the ocean yet some 70 km to the west. The Delta, beginning at the foot of the uplands, is an ancient alluvial fan of Fraser River sediments deposited and expanding westward over the last 5,000 years (Clague, Hebda, and Luternauer 1983**;** Schaepe 2001c:16-19). The Delta is flat and broad with two main branches of the Fraser River that traverse the Delta before connecting with the oceanic waters of the Georgia Strait (the Coast Salish Sea).

1.8 Defining the Terms Stó:lō and Coast Salish

Throughout this thesis, I use the term 'Stó:lō' in reference to the indigenous people inhabiting the lower Fraser River Watershed, i.e., the mainland Gulf of Georgia 'Landscape,' roughly coincident with my study area (Figures 1.2 and 1.3). The Stó:lō represent a collective of indigenous Halkomelem-speaking peoples. 'Stó:lō' is a word in the Halkomelem language literally meaning 'river' with particular reference to the Fraser River, but also used in self-identification by these people as 'People of the River' (Duff 1952; Carlson et al. 2001; Carlson 2003; Schaepe 2007). Historical records provide evidence of this term being used in self-identification going back to the late 1800s (e.g., as used in the title of the St. Mary's Roman Catholic "Stó:lō hymnals" of the 1880s). Not everyone in all First Nations communities along this stretch of the river currently identify themselves as Stó:lō. Individuals frequently identify themselves within a range of identities based on family, Band/First Nation, and/or broader collective units including tribal (e.g., *Ts'elxwéyeqw*) or supra-tribal (i.e., Stó:lō) affiliations -- oftentimes situationally and sometimes simultaneously.

Some degree of confusion also currently exists between cultural entities (i.e., Stó:lō) and a number of contemporary political / service delivery agencies that use the name Stó:lō (e.g., Stó:lō Nation; Stó:lō Tribal Council). The Stó:lō, as I refer to them here, are collectively associated with a cultural group of indigenous people known in anthropological terms as the 'Coast Salish' (Figure 1.4). The Stó:lō maintain close family, linguistic, and cultural ties to their neighbors and relatives (e.g., Nooksack, Squamish, Skagit) living throughout the broader Gulf of Georgia and Puget Sound regions of the south-central Northwest Coast (Suttles 1990). The Stó:lō call their homeland *S'ólh Téméxw* ('Our World' or 'Our Land').

1.9 Chapter Outline and Descriptions

This thesis includes 10 chapters moving beyond this introduction into discussions of theory and methods, followed by specific analyses, and interpretive and concluding chapters. In Chapter II, I define my theoretical approach to this study, informing the framework which I apply to the interpretation of my findings. I discuss the context of the study as drawing from and incorporating elements of settlement archeology, interaction theory, practice theory, and community archaeology. I discuss anthropological perspectives on definitions of 'community' leading to an essay on the application of practice theory and political economic theory to the interpretation of findings on housepit features and settlements. Lastly, I develop a set of expectations with which to compare and interpret my data and findings.

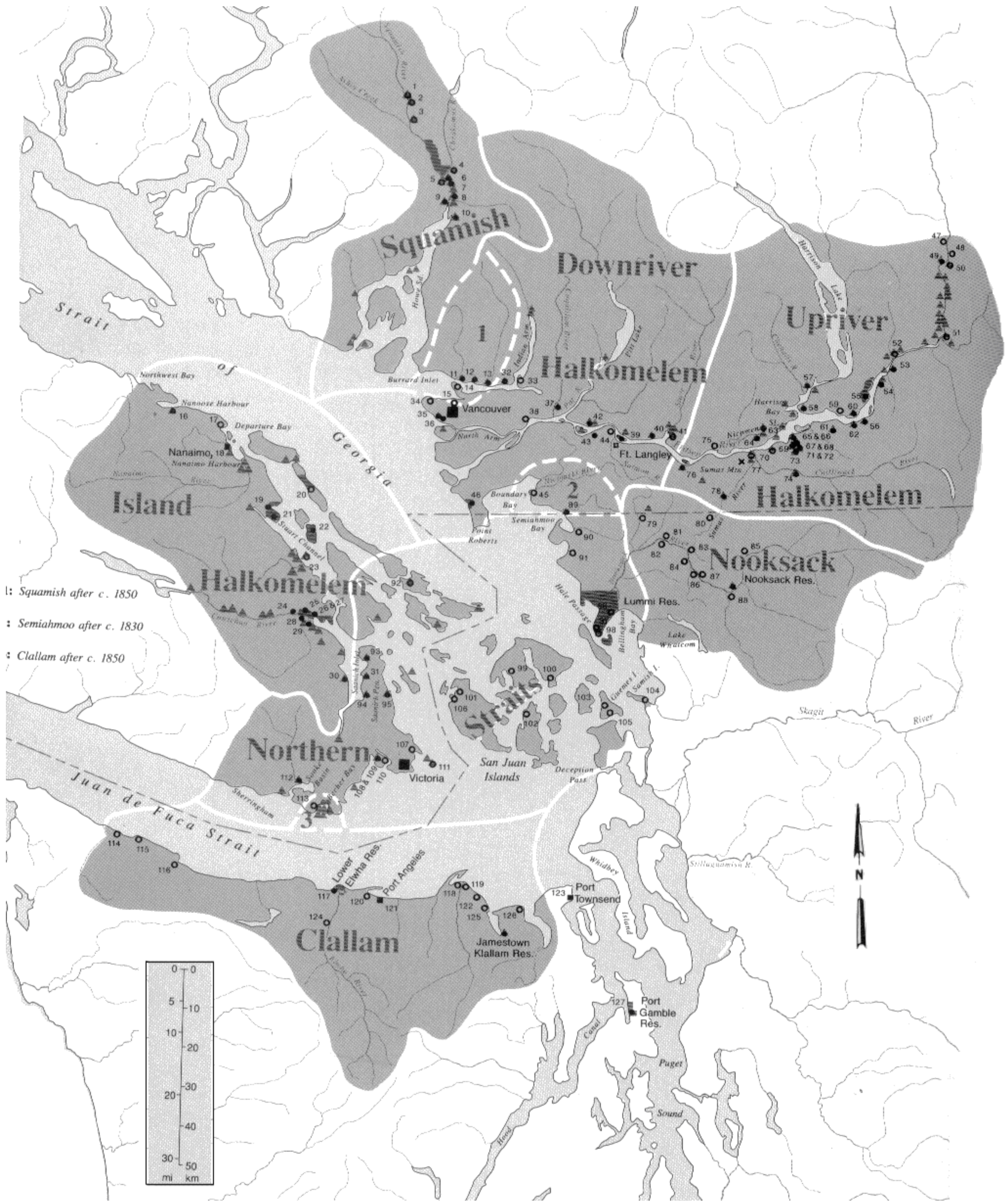

Figure 1.4. Map of the Central Coast Salish area showing the locations of principal villages in the early 19th century (Suttles 1990:454). (Note: This map does not show all Central Coast Salish tribal groups, languages, and First Nations within the region, and a number of local groups are not identified. The main objective of figure is to illustrate the geographic relationship between speakers of Halkomelem and their immediate Central Coast Salish neighbors).

Chapter III deals with the data collection methods used in addressing the data gaps and methodological issues affecting the regions' housepit and settlement data at the outset of this study. I describe methods used in mapping and testing of housepits and settlements in my study area as the primary means of gaining control over those dimensions of space and time critical to this study. These methods describe the collection of new spatial and temporal data from 114 housepit features within 11 settlements acquired as part of the Fraser Valley Project between 2004-2006 (Graesch 2006; Lepofsky et al. 2003; Lepofsky et al. 2005; Lenert 2008; Lenert and Lepofsky 2005, 2006; Sanders and Ritchie 2006; Schaepe, Blake, Lepofsky, and Formosa 2006). I also describe the basic, exploratory quantitative analytic methods used in this study.

Chapter IV involves the broadest scope of analysis in this stud, using housepits settlements as a unit of analysis as distributed throughout mainland Gulf of Georgia Region. I deal with the issues of space and address questions about the locations of the 112 housepits settlements recorded in study area as of 2005. I define the region as a network of transportation and communication routes, both riverine and terrestrial. Within this 'transportation and communication framework' I quantify travel distances between each recorded settlement and the Georgia Strait. I use an Exploratory Data Analysis (EDA) -- defined in Chapter III -- as a quantitative approach to exploring, organizing, and analyzing these data, providing a means of defining groups of settlements by their location along the region's transportation corridors. This analysis also serves to assess long-term trends in settlement patterns defining where the Stó:lō established their settlements within this geographic and interactive framework. These results provide reference and context for the more detailed analyses of both time and space, including a sample of housepits and housepit settlements, conducted in Chapters V-VIII.

Chapter V deals with issues of time and serves to answer questions about the age of housepit features and settlements in the study area. I use both new and existing radiocarbon data to define a temporal framework spanning 3,000 years between A.D. 1850 and 800 B.C., divided into four major periods. This framework serves to situate in time, either directly or indirectly, each the 114 housepit features included in this study.

In Chapter VI, I focus on housepits features as independent units of analysis. Central questions addressed in this chapter focus on variations of size, shape, and age as attributes of housepit features. Using EDA, I quantify the relationships through time and space of my sample features classified and sorted by variables of size, shape, and age as indicators of socio-political differences between households. I extrapolate and compare household populations per feature across housepit features. These analyses inform discussion of household size and organization as it developed through time.

Chapter VII expands the scope of analysis to the level of individual settlements. Retaining housepits as the basic unit, analyses in this chapter address questions relating to variation through time of the spatial relationship between housepits and households within settlements as a basic layer of community organization. Incorporating findings from the preceding chapters focusing on regarding age and size, I define and compare intra-settlement housepit arrangements. These analyses inform discussion of community plans and social organization within settlements as they developed and changed though time.

Chapter VIII returns to the broadest level of analysis comparing settlements and communities through time across the entire region. This chapter culminates as a synthesis of findings in Chapters V-VII, with controls over time and space re-applied to those regional settlement patterns identified in Chapter IV. I address questions regarding variability in inter-settlement relationships through time based on size and community populations. Positioning settlements as my unit of analysis I explore and classify settlement sizes and arrange them in time as discrete occupations. Similar to the analyses in Chapter VI, I extrapolate and compare community populations per settlement/occupation. These analyses inform discussion of the regional system of relations between settlements as they developed and changed among the Stó:lō over the 3,000 years preceding Colonization.

Chapter IX includes a discussion and interpretation of my findings within the intellectual and theoretical frameworks set out at the beginning of this thesis. This chapter provides archaeological insights into the organization of housepits, households, settlements and communities within mainland Gulf of Georgia Region. My goal is to address questions about the nature of pre-colonial Stó:lō community structures and political organization, examined in terms of corporate and network forms of socio-political organization.

I conclude in Chapter X by revisiting my original research questions, summarizing my findings, and evaluating the strengths and weaknesses of my interpretations. I suggest areas for future research highlighted by topics of my study. I link my findings to the broader field of anthropological questions and theories, as well as to the current interests of the Stó:lō communities, related to the utility of archaeology and the investigation of issues concerning authority and community organization.

CHAPTER II - LINKING COMMUNITY AND SETTLEMENT ARCHAEOLOGY

2.1 The Socio-Political Taphonomy of Community: Defining Agents of Formation and Change

Understanding community within an integrated community-settlement archaeology framework requires defining the ways in which community is expressed in material form. Pierre Bourdieu's (1977) *Practice Theory* and William Roseberry's (1988) *Political Economy* provide two sources of theory central to developing an integrated community-settlement archaeology aiding in deriving meaning from the material world of the past. Bourdieu's 'practice theory' and 'habitus' (Bourdieu 1977, 1980, 1994) have been recently adopted by a number of archaeologists addressing identity (Dietler and Herbich 1998; Robb 1998), regional or settlement studies (Mackie 2003), households (Coupland 2006), and cultural practices (Pauketat 2001). Citation of Roseberry remains essentially absent in the archaeological literature, despite the applicability of his work and approach to mediating materialist and ideationist perspectives.

The benefit that both Bourdieu and Roseberry offer archaeologists is their recognition that people make investments of knowledge and symbolic capital in material culture. This theoretical step -- growing out of Sahlins' (1976) *Culture and Practical Reason* -- helps mitigate conflicts between materialist and symbolic theoretical camps recognizing 'ideals' and 'values' as having economic 'praxis' and 'practical reason.' The material culture of houses, as forms of symbolic capital and investments of households, relate to the production of household prestige derived from relations of power and authority. Relation of power and authority act as central elements of community formation that can be measured along vertical and horizontal planes of relations (Blake and Clark 1999; Crumley 1987; Feinman 2000).

Linking houses with symbolic capital requires examining the way in which ideals and values are created within the production of knowledge; a system which integrates material and political economies (Cohen 1985; Delanty 2003). I present, below, eight essential 'taphonomic' elements of community -- framed as a political economic system -- derived largely from Roseberry (1988, 1989) and Bourdieu (1977, 1994). Central to the definition of community applied in this study are: knowledge and economy, time and strategy, power and habitus, and tradition and competition, negotiated within a political economy. The dynamic process of mediating tensions inherent in these interrelated elements of community is a generative process of community formation, integrating material and reason, expressed as a factor of transformation.

2.1.1 Knowledge and Economy

Knowledge is an essential ingredient in the production of meaning and therefore integrally connected to the economy of the meaning of things, including houses, through which expressions of community are manifest. Bourdieu's (1977) *practical mode of knowledge,* as described in Practice Theory, is a fundamental element of community formulation. Knowledge, as a central tool of structuring agents of household, settlements, and communities, is *achieved* through action and produced within an *economic* framework; economic in the sense of being *produced, distributed or exchanged, consumed, and reproduced*. These four sequentially inter-linked actions represent the basic economic cycle. The production of knowledge, akin to Sahlins's practical reason (1976), is recognized by Bourdieu as a basic element in the generation of culture. The generation of knowledge occurs in interactions and relations between individuals and broader social collectives. Herein lies an essential assumption of community formation -- knowledge, and thus culture, is relational, it is interactive, and in this sense is objectified. While individuals can produce and consume knowledge, they cannot fulfill the distributive or reproductive aspects of the economic cycle. Thus, knowledge must be shared and reproduced between groups of individuals in order to be realized in cultural practice. Sharing and reproducing knowledge requires communication (Habermas 1981, 1987).

The generation of knowledge (i.e., the economy of practical knowledge), and thus the formulation of culture, is generated within an economic process negotiated through the interactions and relations between people; between individuals; between individuals and collectives -- as within the formation of communities. As a relational system, the economic process requires interplay between at least two people, i.e., a group. While individuals can produce and consume, they cannot fulfill the distributive or reproductive aspects of the cycle. Individuals, in failing to fulfill the economic cycle, fail to account for culture. Thus, knowledge is discursive; it must be shared, in practice, between individuals in order to be realized (Foucault 1972:182-1853). From this basic set of relations stems a basic Bourdieuian-influenced concept of *community* as a group (or collective) of people engaged in practicing an economy of shared knowledge (i.e., shared culture).

Households are basic groups of people active as agents of practical knowledge influencing community formation. In application, the knowledge of in-ground house construction and the meaning of those houses is shared and practiced in the construction of housepits, and 'housepit communities,' within and between settlements. It is upon the recognition and maintenance or reproduction of a community, like that manifest in the social-spatial relations between households and their houses, that the economies of knowledge and culture are dependent.

Knowledge is not purely unconscious, structured in a fixed and deterministic way, mechanistic and without self-awareness as it is often portrayed by Structuralists, Structural Marxists, Functionalists, and Evolutionists (Foucault 1972; Sahlins 1976). Practical knowledge is a matter of self-reflection among those who are conscious of it and who pose "the questions of the conditions which make... knowledge possible" (Bourdieu 1977:4). Knowledge, thus, is not a representation of human experience; it is a combined product of human self-awareness, agency, and action. Among those conscious of how knowledge is produced, it becomes a tool in the negotiation of social relations and standing.

Relationships between individuals, action, and time all form essential ingredients of strategy in the mechanism of community formation. Individuals are agents of practical knowledge and action (Pauketat 2001). Action moves from 'agency' (conceptualized; conceptual knowledge; conceptual choice; ideational; imagined) to 'agents' (realized; actual knowledge; actual choice; practiced choice; manifest) by way of practice; particularly the control of practice. This relationship between control and practice is played out between individuals and a broader collective community as captured in the concept of habitus (Bourdieu 1977), discussed below. The 'reproductive' element of the economic cycle fosters another key element (also linked to habitus) – that of time. If knowledge accounts for structure, form, and behavior as manufactured and practiced through an economic process, time provides the medium within which knowledge is practiced and structure is replicated and restructured.

2.1.2 Time and Strategy

Time itself, as linked to knowledge, is manufactured in relation to the economic cycle. Archaeologists, for example, manipulate, manufacture, and reproduce concepts of time (Smith 1992). Through time, changes in such things as house form and location relative to other houses within and between settlements represent changes in the relations between individual households, their actions, and the production of knowledge. Such changes indicate an alteration in the strategy of relations between households by which knowledge is produced and manifest as symbolic capital within house structures and settlement layout. The appreciation of a

Bourdieuian sense of time affects how we understand the place of strategy in interaction and exchange. He states:

> ..everything takes place as if the agents' practice, and in particular, their manipulation of time, were organized exclusively with a view to concealing from themselves and from others the truth of their practice, which the anthropologist and his model bring to light simply by substituting the timeless model for a scheme which works itself out only in and through *time*… To abolish the interval is to abolish *strategy*…. Time derives its efficacy from the state of the structure of relations with which it comes into play; which does not imply that the model of that structure can leave it out of account… To restore to practice its practical truth, we must therefore reintroduce time into the theoretical representation of practice which, being temporally structured, is intrinsically defined by its *tempo*. …To substitute *strategy* for the *rule* is to reintroduce time, with its rhythm, its orientation, its irreversibility (Bourdieu 1977:6-9).

Thus, the concept of *tempo* is linked to practice as an emic and meaningful measure of time and economic practice. This definition contrasts with 'science' and anthropological models wherein 'time' is linked to 'rules' and is de-temporalized and divorced from practical reason; divorced from knowledge; divorced from a self-aware strategy. It can become lost in a processual view of the *longue durée* (see Ames 1991). The practical mode of knowledge is characterized by *strategic* implementation and realization, utilizing time as a tool. The economy of practical knowledge is marked by an intrinsic tempo of production, exchange, consumption, and reproduction. The strategy of the agent in this economy, e.g., the household, is linked to the tempo of exchange in practice. Tempo is a production linked to a strategy; a strategy linked to *purpose*. Controlling the tempo of change is comparable to controlling an essential 'rule of the game' (Bailey 1969). For what purpose, then, what 'game' supports an economy of knowledge and culture? The answer to this question links largely to competition for prestige achieved through contests of power.

2.1.3 Power and Habitus

Power is a factor of influence on the economy of knowledge and culture and is necessary in converting labour to wealth to prestige (Arnold 1993, 1996). Power influences the negotiation of authority and provides purpose and motivation to practice. Power is conceptualized within agency (e.g., the idea of a *sqémél*) and maintained by an agent (e.g., the household) and manifest through practice (e.g., materializing / building a *sqémél*). Power situates individuals among a collective as, for example, manifest in the construction and placement of a larger house by a more prestigious household relative to a lower status household within the same community (Matson 1996). Power is manifest as an influence on the economy of knowledge and culture actualized, through practice, as an accepted form of material culture among many alternate possibilities -- for example, as in the persistence and reproduction of square *sqémél* versus other possible shapes (e.g., circular). Power is manifest as influencing community formation -- in both intra- and inter-community relations -- in the spatial arrangement of houses within a settlement and the establishment of one settlement versus another near a 'powerful' place (e.g., resource patch; spiritually significant feature; junction of transportation and communication). The attributes of power must be commonly recognized. Power must be enacted in order to be recognized and made effective in shaping community organization. Houses provide a very effective medium for enacting power as physical manifestations and markers of social-spatial relations speaking to household status and power (Bourdieu 1973, 1994; Coupland 2006).

To have power, then, is to control the means of production in the economy of culture and knowledge. Culture, incorporating knowledge, becomes the means of production. Competition among the collective becomes the mode of production. From an investigative standpoint, economic interaction is an indicator -- with strong material correlates -- of elite /

non-elite relations recognized as a continuum (Blake and Clark 1999; Clark and Blake 1994). Elite / non-elite relations are tied to the definition of 'community' and measures hierarchical differentiation between individual actors (e.g., households) and collectives (e.g., settlements; local residential communities) defined through social-spatial distance (Miller 1989a; Miller 1999). Power binds knowledge, culture, and economy with individuals and collectives as the motivation for interaction. Relations of power between households are expressed in material form as social-spatial relations between houses, both within and between settlements (Pauketat 2000).

Thus 'political economy' is founded on a platform of economic process influencing knowledge, culture, and time, through strategy, exerted by powerful actors aiming to achieve prestige and honour. But, how is practice theory played out? What are the mechanism(s) of such interaction? What are the formative processes by which communities develop? A final and significant element of this theory is 'habitus.'

'Habitus' is, in short, the product of the mode of production and a fundamental element of intra-community relations. It is worthwhile quoting at some length some of Bourdieu's commentary on habitus. He states:

> … The homogeneity of the mode of production of habitus (i.e., of the material conditions of life, and of pedagogic action) produces a homogenization of dispositions and interests which, far from excluding competition, may in some cases engender it by inclining those who are the product of the same conditions of production to recognize and pursue the same goods, whose rarity may arise entirely from this competition. The domestic unit, a monopolistic group defined… by the exclusive appropriation of a determinate type of goods (land, names, etc.) is the locus of a competition for this capital, or rather, for control over this capital… (Bourdieu 1977:63).

He follows up this definition of habitus, and precedes others to follow, by stating:

> [it is necessary] to pass beyond the necessity of the realism of structure [methodological objectivism] by passing from *opus operatum* to *modus operandi* – from statistical regularity to the principle of the production of the observed order… to "construct a *theory of practice*, or, more precisely, the theory of the

> mode of generation of practices, which is the precondition for establishing an experimental science of the *dialectic of the internalization of externality and the externalization of the internality*, or, more simply, of incorporation of the objectification (Bourdieu 1977:72).

Here we see the interplay and negotiation of the dialectic relations defining the 'practical mode of knowledge.' He continues:

> The structures constitutive of a particular type of environment (e.g., the material conditions of existence characteristic of a class condition) produce *habitus*, systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles of the generation and structuring of practices and representations which can be objectively 'regulated' and 'regular' without in any way being the product of obedience to rules, objectively adapted to their goals without presupposing a conscious aiming at ends or an express mastery of the operations necessary to attain them and, being all this, collectively orchestrated without being the product of the orchestrating action of a conductor…. always tending to reproduce the objective structures of which they are a product, *they are determined by the past conditions of which have produced the principle of their production, that is, by the actual outcome of identical and interchangeable past practices, which coincide with their own outcome to the extent that the objective structures of which they are the product are prolonged in the structures within which they function* (ibid., emphasis added).

To paraphrase Bourdieu and others (Maton 2008), habitus refers to a way of acting and valuing things affected by a dynamic of (1) internal social structures, including the acquisition of knowledge and capital, and (2) external forces acting upon them. Habitus is perpetuated through time as tradition -- somewhere between fixed and fluid behavior. I emphasized a section of this quote that strongly relates to the idea of cultural tradition -- the 'folk' element of society. This "common sense world" (Bourdieu 1977:80) is fabricated but is practiced and reproduced in what ranges from conscious to unconscious practice between people of different social standing and place within the relations of power and authority.

The relationship between the individual, their capital and place in society, and external forces acting upon them is know as the 'field' (Bourdieu 1984; also see Elmendorf 1971). The field is a convergence; a 'central' realm where both influential and influenced forces meet and are negotiated as the practice of political-economy. The outcome of negotiations situates the actor(s) within community. Housepits, for example, represent an inseparable material and ideological capital that, as constructions of habitus and full of meaning (Bourdieu 1973), are factors of negotiation within the field.

That individuals strive to distinguish themselves from the collective through hierarchical position recognized as differences in power is another essential assumption of community formation. Powerful individuals or households -- elites -- establish this economy as both informing and as limited by habitus. Those with power influence this economy while mediating a tension between both practicing culture *and* generating habitus. Again, the attributes of power must be commonly accepted among the collective. Individual reckoning of those attributes does not constitute a collective culture. Those lacking power are relegated to greater degrees of practice and lesser degrees of influence serving to reinforce habitus. The benefits of power are linked to prestige and honor.

Gramsci's *transcendent* "man-in-the-mass" (Gramsci 1971; Roseberry 1989:46) -- the one who 'knows thyself' (i.e., linked to knowledge) and transcends the collective 'folk' -- moves into the position of negotiating 'community' and affecting history. History relates, in this sense, to Wolf's **(**1982) world of interconnectedness. The transcendent individual -- as powerful, wealthy, and of elite status -- is linked to the community through kinship relations that form the means and relations of production in the 'natural' or 'pre-hegemonic' political economy (Blake and Clark 1999; Clark and Blake 1994; Meillassoux 1981). Individual-and-collective relations, as linked by Roseberry to community, are also linked to historical process(es) that interrelate locally, regionally, and perhaps more broadly -- as within and between households; within and between settlements; and within and between watersheds throughout the cultural landscape of *S'ólh Téméxw* (the Stó:lō world of the lower Fraser River Watershed).

The level of consciousness within which culture is practiced depends upon political position and provides a means of accessing and manipulating power relations through networks of inter- and intra-settlement relations on numerous scales. The level of political interaction escalates with the intensification of production, in Sahlins's terms (1972), corresponding with the shift between household to corporate and network modes of relations (Crumley 1987, 2001; Feinman 2000). Variation in the attributes of housepits and housepit settlements are attributed to differences of social standing between households, within and between local residential communities. From a broad view, these variations provide a basis for describing social arrangements as corporate or network modes of relations, and issues of political interaction.

> It is natural that politics should be the privileged arena for the dialectic of the official and the useful: in their efforts to draw the group's delegation upon themselves and withdraw it from their rivals, the agents in competition for political power are limited to ritual strategies and strategic rituals, products of the collectivizing of private interests and the symbolic appropriation of official interests (Bourdieu 1977:40-41).

Power, political status, and wealth are linked as aspects of habitus differentiating households (or settlements) collectively recognized as elites from that range of households (or settlements) otherwise lacking such recognition. "Wealthy people work to reproduce relations [interested in acquiring honor and symbolic capital -- tied to material economic exchange]; poor people settle for the ordinary practical [marriage] relations available to them" (Bourdieu 1977:40). Miller (2007) recognizes these differences in Coast Salish society distinguishing *sí:yá:m* (wealthy, respected leaders with unblemished ancestry, extra-human support, and extra-village relations) from the 'rank and file.'[3] "People affiliate with the idiom of kinship strategically based on calculations of social distance to the *siyá:m* and the resources they control and distribute" (Miller, personal communication, 2008). The 'tool-kit' and options of relations

[3] *The halq'eméylem* term *sí:yá:m* (i.e., leaders) is the plural form of *siyá:m* (i.e., leader). Both forms of this term are used throughout this dissertation.

between *sí:yá:m* and those lacking such status is certain to vary, affecting strategy for maintaining, attaining, or closing the social-spatial distance to '*siyá:m*' as a central and significant idiom defining Coast Salish community.

From an archaeological view, the association of housepits with measurements of household status is expected to manifest in differences in size, shape, and location within and between settlements. Social-spatial relationships between houses act as expressions and indicators of various levels of political economic standing, including 'eliteness.' Within Coast Salish society, for instance, the construction of larger houses is not simply an outcome or expression of material economic success based on controlling access to labor and resources (Ames 1995). Rather large houses are important products of an active and consciously controlled knowledge production system and used as part of a strategy for acquiring prestige, accessing material resources, and gaining control over labor (Coupland 2006; Hayden 1994; Matson 1996). Recognizing, influencing, and navigating the political-economic landscape are critical to success. These measures differentiate households and settlements of higher or lower prestige, greater or lesser wealth, and more or less power and influence within the community. Meaning is thus produced and attached to houses whose traces manifest today in the form of depressions on the landscape.

Those of elite status work to manufacture and reproduce habitus, while those on the lower scale of 'rank and file' carry on the practice of habitus as tradition; tradition being the common bond between them maintaining their connection within 'community.' Elites work to establish forms of symbolic capital in things such as house architecture and placement that convey meaning which sets them apart from the rest of the group, as documented ethnographically among the Coast Salish (Barnett 1938, 1955; Haeberlin and Gunther 1938). This system of production is dynamic and affected by relations with others of the same elite class as well as those of lower classes. Elites and those of lower standing alike have agency to affect and change things either directly as *sí:yá:m* (recognized leaders) of powerful and dominant constituencies (kin- and extra-kin network) or otherwise as leaders of resistance groups vying for power. Symbolic capital must be recognizable among elites as representing elite status, serving to distinguish them from others of lesser standing. It must simultaneously be acceptable to, supported by, and reproduced by the other members of their communities from whom elites attempt to distinguish themselves. The symbolic capital of elites must therefore appeal in some way to the 'rank and file' or otherwise risk exposure, resistance, and rejection (Miller 2007). Elites hold political power and to some degree *modus operandi* (i.e., generative principles); non-elites, as those practicing *opus operatum* (i.e., objective structure), don't. Thus, "each agent, wittingly or unwittingly… is a producer and reproducer of objective meaning" (Bourdieu 1977:79).

> In short, the habitus, the product of history, produces individual and collective practices, and hence history, in accordance with the schemes engendered in history. The system of dispositions – a past which survives in the present and tends to perpetuate itself into the future by making itself present in practices structured according to its principles, an internal law relaying the continuous exercise of the law of external necessities – is the principle of the continuity and regularity which objectivism discerns in the social world without being able to give them a rational basis (Bourdieu 1977:82).

Lastly,

> The habitus is the product of the work of inculcation and appropriation necessary in order for those products of collective history, the objective structures (e.g. language, economy, etc.) to succeed in reproducing themselves more or less completely, in the form of durable dispositions, in the organisms (which one can, if one wishes, call individuals) lastingly subjected to the same conditions, and hence placed in the same material conditions of existence (Bourdieu 1977:85).

Habitus, thus defined, is an important concept with powerful application to archaeology, bringing forward explicit definitions of relations between tradition and continuity; innovation and change; collective unconscious and individual free-will; symbolic meaning and material economy; cognition and social structure; action and identity; culture and hegemony; and interaction and community organization. All of these relationships are expressed and objectified as material culture, integrated into identity formation, and played out in the relations of material phenomena through time and across space.

2.1.4 Tradition and Competition

Tradition -- including values and social norms of meaning and behavior -- is set by the dominant power mediating and affecting the relationship between elements of the community, produced and reproduced through time. Roseberry (1989:45) states that,

> differential power is critical in the determination of control over the means of cultural production, the means for the selection and presentation of tradition. But what makes hegemony cultural and not simply ideology is that it appears to connect with the experience and understanding of those people who do not produce it, people who lack access, or have sharply diminished access, to wealth and power….tradition can emerge despite the fact of differentiation.

Roseberry, as with Bourdieu, integrates the dialectic of Weber's social action, social actors, and webs of relations with Durkheim's organic social values and norms (i.e., collective unconscious), and establishes Marx's economy as the mechanism by which this dialectical tension is played out. This integration communicates across divides resulting from attachment to one or the other of these theoretical perspectives and serves to mediate these oppositional tensions in the negotiation of a political economy. It is this historical aspect of political economy, and practice theory, that is significant in --

> its attempt to understand the emergence of particular peoples at the conjunction of local and global histories, to place local populations in the larger currents of world history… Historical political economy does not simply assert that particular societies are part of world history. It also asserts that the attempt to draw rigid boundaries around, say, the South, or Navajo.. is to reify culture. Because populations are not formed in isolation, their connections with other

> populations and, perhaps, with the larger currents of world history, require attention. To ignore these connections is to treat societies and cultures like ‘billiard balls,” in Eric Wolf’s telling words (Wolf 1982:6)… (Roseberry1989:50-51).

Returning to the relations between the individual and society requires combining a number of the concepts discussed so far, addressing the ‘natural economy’ and its links to community. The term ‘natural economy’ describes ‘pre-capitalist economy’ (Roseberry 1989:201), something akin to Sahlins’s (1972) household mode of production, as based not on supply and demand (i.e., market forces) but rather on a form of ‘traditional culture.’ Forces of traditional culture emphasize values and traditions in the derivation of social standing and relations, within and between households for example, affecting community formation (Roseberry 1989:199-200; as derived from the works of E.P. Thompson). Culture, values, and tradition develop within the “experience of community.. [of which it is noted that].. in Thompson’s early work, a cultural feeling of community was seen to rest in the actual experience of community-based social relations..[associated with].. traditional rights and customs” (ibid; notes added).

I reject the notion of ‘natural economy’ as a factor of tradition and community formation, supplanting it, rather, with political economy involving class consciousness, competition and habitus. The ‘natural economy’ concept is problematic in its organic nature and lack of explicit discussion of social action in the formulation of community values and traditions that shape ‘class’ consciousness. The ‘natural community’ remains organic, unproblematic, cohesive, homogenous, and bounded (i.e., non-individualistic). Just what constitutes the internal dynamics of community remains unclear. Understanding community requires addressing this ‘problem of tradition.’ I approach this by contextualizing the idea of a ‘natural’ community with one that manifests its negotiation of power in practice as a ‘practiced community' -- as a community linked, at least in part, to conscious competition for prestige, authority and power. Contrary to their organic idleness within the 'natural economy,' the 'folk' community is differentiated from the powerful community in the extent of their consciousness of and inclusion in relations of power, perhaps even forming diasporic fringe communities of their own.

Roseberry addresses this dynamic in re-evaluating Thompson's work by introducing Benedict Anderson's "imagined community" (Anderson 1983). 'Community' in Anderson's scheme is "imagined because the members of even the smallest nation will never know most of their fellow-members.." (Roseberry 1989:226). 'Community' is presented as an unbounded collective of individual relations surpassing 'face-to-face contact,' as Anderson notes "all communities larger than primordial villages of face-to-face contact (and perhaps even these) are imagined. Communities are to be distinguished, not by their falsity / genuineness, but by the style in which they are imagined" (Anderson 1983:15). Communities are then imagined by whom? Constructed by whom?

> As we look as specific histories, we see that political communities are not formed around images of "the state" itself but around particular social and cultural oppositions that create a group or community feeling among heterogeneous folk (Roseberry 1989:226).

The creation of community is situated in the realm of social action and negotiation among 'heterogeneous folk,' among agency-bearing individuals subject as 'folk' to 'that which came before.' Community is the manifestation of interaction between differentially equipped and positioned individuals acting within the context of the 'traditional' past and strategizing for the future. As Roseberry states,

> Central to our analysis of counter-hegemonic communities [natural economies], then, should be an examination of the cultural forms and symbols around which alternative images of community can be built, and an exploration of the organizational or institutional forms through which such images can be

> given political expression… ..one should not isolate cultural form or content from political process… …[to] see the politics in culture (Roseberry 1989:228-232; notes added).

The production of knowledge that becomes accepted and repetitively practiced over the long term as tradition signifies a successful strategy among elite relations. This otherwise signifies a persistent cap on the manifestation of new forms of social relations engendered by the broader collective. Differences in relations, either elite or egalitarian, are known to manifest in the variation and positioning of households and houses representing corporate or network-based communities (Canuto and Yeager 2000).

Households, as basic actors, strategize to distinguish themselves by generating and utilizing symbolic capital such as houses (Coupland 2006; Hodder 1982; Marshall 1989, 2006). Community identity, subsuming those individuals who identify with the community in ways that are 'stylistic' and 'imagined,' is tangibly defined through attachment to and control of symbolic capital. Human history speaks of the inter-actions between core and periphery (Wallerstein 1974, 1979; Wolf 1982) -- core and peripheral power; core and peripheral identity; core and peripheral relations set against a natural backdrop appreciated in the form of culture. Competition -- for power, prestige, and authority -- is a basic political-economic mechanism at work in the erosion of a domestic mode of production and the development of social-spatial relations centered around elite households (Hayden 1995). Community formation, then, is significantly influenced through household competition for prestige within a political economy.

2.1.5 Interrelationships and Transformation

The powerful principles of 'interrelationship' (Geertz 1973) and 'transformation' provide keys concepts in the formation of community. These concepts serve to reconcile differences between extremist positions on material economy and symbolic meaning, dichotomies of science versus history, Marxism/materialism and practical reason versus culture, and political economy versus symbolic anthropology (Roseberry 1989:32). As implicit in the term 'political economy,' Roseberry joins with Bourdieu in focusing on the realm and understanding of economy as a central part of this mediation process that is possible "if we reject the analogous positioning of the pairs" (ibid.). The mediation of pairs, or oppositional dualities, is a universal theme implicit in the reckoning of community formation and relations of power within a landscape of social-spatial relations. Transformation is a factor of mediating two opposing and competing forces resulting in a single outcome. Power is a factor of this transformative process. This transformative and integrative 'economic' process is inherent in the formation of communities.

Community is generated within the realm of socially situated productive processes requiring two essential ingredients -- the "presence of social and cultural differentiation. Reference to differentiation is, in part, reference to the connections between culture and relations of power and domination" (Geertz 1989:25); and "a concept of culture as material social process" (ibid.). Roseberry champions this culture concept, arguing for its extraction from the epiphenomenal realm of the 'vulgar' materialists and Marxists. He states that "the point is an intersection of the concerns of political economy and symbolic anthropology, an intersection that is based on an emphasis on meaningful action and recognizes that action is shaped by the meanings people take to their action even as meanings are shaped by people's activities" (Roseberry 1989:32). The effect of this 'intersection' is the movement of production of community toward and ultimately beyond Geertz's recognition of cultural meaning "as socially constituted and socially constituting" (Roseberry 1989:20). It moves culture into the realm of production itself, social production linked to people and individuals rather than process; rather than material determinism. These processes generate a material expression and enactment in the construction of houses, for example, and other forms of material culture. These two aspects of culture are integral to the definition and placement of culture within the 'productive machine' of community relations and the negotiation of power and authority. "Cultural creation is itself a form of material production, that the abstract distinction between material base and ideal superstructure dissolves in the face of a material social process through which both "material" and "ideal" are constantly created and recreated" (Roseberry 1989:26).

Roseberry's reading of Marx (Marx and Engels 1846; Marx 1867) also implies this positioning of culture within the productive apparatus of the economy. Roseberry finds these original sources, and others (e.g., Taylor and Rebel 1981) supportive of his definition of culture as both product and production; socially constituted and socially constituting; negotiated through political means and tied to the (trans)formation of social class, social domination, and hegemony. Culture cannot be separated from what people say, do, or have done to them. Culture is defined through action.

Culture, then, as something practiced and not simply something produced is embodied in history (Pauketat 2001). History becomes a construction of social action representing the political economy of culture, not simply a process… an outcome of material economy separate from culture. Again, these thoughts echo those of Bourdieu and incorporate the same dialectic relationship between 'objective and subjective' in the co-mingling of relations of culture (e.g., houses) and power (e.g., control of knowledge) defining community.

Nature is 'activated' as something constructed and something practiced, conscious to some, unconscious to others dependent upon relative social position.

> "Marx himself stressed that the interaction between humans and nature in the production process *transformed* nature. The whole understanding of the human/nature relationship to which the concept of productive forces refers is more active, with humans as the subject of a process by which they transform nature and, in the process, transform themselves" (Roseberry 1989:157; see Marx and Engels 1970 [1846]:62-63; Marx 1964 [1844]:177-193).

Nature is no longer conceived of as passive, objective, or apart from culture. Among the Stó:lō, the landscape is transformational (McHalsie et al 2001). It is achieved as a result of interactions between powerful people and inhabited by powerful beings. The built landscape of the Stó:lō world is further achieved and transformed by the houses marking their past community relationships and their past negotiation and integration of culture and nature.[4]

As documented ethnographically in Stó:lō-Coast Salish society, power relations are negotiated and expressed within a realm of social-spatial forms and relationships (Bierwert 1989; Miller 1999). These are expressed as mediations between oppositional forces including, for example, the arrangement of household groups at gatherings or houses within a settlement layout -- between large and small, front position and back, center position and side, parallel or perpendicular orientations… at local and more widely regional scales of relations (Bierwirt 1989). A core element of this study is to examine housepit patterning within and between settlements for patterning across horizontal and vertical planes of relations, as an indication of community structure.

I view the formation of community as an interconnected formula of knowledge and communication, time, strategy, power, and habitus constituting elements of a political-economic process. That the built landscape of Stó:lō-Coast Salish community relations is partly manifest in the construction of housepit settlements is a core assumption, and orientation of exploration, of this archaeological study. Central to the theoretical underpinning of this study is a flow of logic connecting community, authority, and archaeological housepit features. Community manifests and creates physical patterns through a dynamic economic process of production (e.g., building houses), distribution (e.g., relations between houses / settlement layout /

[4] The remains of both plank houses and pithouses constitute the built landscape of the Stó:lō. I focus on the physical remains of housepits in this study (see Chapter I for a discussion of the relationship between pithouses and plank houses).

settlement patterning), ‘consumption’ (i.e., inhabitation), and reproduction (e.g., maintenance of houses and patterning of housing within and between settlements throughout the region). Community is enacted and physically manifest, in this case, as variation within and between houses and settlements. House and settlement social-spatial patterns are integrally related with the geo-political landscape in which they are established; that they, in fact, worked to establish. The relations of settlement production are driven by agents of a community whose politics, values, knowledge, and culture are embedded and materialized by and between the basic socio-political elements of those settlements -- households. Incorporating this perspective on the production of community is central to the development of an integrated community-settlement archaeology addressing issues of political economy and communities formed around relations of authority.

2.2 Integrating Community and Settlement Archaeology

Developing an integrated ‘community-settlement archaeology’ builds on long-standing definitions of settlement archaeology and addresses the need for integrating social theory and archaeological perspectives on settlement patterns incorporating ‘community’ as discussed above. Bruce Trigger (1967) defined settlement archaeology as including three basic levels of analysis including: (1) the *individual structure* regarding the structuring of the family, residential units, class divisions, and occupational specialization within a community; (2) the *settlement* including information concerning social relationships; the location and nature of buildings indicating something about government, religious, economic, and other social institutions/structures in the community; and (3) *settlement distributions* including spatial relationships between communities, still treated as embodied in separate sites, revealing ecological and political arrangements. Trigger’s three basic levels of analysis directly inform my use of housepits as a basic unit of analysis (i.e., individual structure) as well as my basic analytic framework. My attempt at integrating these perspectives recognizing issues of power and contextualizing settlement patterning within a context of built, cultural landscape of interconnected places (Cannon 2002; Mackie 2002).

Combining social theory on the formation of communities with settlement archaeology forms an integrated approach to the study of settlement patterning and community formation in archaeology. Community-settlement archaeology provides an interpretive framework linking measurable housepit attributes (e.g., dimensions, shapes, age, and locations) forming spatial arrangements within and between settlements with relations of power and authority influencing community organization.

I maintain a fundamental outlook in this interpretive process -- that indigenous reasoning anchored in the construction of houses and expressed in their various forms and locations remains embedded in these features of the built landscape. The political economy of remnant houses -- surviving as archaeological housepits -- remains active and continues now, as before, to transmit, convey, and play out the reasoning and reckoning of authority and power of an ancestral community. As these housepits have persisted through time so too have the thought processes of the people who built them. Those thoughts and decision-making processes are embedded in the physical forms of and relationships between these features. Housepits, as reasoned features and forms of practical knowledge, embody a set of total cultural relations integrating society, politics, economics, religion, and environment as elements of a built cultural landscape.

The position of housepits and settlements within any political economic system is likely to ebb and flow through the rising and falling in power of households and large collectives. Power may be negotiated in new ways and re-situated in new locations, away from the places where households previously built their homes and attached to land and resources in the past. Such shifts may incorporate an enduring connection to these places within a broader context of reckoning relations within and to a cultural landscape. Such shift may be caused by any number of reasons including shifts in the location of important resources in the environment and technological adaptations which provide different access to and uses of resources. Changing social relations and the development of new networks providing control over labor and/or links to more distant resources are equally significant causes of change. These shifts, whether environmentally, technologically, or socially motivated, come as part of incorporating change into the production of knowledge and reckoning of relations and meaning between people, places, and things expressed as material culture. Tracking the changes in the relations of housepits through time requires measuring and describing differences in housepit form and location at multiple levels of analysis coincident with definition of settlement archaeology (Trigger 1967).

Changes in the physical dimension of housepits and their arrangements within and between settlements represent patterns affected by political economic influences. Political economic factors can be described on two basic levels of horizontal and vertical planes relations. These planes are useful in describing the degree of social stratification within society representing heterarchical or hierarchical forms of social organization; and the extent of spatial relations between settlements representing corporate or network modes of relations (Feinman 2000), discussed in more detail below. Changes in these two basic forms of relations are affected by the political economic processes described below and can be traced out within a framework of changing community formation. Describing these changes over the long-term leads to a framework for investigating changes in the formation of Stó:lō-Coast Salish ‘housepit’ communities.

2.3 Examining Current Relations between Community and Settlement Archaeology

The relationship between community and settlement archaeology hinges on Bruce Trigger's (1967:158) recognition of the need to address social relations. This position still holds currency as a cornerstone of settlement archaeology and provides a basis from which archaeologists have approached its modernization over the last 40 years. This aspect of settlement archaeology connects with the more recent outgrowth of what has been called 'community archaeology' (e.g., Marcus 2000). The addition of social theory augments the interpretive framework of settlement archaeology which was largely methodological in its definition.

Community archaeology incorporates elements of interaction theory and interaction studies. Schortman and Urban (1992) define interaction studies as "research founded on the notion that individual societies, or 'cultures,' are not viable but depend on inputs from other societies for survival and reproduction from generation to generation" (Schortman and Urban 1992a:3). Interaction studies are complementary, rather than adversarial, to culture ecology and processual studies. The ultimate goal of interaction research has been identified as writing "total histories of ancient societies, histories which place local developments within the rich network of connections any one society maintained" (Schortman and Urban 1992b:248). Embracing elements of feminist archaeology and post-processual theory attributing agency to individual actors, the *basic unit of analysis* in interaction studies equates to "a dynamic network of inter-actors whose transactions link their respective polities and affect sociopolitical developments within these units" (ibid:238). A central question arising from this point of view, then, is what scale of interaction is most critical in defining a community?

Recent practice among archaeologists dealing with 'community' addresses the relationship between interaction and scale in different ways. Kolb and Snead (1997) treat community as a "fundamental unit of human society" (Kolb and Snead 1997:609) located *socially* between the family and their extensive social networks, and *archaeologically* between the site and region. Their view of community is quite different from Johnson's (1982) 'sequential or simultaneous hierarchies,' Service's (1962) 'tribes,' or Johnson and Earle's (1987) 'local groups.' Kolb and Snead (1997:611) consider community to be "a minimal, spatially defined locus of human activity that incorporates social reproduction, subsistence production, and self-identification." They derive their definition from Hollingshead's (1948:145) earlier view of 'community' "1. as a form of group solidarity, cohesion, and action around common and diverse interests; 2. as a geographic area with spatial limits; or 3. a socio-geographic structure which combines the ideas embodied in 1. and 2."

Asserting that the blending of regional and local level archaeological investigation creates "fuzzy pictures," Kolb and Snead (1997:612) develop a methodological program of "microregional analysis" incorporating three analytic strategies examining differential labour investment (family, festive, corvée), spatial relations between community elements (houses, etc.), and boundary maintenance (physical, stylistic markers). This approach is intended to enhance the "operational ability of archaeologists to examine local and medium-scale social organization, better meshing the dimensions of system and time with the dimensions of space and ecology" (Kolb and Snead 1997:622). Kolb and Snead's attempt to balance social-spatial and material-ecological relationships provides a middle-ground between processual and post-processual theory and practice. Their 'local' approach, however, remains limited in its emphasis on a 'small world' apart from broader, regional collectives and extensive community networks (e.g., Steponaitis 1978).

I maintain the household as the basic building block of community, located socially, economically, and politically between the family and their extensive networks, and *archaeologically* between the feature and region. Housepit features, in this case, correlate with households that may include extended or multiple families. I do not incorporate the rather severe limits Kolb and Snead place on the extent of those networks potentially stemming from micro-regional types of relations. The self-reflexive socially reproductive aspects of their work provide a lead into Practice Theory as incorporated by Yeager and Canuto (2000).

Yeager and Canuto's (2000) *Interactive-Practice* based approach to the 'archaeology of community' rejects Murdock's functionalist notion that the *site* equating to *community*. They counter a view inherent in most processual studies of settlement patterns maintaining the site as the basic social unit. Their definition of *community* is founded on "the conjunction of people, place, and premise… an ever-emergent social institution that generates and is generated by supra-household interactions that are structured and synchronized by a set of places within a particular timespan" (Yeager and Canuto 2000:5). A community is "not a spatial cluster of material remains to be observed, but rather a social process to be inferred" (ibid.). Community, for them, is the outcome of social action of which interaction is a central tenant.

I do not entirely agree with the premise of 'practice' as understood and utilized by Yeager and Canuto. Archaeologically, community is represented by social-spatial and temporally clustered material remains. Within these arrangements one can observe the socio-political processes by which they were formed. Community, as the conjunction of people, place, and premise is completely understood with the inclusion of 'things' as in resources and material goods. Communities at all levels have a powerful need to materialize themselves for a number of reasons, from warding off the prospect of an abstract, ambiguous, and ever-changing existence to self-identification and self-actualization in relation to an 'other.' This need involves the competition over and negotiation of status and authority as part of their actualization and organizational form. The perpetuation and survival of a community is, in part, connected to the production and reproduction of a recognizable material manifestation over time. Housepits are 'things' of community built by households affected by social, economic, and political processes. From a Stó:lō-Coast Salish point of view it is also necessary to include religion or spiritual forces. Meaning is anchored and expressed in things (Cohen 1985; Delanty 2003). These are essential parts of community that permit archaeological investigation.

Peterson and Drennan (2005:6) focus on "patterns of intensity across space" with interaction coming into focus "at different scales to reveal different structures that exist simultaneously in a given region." They accuse Yeager and Canuto of being too ideational, lacking grounding in the 'reality' of influences of the environment and the substance of direct face-to-face contact and daily interactions. They focus more on the level of daily face-to-face interactions as the significant substance of community. I support Peterson's and Drennan's argument only in so far as they identify a lack of balance between the ideational and material composition of community, pointing to a divide between settlement and community archaeology that I address in this study. They neglect the power inherent within the relationship between an imagined community and a material realm.

The notion that *people* -- versus more organically structured *societies* -- are the basic agents of interaction situates this form of analysis squarely within realm of social theory as applied to regional analysis. Primary social factions motivating involvement in interactive relations are *elites*. Elites are those powerful individuals dominating political-economic networks of interaction, controlling labour and the relations of production, and most actively involved in defining societal *habitus*. The influence of elites is discussed at great length by archaeologists focusing on the development of complex social organization among intermediate-level societies (e.g., Arnold 1996a; Clark and Blake 1994; Hayden 1995).

Modeling interaction among elites within a community requires considering the possibility that elites engaged in the daily, day-to-day interactions of local village life and (or perhaps even moreso) maintained more extensive relations between settlements with households of equally high status. Thus, powerful households maintain an elite stratum of community described by a broad social-spatial scope and potentially limited daily interaction with lower-status families living in the same settlements. Elite households can be both locally and regionally engaged, and influential in the establishment and maintenance of a multiplicity of community strata operating simultaneously. This view of community fundamentally differs from those described above by recognizing multiple layers of community, stratified by wealth and status, operating simultaneously in different scales of interaction -- differentiated and sorted by access to power. Blake and Clark (1999) argue that this is one of the ways that elites can overcome the egalitarian-maintaining processes in tribal societies.

Relations between households operating within a domestic mode of production and having minimal social stratification are the most localized expressions of community (Sahlins 1972). Feinman (2000) describes this expression of community relations as a form of corporate organization exhibiting a limited range of horizontal relations with others and a 'flattened' vertical scale of internal social differentiation. This form of organization may not change but may be added to as upper echelons of those with elite status and having broader networks emerge from this basic form of community organization. Sahlins (1972) connects this process with the intensification of production moving away from the domestic or household mode of production. Alternately, more localized levels of community operate within a domestic mode of production as an under-class of households within a broader landscape of social stratification. Such households exist as an element of a wider-ranging, nested hierarchy of relations dominated by networks of elite or upper class households simultaneously operating beyond the limits of household production.

The process of removing the cap from or operating outside a domestic mode of production leads toward the development of what Feinman (2000) calls a network strategy and form of socio-economic/political organization. Network relations are associated with relations over a broad horizontal plane and a more stratified social structure on an expanded vertical scale. Thus, multiple elements and levels of communities may arise and simultaneously function in an integrated way as differentiated by access to power, prestige, and authority.

2.4 Stratification and Corporate-Network Relations: A Framework for Investigating the Evolution of Housepit Communities

A foundation of my interpretive framework is the relationship between housepit and/or settlement size and socio-economic and socio-political status, and thus power. As is commonly acknowledged in Northwest Coast household studies (Ames 1995; Coupland 1996; Matson 1996), larger houses (therefore larger housepits) represent households of higher social status[5]. This assertion is supported by the oral history and ethnographic records of Stó:lō-Coast Salish household relations (Barnett 1938, 1955; Bierwert 1986; Haeberlin and Gunther 1938; Smith 1940; Snyder 1964; Miller 1999). The application of practice theory and political economy equates households, and therefore the house in which they occupied, with a central place in the production of knowledge, relations of authority and power, and development of Stó:lō-Coast Salish community.

[5] I recognize that large houses are not a necessity of complex social organization and that other forms of relationships beyond those expressed in house or settlement size may support the development of complex social systems, such as among the Chumash who operated out of small households (Arnold 2004:173). I also recognize that this association is not universal. Support for this association among the Stó:lō-Coast Salish, however, comes from the ethnographic and archaeological information drawn from the previous chapter.

My interpretive framework is influenced by Arnold's (2004:173) statement about understanding the evolution of community organization where "by tracking emergent hierarchical organization alongside [a] corporate network dimension, we may begin to understand the evolution of pithouse communities." This framework describes community formation relationally along two axes and continuums of measurement defining (1) heterarchical-to-hierarchical structures (Crumley 1987; 2001), and (2) corporate-to-network socio-economic strategies (Feinman 1995, 2000; Feinman et al. 2000). Addressing power, political action, and practice, Feinman (2000) adds the 'orthogonal' dimension of the 'corporate-network' continuum to the prior monolithic 'egalitarian-stratified' view of social organization (Fried 1967; Service 1962, 1971; Flannery 1972; see Haas 2001). He challenges the view that "political complexity can be equated generally with (or measured by) marked centralization or rampant self-aggrandizement or individualism" (Feinman 2000:31). I recognize this view, among the Coast Salish, as the emergence of complex community relations within a collective, rather than individualistic, society.

Corporate and Network strategies tend to be opposed modes "at the polar ends of a more continuous dimension that can be conceptualized as orthogonal to (or cross-cutting) the familiar axis of hierarchical complexity" (Feinman 2000:32). Corporate-mode relations and access to power are less individualized, more apt to be shared, and often a product of group membership. Network-mode power can also be group-oriented. This mode of power assumes elements of the traditional model that "hierarchical complexity, greater wealth stratification, and the increasing centralization of power always co-occur" (Feinman 2000:31). The concept of 'network' opens the possibility, however, that this co-occurrence can be manifest at a broader, more collective level rather than in a more individualistic sense, as personified by accumulators (Hayden 1990), aggrandizers (Clark and Blake 1994), and entrepreneurial elites (Hayden 1995). Network mode power, too, acknowledges that the formation of hierarchical complexity (i.e., expressed as centrality in social arrangements) can be spread out across a wider plane of horizontal relations. "If centralization is defined as the greater consolidation of wealth and political power in the hands of a single individual or ruler, then larger, more hierarchical polities are not always more centralized" Feinman argues (2000:31). The two axes of measurement described by Arnold are required to assess this suggestion. A basic rationale for developing this framework is to force archaeologists to focus on power and the different ways it is achieved, while providing a framework for the comparative examination of political action.

Emergent corporate or network forms of interaction are expressed on a horizontal plane of relations represented by social-spatial relations between households at two levels -- within settlements and between settlements. Differences between households may not be evenly distributed between the co-existent settlements of the region. Measures of variability may be consistent or otherwise vary between settlements, indicating heterarchical or hierarchical relationships that extend beyond the settlement-specific level. Exploring the horizontal plane of relations requires describing variability in the spatial arrangement of housepits of different sizes across at least two levels analysis.

Defining corporate or network modes of relations between households requires looking at the entire system of horizontal and vertical relations, manifest in the three levels of analysis described in Trigger's (1967) definition of settlement archaeology. Horizontal and vertical planes of relations are not independent of one another but represent an interconnected system. I visualize this relationship as the two axes joined together with the vertical axis centrally anchored on a horizontal plane. The relationship between heterarchy and hierarchy on the vertical plane and corporate or network relations on the horizontal plane is associated with two things: the height and angle or tilt of the vertical axis; and the spread of the horizontal plane.

A corporate organizational model, for example, includes a perfectly upright or straight vertical axis of social relations. No matter how hierarchically differentiated, corporately organized communities can be thought of as constituting a 'self-contained' set of social-spatial relations represented as series of expanding concentric rings (i.e., social strata) contained by an outer ring. The level of hierarchical authority diminishes and becomes more heterarchically arranged with the flattening of the vertical axis and reduction of variation between households. This corporate arrangement constitutes a normally-shaped community demographic replicated across the landscape. This type of formation is only one of many possible manifestations of community organization, one that would indicate a heterarchical foundation of hierarchical authority (Crumley 1987, 2001).

Expanding this system into a more complex system of community relations -- associated with a hierarchically arranged, network mode of relations -- is slightly more difficult to describe. Such models require conceptually tilting the vertical axis. Tilting the vertical axis expands the range of relationships across a broader horizontal plane. The relationship between the height of the vertical axis and its degree of tilt describes stratification as socially and spatially differentiated sets of community relations. The greater the tilt of the vertical axis and the wider the horizontal plane of relations, the greater the degree of hierarchically arranged network-type relations. This is particularly so when matched with high order stratification and more hierarchical forms of social order -- expressed as pronounced inter-settlement variation among households within and between settlements. Taken to an extreme, some settlements -- particularly those between the extreme upper or lower echelons of society -- may become so disassociated or off-set from each other that they, in essence, form a sub-set of 'communities within communities.' This network societal form constitutes a non-normal shape in statistical terms whereas the shape of the previous (corporate) model, with a straight vertical axes, is far more normal or 'circular' (i.e., normal) in its demographic patterning.

This interpretive framework bridges mathematical and socio-political languages. The measurement and comparison of housepit dimensions and locations captures community relations and translates them into the quantitative terms using mathematical language. These data are essential in investigating horizontal and vertical planes of relations. Meaning is derived through the process of translating quantitatively-based patterns describing housepits and their groupings into political economic terms describing patterns of social organization and change. Changes in housepit and settlement attributes described in mathematical terms reveal changes in Stó:lō households and communities over the nearly 3,000 years reviewed in this study.

CHAPTER III - DATA COLLECTION: MAPPING AND TESTING HOUSEPIT SETTLEMENTS

Neither a regional settlement pattern (i.e., top-down) approach nor a household (i.e., bottom-up) approach are sufficient, on their own, in undertaking an archaeological investigation of community organization. A community exists both emically as "a network of interactions among families, residential wards, real and fictive kinsmen… [down to the earth and resources themselves]" and etically or archaeologically as "a cluster of artifacts and ruined structures that exists in space" (Marcus 2000:239). The term *region* has at least two meanings as "a mental concept on the part of its inhabitants… [and]… a reality that exists in space" (Marcus 2000:238**;** also see Kantner 2008; Tabor 2004). Investigating households and villages is a good start, but "ahead lies the difficult task of developing methods to recover the units defined by indigenous societies. It is a task that must inevitably unite excavators and settlement pattern archaeologists with ethnohistorians and ethnologists" (Marcus 2000:240), not to mention geographers, geologists, linguists, and indigenous oral historians. I address this task by examining three basic variables of housepit form (size, shape), location, and age across three levels of analysis spanning 'the housepit' and 'the region.' I apply this process in connecting archaeological data and ethnographic models regarding Stó:lō-Coast Salish community organization and change through time.

A number of intermediate questions link my broader objectives concerning Stó:lō-Coast Salish community formation with the study of archaeological housepits and settlements. These questions include: Where are housepits located throughout the landscape? Is there patterning evident in housepit settlement locations, particularly when examined within a framework of travel routes and avenues of communication? What is the range of housepit sizes and has this changed over time? What is the range of housepit shapes -- circular, square, rectangular, or oval -- how has that changed through time? How are housepits spatially arranged within settlements, considering differences in size and form? Does settlement composition -- layout and arrangement -- change through time? What is the range of settlement sizes and how have those dimensions changed through time? Are there quantitative patterns in housepit and settlement data -- location and form -- when viewed through time?

A lack of fundamental information made previous attempts at answering such basic questions about housepit form and size untenable. Addressing these questions required collecting new data describing the location, form, and age of housepits, as a basic unit of analysis. Archaeological information on above-ground houses (i.e., plankhouses) is far more limited than for in-ground houses. While this study provides new information on plankhouse features and includes them in the discussion of settlement patterns (see Chapters VII and IX), their limited archaeological visibility and the available information about them effectively excluded them from consideration in developing the basic framework of this study.

While incorporating housepit data from a broad range of sources, I rely mainly on data recently collected from 11 housepit settlements. These data, collected between 2003-2006 as part of the Fraser Valley Archaeology Project, form a sample of approximately 10 % of recorded housepit settlements in the mainland Gulf of Georgia Region (as of 2005). I focus on the analysis of 114 housepits derived from the mapping of these 11 settlements, approximately 15 % of those recorded in the study area.

I use Exploratory Data Analysis (EDA) techniques described by Drennan (1996:3-73), Fletcher and Lock (1991), Hartwig and Dearing (1979), and Tukey (1977) as a means of quantifying and exploring the structures of these data sets. I draw on the basic principle set out by Tukey (1977:v) in his introduction to EDA that “It is important to understand what you CAN DO before you learn to measure how WELL you seem to have DONE it.” EDA differs from classical ‘confirmatory’ statistics in its focus on “looking at data to see what it seems to say… It regards whatever appearances we have recognized as partial descriptions, and tries to look beneath them for new insights. It concern is with appearance, not with confirmation” (ibid.). EDA allows more subjectivity than classical or Bayesian statistics, suiting studies like this one aimed at the preliminary exploration of data structures and data organization rather than testing of hypotheses. This preliminary approach to data organization and analysis serves a fundamental purpose of supporting follow-up confirmatory analyses, defining what we can do before we enter that realm of statistical testing. EDA is, thus, a non-parametric approach to statistical analysis aimed at exploring and understanding data structure rather than hypothesis testing.

EDA provides a range of methods for exploring data structure. A basic approach used here aims to explore data structure by defining and describing the center, spread, and shape or distribution of values in a batch or group of data. The center of a group of data -- where values bunch together -- is indicated by its measure of central tendency or mid-point (Drennan 1996:17). Outside EDA, the mean or average value is commonly used as a measure of a group’s center. In EDA, the median, or most commonly occurring value, is used to identify center though often in conjunction with the mean. Spread, or dispersion, describes the extent to which the values in a group of data are all-together spread out or bunched together (Drennan 1996:27). Spread is measured in various ways including the range of values above and below a group’s center, the inter-quartile range (IQR) or mid-spread (i.e., middle 50 % of values), and variance or standard deviation. Shape, or distribution, refers to the way in which values in a group of data “are distributed along the number scale, apart from [the center] and spread… There are two principle aspects to the shape of a [group]: number of peaks and symmetry” (Drennan 1996:53). Also, “the presence of multiple peaks in a [group] is always an indication that two or more fundamentally different kinds of things have been thrown together and measured… [groups with multiple peaks cannot be analyzed further. The only correction for this problem is to subdivide the [group] into separate [groups] for further analysis" (Drennan 1996:14-15).

EDA is visual. I use graphic techniques including stem-and-leaf graphs, box plots, and histograms to explore data structure, compare groups, identify anomalies (e.g., groups with two centers or modes), and define sub-set groups with single centers and more normal shapes.[6] Throughout this study I use stem-and-leaf plots in preference to histograms, though sometimes both together (Chapter VI), as a way of maintaining transparency of data values in presenting the results of analyses. These techniques are used to identify relationships between center, spread, and shape, as well as outliers or anomalous values that fall far from the group and cause its shape to become asymmetrical or non-normal.

EDA uses methods and values more 'resistant' to being affected by widely spread or outlying values within a group, such as median rather than mean to measure a group's center, as

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[6] The following definitions of box-plots and stem-and-leaf plots are based on Drennan (1996:39-41) and Tukey (1977:675). Stem-and-leaf plots are a fundamental data organization tool used to order data along a scale; corresponding to the more commonly used histogram. The stem section defines the scale and the leaf attaches each value to its place within that scale, exposing patterns in the distribution of data. Stem-an-leaf plots present all numeric values, whereas histograms do not. A stem-and-leaf plot graphically represents the spread and shape of a group of data, where data values are portrayed in place of the bars common to histograms. A stem-and-leaf plot "is a generalized two-digit display, in which the lefthand portion of the values displayed is given by a stem value, while the righthand portion makes up a leaf" (Tukey 1977:675). As in a histogram, the stem represents a bin- or stem-width defining a range of values (e.g., units of 10; as in values within sets of ranges from 1-10; 11-20; 21-30 and so on). The stem forms a vertical column. A plot with a stem-width of 10 (km), is represented by a vertical, lefthand column with a sequence of values of, for example, 6, 7, 8, 9, and 10 equating to measurements of 60-69, 70-79, 80-89, 90-99, 100-109 km (e.g., units of distance). Actual values of data in a group are attached as leaves projecting from each stem, organized by values falling within each stem-width. Thus, using the above example, a sequence of leaf-values of 2, 4, 4, 5, 7 attached in the righthand column to the stem value of 6, represent values of 62, 64, 64, 65, and 67 km (e.g., actual distance travelled). Stem-widths are identified in each of the stem-and-leaf plots included in the following analyses.

Box-plots (or box-and-whisker plots) graphically represent the center and spread of data within a group. The median represents the center. The mid-spread (middle 50 % of values) is represented as a central box; the upper and lower quartile ranges (upper and lower 25 % of values) as whiskers stemming from the box including the largest values that are not outliers; and any outliers (values that fall far outside the central bunch) as dots located beyond the whiskers. Extreme outliers are values that fall more that two times the midspread, or inter-quartile, range from the center.

noted above. Using techniques described above, outliers or extreme values (i.e., values far away from the bunch of values in a group), and coarse or inaccurate data, that cause asymmetrical shapes and skewness of a group's center, shape, and/or spread, can be identified. Outliers, extremes, and coarse data can be treated in a number of ways including elimination as a means of smoothing data and organizing groups based on normal shapes and distributions. Re-expression or transformation (Drennan 1996: 56; Tukey 1977:57) is another EDA technique used to treat groups with asymmetrical shapes. Arithmetic functions (e.g., square root or logarithm transformations) may be used to remove a group's shape or set it to a standard, single-peaked, and symmetrical form to produce a new group that may be better suited to analysis. EDA provides a choice of a range of exploratory options. I do not apply re-expression in this study, though potentially useful, in deference for maintaining the transparency of unaltered data values. The results of EDA, as applied here, aid in data organization and lead to the more confident use of classical, confirmatory statistical tests (e.g., Chapter VI).

The exploratory principles and objectives EDA are well-suited to the exploratory principles and objectives of this study. This study, at its outset, produced a new set data describing 114 housepits about which little could be said of patterns underlying their appearance. The housepits represent 14 distinct occupations in settlements located throughout the Fraser Valley, spanning nearly 3,000 years between 2,550 cal B.P. and 100 cal B.P. EDA is also used in Chapter IV to explore travel distance values and the distribution of housepit settlements with the region's transportation system. The quantitative foundation of this study rests on an objective of looking into this new set of data describing housepit form and seeing what it seems to say; looking beneath its appearances for new insights; finding out what we can do with it. Results of these analyses provide a basis for describing and classifying housepit features and settlements by size, age, and geographic location. These EDA-based results support the use of statistical tests addressing questions of association and independence of data sets (e.g., housepit size and age).

3.1 Housepit Form and Indigenous Identity in the Fraser Valley

Variation in house form fuels anthropological debate about the relationship of Fraser Valley housepits -- and Stó:lō peoples -- to the Coast and/or the Interior. Although housepit features of various types are commonly found throughout coastal areas of the Pacific Northwest (Barnett 1938; Mackie and Christensen 2003; Acheson 1995), archaeological perception often and questionably takes an 'Interior' rather and 'Coastal' view of housepits in the Fraser Valley. Rectangular features are more commonly and acceptably recognized as 'Coastal' house forms. A long-standing perception among archaeologists is that Fraser Valley housepits are most commonly circular in shape and therefore related to the pithouses of Interior Plateau peoples (e.g., Borden 1970, 1975; Carlson and Wilson 1980; Duff 1952; Hanson 1973). This premise of Interior-oriented relations historically affected the development of archaeological models describing Lower Fraser River Canyon and Fraser Valley material culture as significantly affected by the diffusion of traits from the Interior to the Coast (e.g., Borden 1968; Burley 1980; Mitchell 1963; Matson 1976). This in turn influenced an anthropological view of 'upriver' Stó:lō identity as composed of 'mixed' cultural traits, origins, and affiliations -- neither really Coastal nor of the Interior. These assumptions remain unfounded and unsupported by any solid set of housepit data.

In my experience among the Stó:lō, this anthropological identity crisis is not commonly shared within an indigenous reckoning of Stó:lō-Coast Salish identity. The Stó:lō collectively view themselves as a community with extensive social, economic, linguistic, and cultural relations centered within the lower Fraser River Watershed and extending across the Georgia Strait, into Puget Sound, and upriver among the Interior Salish (Carlson 2001a:24-28; Smith 2001). A downriver, coastal orientation is predominant in these sets of relationships (Bierwert 1986). Exploring housepit form as a factor of community formation in this study incorporates landscape -- beyond individual features -- as an aspect of "identity geography" (Carlson 2001:26) and serves to test archaeological assumptions about housepit form affecting the anthropological understanding of Stó:lō identity.

3.2 Archaeological Data on Housepits in the Mainland Gulf of Georgia Region

The data collection strategy in this study was designed to augment existing spatial and temporal information supporting the study of housepits and settlements in the mainland Gulf of Georgia Region -- particularly in the Fraser Valley or 'upriver' portion of the region. In 2004, the provincial archaeological database accounted for 112 housepit settlements containing at least 560 individual housepit features (Schaepe 2004). The majority of these records are founded on archaeologically documented sites (74 %) while others are based on oral historical (25 %) or historical records of site locations (1 %). Previous overviews of housepits in the region are provided by Duff (1949), Little (1996), Mohs (1990), and Schaepe et al. (2001).

Useful information about Stó:lō housepits and settlements comes from both archaeologists and ethnographers. A number of ethnographers (Barnett 1938, 1955; Duff 1950, 1952; Hill-Tout 1902, 1904; Jenness 1955; Smith 1945, 1947; Wells 1987) working in the region over the past 100 years described the two archetypical Stó:lō house types -- *sqémél* ('in-ground' pithouses) and *s'iltexwáwtxw* ('on-ground' shed-roofed plankhouses). Other less well known house types such as mat-lodges and 'hybrid-structures' combining elements of both pit- and plank-houses are also described (Smith 1945). The earliest anthropological descriptions of *sqémél* come from ethnographer Charles Hill-Tout in 1895. Archaeological investigation of housepit features otherwise began in the 1940s (Duff 1949; Smith 1947) and intensified in the 1950s and 1960s (e.g., Borden 1950, 1960, 1961; Kenyon 1953; Kidd 1968). Investigations carried out between the 1940s and 1960s account for approximately 53 % of all documented housepits settlements in the mainland Gulf of Georgia Region. On-going work carried out largely within the context of cultural resource management projects of the 1970s (e.g., Hanson 1973), the 1980s (e.g., Arcas 1986), and the 1990s (e.g., Schaepe 1997) account for most of sites recorded as of 2004.

Many housepit settlements recorded in the region have been severely impacted by 19th and 20th century development and land alteration. The majority of housepit features recorded in the region have suffered disturbances that limit their usefulness for, or in some cases eliminate the possibility of, archaeological investigation. Based on my review of site records, I estimate that about 7 % of all recorded housepit sites in the mainland Gulf of Georgia Region are destroyed, while 66 % have suffered significant impacts, leaving only about 27 % of documented housepit settlements largely intact (Schaepe 2004). While archaeologists have investigated a few housepit settlements (Mitchell 1963; Hanson 1973; Schaepe et al. 1999; von Krough 1980), data from these sites and features have never been systematically analyzed to provide even basic descriptions of the range of variation in size, shape, or age.

Initial ‘pilot’ attempts at sorting housepit settlements and features by any level of detail beyond basic site type and location were frustrated by lack of data (e.g., Schaepe 2001a). Analysis and comparison of housepits and settlements was limited by the lack of a uniform unit of measure for plotting sites and features in space. Given that the majority of sites were recorded prior the 1980s, most researchers used latitude and longitude while others, later on, used the much more intuitive, Universal Transverse Mercator (UTM) system. The British Columbia Archaeology Branch maintains a database of all recorded archaeological sites in the province, one field of which contains spatial location information. Generally, spatial data were available in one form or another but only for sites, not specific features. Very little spatial information existed beyond site location. Within-site spatial information came only from hand-drawn maps, if available, on the archaeological site forms. These maps are generally detailed enough to show the location of housepits in a site plan. The scale and level of detail of these maps varies widely, sometimes for the same site as exemplified by differences in depictions of the well-known 'Katz' (DiRj-1) site developed by Hanson (1973), Coupland (1996), and Schaepe (2001b). Housepit features tend to be represented as circles and are often ambiguous, recognizing that feature shape is difficult to determine without extensive vegetation clearing and detailed mapping techniques.

The housepit dimensions provided in site forms were typically determined as a factor of expedient, low resolution mapping techniques -- useful as general estimates of size based on length and width measurements but not suitable for determining area calculations (as discussed below). Dimension measurements were sometimes found to be lacking altogether. Settlement area measurements were based on a single polygon or site boundary including the entire site area and were not accurate enough to be of use in my study which required area measurements at the level of the individual house feature. Typically, only limited topographic information is provided describing the landscape in which these sites are located -- again, as an understandable factor of expedient mapping techniques. The methodological objectives of this study address these spatial issues as a means of allowing feature-level, settlement-level analysis, and inter-settlement-level analyses.

The limits of existing temporal data were found to be even greater than those affecting the spatial dimension of this study. Only seven of the 112 housepit settlements documented as of 2005 had radiocarbon dates directly associated with house features. Of these, only five fell within the temporal limits of this study.[7] A number of dates from above-ground house features indirectly supplement this body of information, primarily derived from work at the Scowlitz site (Lepofsky et al. 2000). Additionally, Mitchell (1963:133) provided a relative age for one housepit feature at the Esilao site (DjRi-5). Arnold and Schaepe (2003) also provide a relative age for a housepit feature at the Ts'qo:ls site (DiRi-1) which was excluded from this study due to its Colonial-era age (i.e., post-1850 AD). Supplementing the available set of temporal data was critical to addressing the objectives of to this study.

Thus, existing spatial and temporal data describing the 112 housepit settlements recorded as of 2005 proved to be limited in their usefulness for the purposes of the present study. A pilot study that I carried out in early stages of the project helped define issues and pinpoint those areas where data collection was most needed. The data collection strategy employed in this study thus facilitated the study of housepit features by adding to the radiocarbon record, providing for uniform and comparable units of spatial measures, and producing high resolution maps for a sample of entire settlements and the individual houses within them. Fieldwork carried out between 2004 and 2006 implemented the data collection strategies described below.

3.3 Settlement Data

Spatial locations at the settlement-level were established using UTM coordinates for each of the 11 settlements included in this study (Figure 3.1). Calculation of UTM coordinates was done with ArcView 3.2 geographic information system software using the standard North American Datum (NAD) 1983. Having UTM coordinates at a fine scale of resolution provides accurate settlement plots from which to investigate broad, regional-level analysis of settlement

[7] Data from the Maurer site - DhRk-8 (LeClair 1976; Schaepe 1998, 2003), the Xa:ytem site - DgRn-23 (Mason 1994), Iy'oythel - DgRl-10-Feature 2 (Schaepe et al. 1999), and Scowlitz site - DhRl-16-Features 4 and 8 (Lepofsky et al. 2000) were excluded from this study as pre-dating 3,000 cal B.P.

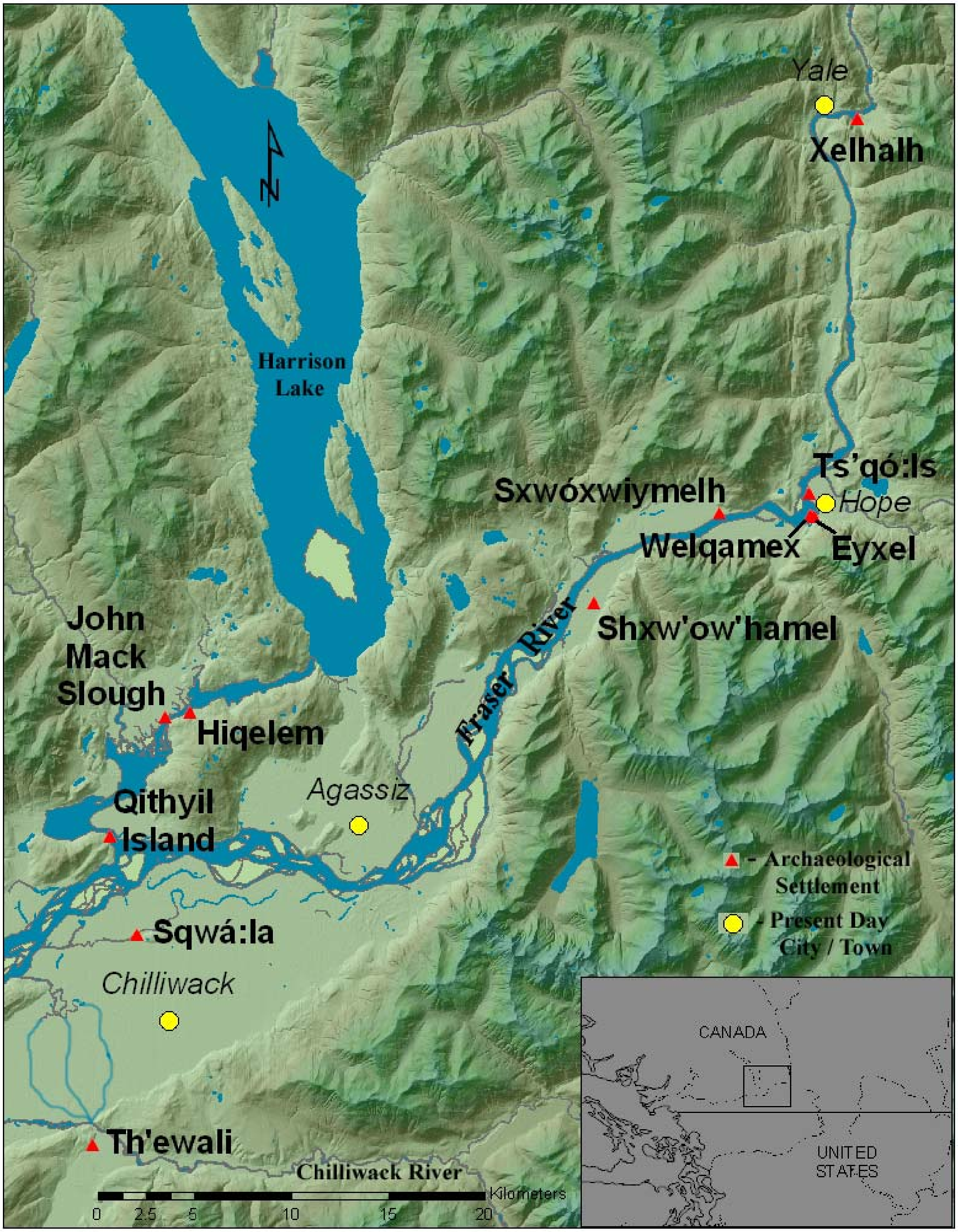

Figure 3.1. The location of eleven housepit settlements included in this study.

locations. UTM location data were adjusted to a sub-meter level of accuracy (e.g., +/- 10 cm). A table of housepit settlement UTM-location coordinates is presented in Appendix I.

Using UTMs has advantages including allowing the accurate plotting of features and sites using simple scatterplots -- as found in standard statistics packages like SPSS -- where the X-axis is UTM mE (metric easting) measurements and the Y-axis is UTM mN (metric northing) measurements. Settlements and features represented as points on a spatial plane can be directly incorporated into the outcomes of analyses and easily, accurately, and expediently plotted in space as various classes or groups (e.g., size, age) of data. This was found to be particularly useful in analyzing intra-settlement arrangements of housepits. Also, UTMs are the standard spatial unit of measure used in Golden Software's *Surfer 8.0* mapping and surface imaging software, used extensively as an integral feature of data analysis in this study as described below. UTMs also permit the easy movement between levels of analysis (e.g., housepit/feature, settlement/site, and region) and facets of research (e.g., surveying and mapping, testing, formal excavation unit layout, carbon sample or artifact proveniencing, analysis) as a common unit of measure with a single datum point and a flexible resolution range that accommodates measurements ranging from centimeters to kilometers.

3.4 Feature Data

Housepits and other features at the 11 housepit settlements were mapped using a high precision GPS unit (Leica 1200 GPS; 1200 GPS rover) to tie each site into the UTM grid, and establish datum points and mapping station locations. This process resulted in centimeter-level accuracy on a global scale. A Leica Total Station (703R or 705R) was used to collect three-dimensional topographic data across the surface of each site, with particular focus on all housepit features. Brush was cleared at each site to provide visibility for mapping. This activity, in itself, proved to be a very useful way of gaining insight into the organization of features at each settlement.

Detailed information on this mapping process is provided in Schaepe, Blake, Formosa, and Lepofsky (2006:7), a sample of which is provided below:

> Through trial and error, our mapping methodology was refined in order to collect enough data to make accurate surface models for the sites, while at the same time, avoiding over-sampling and potentially collecting more data points than necessary to create the surface model. The full surface of a site was walked either in a grid with regular capture intervals between measurements, or in radiating lines extending out from the total station. Housepit depressions were sampled more intensively, with data collection points spaced every 30-50 cm depending on the degree of vertical rise between points. Smaller cultural depressions, such as cache pits were sampled at 20 cm intervals. Mounds were sampled around the perimeter then points were collected at approximately 30 cm intervals with an additional point or two at the top of the mound. Portions of the site with no visible surface features were sampled at approximately 1-2 m intervals. Any structures – stone walls, cairns – were surveyed as standing structures separate from the topographic survey.

UTM coordinates marking the center-point of each housepit feature were extracted from these precise measurements (Appendix I). These data were used to make detailed settlement maps which in turn were used to make accurate and reliable measurements of feature form (e.g., dimensions, area, and shape).

3.5 Housepit Form - Size and Shape

Digital topographic data collected using the Total Station and GPS units were processed and projected in various map forms (e.g., surface maps, topographic maps, shaded contour maps, etc.) using Surfer 8.0. Field point measurements were interpolated using a kriging algorithm with grid size of 0.33 m in order to create a digital elevation model for each site in the study. Surface maps of each of the 11 settlements included in this study are based on data from Schaepe, Blake, Formosa, and Lepofsky (2006), Graesch (2006), and Lenert (2008), and Lenert and Lepofsky (2006). The following sections describe the three-part process by which measurements of housepit feature size and shape were 'pulled' from these maps.

3.5.1 Step 1 - preparing feature-level maps

Surfer 8.0 map-making software was used to develop a set of high resolution maps of housepit features at each settlement (see Figures 3.2-3.12). These maps were developed from the three-dimensional surface points recorded for each site. I then produced maps that integrated topographic map (5 cm intervals) and shaded contour maps as illustrated in Figure 3.13 which, in combination with surface maps, provided a range of viewing options for each settlement and set of features. Visual manipulation of these maps allowed for control over perspective and the definition of vertical scale to highlight and define each feature's form. While the features of small settlements (e.g., Sqwá:la / DhRl-6) could all be captured in a single map, multiple maps were produced for sections of larger settlements (e.g., X̲elhálh / DjRi-14) in order to achieve a common level of resolution -- important to the next steps of this process, described below.

3.5.2 Step 2a - defining feature outline / perimeter

Using Surfer 8.0, with a set of combined shaded contour and topographic maps, the outline of each feature was drawn around the apex of the rim or high-point of the ground surface immediately surrounding each depression feature (Figure 3.13). In this way, a polygon was created for each feature that defined its perimeter and established the basis for calculating the area (m^2) and analyzing the shape of each of the 114 housepits included in this study. The process for defining each housepit's area as an explicit measurement is described, below, in Step 3a. The process developed to define each housepit's shape was less explicit and more

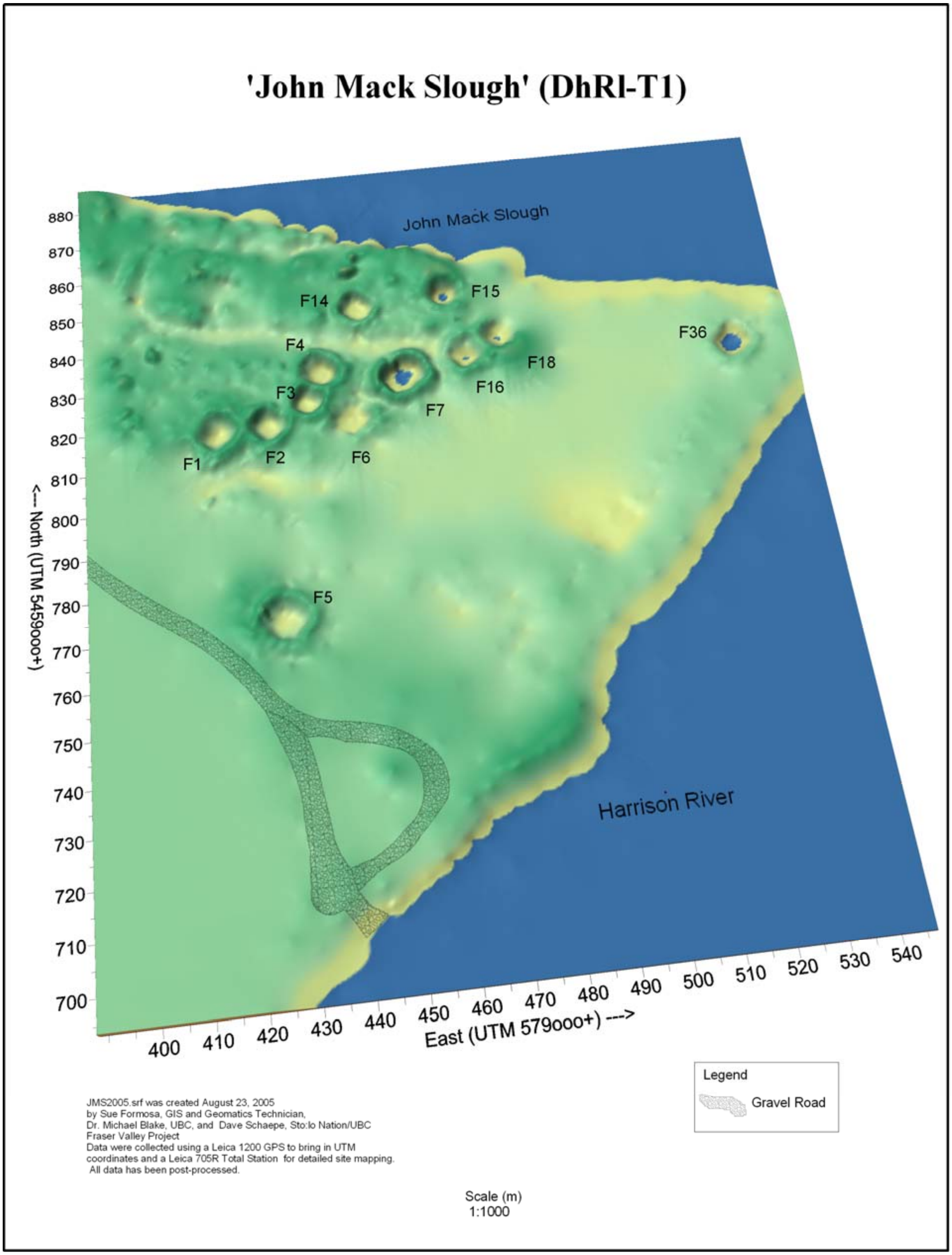

Figure 3.2. 'John Mack Slough' (DhRl-T1) surface map with housepit features.

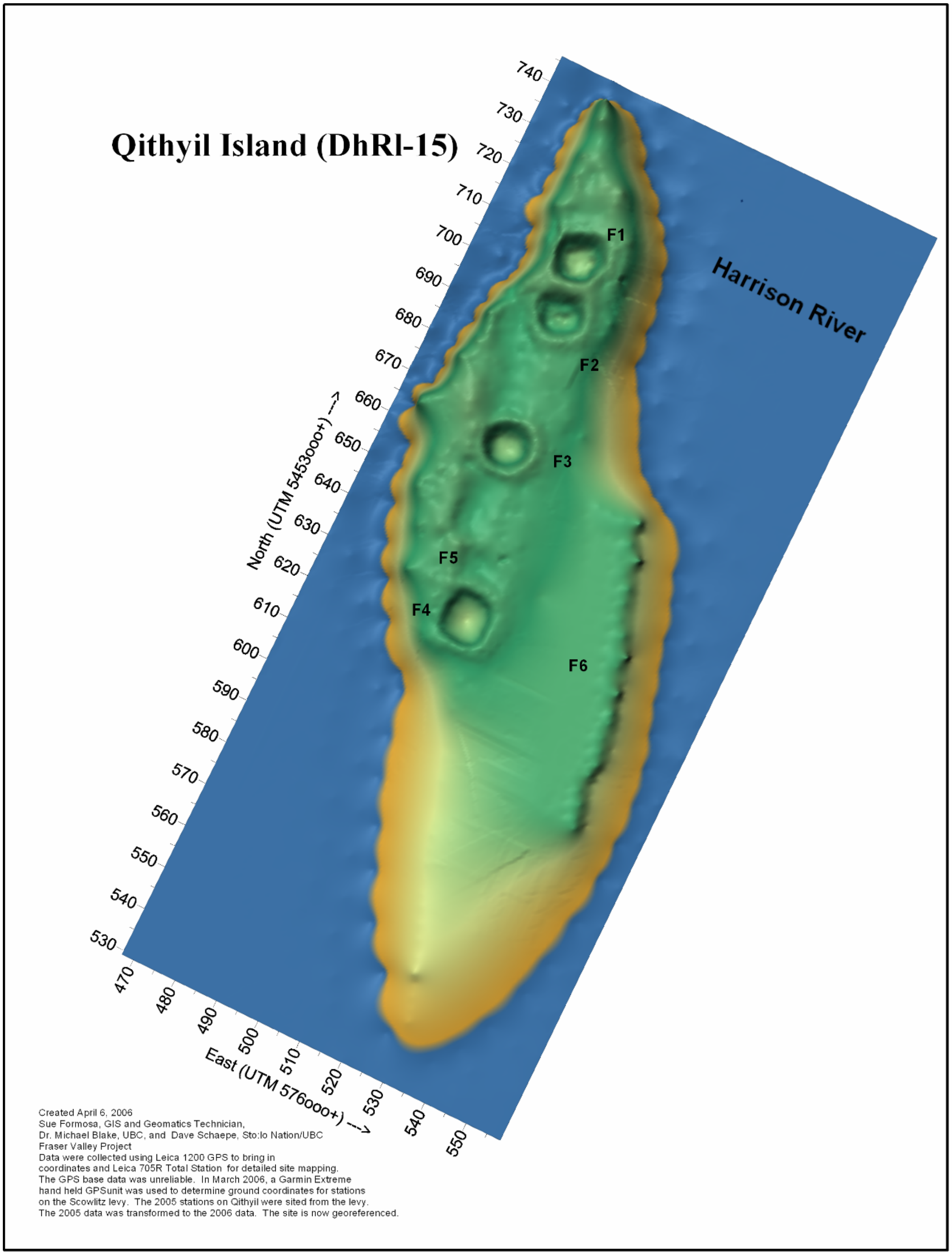

Figure 3.3. Qithyil Island (DhRl-15) surface map with housepit features (F1-5) and apparent plankhouse platform (F6).

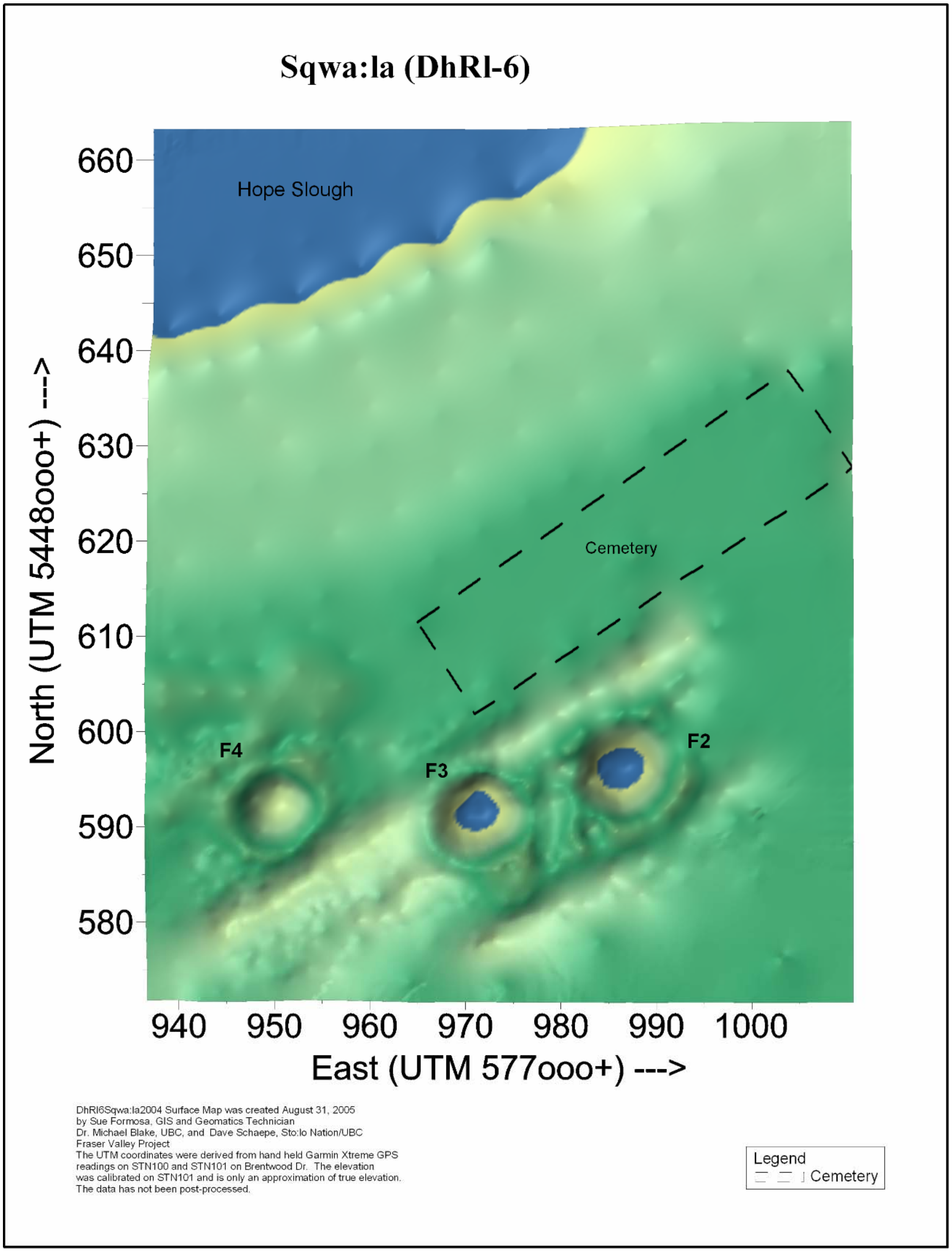

Figure 3.4. Sqwa:la (DhRl-6) surface map with housepit features (*note*: the blue -- or dark grey if depcited in black and white -- in F2 and F3 is a factor of surface elevation coloration and does not represent water).

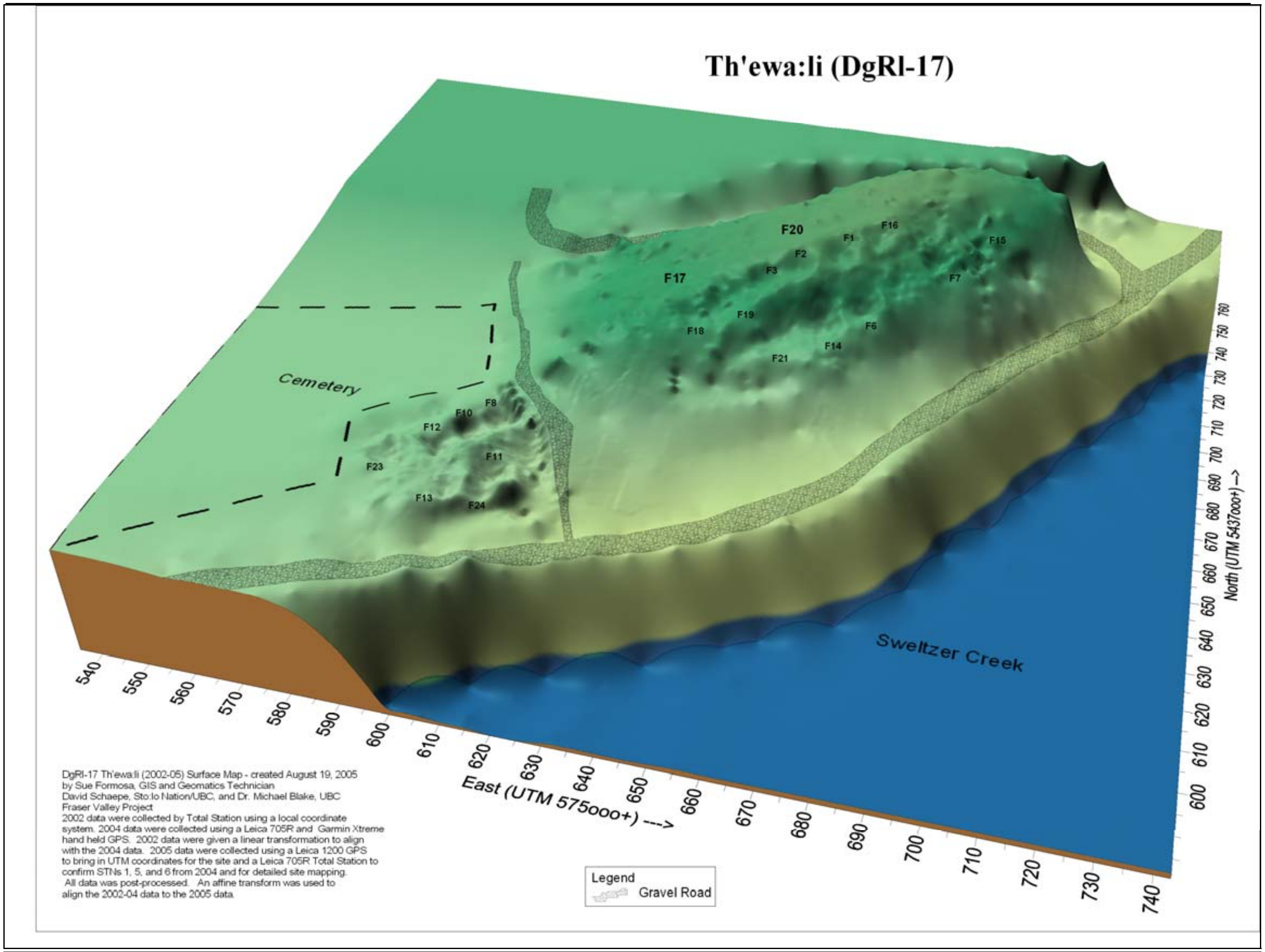

Figure 3.5. Th’ewá:lí (DgRl-17) surface map with features (note: southeast bank of Sweltzer Creek not shown).

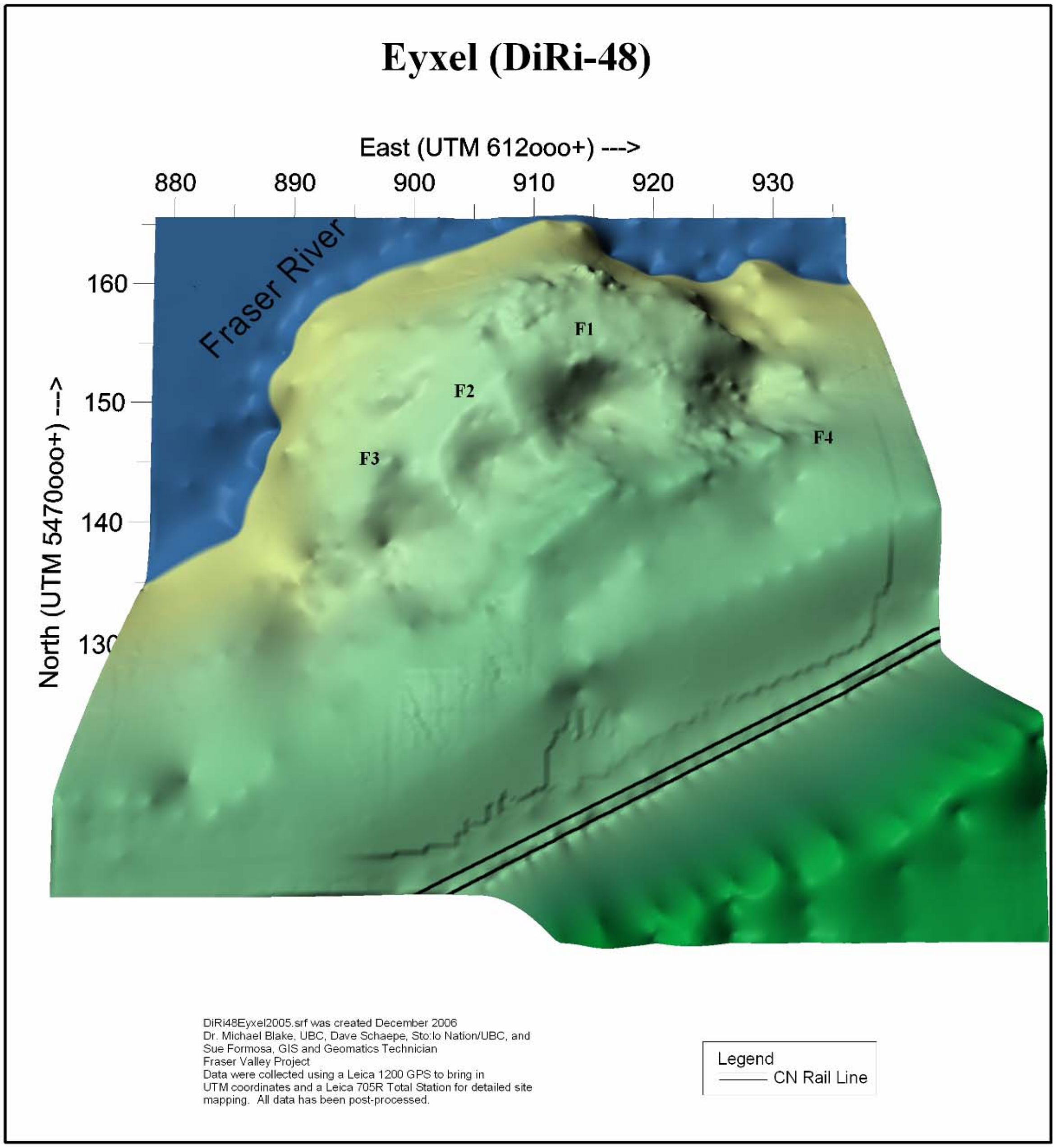

Figure 3.6. Eyxel (DiRi-48) surface map with housepit features.

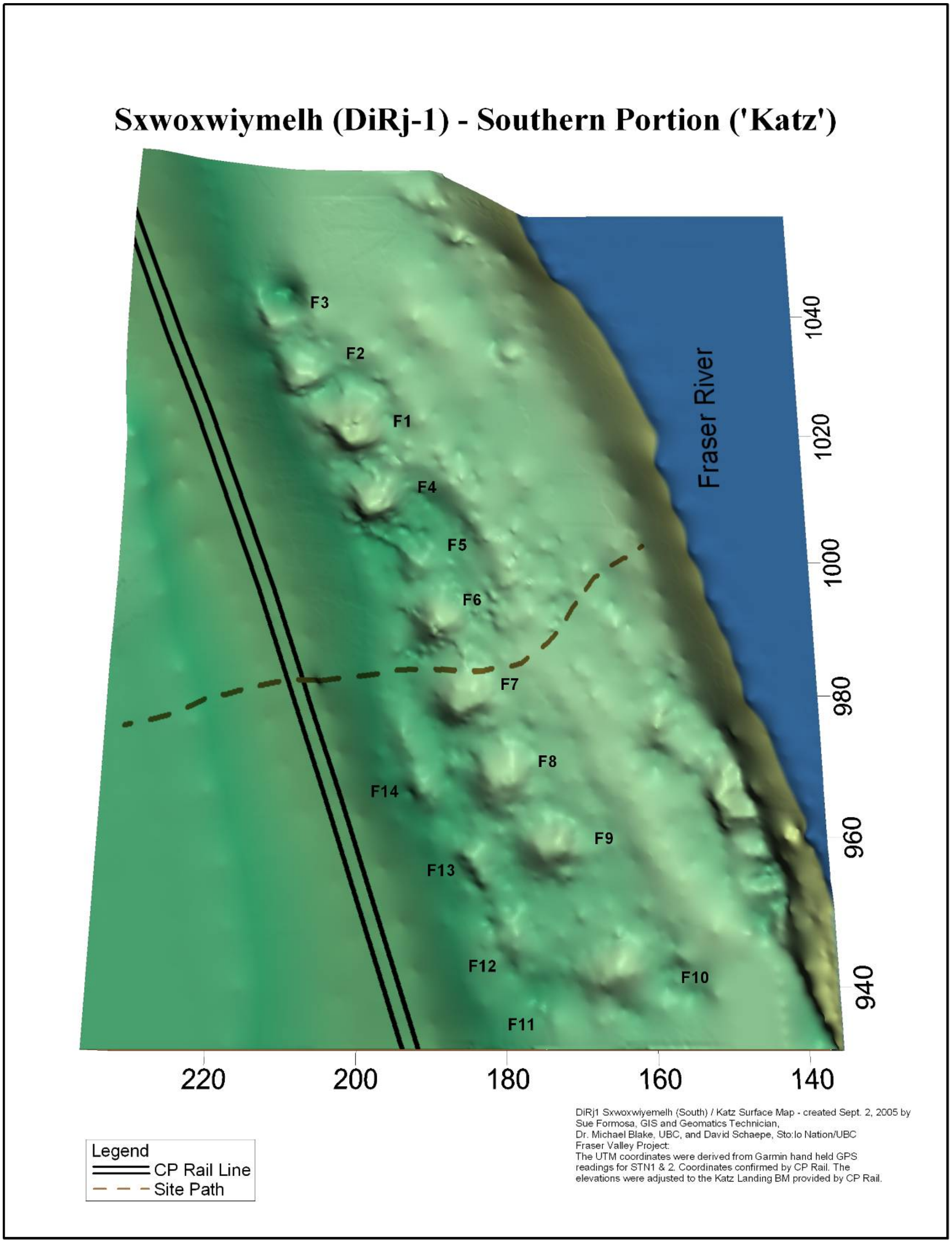

Figure 3.7. Sx̲wóx̲wiymelh ‘South’ (Katz) surface map with housepit features.

Sx̲wóx̲wiymelh (DiRj-1 Northern Portion)

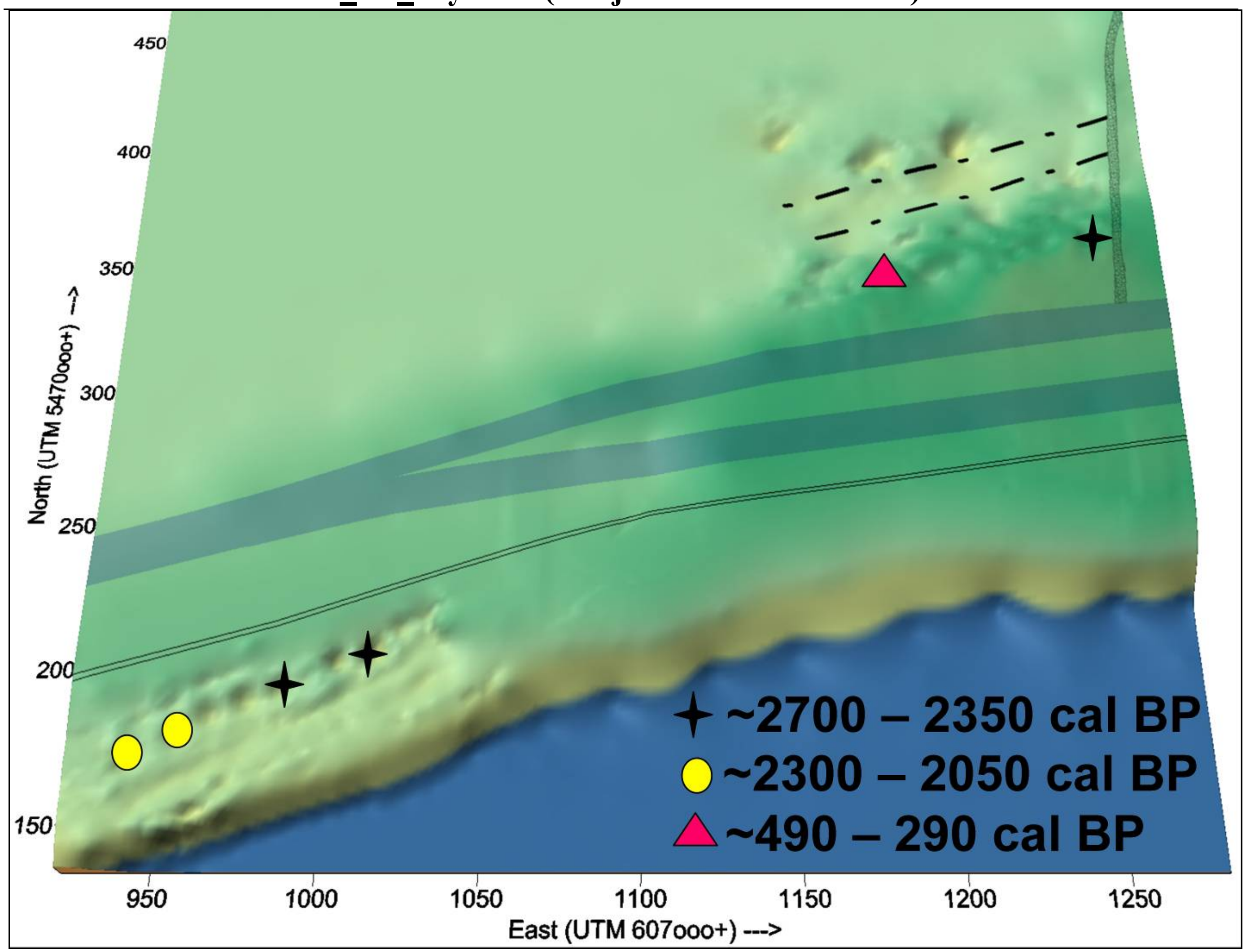

Figure 3.8. Composite surface image of Sx̲wóx̲wiymelh (DiRj-1) 'South' and 'North' with radiocarbon results - per Lenert and Lepofsky (2005, 2006) (Note: dashed, shaded, and solid lines represent pipeline, highway, and railway right-of-ways, respectively).

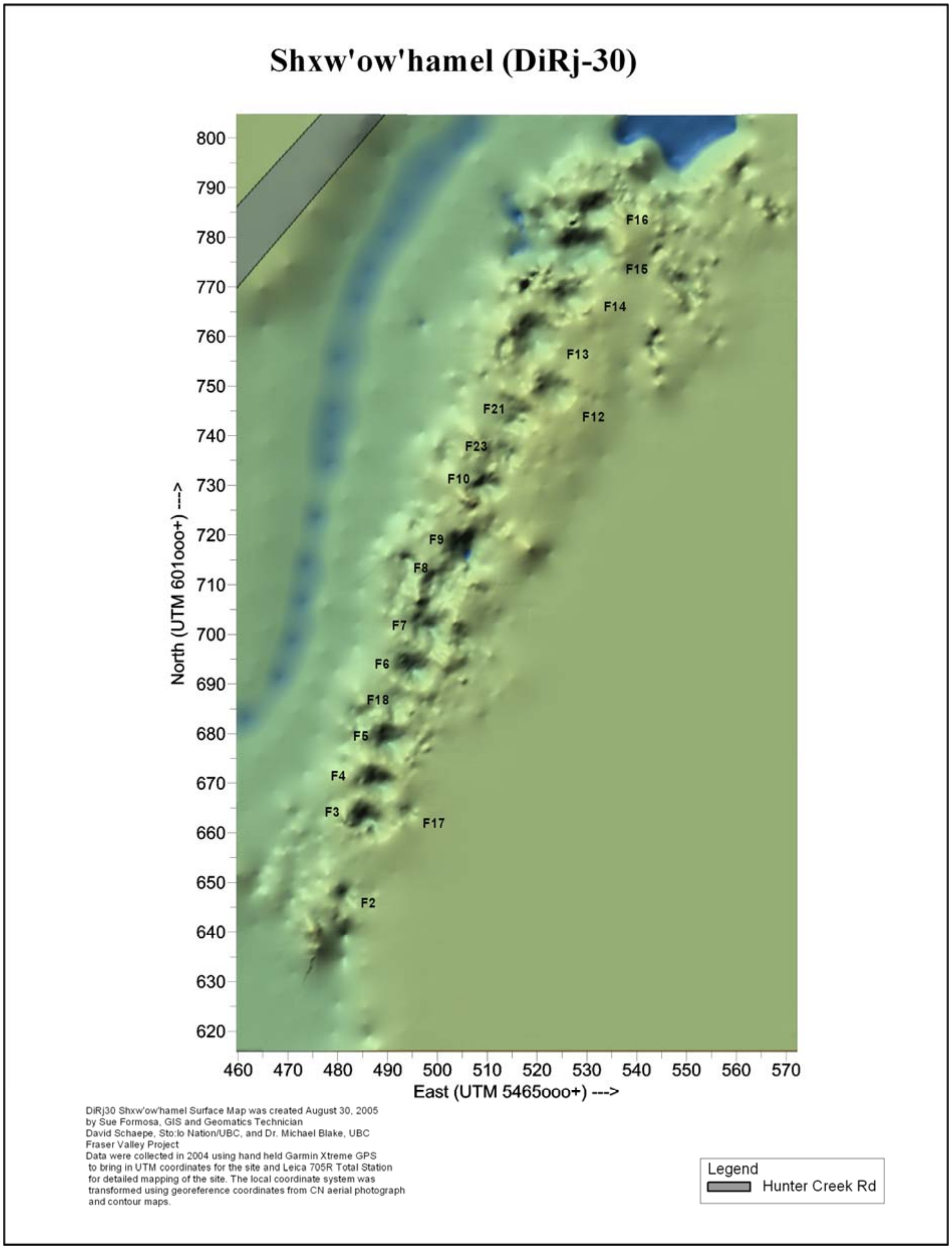

Figure 3.9. Shxw’ow’hamel (DiRj-30) surface map with housepit features.

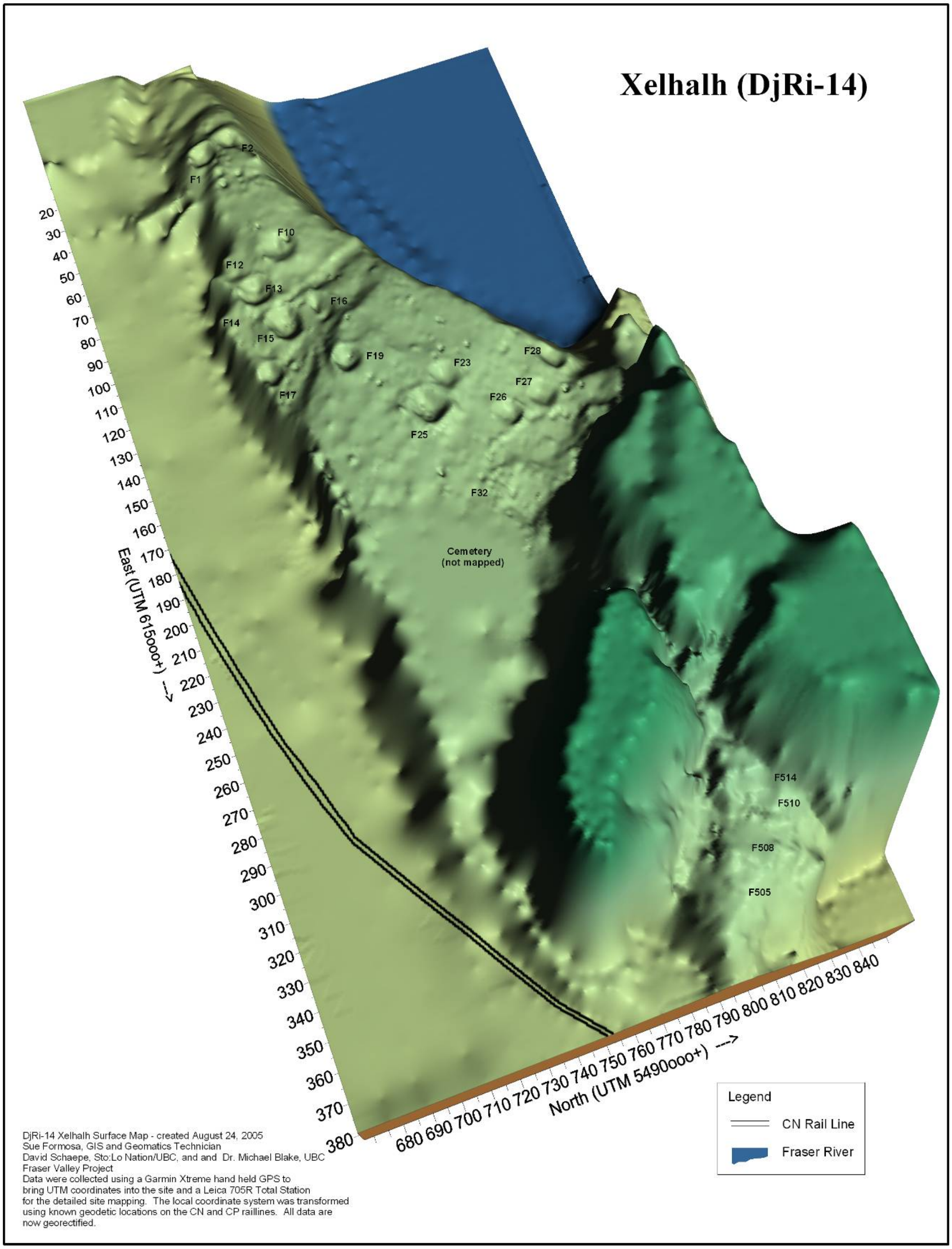

Figure 3.10. Xelhálh (DjRi-14) surface map with features.

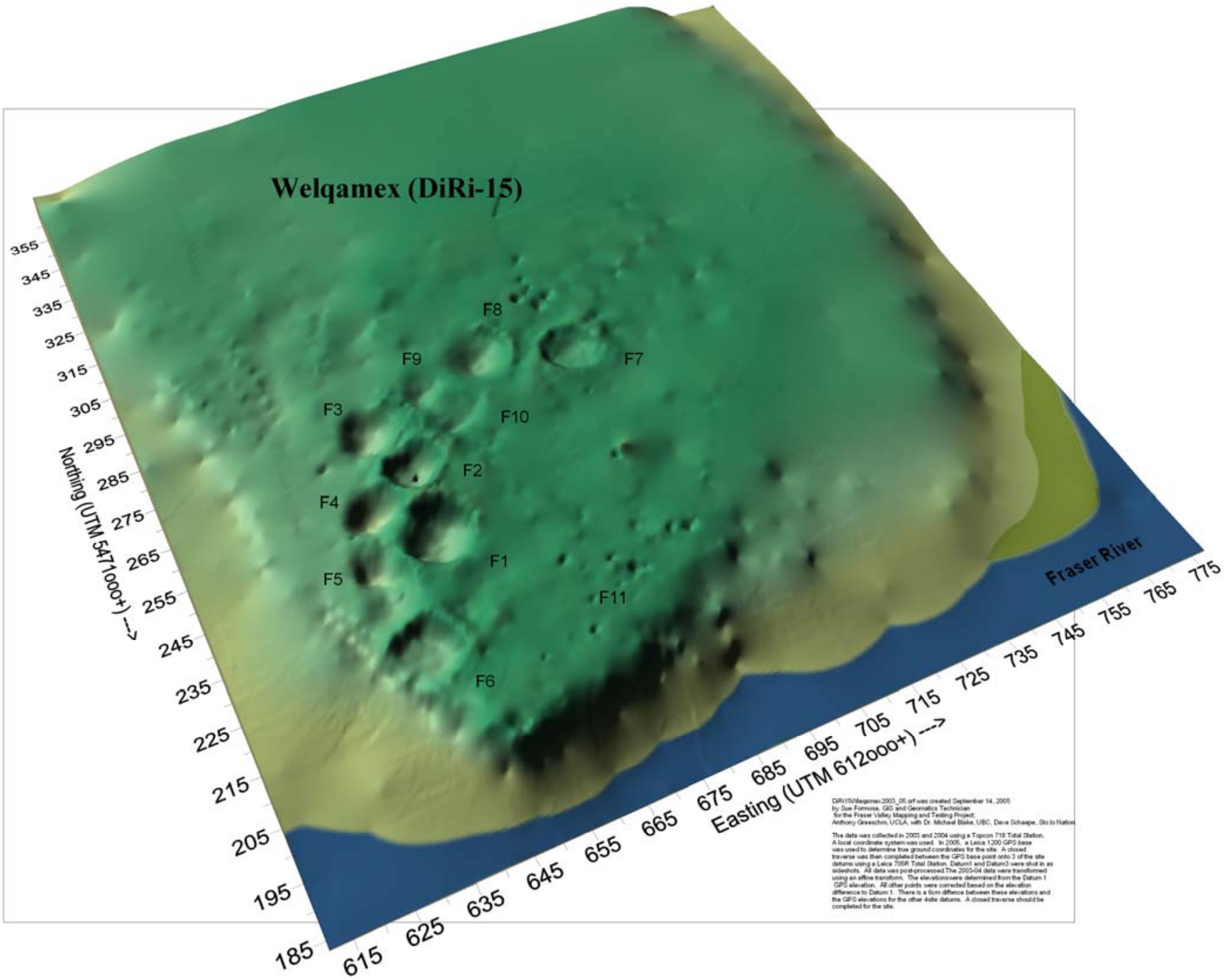

Figure 3.11. Welqámex (DiRi-15) surface map with features (Graesch 2006).

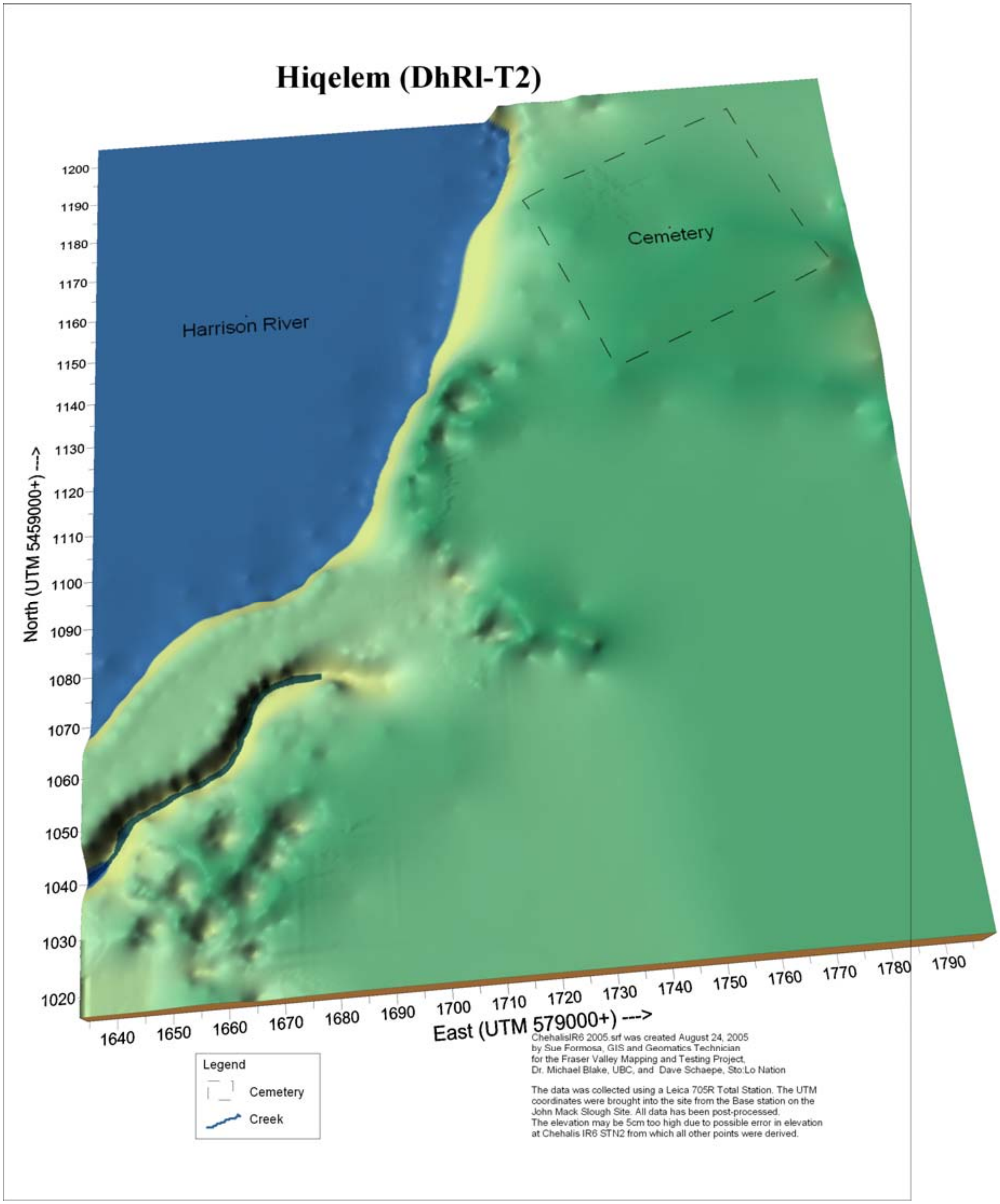

Figure 3.12. Hiqelem (DhRl-T2) surface map with features (Lepofsky et al. 2006).

exploratory in nature. In some cases, a feature's shape (i.e., square or circular) was clear and explicitly apparent in the visual appearance of the perimeter line. In many cases, though, feature shape was not readily apparent from simple visual inspection. The qualitative process of determining shape more often than not was found to be highly subjective. A quantitative analysis was developed for the purpose of making shape determinations based on an objective, reliable, and systematic mathematical process as described in Chapter VI.

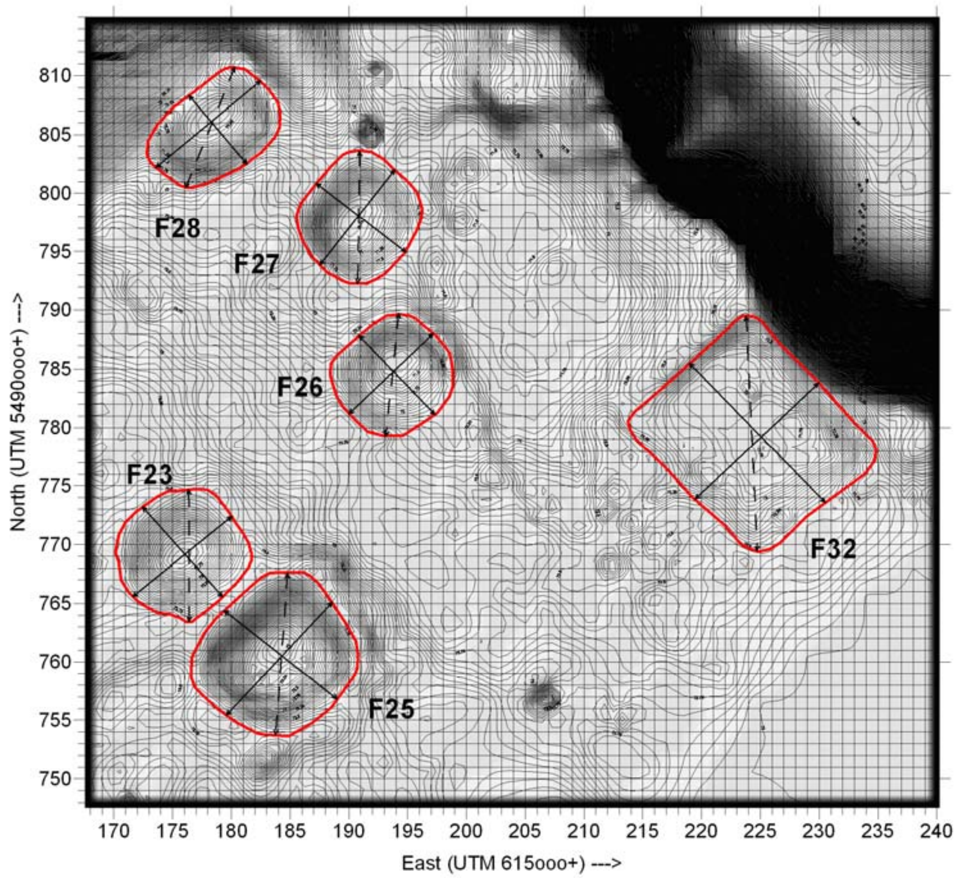

Figure 3.13. Schematic illustration of the housepit measurement system applied to Xelhálh (east settlement area) shaded contour/topographic map (with 5 cm topographic intervals).

3.5.3 Step 2b - defining feature dimensions

Using the same set of feature maps and based on the established housepit polygons (i.e., perimeter lines), three additional lines were drawn between bounding edges within each feature representing its maximum length, maximum width, and maximum diagonal dimensions (Figure 3.13). For each feature, a line representing its maximum length was drawn between two points of the feature's perimeter line, across the longest distance parallel to the long axis. A second, perpendicular line representing maximum width was drawn between two points of the feature's perimeter line across the longest distance of the short axis. A third line, representing the maximum diagonal distance across each feature was drawn between opposing 'corners' set farthest apart from one another. The dimensions of each feature were gathered from measuring the distances of each of these three lines (see Step 3 below).

These measurements represent linear variables describing feature dimensions that can be analyzed in various ways. They can be viewed as stand alone variables; in combination and comparison with each other; or in combination and comparison with each other and with measurements of area as descriptors of housepit form including size and shape. For example, all three dimensions will be the same size in features with a perfect circular shape. The area of that feature within its perfectly circular perimeter outline will match exactly the calculation of area based on the relevant dimension measurements. Mathematical representations and expressions of perfect shapes, such as circles, squares, rectangles, and ovals, can be used as ideals in comparison with the actual mathematical representation of each feature, by which feature shape can be systematically described and determined. The specific calculations developed and used in this process are further described in Chapters VI and VII for addressing housepit features and settlements, respectively.

3.5.4 Step 3 - gathering accurate measurements

Measurements of the line-work created in Step 2 were established using ArcView (version 3.2). The line-work drawn in Steps 1 and 2 were saved as shape-files and exported from Surfer to ArcView. Functions within ArcView were used to translate the line-work for each feature into metric measurements of maximum length, maximum width, maximum diagonal dimension, perimeter distance, and area. Housepit dimensions (length and width) were measured from 'rim-crest to rim-crest' on perpendicular axes as others have done in B.C. (Archer 2004; Arnold 2004; Graesch 2006; Hayden and Spafford 1993; Mackie and Christensen 2004; Wilson and Carlson 1980). Calculations of length, width, and diagonal dimensions required manually tracing over each line, from end to end, with ArcView's distance measuring tool. Calculations of the area and perimeter line distance for each housepit feature were carried out automatically as a factor of ArcView's shape-file processing capacity. Accuracy was maximized by zooming in on each individual feature so that it was generally shown as a single polygon and set of line-work, or nearly so. Three measurements were generally taken for each line, with the average of the measurements serving as the final calculation. These repeated measurements were generally found to be the same or to vary only within a range less than 10 cm over a 10 meter distance. Likewise, each feature's area value correlates with the 'aperture' (i.e., area at aperture) defined by the perimeter of the feature at its rim-crest or otherwise the peak of the immediately surrounding ground surface.

This strategy attempts to minimize the effects of in-filling and erosion on the area measurements used. These taphonomic forces generally cause greater disturbance to the interior shape of housepits including their base and side-walls, in comparison to the apex which better withstands the ravages of time as a structurally more stable element of these features. Taking dimension measurements from the perimeter -- at the apex -- also serves to reduce the effects of erosion and infilling in the same way. Also, judging from clear plan views, obvious areas of disturbance such as slumping can be avoided and adjusted for when taking dimension measurements. The most common taphonomic effects like slumping and infilling tend to diminish the size of housepits rather than make them bigger. If anything, these effects tend to minimize rather than exaggerate the area of housepits. Maps of each settlement showing individual feature area polygons are presented in Appendix II. The dimensions and areas of the 114 housepits included in this study are presented in Appendix I.

Variation within these measurements, while present in my dimension calculations, is minimal -- far less so than field-based measurements affected by lack of perspective and visibility impacting on the discrimination of minute topographic variation apparent in the Surfer-based settlement maps. The mapping process described above permits the inclusion and consideration of a wider range of data in defining feature perimeters and related measurements. Variation in dimensional data is inescapable no matter how it is determined. The process used here minimizes that variation and establishes a systematic process, the reliability of which can be readily evaluated and tested by future researchers.

It is necessary to establish some basic assumptions when using archaeological data describing housepits that may have been rebuilt or reconditioned throughout the period of their occupation. As a basic assumption, I maintain that the physical dimensions of housepits become larger, if affected at all, as a result of rebuilding. As such, the maps and dimensions of the features analyzed in this study describe the size of each feature at its time of last occupation. If occupied and occasionally rebuilt over a long period of time, the size of a housepit may not accurately reflect its original dimensions. Rebuilding episodes or perhaps subsequent building activity nearby may have changed the attributes of a housepit. Applying these measurements to the initial construction and occupation of each housepit -- some lived in and re-modeled over hundreds of years -- will, if anything, exaggerate the initial size of the house. Acquiring the data needed to address the construction and taphonomic histories of each and every housepit in my sample is beyond the scope of this study. While these assumptions are thought not to affect the results or interpretations of the qualitative analyses in this study, they should be kept in mind when viewing the distribution of housepit sizes through time presented in Chapter VI.

Having access to the three-dimensional Surfer maps, while aiding significantly in determining some elements of feature form, does not provide sufficiently accurate information to calculate or address housepit depth as a variable in this study. Accurate measurement of feature depth(s) can be gained only through supplementary excavation locating the feature floor(s) in relation to the ground surface. As such, I exclude data from the third dimension (depth) as beyond the scope of this study. Sub-surface testing revealed that the relationship between the modern ground surface and housepit base elevations is not a good indicator of actual housepit depth. Taphonomic effects of post-occupation erosion and in-filling can significantly obscure the actual depth of the floor surface(s) below the modern ground level. Useful information on 'depth' can be derived at some level from the Surfer maps, and in a few instances I make qualitative references regarding general relationships between measurements of area and volume in Chapter VI.

3.6 Measuring Age

This study required defining the occupations of each settlement based on the grouping housepits that were lived in at the same time. A sample of housepits was tested within each settlement with the specific intention of exposing stratigraphic profiles and collecting radiocarbon samples from those strata (i.e., occupation surfaces and/or floors) directly associated with each of the housepit occupations. Establishing radiocarbon dates for each of the mapped features was beyond the financial scope of this project. Rather, a sampling strategy was employed that could provide tight definition of co-resident housepits and settlement occupations based on analysis of stratigraphy and careful processing of carbon samples from those collected at any given site. Prentiss et al. (2008) demonstrated an effective investigation strategy that minimized testing and maximized dating of 100 % of housepits at the Bridge River site in the Middle Fraser Region. Their work represents an ideal for testing settlements that the researchers of the Fraser Valley Archaeology Project would liked to have achieved, and which we hope to achieve in the future through on-going work at the 11 sites included in this study.

Seventeen AMS dates from 15 features in six sites were collected specifically for this study through fieldwork carried out in 2005 and reported by Schaepe, Blake, Formosa, and Lepofsky (2006:104-115).[8] These included 'John Mack Slough' (DhRl-T1), Qithyil Island (DhRl-15), Th'ewá:lí (DgRl-17), Eyxel (DiRi-48), Shxw'ow'hamel (DiRj-30), and X̲elhálh (DjRi-14). An additional six AMS dates and one conventional date were collected from six features at Welqámex (DiRi-15) by Graesch (2006:66). Lepofsky et al. (2005:4-5) recovered two AMS dates from two features at Hiqelem (DhRl-T2). Five AMS dates were provided for five features at Sx̲wóx̲wiymelh (DiRj-1) by Lenert and Lepofsky, as reported in Lenert (2008) and Lenert and Lepofsky (2005). These data are presented in Appendix III. Radiocarbon data from Schaepe, Blake, Formosa, and Lepofsky (2006) is presented in Appendix IV.

All radiocarbon age estimates represent a 95 % confidence level calibrated at two sigmas using Calib 5.0.2 (Stuiver et al. 2005). Conventional dates resulting from Hanson's and von Krogh's work were also calibrated using Calib 5.0.2. These dates provide a foundation for developing a temporal framework and context for the analyses of housepits and settlements carried out in this study, presented in Chapter V.

3.6.1 Test Excavations: Soil Probes, Auger Tests, and Shovel Tests

The methods by which radiocarbon samples used in this study were collected vary between researchers. The methods used in extracting radiocarbon samples from the sites that I

[8] Beta Analytic processed all the radiocarbon samples from Fraser Valley Archaeology Project included in this analysis.

was directly involved in testing -- i.e., co-directing the 'Stó:lō Pithouse Settlement Mapping and Testing Project' -- constitute a form of "evaluative testing" (Apland and Kenny 1998:12-13). In comparison to what may be more commonly recognized as a formal excavation process (e.g., Graesch 2006; Hanson 1973; Lenert 2008), this program of testing aimed to minimize both the areal extent of excavation and the recovery of artifacts. This strategy maximized the recovery of information on the stratigraphy, composition, and integrity of housepit deposits, as well as associated carbon and soil samples while minimizing site disturbance.[9] Thus, small-scale shovel-, auger-, and soil probe testing served, variously, as means of executing small-scale excavations aimed at minimizing artifact collection and maximizing the recovery of stratigraphic data and radiocarbon samples.[10] This evaluative testing strategy involved,

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[9] This strategy was guided by the principle in the Stó:lō Heritage Policy Manual (Schaepe and McHalsie 2003:7) of "taking only what you need."

[10] Schaepe, Blake, Formosa, and Lepofsky (2006:9-10) -- "The Oakfield Probes allowed us to collect 25 cm-deep core increments. Each 25 cm core increment was removed, described, and photographed before continuing down through the deposits. This continued until we reach the C Horizon. The Oakfield probe provides an exposed 'window' on one side of the coring tube, allowing effective examination, stratigraphic description, and identification and collection of radiocarbon samples from core sample while still contained in the probe. Depths of the core were established for each probe, as it progressed downward, allowing for an accurate description of sediment compaction that tended to occur within the core, itself, as a result of pushing the probe into the ground. Photographs and stratigraphic drawings included the 'corrected' depths for each core, based on direct measurements inside the test unit.

Auger and shovel test excavations were carried out stratigraphically when possible. They were excavated in arbitrary 10 cm levels within strata exceeding 10 cm in thickness. This strategy was more effective for the shovel tests than for the bucket auger tests, because they afforded a better view of the unit's side walls and base during excavations. Auger tests were usually excavated in 15 cm increments, the length of the auger bore. This precluded examination of layers or stratigraphic contact zones within the 15 cm span of the auger.

All excavation units were precisely plotted and provided 'real-world' three-dimensional provenience (UTM / mASL) from established stations on the site using the Leica Total Station, as noted above. Each test type was differentiated by a code and assigned a unique number which was also recorded on the total station. Shovel tests had the four surface corners surveyed beginning with the test datum. The same sequence was repeated at the base. Auger tests had four surface points taken around the perimeter beginning with a point above the best profile for the test. The same sequence was repeated at the base. Soil probes had a surface point taken. Most of the time, the diameter of the hole created by the soil probe was too small for the prism rod so no reliable basal readings could be taken. The depth of the probe was measured by tape and calculated by subtracting from the surface elevation reading.

Information on the excavations was maintained on excavation and sample forms created for this project. All units were given 'numbered' designations (e.g., ST-1) on a site-by-site basis (e.g., DgRl-17-F8-ST-1; DgRl-17-F3-ST-2; DgRl-17-F20-ST-3), progressively increasing by test type throughout the testing program at each site (as opposed to a feature-specific numbering system). Excavation unit locations are provided in the data tables presented in Appendix I - Mapping Data. Elevations were established for the surface and base of minimally, probing with a 2 cm diameter Oakfield soil probe, and/or augering with a 13 cm diameter bucket auger or digging square or rectangular shovel tests generally measuring 20-25 cm per side. Where possible, the least obtrusive testing methods were used to recover data. Existing soil exposures and profiles with visible stratigraphy were opportunistically investigated (e.g., DhRl-15-F6). All test excavations terminated at the C horizon which was culturally sterile -- with the exception of a few features, including Feature 13 at Xelhálh, excavation was halted to minimize unnecessary impacts. High precision three-dimensional proveniences were established for the locations of all collected carbon samples (Schaepe, Blake, Formosa, and Lepofsky 2006). Some of the detailed profiles from tested housepit features are included for reference in this thesis (Appendix V).[11]

Tests were generally placed within the central floor area (generally within a 1 m radius circle) of each feature. Systematically placing tests this way provided some ability to compare patterning in the internal features of housepits, particularly hearth locations. These testing methods proved effective at exposing carbon-rich hearth deposits associated with the earthen floors in many of the housepits.

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each unit; including each corner of the shovel tests. All matrix was screened through a 6 mm (1/8") mesh size in order to recover all archaeological material. These collections were recorded according to site number, test unit designation, level/stratigraphic layer, and/or depth below ground surface. Artifacts discovered *in situ* were recorded three dimensionally using the total station.
Paleobotanical samples were collected when possible, but these collections were limited by the small size of the test excavation units. Paleobotanical analyses were carried out on the soil sample collected from DiRj-30-F12. Profiles from at least one wall per unit were drawn and photographed. A hand-held digital camera was used to take photographs of each excavation unit (overview location) and exposed profiles, including detail profile shots from within each unit (taken by reaching down into and photographing the 'inside' of the unit, progressively from the top to bottom, and, when necessary, specific parts of the profile). Plan views were drawn and photographed where features were noted in the base of any excavation unit." Additional information on the testing strategies and methods employed at the other settlements included in this study can be found in Graesch (2006), Lenert (2007), Lenert and Lepofsky (2005), Lepofsky et al (2005), and Ritchie (forthcoming M.A. thesis).

[11] Additional information on housepit stratigraphy can be found in Graesch (2006), Lenert (2007), Lenert and Lepofsky (2005), Lepofsky et al (2005), Ritchie (forthcoming M.A. thesis), and Schaepe, Blake, Formosa, and Lepofsky (2006).

I use the term ‘floor’ as representing a discrete living surface of an earth-floored house. Floor strata are best thought of as a zone developed over a period of time and comprised of debris from that period of occupation mixed together to create that stratum. These floors are not like the hardened surfaces associated with clay or wood, but rather represent a somewhat broader timeframe of living that permeates the softer earthen surfaces on which people lived. These were recognized in many housepit features as dark, often black, bands developed by the accumulation of debris on that surface, commonly creating an occupation zone no more than a centimeter thick. Floor deposits tended to be carbon-rich and yielded many carbon samples, of which only a small portion were dated, limited by funding. These carbon-rich floors may be the result of encountering numerous individual or intersecting hearth features in our testing.

Multiple floors overlaying and separated from one another as discrete strata were common (e.g., DiRj-30-F18). Multiple floors within a single housepit tended to be composed of distinct materials, with each floor having different attributes (e.g., compaction, color, and consistency). Episodes of floor surface rebuilding apparently involved adding a capping layer of construction fill over the old floor that could serve as the base of the next floor. Material associated with these floor renovation episodes constituted distinct strata between floors and were often no more than a centimeter thick. Basal and terminal occupations were generally obvious as distinct strata set against B horizon or C horizon sediments, and generally unencumbered by pre-housepit occupation midden. Well-stratified deposits were encountered in most of the tested housepits, with the exception of those at Th’ewá:lí (DgRl-17) which was composed of a thick deposit of midden accumulation throughout the site. This allowed us to collect radiocarbon samples that were reliably associated with floors, and in some cases we were able to recover samples from a superimposed sequence of floors in the same house.

In summary, the mapping and testing results of the Fraser Valley Archaeology Project, including all 11 documented settlements, represent 10 % of the housepit settlements documented in the region as of 2006. The 'Stó:lō Housepit Mapping and Testing Project' alone documented eight of these settlements and accounted for a 7 % sample of housepit sites, and approximately 12 % all recorded housepits in the region. The radiocarbon results from this project effectively doubled the number of dated housepit settlements in the region.

CHAPTER IV - HOUSEPIT SETTLEMENT DISTRIBUTION

Viewing the mainland Gulf of Georgia Region as a network of transportation and communication systems provides a backdrop for exploring the arrangement of housepit settlements within this broad landscape. For thousands of years, the two basic means and avenues of communication traditionally used by the Stó:lō included canoeing along water-based transportation systems following rivers and slough channels, and walking or running along over-land trails (Schaepe 1999, 2001a). Traveling by canoe was the basic and fundamental link between settlements dependent on the network of rivers and sloughs within the region. These routes provided a fundamental link between settlements within and beyond the region, as influenced by the unique geographic structure of the lower Fraser River Watershed. I view the relationship between geography, transportation, and communication as integrated within the Stó:lō cultural landscape. Waterways and pathways used as transportation and communication routes are, thus, significant elements of interaction affecting community formation within a social-spatial framework. I explore broad-scale spatial and temporal relations between housepit settlements based on their position within this network described by travel distances.

Watershed landforms and river channel locations are significant elements of environment brought into cultural appreciation, through practice, as avenues of interaction. These features are integrated into cultural landscapes as elements of the economies of transportation and communication. Travel routes are recognized and applied in analyses throughout North America as important links to understanding social interaction and relationships between settlements (e.g., Ames 2002; Earle 1991). The structure of water-based routes of transportation and communication traditionally navigated by canoe throughout the Gulf of Georgia Region forms the basic framework of this spatial analysis. Measurements incorporated into this analysis reproduce the waterways and pathways of the region rather than using arbitrary straight line measurements blanketing an undifferentiated space. The locations of major waterways and pathways within the study area remain largely the same now as they were over the past 3,000 years -- identifiable and measurable as a foundation for this analysis.

Terrestrial travel routes factor into this analysis, affecting those settlements not directly accessible by water. A number of settlements throughout the region are not accessible by canoe, including those located in the upper reaches of the lower Fraser River Watershed beyond the entrance to the lower Fraser River Canyon; the majority of the Chilliwack River Valley; and the majority of the Chehalis River Valley. Water-transport to and from these places was limited, if impossible at times, due to the local hydrology -- thus requiring use of trails as a regular or primary means of travel.

Within this landscape-based framework of transportation, I maintain a basic assumption that interaction regulating the flow of information, access to resources, and communication is a significant factor of community formation. It is critical to note that different modes and means of transportation drastically effect the way in which this basic assumption becomes manifest in the tempo and scale of interaction. For example, the development of canoe technology played a significant role in the development of complex social organization and chiefdom-level authority among the Chumash of southern California (Arnold and Graesch 2004). Water-based travel is recognized as facilitating a tempo and scale of interaction far more intensive and extensive than land-based travel (Ames 2004). Water-based travel using canoes serves to move more people and things over greater distances far more efficiently and effectively than walking along trails. This assumption is substantiated by numerous Stó:lō and Coast Salish ethnographies (e.g., Duff 1952; Elmendorf 1993; see Peterson and Drennan 2005:5-6). My objective is to quantify, explore, and define cumulative, ‘longue duree’ patterns of Stó:lō-Coast Salish housepit settlement relative to a system of transportation along the waterways and/or pathways particular to the landscape of this region.

4.1 Mapping Settlement Location and Transportation Systems

The Fraser River, linking 24 watersheds within its lower 200 km stretch, is *the* central feature of intra-regional transportation and communications historically affecting inter-settlement relations among the Stó:lō. The capacity for this river system to sustain interaction between watershed-based populations of settlements is unsurpassed and largely unparalleled by any other region of the Northwest Coast. This analysis defines sub-set portions of the region based on spatial relations between 112 housepit settlements set against a framework of regional transportation routes. The results of this quantitative exploration provide a context for the more detailed analyses of the 11 settlements and corresponding housepits on which the rest of this study focuses.

Plotting the geographic distribution of the 112 housepit settlements (Figure 4.1), a 100 % sample of all recorded housepit settlements in the region as of 2006, reveals several clear patterns. It is immediately apparent that a large majority (n=106; 95 %) of housepit settlements are located in the upriver portion of the region, from the Central Fraser Valley to the east. Many settlements in this 'upriver group' are located along the Fraser River although some are located, quite far up tributary drainages including the Chilliwack and Harrison rivers. Only five recorded housepit settlements are located near to the mouth of the Fraser River and its confluence with the Georgia Strait, constituting a small 'downriver group.'

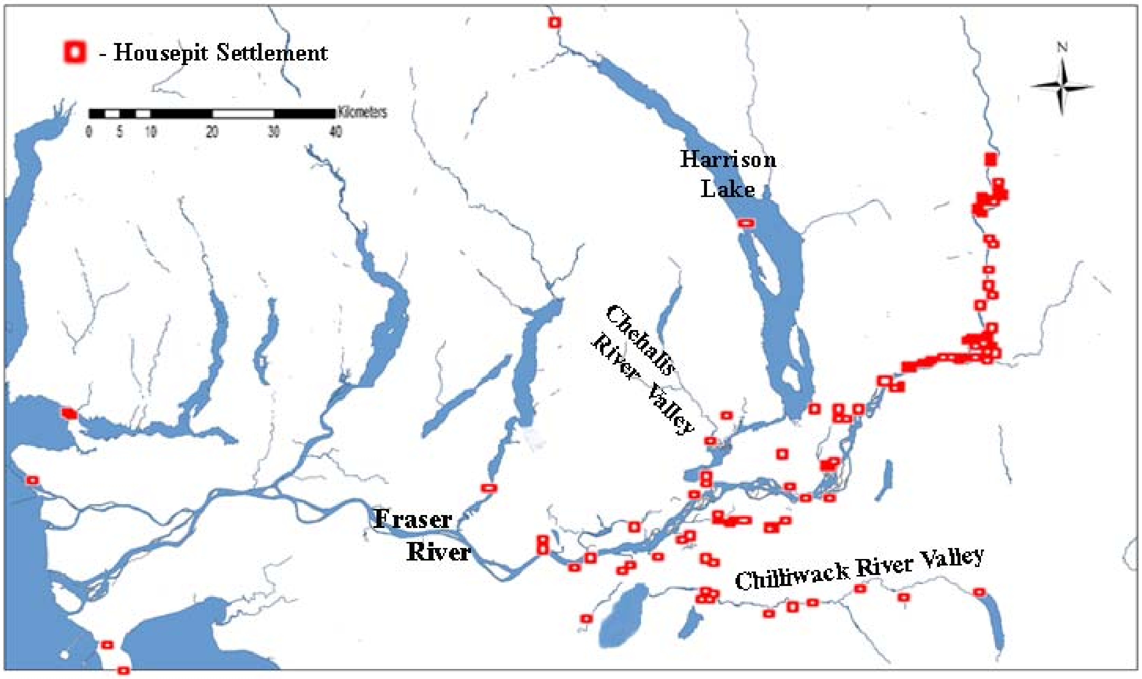


Figure 4.1 The spatial distribution of 112 housepit settlements throughout the mainland Gulf of Georgia Region, showing a pattern of downriver and upriver settlement groupings.

The definition of basic 'upriver' and 'downriver' groups is not a factor of differences in survey coverage or data documenting housepit settlements in the region. While significant ground disturbance is a factor of 20th century urbanization along its lower reaches, the Fraser River corridor was subject to similar archaeological survey coverage both up- and downriver from the Central Fraser Valley, throughout the 'gap' separating these two groups of housepit settlements. Downriver people of the Lower Fraser Valley and Delta built 'on-ground' plankhouses as their predominate form of housing, generally establishing settlements without pithouses. In the analyses that follow, I explore how patterning can be further identified and refined beyond this impressionistic picture of broad, upriver and downriver housepit settlement groupings.

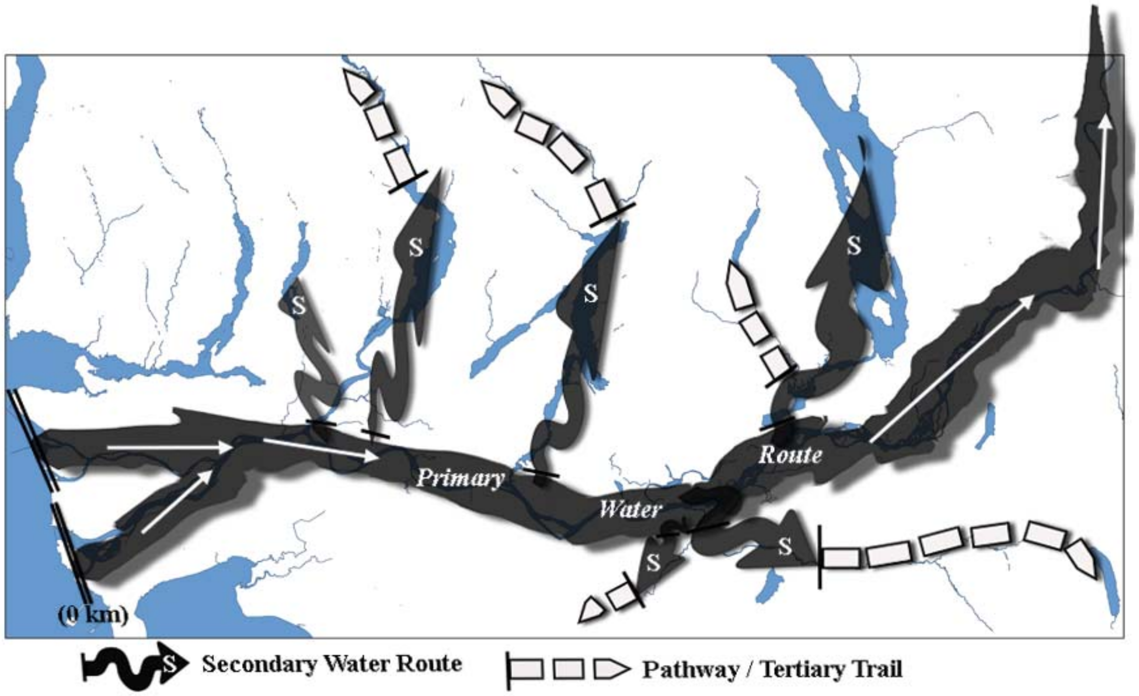


Figure 4.2. Schematic illustration of waterways (primary and secondary) and pathways throughout the region.

As a foundation to this analysis, I established a basic framework of two types of transportation routes, waterways and pathways, describing the region (Figure 4.2**).** The locations of these routes are based on the physical structure of the lower Fraser River Watershed, reconstructed as of 1800 A.D (Schaepe 2001c:19), prior to the industrial modifications that now affect this landscape. Waterways are sub-divided into primary and secondary waterways. Terrestrial pathways are defined as travel routes beginning from the point where water-travel is recognized as no longer possible. I made these determinations based on my knowledge of the region's landforms and waterways as informed by geography, oral history, historic accounts, and personal experience of extensive travels throughout this country-side. This schematic provides the conceptual backdrop against which I plot all 112 pithouse settlements used in this analysis.

4.2 Mapping Transportation Networks and Housepit Settlement Locations

Quantifying housepit settlement locations along the region's network of travel routes followed a basic framework of establishing the travel distance (km) following an up-river travel route starting at the mouth of the Fraser River and ending at each of the 112 settlements. I set the starting point of this route at the mouth of the Fraser River as marking the access point to this intra-regional travel network. Travel beyond this point and within the Georgia Strait provides access to many neighboring regions throughout the broader 'Coast Salish Sea' and Central Northwest Coast.

Total travel distance measurements were established according to a system of travel between the mouth of the Fraser River and each settlement. This measurement was sub-divided, as determined by each specific journey, into three possible sequential parts defining travel distance(s) along: (1) the 'primary water route' (i.e., the Fraser River); (2) a 'secondary water route' (i.e., a tributary of the Fraser River); and (3) a 'terrestrial route' or pathway. The 'primary water route' value provides a measure of travel distance up the Fraser River as a required initial leg of travel common to all 112 settlements. This measurement identifies travel distance to either a settlement, directly, or to a point where travelers exit from the Fraser River as a central feature of this system and continue upriver along a secondary waterway. The 'secondary water route' value is required for those settlements not directly located on the banks of the Fraser River but otherwise along a tributary waterway such as the Harrison, Sumas, or Chilliwack rivers, or various slough channels of the Central Fraser Valley. This value is a measure of distance traveled along a tributary waterway between its confluence with the Fraser River and the settlement itself, or a point of connection to a pathway leading to the settlement. The 'terrestrial route' value is a measure of distance traveled on foot as a final leg of the journey to any settlement requiring such a shift to a terrestrial means of travel -- including those in the upper Chilliwack and Chehalis river valleys. All travel distance measurements are thus modeled on upriver travel by canoe from a starting point (0 km) at the mouth of the Fraser River, and increasing as one follows the respective sequence of travel routes needed to reach each of the 112 settlements.

Measuring travel distance serves as a proxy for measuring social-spatial relations between settlements, akin to the 'anchored radiance' model (Miller 1999) of Coast Salish settlement. Primary water route travel distances define locations of 'exits' where travelers the left the Fraser River either to reach a settlement directly or take a subsidiary route. Analysis of the distribution of primary water route travel distances provides insight into these 'exit' locations as prospective clusters of points of connection or 'hubs' of travel and communication along the Fraser River. Such hubs define clusters or groupings of proximate settlements -- either co-existing or other representing longer-term patterns of use and occupancy (Cannon 2002; Mackie 2003). Hubs, representing more densely or consistently occupied portions of the landscape, indicate potential 'central places' of interaction. Defining settlements associated with secondary or tertiary water route travel distances is also insightful as a measure of social-spatial distance away from the central Fraser River corridor. As travelers enter tributary watershed systems, they enter more locally-oriented networks of travel and communication -- one step removed from direct connection to the inter-regional waterway. Settlements requiring terrestrial travel (i.e., with terrestrial travel distances) are the most peripheral to this system and maintain the greatest degree of social-spatial separation from the intra-regional network of relations.

Defining the region by travel distances, while based on a topographic foundation, helps recognize a topologic view of the landscape. Travel time is a significant factor of this process and is linked directly to the concept of tempo, discussed in Chapter II, as a factor of the community formation process. The tempo of travel (i.e., travel time), moreso than distance, influences the potential for communication and affects the perception proximity between settlements. Travel time, of course, would vary between up-river and down-river trips depending upon current, tide, wind speed, weight, technology, and so on. Distance measurements used in this analysis represent one-half of a round-trip journey from the mouth of the Fraser River to each settlement. In this model, travel conditions similarly affect all travelers on their journey upriver. Distance serves as a proxy for travel time, assuming a constant speed of travel -- equalizing time as a factor in this analysis. More complex modeling, beyond the scope of this study, is required to create a truly topologic perspective of the region based on factors of travel distance, travel time, and different means and modes of transportation.

Recognizing travel time in conceptual terms does, however, provide insight into a topologic view of the region's landscape defined as a factor of travel-distance:travel-time ratios. The impact of time on a topologic landscape would most significantly affect the transition from water to land-based travel. This transition would effectively warp and 'extend' physical space relative to the increased time:distance ratio for settlements accessible only by trails. Conceptual (topologic) space grows as travel time increases. Topologically, describing social-spatial distance, settlements accessible only by terrestrial means would be farther removed than water-accessible settlements. Topologic warping of the region would, considering the distribution of housepit settlements, most significantly affect the Chilliwack River Valley, Chehalis River Valley, and lower Fraser River Canyon, as noted above.

An objective of this analysis is to define groups of settlements based on measureable differences in relationships between three travel distance variables -- primary water route, secondary water route, and terrestrial route. This approach sets the results of bivariate statistical analyses of these variables against a geographic landscape. The geographic context provided in plotting these statistical descriptions of housepit settlements is critical to the interpretation of these findings. The inventory of documented housepit settlements used in this study was plotted on a 1:180,000 scale map approximating the region's geographic landscape circa 1800 A.D. Travel distances were measured in kilometers using a digital planimeter (Scalemaster Classic v2.0 Digital Plan Measure) set to this scale (Appendix VI). In Figure 4.1 and subsequent maps in this chapter, X- and Y-axis scatterplot coordinates represent geographic UTM mE and mN measurements, respectively. This geographic referencing provides a means of coding settlements according to the results of these statistical analyses and plotting them in their real world, geographic locations.

I used an Exploratory Data Analysis (EDA) approach and methods as a foundation to the quantitative analyses carried out in this analysis (see Chapter III). I use stem-and-leaf graphs and box-plots as core analyses in the EDA toolkit (Drennan 1996; Tukey 1977). These analyses resulted in the identification of a number of settlement groups which I coded by type and projected on the regional maps presented below. As proxies for social relations, housepit settlement groups identified in this analysis reveal both the landscape of travel and communication networks.

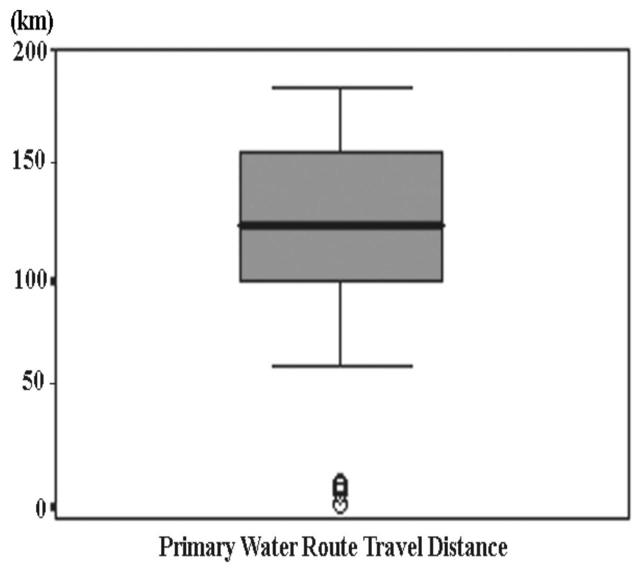
4.3 Analyzing Primary Water Travel Route Distances

The first step in defining housepit settlement groups focused on primary water route travel distances for all 112 settlements in the region. This analysis readily quantified the 'impressionistic' recognition of downriver and upriver groups noted above. These groups appear in the structure of these data when shown as stem-and-leaf and box-plots (Figures 4.2 and 4.3). The main point of Figures 4.2 and 4.3 is to show that the total group of housepit settlements can be initially sub-divided into two basic groups based on primary travel distance values with those less than 11 km and those greater than 63 km respectively representing downriver and upriver groups of settlements. The shape of the overall group is downwardly skewed by five housepit settlements with travel distance values under 11 km corresponding (sites DgRs-1, DgRs-14, DhRs-2, DhRs-275, and DhRt-T1) -- representing five extreme outliers within this group. These five settlements represent the 'downriver group.' The remaining set of values represents the 'upriver group.' The downriver and upriver groups are separated by a spatial gap or 'break' of 53 km within which there are no recorded housepit settlements.

Primary Water Route
Travel Distance (km)
All Settlements (n=112)

Frequency	Stem & Leaf	(Dist. in km)
5.0	Extremes	(=<11 km)
1.0	6.	3
2.0	7.	89
6.0	8.	346999
16.0	9.	4888888888888888
18.0	10.	000000000477777777
3.0	11.	448
9.0	12.	014444467
3.0	13.	477
7.0	14.	0335679
17.0	15.	01122344555556778
7.0	16.	1444567
16.0	17.	1223455566667788
2.0	18.	01

Stem width: 10.0



Figures 4.2 (left) and 4.3 (right). The structure of primary water route travel distances (km) shown in a stem-and-leaf plot and box plot, respectively.

The primary water travel distances of upriver group settlements range from 63-181 km. The stem-and-leaf plot identifies at least two additional groups of upriver settlements with peak measurements between 90-100 km and 150-170 km. Overall, the spatial distribution of downriver (n=5) and upriver (n=107) settlements form the first two groups identified in this analysis (Figure 4.4). I cut the downriver group of settlements from this study in the process of narrowing my set of data and scope of analysis within the region. The upriver group forms a spatially clustered and robust set of settlements on which I focus the remaining analyses.

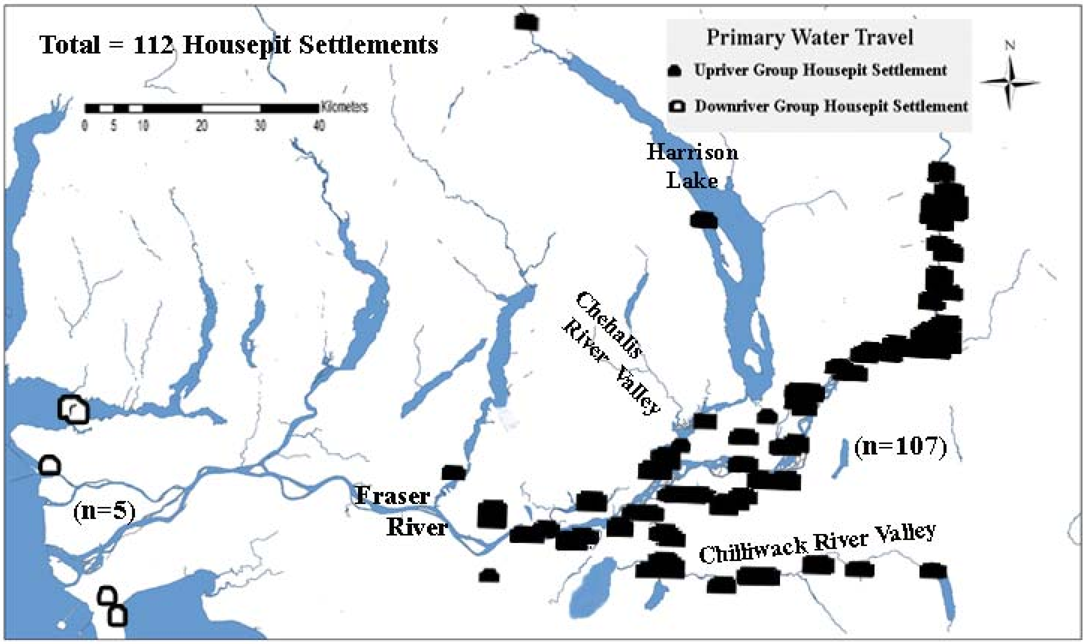


Figure 4.4. Spatial distribution of downriver and upriver housepit settlement groups (n=112).

Three additional sites (DhRo-25, DjRl-3, and DkRn-5) were culled from the upriver group of settlements. The cases were removed from this analysis for the following reasons. The validity of the housepit settlement at DhRo-25, the case with the lowest (i.e., westernmost) ‘primary water route’ value (63 km) of the upriver group located in the Stave River Valley, is highly suspect and lacking confirmation. This site was removed from consideration due to its questionable nature. DjRl-3 and DkRn-5 -- respectively situated in the mid- to upper-Harrison Lake area -- were removed due to their very distant location from any other site in the Fraser River corridor. These two sites stand out in Figure 4.4 as the two outlying sites in the middle and upper Harrison Lake area. Removing these cases, as coarse data, from the upriver group smoothes the sample and removes the possibility of their skewing the results of this analysis. They are useful to note as part of the broader distribution of housepits settlements in the region.

The upriver group of housepit settlements is geographically situated between the Central Fraser Valley and the lower Fraser River Canyon (Figure 4.5). The primary water route travel distances for these settlements are again presented using stem-and-leaf and box-plots (Figures 4.6-4.7). Travel distance measurements for the upriver group range of values between 78.8-181.7 km (mean=132.1; median=131.0 km). The stem-and-leaf plot of these data depicts a non-normal shape with multiple peaks (Figure 4.7), providing a basis for further dividing this group into groups of more normally-shaped, single-mode sub-sets.

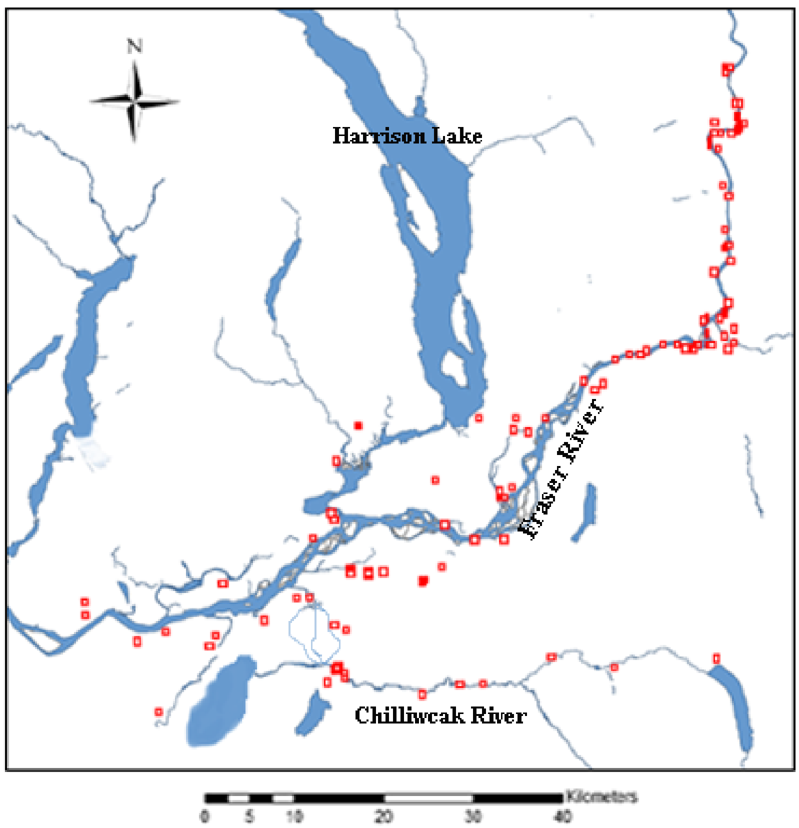
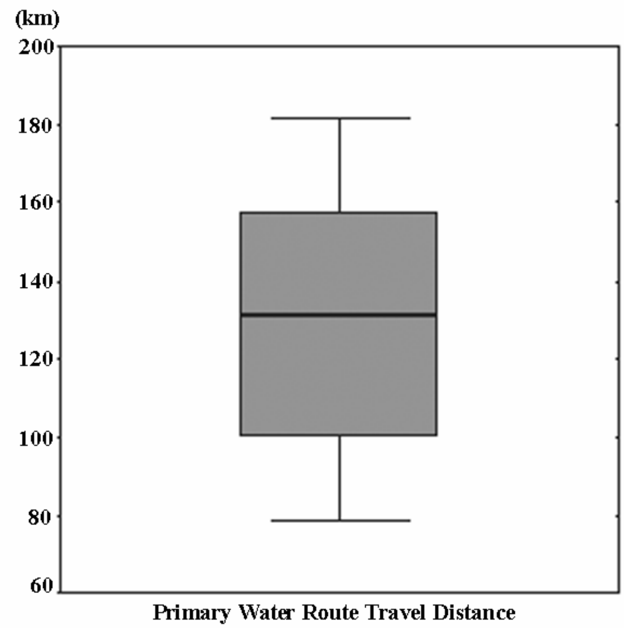


Figure 4.5. Spatial distribution of 'upriver group' housepit settlements (n=104).



Primary Water Route
Travel Distance (km)
Upriver Group (n=104)

Frequency	Stem & Leaf (Dist. in km)
2.0	7. 89
6.0	8. 346999
16.0	9. 4888888888888888
16.0	10. 0000000004777777
3.0	11. 448
9.0	12. 014444467
3.0	13. 477
7.0	14. 0335679
17.0	15. 01122344555556778
7.0	16. 1444567
16.0	17. 1223445566667788
2.0	18. 01

Stem width: 10.0

Figures 4.6 (left) and 4.7 (right). Box plot and stem-and-leaf plot of primary water route travel distances for upriver group settlements (n=104).

Using a subjective process guided by the insight into data structure provided by the box- and stem-and-leaf plots, I dividing the upriver group at the median value of 131 km, forming two equal sized groups (n=52). I selected the median as representing the most prominent trough or valley separating the two sets of peaks. Group 1 settlements have travel distances ranging from 78.8 -130.9 km. Group 2 settlements range between 131-181.7 km from the mouth of the river. The distribution of upriver Group 1 settlement distances forms a single mode, though positively skewed (Figures 4.8 - 4.10). The majority of settlements in this group are located between 86 km and 120 km upriver. Group 1 has a median travel distance of 100.4 km and a mean of 103.2 km. The mid-spread is fairly well centered within the four quartiles. Half of these settlements lie within a small inter-quartile range of 9.15 km, surrounding these central distance values. A number of extreme values are identified on both the upper and lower ends of the distribution. On the lower end of outlying values, travel distances to four settlements range from 78.8-85 km. On the upper end of extreme values, travel distances to eight settlements range from 122-130.9 km. Both sets of extremes are clustered within a distance of 10 km either side of the main bunch of values. Group 1 is geographically representative of settlements accessible by traveling up the Fraser River to the Central Fraser Valley.

Primary Water Route Travel Distance (km)
Upriver Group 1

Frequency	Stem & Leaf (Dist. in km)
4.0	*Extremes* (=<85 km)
4.0	8. 6999
1.0	9. 4
15.0	9. 888888888888888
10.0	10. 0000000004
6.0	10. 777777
2.0	11. 44
1.0	11. 8
1.0	12. 0
8.0	*Extremes* (>=122 km)

Stem width: 10.0

Primary Water Route Travel Distance (km)
Upriver Group 2

Frequency	Stem & Leaf (Dist. in km)
3.0	13. 477
7.0	14. 0335679
17.0	15. 01122344555556778
7.0	16. 1444567
16.0	17. 1223445566667788
2.0	18. 01

Stem width: 10.0

Figures 4.8 (left) and 4.9 (right). Stem-and-leaf plots for primary water route travel distances associated with upriver settlements -- upriver Groups 1 and 2.

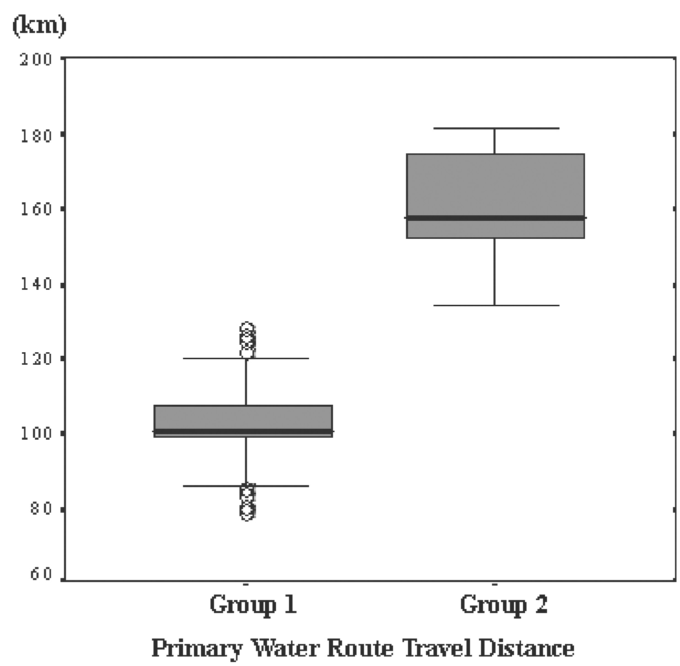


Figure 4.10. Box plots of primary water route travel distances for upriver Groups 1 and 2.

Group 2 includes settlements with travel distances of 134 to 181 km from the mouth of the Fraser River (Figures 4.9 and 4.10). This group remains non-normally shaped and negatively skewed and has two peaks representing possible sub-groups. I again divided this group in two at a point in-between the two peaks. I separated Group 2 at 167 km. Recognizing that other possible break-points exist (e.g., between 161 and 164 km), I judgmentally selected this point between 167 and 171 km as providing the widest (spatial) gap among values in the trough separating the two peaks. The constitution of these sub-groups will vary by only a few settlements depending upon the selection of a break-point within this range of options.

Dividing upriver Group 2 into two sub-groups resulted in the definition of two normally-shaped, albeit small, groups with single peaks (Figures 4.11-4.13). Travel distances for settlements in Group 2 (n=34) range across a distance of 33 km between 134-167 km from the mouth of the river. Half of these settlements are located within a (inter-quartile) range of 10.4 km and are relatively evenly centered within the whiskers of the box-plot (Figure 4.13), distributed around a median of 154.4 km and mean of 153.1 km. Group 2 is geographically associated with the Upper Fraser Valley.

Primary Water Route Travel Distance (km)
Upriver Group 2

Frequency	Stem & Leaf (Dist. in km)
1.0	13. 4
2.0	13. 77
3.0	14. 033
4.0	14. 5679
8.0	15. 01122344
9.0	15. 555556778
4.0	16. 1444
3.0	16. 567

Stem width: 10.0

Primary Water Route Travel Distance (km)
Upriver Group 3

Frequency	Stem & Leaf (Dist. in km)
6.0	17. 122344
10.0	17. 5566667788
2.0	18. 01

Stem width: 10.0

Figures 4.11 (left) and 4.12 (right). Stem-and-leaf plots of upriver settlement Groups 2 and 3 -- based on primary water route travel distances.

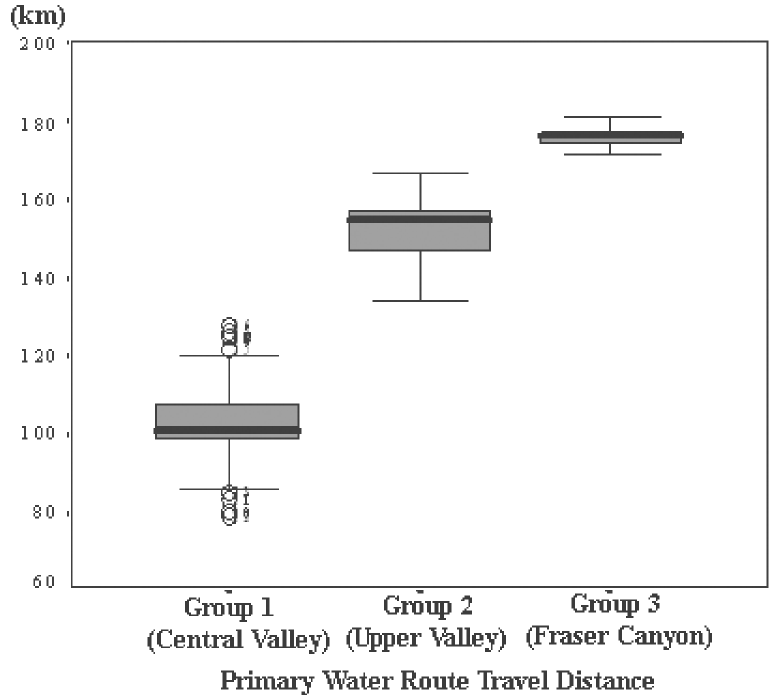


Figure 4.13. Box-plots of upriver Groups 1-3 (Central Fraser Valley, Upper Fraser Valley, and Lower Fraser Canyon housepit settlement groups) -- based on analysis of primary water route travel distances to each settlement from the mouth for the Fraser River.

Group 3 (n=18) travel distances range from 171-181.7 km. Settlements in this group are tightly clustered within a small range of only 10.7 km. Half of these settlements lie within an inter-quartile range of 3.5 km -- a mid-range that is also evenly centered within the whiskers of the box-plot (Figure 4.13) -- surrounding a median of 176.4 km and mean of 176.1 km. Group 3 is geographically associated with the Fraser Canyon.

Analysis of primary water route travel distances thus provides a means of dividing the initial group of 104 upriver settlements into three sub-groups: Group 1 (n=52) associated with the Central Fraser Valley; Group 2 (n=34) associated with the Upper Fraser Valley; and Group 3 (n=18) associated with the Lower Fraser Canyon. The geographic labels attached to these groups derive from the geographic locations of each group when plotted within the region (Figure 4.14). One final examination of upriver settlements based on primary water route travel distance measurements entails subdividing Group 1(the Central Fraser Valley group) by its two sets of extreme values. The lower and upper extreme values in the Central Valley Group were defined as subgroups -- 'East-Central Valley Group' (n=4) and 'West-Central Valley Group' (n=8) -- with the remaining portion of this sample maintained as the 'Central Valley' Group (n=41). The spatial distribution of five upriver pithouse settlements groups, including these three Central Valley groups and both Upper Valley and Fraser Canyon groups, is presented in Figure 4.15.

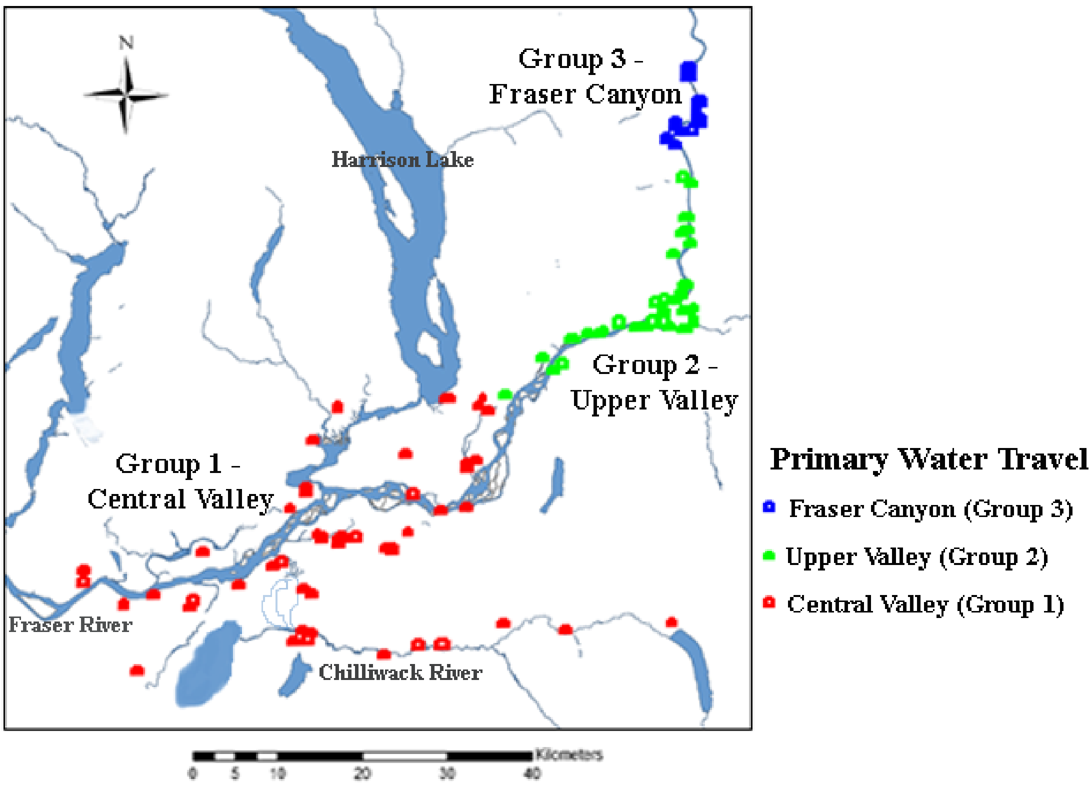


Figure 4.14. Spatial distribution of upriver Groups 1-3 (Central Fraser Valley, Upper Fraser Valley, and Fraser Canyon housepit settlement groups) -- based on analysis of primary water route travel distances to each settlement from the mouth for the Fraser River.

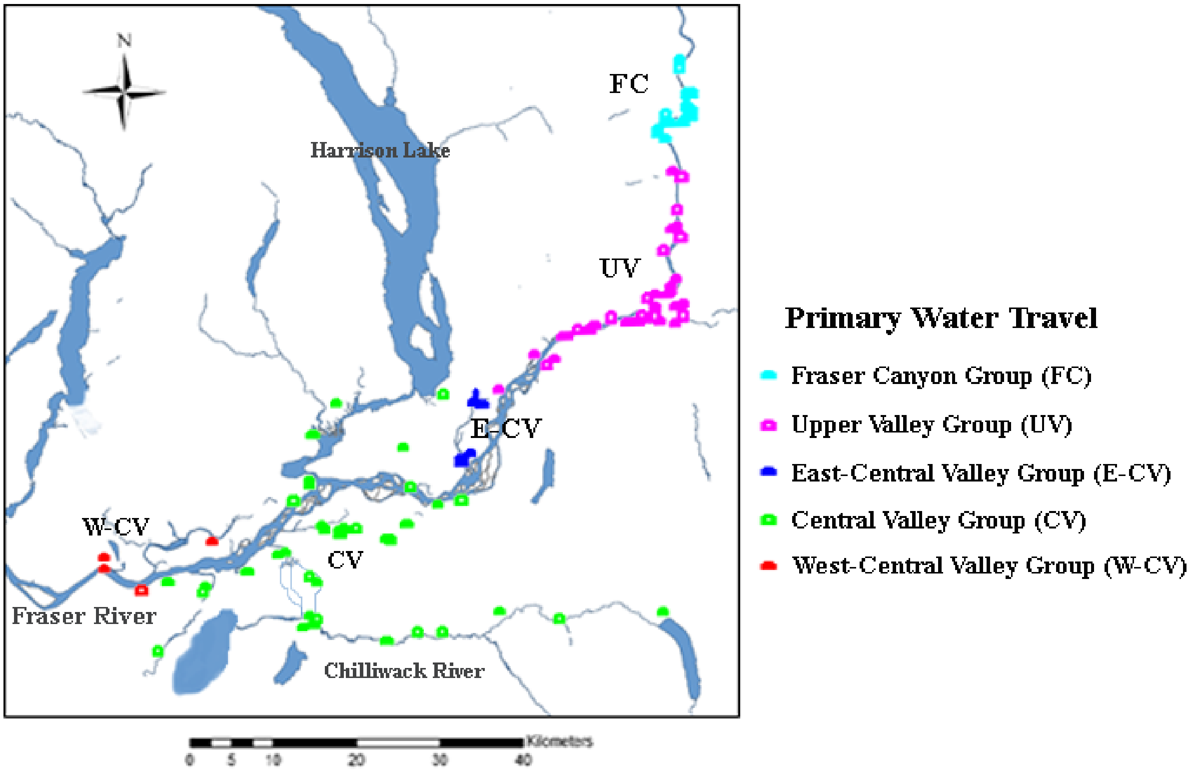


Figure 4.15. Spatial distribution of upriver housepit settlements defined as five groups (West-Central Fraser Valley, Central Fraser Valley, East-Central Fraser Valley, Upper Fraser Valley, Lower Fraser Canyon) -- based on analysis of primary water route travel distances to each settlement from the mouth of the Fraser River.

Since ‘primary water travel’ measurements mark only the distance along the Fraser River to the ‘exit’ point leading to each tributary watershed, all settlements, including those along terrestrial routes (e.g., Chilliwack River Valley), are included in the grouping shown in Figure 4.15. Settlements are grouped according to the section of the Fraser River system to which they are linked either directly or by tributary waterways and trails. This analysis provides two optional views of housepit settlement groups, with either three or five grouping categories, for consideration in subsequent analyses of regional settlement patterns (Figures 4.14 and 4.15).

4.4 Analyzing Secondary Water Route Travel Distances

This set of analyses focus on the measurement of secondary water route travel distances among the upriver group of housepit settlements (n=104). Given that slightly over half of these settlements (n=53) are located directly on the banks of the Fraser River, I divided settlements situated alongside the Fraser River from those with secondary water route values. I thus created two groups with travel distances of zero (Group 1 - ‘Riverside;’ n=53), and those with values greater than zero. The later group includes all settlements set back along a secondary waterway, some distance from the Fraser River (Group 2 - ‘Distanced from the Fraser River;’ n=51).

Figure 4.16a
Secondary Water Route
‘Distanced’ from Fraser River
Group 2

Frequency	Stem & Leaf (Dist. in km)
11.0	0. 01111111111
5.0	0. 22333
8.0	0. 44445555
2.0	0. 77
3.0	0. 999
3.0	10. 011
5.0	10. 22333
4.0	10. 4555
9.0	10. 666666666
1.0	10. 9

Stem width: 1.0

Figure 4.16b
Secondary Water Route
Near to Fraser River
Group 2a

Frequency	Stem & Leaf (Dist. in km)
1.0	0. 4
10.0	1. 1222477888
2.0	2. 07
3.0	3. 236
4.0	4. 0358
4.0	5. 0239
0.0	6.
2.0	7. 57

Stem width: 1.0

Figure 4.16c
Secondary Water Route
Far from Fraser River
Group 2b

Frequency	Stem & Leaf (Dist. in km)
3.0	9. 569
1.0	10. 1
2.0	11. 13
2.0	12. 77
3.0	13. 457
1.0	14. 4
3.0	15. 345
9.0	16. 444444589
0.0	17.
0.0	18.
1.0	19. 0

Stem width: 1.0

Figures 4.16a-c. Stem-and-leaf plots of all upriver housepits settlements (n=51) distanced from the Fraser River by travel along a secondary water route, and two sub-groups of settlements -- located either near to (< 8 km) or far from (> 8 km) the Fraser River -- based on the distance of travel along secondary waterways.

The stem-and-leaf plot of Group 2 (Figure 4.16a) shows a bimodal distribution of secondary water route travel distance measurements. I used the median (8 km) as a break-point to establish two unimodal sub-groups of settlements (Figures 4.16b-c) -- a ‘Near to Fraser

River' group (n=26) and a 'Far from Fraser River' group (n=25). I use 'near' and 'far' as intuitive, relative indicators of distance from the primary Fraser River travel corridor. 'Near' Group 2a ranges between 0.1-8 km in distance from the Fraser River. 'Far' Group 2b ranges between 9-19 km in travel distance along tributary waterways. The means and medians of both the 'Near' group (mean=3.2, median=3.0) and 'Far' group (mean=14.2, median=15.3) mark sizable differences in relative travel distances (also see Figure 4.17).

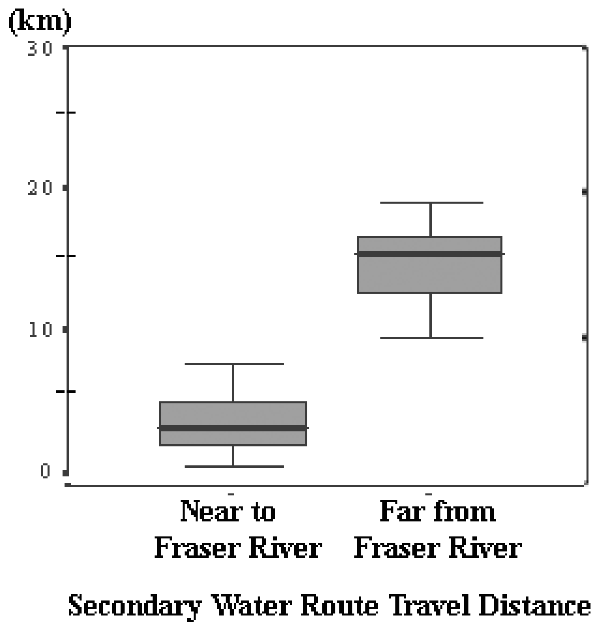


Figure 4.17. Box-plots of three groups of housepit settlements defined by secondary water route travel distances (km) from the Fraser River -- Fraser River-side settlements and those near to or far from the Fraser River accessed by secondary waterways.

This analysis identifies three groups of housepit settlements. One group of settlements is located directly along-side the Fraser River travel-way ('River-side'). Two other are more subjectively situated either 'Near to the Fraser River' or 'Far from the Fraser River' as determined by travel distance along a tributary waterway and/or trail (again resulting in the values for and classification of the trail-based Chilliwack River Valley settlements). The geographic distribution of pithouse settlements plotted according to these settlement groupings

(Figure 4.18) shows some clear patterning. Eighty-seven % (n=46) of 'Fraser River-side' settlements are located in the Upper Fraser Valley and Lower Fraser Canyon. This settlement pattern appears to be a factor of the region's geography which constricts to the east of the Central Valley (see Chapter I).

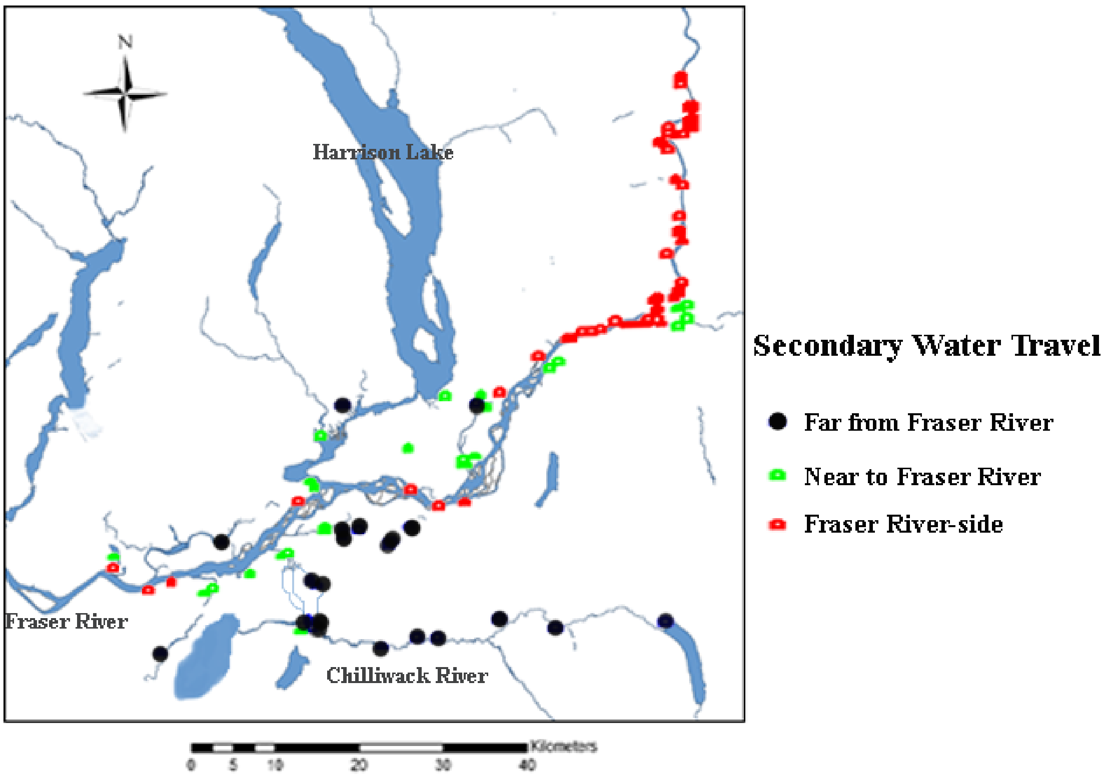


Figure 4.18. Spatial distribution of three groups of housepit settlements defined by secondary water route travel distances from the Fraser River -- Fraser River-side settlements and those near to or far from the Fraser River accessed by secondary waterways.

Settlements throughout the Upper Fraser Valley and Lower Fraser Canyon, as previously defined, form a linear arrangement of tightly clustered settlements along the Fraser River. In comparison, the Central Fraser Valley forms a more complex landscape of relations between settlements located on the Fraser River and those located among the numerous tributary waterways surrounding the Fraser River. Contrary to what some might hold as an intuitive impression, this analysis identifies a number of settlements in the Central Fraser Valley as located quite far from the Fraser River -- particularly those assessable only by way of the twisting slough channels that meander through the valley. Further analysis of terrestrial route travel distances provides an additional layer of information useful in understanding of settlement patterning.

4.5 Analysis of Terrestrial Route Travel Distances

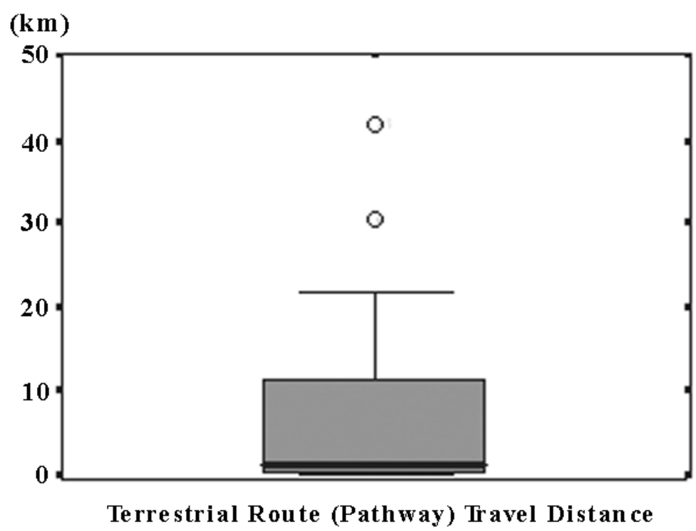
Analysis of terrestrial route travel distances requires separating settlements accessible by water from those accessible only by land. Of the total sample (n=104), a group of water-accessible or 'No Terrestrial Travel' settlements (n=87) was derived by isolating cases with terrestrial route travel distances of zero. The remaining settlements defined the 'Terrestrial Travel' group (n=17). Overland travel distances in this group vary widely (Figures 4.19-20). Travel distances range from 0.1-42 km, with a median of 1.1 km, indicating extreme skewing in the distribution of these data and compression among the lower values. Two extreme values (>=30 km) associated with travel in the Chilliwack River Valley factor into this distribution.

Terrestrial Route Travel Distance (km)

N=17

Frequency	Stem & Leaf (Dist. in km)
11.0	00. 00000000112
1.0	00. 6
2.0	10. 13
0.0	10.
1.0	20. 1
2.0 *Extremes*	(>=30 km)

Stem width: 1.00



Figures 4.19 (left) and 4.20 (right). Stem-and-leaf plot and box-plot of terrestrial route travel distances (km) for settlements necessarily accessed by overland pathways.

The small sample size, the lack of apparent break-points in these data, and the tight clustering and extreme compression in the lower half of this group of values was problematic in sub-dividing this group. To provide a basic categorization of terrestrial travel distances, I decided to rely on quantitatively-defined break points associated with the inter-quartile range. I judgmentally cut this set of values at the lower hinge (0.3 km) of the inter-quartile range. This division captured 25 % of the smallest values in this group, ranging from 0.1-0.3 km, as identified in the box-plot (Figure 4.19). The remaining 75 % of values range between 0.6-42 km. These groups are differentiated by access requiring either 'short' (n=4) or 'long' (n=12) travel distances along terrestrial pathways. Again, I use the terms 'short' and 'long' as qualitative measures of relative distance. This manner of grouping provides a basic means of sorting settlements by highlighting those settlements in close proximity to the system of navigable waterways from those distanced by moderate-to-long overland treks. Most importantly, these additional groups identify settlements that were either water-accessible or otherwise necessitated a shift in the means of transportation requiring either short or moderate-to-long overland treks.

The geographic distribution of the three groups of pithouse settlements defined by differences in the means of travel and terrestrial travel distances is shown in Figure 4.21. This brings definition to settlements accessible by moderate to long overland treks. The majority of settlements with 'long-range' terrestrial travel distances are located mainly in the 'upper' Chilliwack River Valley -- above the point where that watershed connects with the Fraser Valley. In combination with their placement in the results of the previous analysis (see Figure 4.18) these settlements appear as markedly removed from the Fraser River-based network of transportation and communication. These findings add to the identification of the upper Chilliwack River Valley as a geographically defined sub-group of settlements connected to the

Central Fraser Valley group(s) of the lower Fraser River Watershed (see Figures 4.14, 4.18, and 4.21).

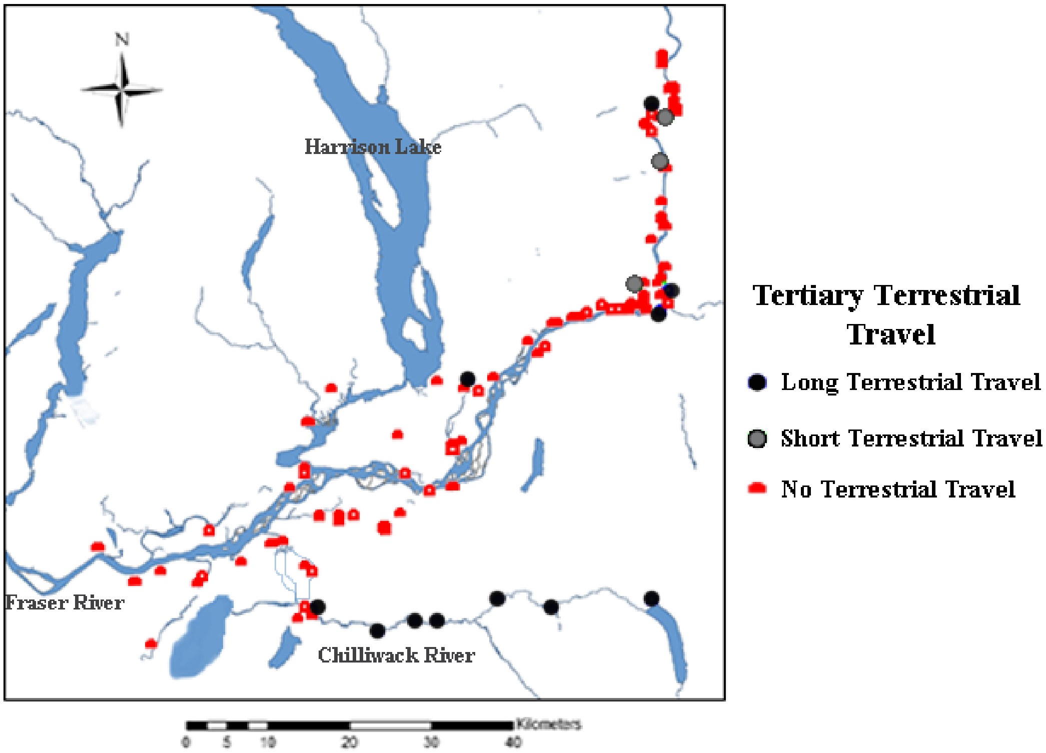


Figure 4.21. Spatial distribution of pithouse settlements categorized by final terrestrial travel-based groups -- no terrestrial travel, short terrestrial travel (< 0.3 km), and moderate-to-long terrestrial travel (> 0.3 km).

It is also necessary to discuss settlements in the Lower Fraser Canyon in this analysis. The water-accessibility of settlements located within the Canyon, above its entrance marked by Lady Franklin Rock, is affected by seasonal fluctuations in water levels. High water levels throughout much of the later spring, summer, and early fall create generally impassible white-water obstacles to upriver canoe travel at a number of locations within the Canyon. Canoe travel across select stretches of river between settlements located on either side of the Canyon, however, remains possible year-round. Otherwise, pathways along both sides of the Canyon provide access to these settlements from the water-accessible X̲elhálh Bay at the Canyon entrance. The means of travel, either water- or terrestrially-based, required to reach those settlements located beyond the Canyon entrance in the upper reaches of the lower Fraser River Watershed thus stand out, uniquely, as seasonally affected.

4.6 Defining 'Hubs' of Interaction along the Fraser River and its Tributaries

The locations of three major 'hubs' or points of connection to the Fraser River are derived from the long-term patterning of housepit settlements that developed around this central travel route (Figure 4.22). 'Hub,' as I define and apply this term, has a dual meaning – both geographic and social. I use the term 'hub' in a socio-political and socio-economic sense following along the lines of Miller's (1989) discussion of connective points articulated within a framework of communication theory. The following discussion of 'hubs' links social and geographic frameworks based on this quantitative analysis of housepit settlements, the local network of transportation and communication routes, and the geography of the upriver portion of the region.

Geographically, the locations of the three hubs identified in Figure 4.22 are defined by the central measures (i.e., median values) describing the distribution of housepits of the Central Valley (100.4 km), Upper Valley (154.4 km), and Fraser Canyon (176.4 km) sub-groups of the larger Upriver Group, based on primary water route travel distances. Settlements cluster around these central points, as described by the inter-quartile ranges noted above. I discuss the importance of the geographic locations of these hubs in more detail, below.

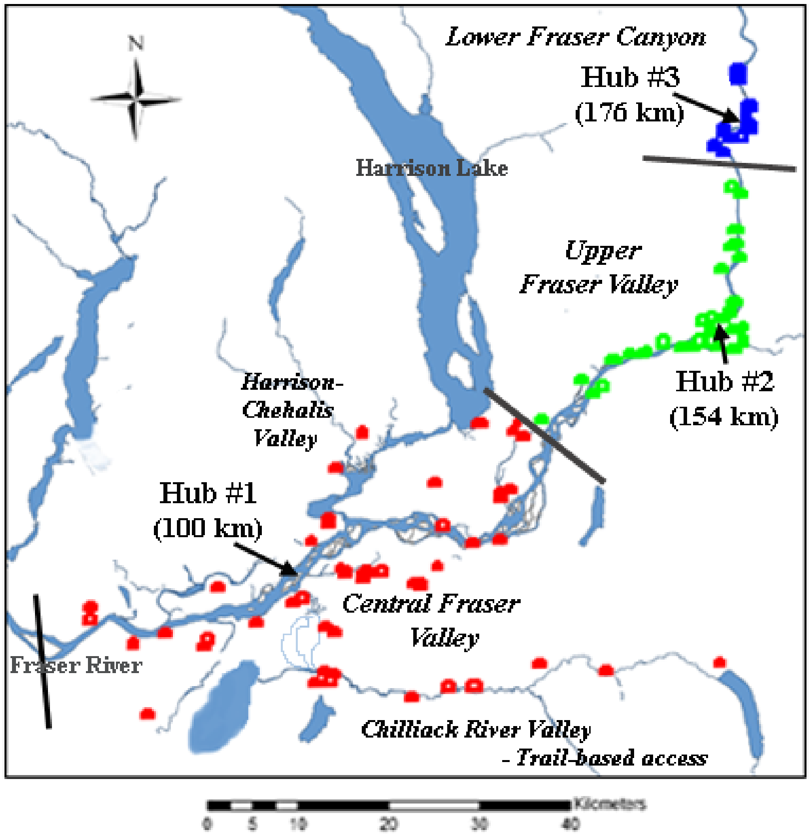


Figure 4.22. The general locations of upriver 'hubs' -- central locations in the distributions of each of the three sub-set upriver housepit groups and geographic connective points among Central Fraser Valley, Upper Fraser Valley, and Lower Fraser Canyon housepit settlement groups.

Hub 1, located in the Central Fraser Valley some 100 km from the mouth of the Fraser River, is a major point of access to a group of settlements located off the main Fraser River channel and along the river's extensive network of braided slough channels. The Fraser River does not provide direct access to the vast majority of settlements along these slough channels. Access points to these channels and their settlements converge near Hub 1. Conceptually, this hub serves as an important access point from the river to the settlements along the sloughs. In addition, the Chilliwack, Sumas, and Harrison Rivers are also linked to this hub. This connection among the tributary waterways is not immediately apparent when looking at the distribution of settlements in the Central Fraser Valley, which appear quite dispersed. In fact, this pattern may be better described as a clustering of settlements along secondary waterways, set back from the Fraser River.

Hub 2 is located in the center of the Upper Fraser Valley Group near Welqámex-Ts’qo:ls (Hope) about 154 km from the river’s mouth. Settlements in this locale differ from those associated with Hub 1 in that they are nearly all directly associated with the Fraser River rather than navigable tributary waterways. The geographic extent of this ‘upriver’ locale is defined by a narrowing valley bordered by steep-sided mountains and numerous truncated or ‘hanging’ tributary systems generally unfit for navigation by canoe, or salmon for that matter. The distribution of settlements in this group clusters around Welqámex-Ts’qo:ls, and thins to the north, with a slight gap separating this group from the lower Fraser Canyon Group. A number of major drainages and associated terrestrial pathways, including the Coquihalla River, Silverhope Creek, and Semallo River, converge at this hub from regions beyond the Gulf of Georgia. In some ways, this hub is like the Vedder Crossing locale near Hub 1, insofar as it is a junction between water and terrestrial modes of transportation. The grouping of settlements in the Upper Fraser Valley surrounding Hub 2, provides significant opportunity for direct contact between settlements situated closely along the Fraser River. This set of relations is similar to those settlements within the side-channel slough and tributary river systems of the Central Fraser Valley, associated with Hub 1.

Hub 3 is located near near X̲elhálh Bay about 176 km from the mouth of the river at the upper extreme of riverine travel along the Fraser River. The hub at X̲elhálh Bay, the geographic entrance to the lower Fraser Canyon, is central to interaction associated with this locale. While canoes can pass freely from the sea to this point of the river, and vise versa, a significant set of seasonal rapids surrounding Lady Franklin Rock -- a large bedrock protrusion in the middle of a very narrow stretch of the river -- define the upriver edge of the bay and restrict water-based travel into the Canyon. A sizable gap separates the cluster of Stó:lō-Coast Salish settlements in the Canyon from the southern-most Interior Salish village, located farther upriver at Spuzzum Creek. Villages in the Canyon connect to X̲elhálh Bay by way of trails and, seasonally, canoe. The locale and settlements associated with Hub 3 thus form a major conceptual change in the structure of the Fraser River itself. This locale defines a point of connection (or dissection) between shifting modes of intra-regional transportation and communication separating the Coast and Interior Salish. The Coast Salish world and networks of transportation and communication directly connected to the Coast Salish Sea reach a terminus within the lower Fraser River Canyon at the upper end of the lower Fraser River Watershed.

Settlements clustered at the outlet of the Chilliwack River Watershed, where it meets the Fraser Valley (Figure 4.23), form a similar point of connection within the landscape of interaction. Settlements in this locale are linked to the Central Fraser Valley group by way of tributary waterways supporting canoe travel. This locale links two different modes of transportation and communication, for shortly beyond this location the Chilliwack River becomes impassable to canoe travel. In fact, *Ts'elxwéyeqw* ('Chilliwack') -- the indigenous name of the river -- translates as "as far as you can go with a canoe" (Elder Albert Louie in Oliver Wells 1987:160). This junction forms a connective point or 'hub' similar to those identified along the main Fraser River system. A similar pattern is more recently emerging in the patterning of newly documented housepit settlements at the junction of the Chehalis and Harrison rivers (Lepofsky et al. 2005; Sanders and Ritchie 2006), not included in this analysis.

These hubs thus represent locales along the Fraser River formed as central points among concentrations of settlements or otherwise significant points of connection to the river associated with access to tributary systems. The locations of these hubs correlate with central places in the Central Fraser Valley, the Upper Fraser Valley, and lower Fraser Canyon -- at the entrance to the Lower Fraser River Watershed. The definition of these three settlement groups (based on EDA) and related hubs (based on EDA, social and geographic context) provide insight into the way in which the Stó:lō developed their relationship with the river and surrounding landscape. This relationship developed as a particularly 'Stó:lō' phenomenon in part as connections between the local transportation network and with each other as the builders and inhabitants of those settlements over the last 3,000 years.

4.7 Discussion of Communication Networks and Settlement Patterning

A close connection between geographically defined sections of the lower Fraser River Watershed and settlement groupings indicates a relationship between the landscape of Stó:lō settlement patterning, geography, and networks of transportation and communication. These travel distance analyses highlight the relationship between water-based or terrestrial means of travel, the network of transportation and communication corridors, and housepit settlement locations in the upriver portion of the region. The region as a whole is composed of two basic groups of housepit settlements -- downriver and upriver groups -- the latter of comprising the vast majority of housepit settlements in the region (n=104) and the focus of this analysis. Settlements in the upriver group comprise four basic groups geographically associated with Central Fraser Valley, Upper Fraser Valley, Lower Fraser Canyon, and upper Chilliwack Valley. The distribution of housepit settlements defining these groups is very closely associated with the geo-physical sub-sections of the lower Fraser River Watershed defined in Chapter 1.

The four main regional settlement groups identified in this study are also closely associated with major linguistic and tribal affiliations charactering the Stó:lō, as defined ethnographically (Figure 4.23). The geographic areas associated with upriver and downriver

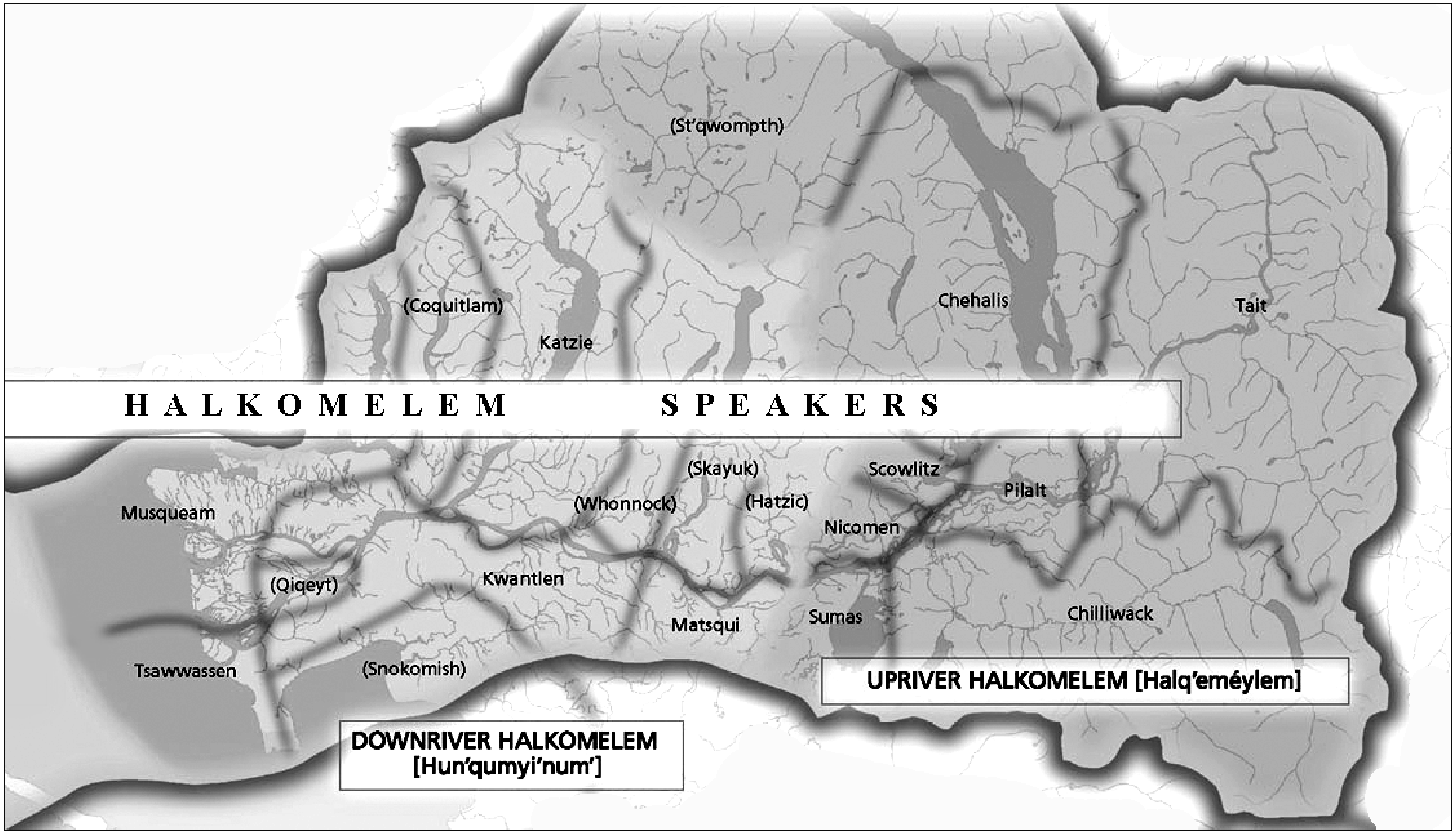


Figure 4.23. Halkomelem language area and Stó:lō tribes of the lower Fraser River Watershed (after Smith 2001). This map does not show all the tribal groups, languages, and First Nations within the region, and a number of local groups are not identified. The main objective of figure is to illustrate the close relationship between housepit settlement groups defined in the text and a number of the Halkomelem language dialects pictured above -- particularly with sub-sets of the Upriver Group.

settlement groups -- defined primarily on the presence or absence of pithouse-type dwellings -- overlap closely with the spatial grouping of upriver and downriver language dialects within the Halkomelem language family. The presence of the vast majority of known housepit settlements (i.e. the Upriver group) corresponds with the distribution of *halq'eméylem* speakers -- the upriver dialect of Halkomelem. The area defined by a relative absence of housepit settlements corresponds with the distribution of hun'qumyi'num' speakers -- the downriver dialect of Halkomelem.

Similar correspondence defines the relationship between Stó:lō tribal units and settlement groupings of the Central Fraser Valley, Upper Fraser Valley, Lower Fraser Canyon and the upper Chilliwack Valley. A number of tribal groups are recognized ethnographically (Duff 1952), as they are currently, among traditional 'upriver' *halq'eméylem* speaking Stó:lō. The *Ts'okwám* occupied and maintain connection to the Lower Fraser Canyon (Carlson 2003). The *Tít* tribal area corresponds closely with the Upper Fraser Valley -- the *Ts'okwám* representing a particular sub-group of *Tít* in the Canyon. *Ts'elxwéyeqw* territory is associated with the upper Chilliwack Valley and, since at least the 18th or 19th century, the lower Chilliwack River system within the Central Fraser Valley.

This social-spatial relationship indicates the presence of long-standing and persistent patterns of relations between people and place, influenced by the indigenous landscape of interactive networks within the lower Fraser River Watershed. The Central Fraser Valley, itself, is home to a number of tribal groups including the *Pilalt*, *Semá:lh*, *Scowlitz*, and *Leq'á:mél*, each associated with a tributary waterway in this portion of the region. These tribal units are defined in part in linguistic terms by micro-dialects of *halq'eméylem*. A strong association describes the relationship between the geographic patterning of housepit settlements and the definition of Stó:lō cultural-linguistic groups. These settlement groups represent expressions of intra-regional interaction developed over the long-term and based on the physical characteristics of the riverscape together with the development of canoe travel. These forces influenced the Stó:lō's selection of pithouse sites and places to live, the expression of which is characterized within these three basic locales (i.e., Central Valley, Upper Valley, and Canyon) along the Fraser River travel corridor and adjacent tributary watersheds. The patterning of settlements defining these locales and their associated hubs developed from the long-term and persistent use as places entrench relations within the built landscape. The relation of these hubs to the cultural geography of the area supports their identification as important places within a social-spatial framework fundamental to the formation and maintenance of Stó:lō communities.

These discussion draws our attention back to Bourdieu's (1977) *practical mode of knowledge* (Chapter 2), in which communication (between households and settlements throughout the region) is viewed a fundamental element of community formulation. Communicative pathways identified above serve as means of sharing and reproducing knowledge between groups, realized in their expression of identities and cultural practices. The concentration of what appear to be communicative centers (hubs) correlate with a concentration of interactions of all sorts -- exchanging material goods, establishing social ties, and sharing knowledge. These extensive avenues of communication support the distribution of knowledge in the political-economic cycle. The relationship between this region's communication network and the location of housepit settlements forms an integral part of the forces critical to the negotiation of household position in social space. The long-term patterns of communication brought to light here provide insight into the structure of the region as an element of a political-economic 'field' (Bourdieu 1984), influencing the negotiation of social standing among those living within this system.

CHAPTER V - FRAMING TIME: A CHRONOLOGY OF UPRIVER HOUSEPIT FEATURES

The problem of time in this study presents significantly greater constraints than the problem of space. In this chapter I develop a chronological framework supporting the analysis of the 11 housepit settlements and 114 housepit features forming the core dataset of this study. Measurement of dimensional space was recorded very precisely for every observable housepit feature in the sample. Measurement of time, on the other hand, remains incomplete due to the small subset of housepits for which we have dates (even after including the supplementary data discussed in Chapter III). The temporal resolution of this analysis is, thus, limited to the small sample of radiocarbon dates, even though now significantly more robust than before the Fraser Valley Project began. As a result, the temporal resolution of this study is coarse. The units of time defined here are restricted to broad-banded periods measured on the order of hundreds of years.

5.1 Establishing a Chronology of Housepit Features

The chronology applied in this study is based entirely on radiocarbon data from housepit features in the 'upriver' portion of the study area.[12] Developing this chronology followed a quantitative process correlating groups of radiocarbon dates with periods of time useful in classifying housepit features and settlements. I focused on defining groups based on major breaks in the distribution of their radiocarbon ages. A secondary factor involved paying attention to, and trying to maintain, the robustness of group sizes as possibly affecting further analysis. Efforts were made to maximize the temporal resolution of data groupings as much as

[12] All radiocarbon data used in this analysis are presented as calibrated (cal B.P.) radiocarbon ages representing a range of probable ages determined at 2 sigmas and 95% confidence level ($p = .05$; calibrated at 2σ).

Table 5.1. Radiocarbon dates from all 34 radiocarbon-dated house features in the Central, Upper, and Canyon sections of the Fraser Valley, sorted by age (p = .05; calibrated at 2σ) -- as of 2006.

Site #	Feat. #	Sampl. #	Min. Age (cal B.P.)	Max. Age (cal B.P.)	Lab ID	Context / Notes	Reference
DhRl-16	03	--	2070	2750	consolidated[13]	plankhouse; initial-to-terminal occupation age range	Lepofsky et al. 2000:400
DiRj-1	01	--	2334	2741	I-6191		Hanson 1973:267 (Calib 5.0.2)
DiRj-1a	15	--	2360	2730	Beta-208879		Lepofsky & Lenert 2005
DhRl-16	08	--	2340	2710	CAMS-61997	uncertain type of structure	Lepofsky et al. 2000:400
DiRj-1	06	--	2340	2690	Beta-208885		Lepofsky & Lenert 2005
DiRj-1	10	--	2160	2350	Beta-208881		Lepofsky & Lenert 2005
DiRj-30	09	3	2120	2330	Beta-201169	initial occupation	Schaepe et al. 2006
DiRj-1	09	--	2050	2320	Beta-208882		Lepofsky & Lenert 2005
DiRj-30	12	4&6	1900	2290	Beta-217438-217439 (consolidated)	initial-to-terminal occupation range	Schaepe et al. 2006
DiRj-30	18	4	1900	2120	Beta-210137	initial occupation	Schaepe et al. 2006
DiRj-30	04	1	1880	2060	Beta-210170	terminal occupation	Schaepe et al. 2006
DhRl-16	05	--	1630	1920	WSU-5052	uncertain type of structure	Lepofsky et al. 2000:400
DiRj-30	13	5	1300	1480	Beta-210171	initial occupation	Schaepe et al. 2006
DgRl-17	02	4	970	1180	Beta-210179	initial occupation; extends into late-precontact	Schaepe et al. 2006
DhRl-T2	01	--	940	1,070	Beta-208884	mid-occupation	Lepofsky et al. 2005:4
DgRl-17	08	4	930	1,060	Beta-210180	initial occupation; extends into late precontact era	Schaepe et al. 2006
DiRj-38	02	--	504	768	Gak-5429		von Krogh 1976:210-211 (Calib 5.0.2)

[13] 'Consolidated' indicates the grouping of a series of radiocarbon dates associated with a single feature, such as DhRl-16-F03, including the maximum and minimum values of the series. A complete listing of radiocarbon dates (n=46) is including in Appendix III.

Site #	Feat. #	Sampl. #	Min. Age (cal B.P.)	Max. Age (cal B.P.)	Lab ID	Context / Notes	Reference
DgRl-15	06	3	640	700	Beta-217441	plankhouse; initial age; occupation extends into contact-era	Schaepe et al. 2006
DiRi-15	11	--	540	670	Beta-213534	plankhouse; initial age; occupation extends into contact-era	Graesch 2006:66
DiRi-48	02	5	500	550	Beta-210178	initial occupation (possibly pre-housepit)	Schaepe et al. 2006
DgRl-15	04	1	470	540	Beta-217440	single, short-term occupation	Schaepe et al. 2006
DhRl-T2	04	--	460	540	Beta-208883	near terminal occupation	Lepofsky et al. 2005:5
DiRj-14	01	--	156	535	Gak-5432		von Krogh 1976:210-211 (Calib 5.0.2)
DiRj-1a	20	--	290	490	Beta-208880	.	Lepofsky & Lenert 2005
DiRi-15	01	--	290	490	Beta-213529	initial occupation; extends into contact-era	Graesch 2006:66
DhRl-T1	05	1	290	470	Beta-210181	single, short-term occupation	Schaepe et al. 2006
DiRi-15	07	--	60	470	consolidated	initial-to-terminal occupation age range	Graesch 2006:66
DjRi-14	28	2	150	440	Beta-210176		Schaepe et al. 2006
DjRi-14	23	2	150	430	Beta-210175		Schaepe et al. 2006
DjRi-14	13	3	150	430	Beta-210174		Schaepe et al. 2006
DiRi-15	06	--	60	290	Beta-213531		Graesch 2006:66
DiRi-48	01	6	60	280	Beta-210177		Schaepe et al. 2006
DiRi-15	09	--	60	270	Beta-213533		Graesch 2006:66
DiRi-15	05	--	60	270	Beta-213530		Graesch 2006:66

possible, but considering data robustness, some cases were lumped together creating periods with broader time spans and larger sample sizes. Finer resolution in defining time periods may be possible given larger numbers of dated housepits.

Median radiocarbon age values are used as the basis of the groupings defined in this chronology. I consolidated multiple dates from individual housepits as well as dates from multiple housepits describing individual settlements as a means of simplifying these data sets. I explored the structure of these data using 'hi-lo' plots and histograms with variable bin widths, working to identify and define breaks in the grouping of housepit and settlement age values. Table 5.1 provides radiocarbon ages for all 34 post-3,000 cal B.P. house features documented in the upriver area as of 2006. This sample includes a number of plankhouse features.[14] The distribution of these radiocarbon ages is plotted in Figure 5.1. Three basic groups are formed by two breaks in mid-point plots at about 600-900 cal B.P. and 1500-1900 cal B.P. Differences in the slope of the line linking mid-points and spatial clustering based on temporal distance between mid-points indicate breaks separating these groups. Gaps between groups are generally traversed by a steep a line linking mid-points. The clearest groups are those points linked by a gently sloping line between 100-600 cal B.P. (Group III) and those with mid-points ranging between 1800-2550 cal B.P. (Group I). Another more dispersed group (II) lies in

[14] In order to establish as robust a sample as possible while yet remaining focused on house features, I did not restrict the compilation of radiocarbon dates to housepit features solely but also included dates from plankhouse features where available (i.e., DgRl-16-F3; DgRl-15-F6; DiRi-15-F6 and F11). In two instances, dates from structural features believed to be houses but of an uncertain type were also included (DhRl-16-F5 and F8). Features with multiple radiocarbon dates -- including DhRl-16-F3, DiRi-15-F7, and DiRj-30-F12 -- were consolidated into a single measure representing a span of maximum-to-minimum radiocarbon ages derived for each particular feature. This fact accounts for the apparent discrepancy between the total number of radiocarbon dates referenced above and the number of features listed in Table 5.1. In two instances, conventional radiocarbon dates were all that were available (i.e., DiRj-1-F1 and DiRj-38-F2). Calib.5.0.2 (Stuiver et al. 2005) was used to calibrate these dates as included in Table 5.1. The group of features and dates used in this analysis were selected from a slightly larger sample that included five additional house features from three sites -- DiRi-1-F1 and F2 (Ts'qo:ls), DiRj-5-F1 (Eayem), and DiRj-14-F1 and F2 (Xelhálh) -- with relative ages determined from their artifact assemblage (Appendix 5.1). These five features were not used in establishing this framework because they either represented Colonial Period features or control over their dating was too imprecise.

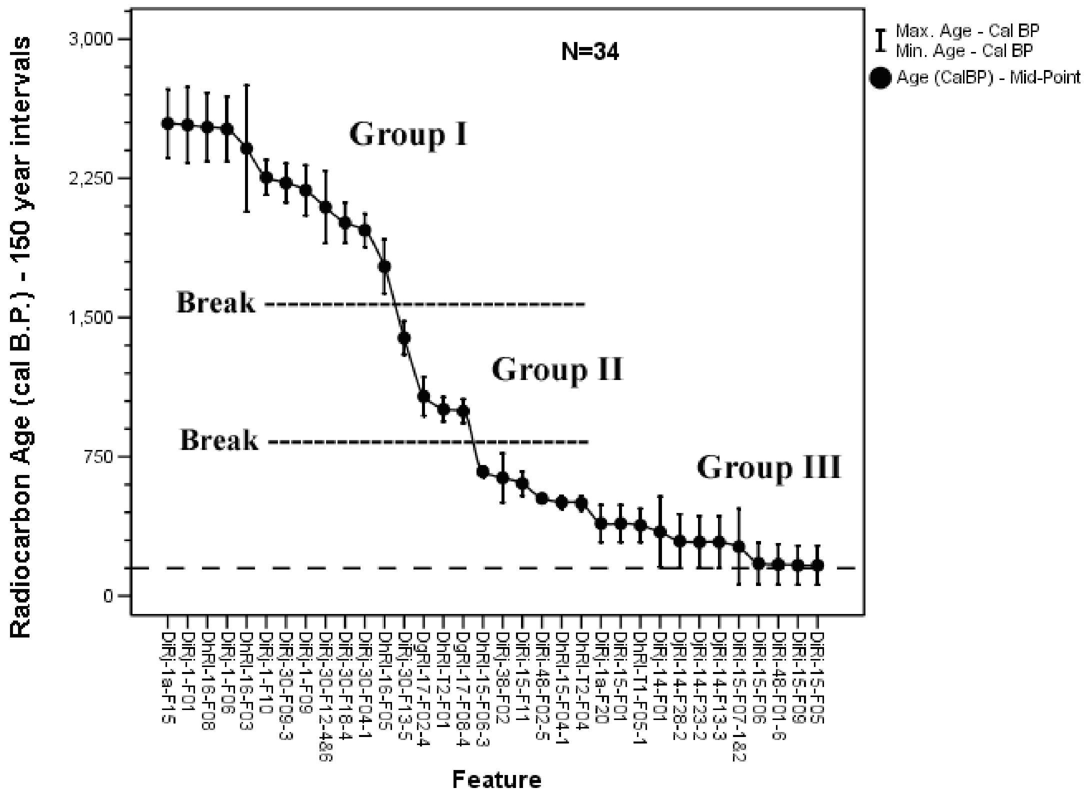


Figure 5.1. Chronologically ordered sequence of 34 radiocarbon ages (cal B.P.; $p = .05$; calibrated at 2σ) showing maximum, minimum, and mid-point values for all radiocarbon- dated housepit features in the Upriver Group area (as of 2006), connected by mid-point.

between, in the 900-1400 cal BP range. This patterning is based on the entire regional sample of dated houses.

The resolution of patterning in this image increases when re-plotted using dates from only those features (n=29) directly associated with house features from the settlements forming the focus of this study.[15] Figure 5.2 shows a clearer pattern of breaks in the distribution of housepit ages, indicated by both gaps in the distribution and shifts in the slope of the line, mainly in the relationship between the mid- (900-1850 cal B.P.) and upper- range (> 1950 cal B.P.) groups. Steeply-sloped lines defined breaks between the mid-range group and those

[15] Detailed descriptions of these samples are provided in Appendix 5.2

surrounding it. Breaks of approximately 300 and 600 years, respectively, separate this group from the next nearest younger and older features.

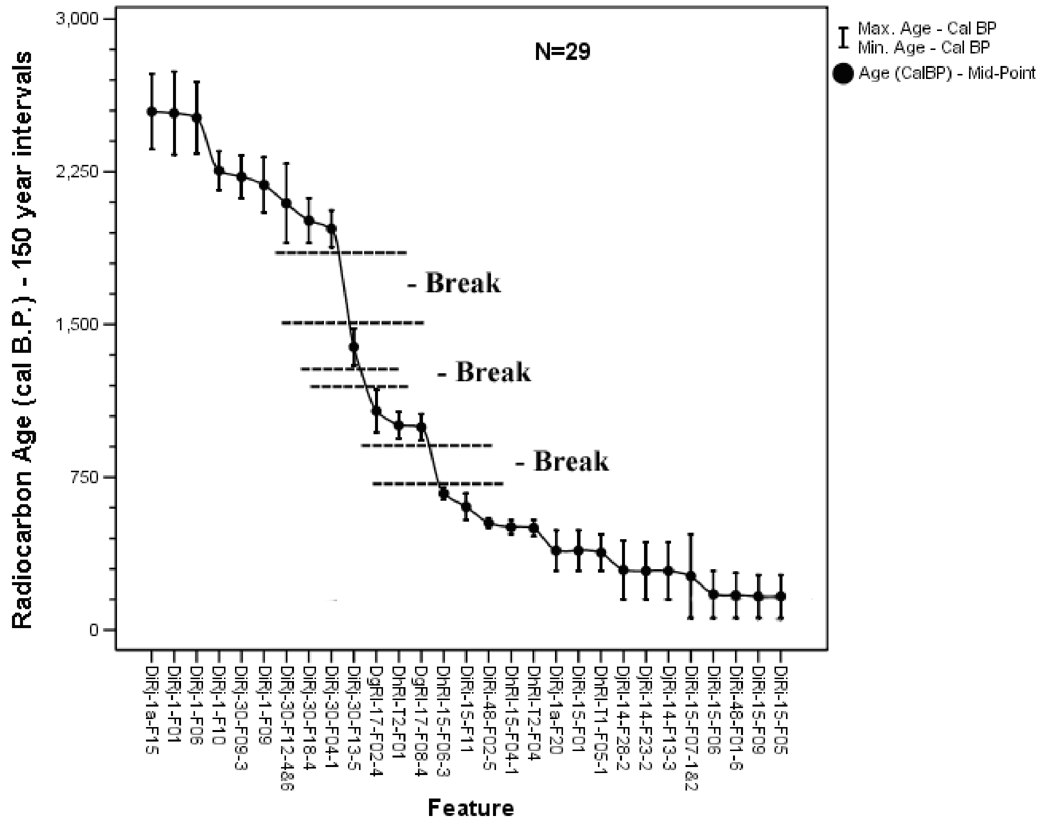


Figure 5.2. Chronologically ordered sequence of radiocarbon ages (cal B.P.; p = .05; calibrated at 2σ) showing maximum, minimum, and mid-point values for all 29 radiocarbon dated housepit features from the 12 settlements included in the Upriver Group sample (as of 2006), connected by mid-point.

The mid-range group, itself, could be separated into two groups. A steep line and sizable (300 year) gap separates DiRj-30-F13 (ca. 1390 cal B.P.) from the other three slightly younger features (n=3) with which it is most closely associated. While this gap may be represent a legitimate break, I decided to group these four features into a single temporal group so that the sample was large enough to be included my analysis. The results of two grouping options are presented in the distribution of housepit ages shown in histograms[16] with 150 and 250 year bins (Figures 5.3 and 5.4). Defining one as opposed to two separate groups decreases the bin width or resolution of this analysis from approximately 150 year intervals to 250 year intervals. At 150 year intervals (Figures 5.2 and 5.3) this group appears divided by a sizable gap. At 250 year intervals (Figure 5.4), this mid-range group forms a single mode relative to the two surrounding (younger and older) groups. This mid-range group (n=4) covers a nearly 600 year span and includes features ranging from 900-1450 cal B.P.

The relationship between mid-points in the lower range (< 600 cal B.P) groups is characterized by mid-points arranged along a line with a low slope. Figures 5.2-5.4 show that the younger group consistently forms a single mode or group of features -- downwardly skewed when viewed at 150 year resolution (Figure 5.3) and more normally shaped at 250 year resolution (Figure 5.4). The younger group (n=16) covers an approximate 500 year span and includes features ranging from 100-600 cal B.P -- extending from the contact- into the late precontact periods.

While the upper-range group appears cohesive in its distribution of mid-points (Figure 5.2), the data structure contains a slight break between mid-points at about 2300-2400 cal B.P. that are more clearly identified in Figures 5.3 and 5.4. Both histograms (Figure 5.3 and5.4) identify two groups, one including features (n=6) ranging between about 1950-2250 cal B.P. and the other including a features (n=3) dating to around 2500 cal B.P. Maintaining robust samples supports the consolidation of these features into a single group (n=7) spanning about 600 years and including features ranging from 1950-2550 cal B.P.

[16] I found that using histograms, manipulating and exploring various bin-widths, enhanced my ability to more clearly define breaks between groups of data and increase the level of accuracy in defining temporal classes in this analysis -- beyond what I was able to do initially using stem-and-leaf graphs.

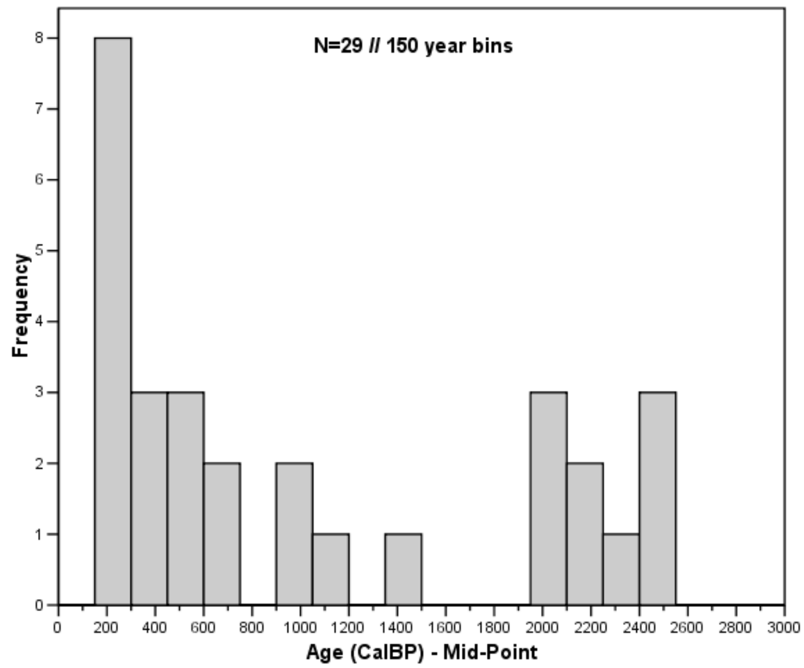


Figure 5.3. Histogram showing the distribution (150 year intervals) of radiocarbon ages from 29 housepit features among the 12 settlements in the Upriver Group sample.

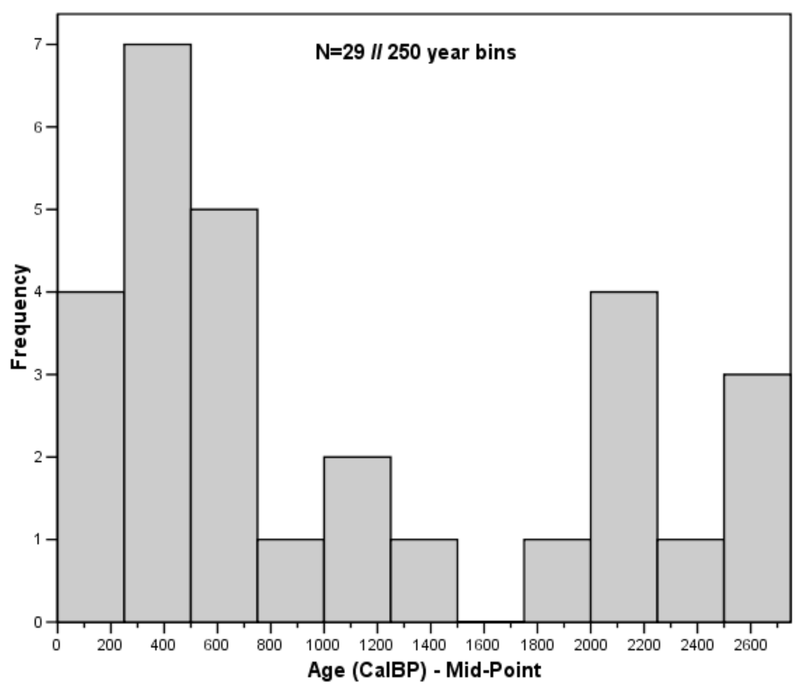


Figure 5.4. Histogram showing of the distribution (250 year intervals) of radiocarbon ages from 29 housepit features among the 12 settlements in the Upriver Group sample.

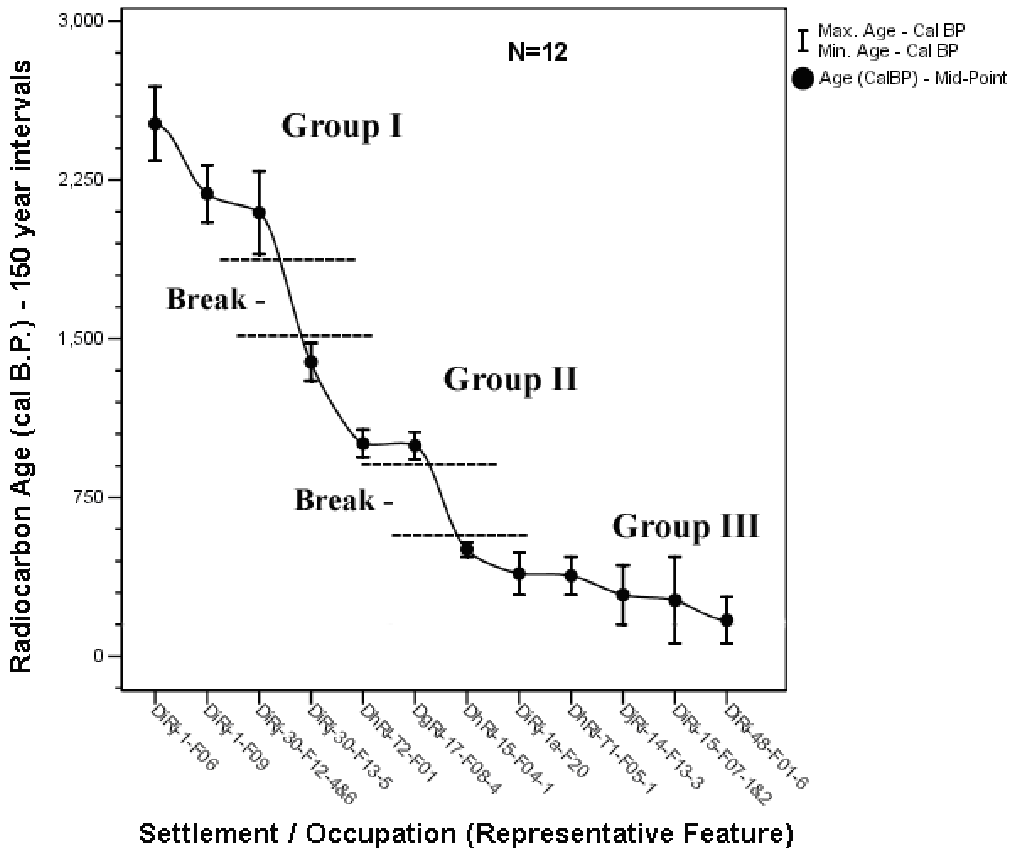


Figure 5.5. Graph showing the distribution of radiocarbon age ranges and mid-point values (cal B.P.; $p = .05$; calibrated at 2σ) for sampled Upriver Group settlements/occupations, based on representative housepits.

A final step taken in refining the definition of house feature groupings and time periods in this chronology involved characterizing the age of each settlement using radiocarbon data from a single, representative feature.[17] Figure 5.5 shows the distribution of radiocarbon ages (n=12) representing each settlement in the Upriver Group sample. I discuss below the fact that some settlements appear twice in this graph as having multiple occupations (e.g., DiRj-30 and DiRj-1/1a). The patterning in this graph shows the breaks already noted between the three basic upper, middle, and lower groups, only with slightly greater resolution. Notably, the distribution of ages representing the lower group falls within a slightly narrower range of 450

[17] One settlement among the Upriver Group sample -- DhRl-6 (Sqwa:la) is not represented in this graph as no radiocarbon dates were taken from any of the features at this settlement. Based in historic documentation and oral history of its occupation, Sqwa:la is associated with the late period group of settlements.

years between 100-550 cal B.P. The ranges and dates defining the middle- and upper- groups remain as noted above. Periodization of these groups is, thus, based on a combination of this set of figures and analyses.

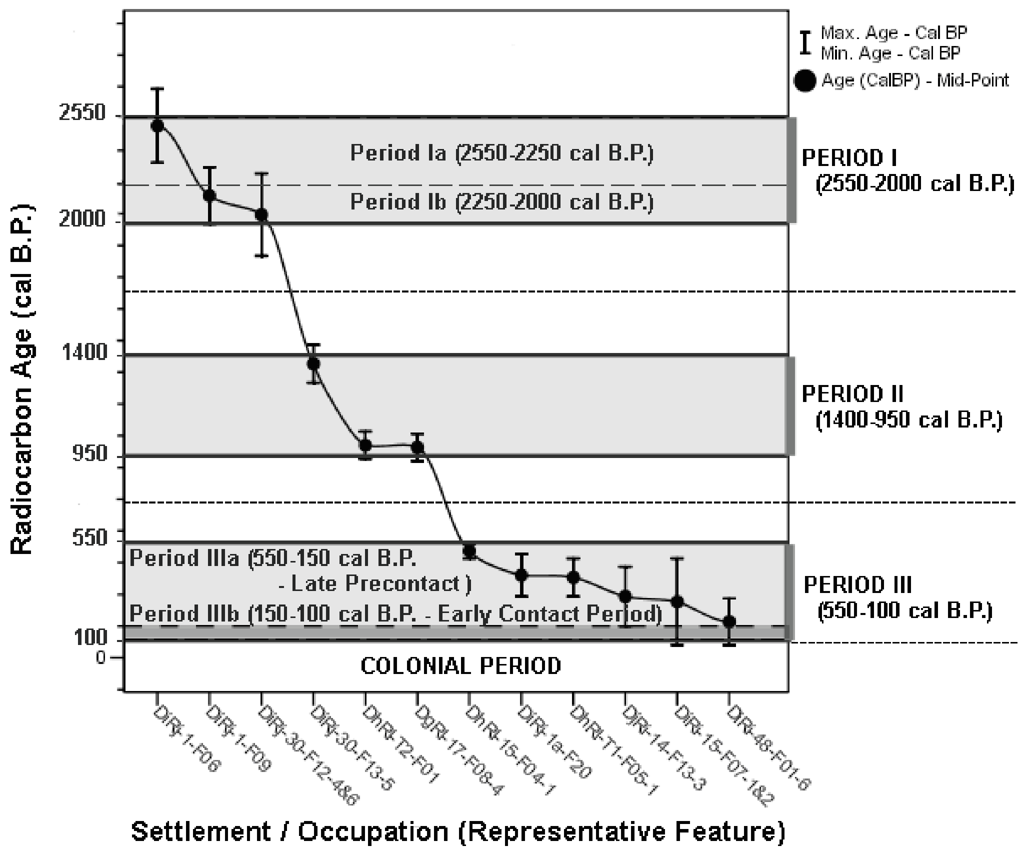


Figure 5.6. Chronology developed for the purpose of classifying Upriver Group housepits and settlements. The three highlighted bands represent the most discreet ranges of time associated with Periods I, II, and III, specific to the 11 Upriver settlements sampled in this study. These three sub-groups fall within broader, continuous bands of time defined by the dotted line running through the mid-point between each grouping. This broader chronology frames Periods I through III, as defined in the right-hand column.

These analyses resulted in the definition of a chronology (Figure 5.6) composed of three basic time periods: Period I (2550-2000 cal B.P.), Period II (1400-950 cal B.P.), and Period III (550-100 cal B.P.). The three highlighted blocks in Figure 5.6 represent the most discreet ranges of time associated with Periods I, II, and III, specific to the 11 Upriver settlements sampled in this study. The start- and end-dates of Periods I-III fall within broader bands of time defined by the fuller set of dated house features. Three broader and continuous periods are defined by the dotted line running through the mid-point between each of the highlighted groupings. This rendition of my chronology addresses any suggestion of breaks or gaps in the settlement of the region that might be misinterpreted from the preceding analyses. This broader chronology represents a continuous range of time frames associated with the settlement of the region and frames the more specific, highlighted bands of time within Periods I through III specific to the sample used in this study (as defined on the right side of Figure 5.6.). For the purposes of my analyses, I used the most discreet set of time periods possible in exploring relationships between housepit forms specific to the eleven sampled Upriver Group settlements, as defined above.

Two of the three periods in this chronology can be divided into sub-set groups. Period I is composed of Period Ia (ca. 2550 cal B.P.) and Period Ib (2250-2000 cal B.P.), defined by the discreet break in the distribution of housepit ages within the larger grouping. I maintain Period II as a single group, although possibly separable, due to its very small sample size. Period III, alternately, is subdivided judgmentally, on qualitative grounds, due to the fact that it transcends the late precontact and early contact periods leading up to the colonial period. I defined Period IIIa (550-150 cal B.P.) and Period IIIb (150-100 cal B.P.) to separate late precontact and early contact-era housepits and occupations, respectively. The transition from the early contact-era to the colonial period is set at 1858 A.D. (ca. 100 cal B.P.) and marks the end date of this study. The frequency of housepits associated with the three age periods, and their sub-categories, are depicted in Figure 5.7 and 5.8. As these figures show, classifying housepits by the three main periods, rather than by their sub-classes, clearly retains the most robust grouping of housepits available for analysis in this study.

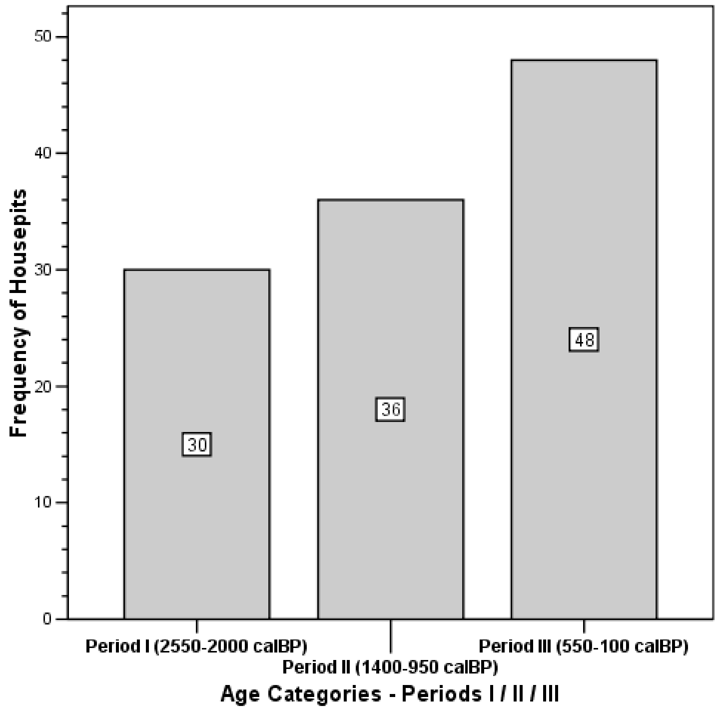


Figure 5.7. Bar graph showing the frequency of sampled Upriver Group housepits (n=114) by the three main age categories -- Periods I - III -- as the most robust set of groupings.

This chronology provides a basic means of ordering time in this study applicable to the comparison housepits as individual features or as elements of settlements. Each of the 114 housepit features in the 11 settlements included in this study was classified according to this chronology, 29 of these having directly associated radiocarbon dates. Radiocarbon samples were selected for processing that provided the best foundation for linking C^{14} dates not only to individual housepits but to intra-site stratigraphic relations between features (Schaepe et al. 2006). Temporal classifications for all 114 features were thus established either directly through C^{14} dating, or indirectly through assessment of their stratigraphic association with dated features. This chronology serves to classifying each housepit by a representative and quite broadly defined age group to which they belong.

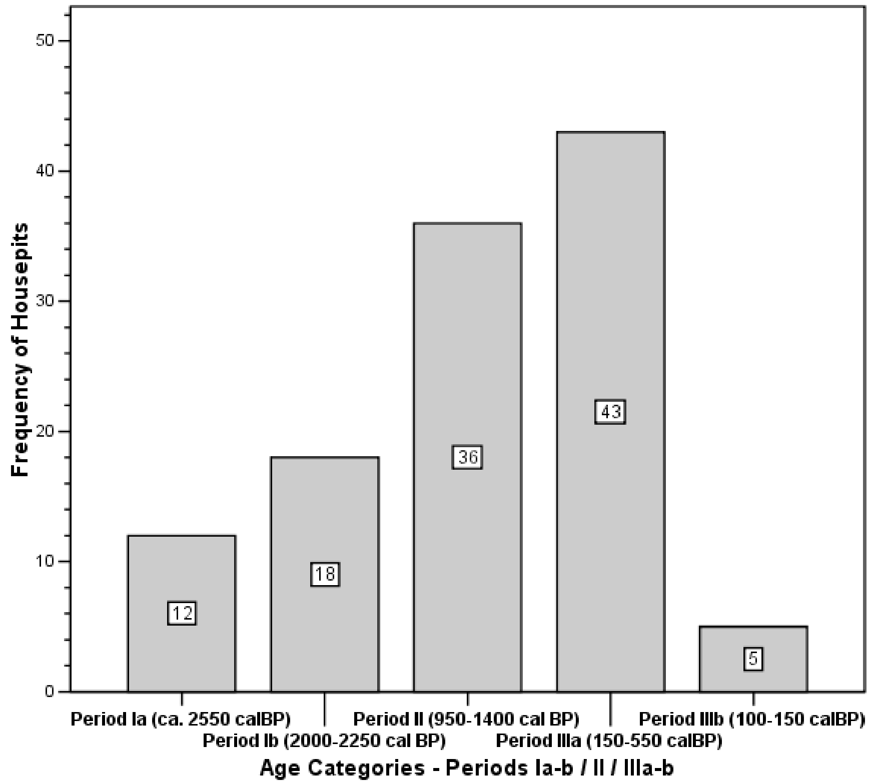


Figure 5.8. Bar graph showing the frequency of sampled Upriver Group housepits (n=114) by age category sub-groups -- Periods Ia-b, Period II, and Periods IIIa-b.

5.2 Defining the Chronology of Settlement Occupations

An important step in this analysis involves grouping housepits by the periods of occupation defined above (Figure 5.9). Determining each settlement's occupation was based on available radiocarbon and stratigraphic data from each housepit. Descriptions of stratigraphic profiles and radiocarbon sample locations, derived from the Fraser Valley Archaeology Project (Graesch 2006; Lepofsky and Lenert 2005; Lepofsky et al. 2005; Ritchie and Sanders 2006; Schaepe et al. 2006), informed this portion of the analysis. Housepits of the same or similar ages were grouped together within each settlement, forming 'occupations' of contemporaneous houses. The classifications of features and occupations associated with each of the 11 settlements -- including the multiple options developed for S<u>x</u>wó<u>x</u>wiymelh, Welqámex, and Hiqelem -- are presented in Table 5.2. These 11 settlements represent 13 distinct occupations.[18] The grouping of housepits as 'settlement occupations' -- as housepits that are proximate in space and time -- provides the basis for describing and comparing the arrangement of housepits within each settlement.

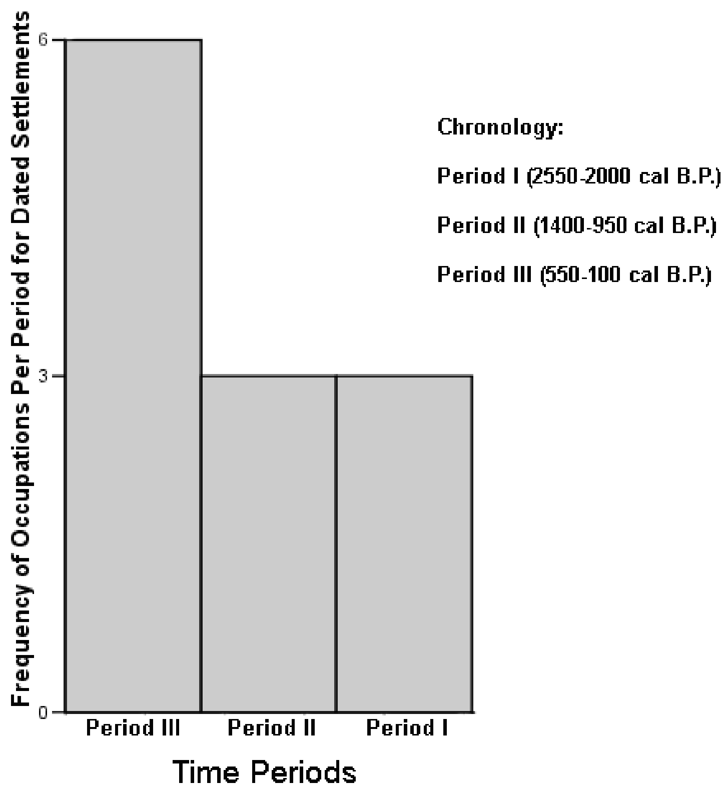


Figure 5.9. Bar graph showing the frequency of housepit settlement occupations per Period I (2550-2000 cal B.P.); Period II (1400-950 cal B.P.), and Period III (550-100 cal B.P.).

In some cases, multiple occupations of a single settlement, separated in time, were defined in this analysis process (e.g., DiRj-30 and DiRj-1). The investigation of housepits at DgRl-17 (Th'ewá:lí) and DhRl-T2 (Hiqelem) otherwise provided evidence of long-term continuity of occupation beginning in Period II and extending to Period III. While based on radiocarbon samples from only two features at each settlement, stratigraphic association links these features to a common occupational sequence, more certainly for Th'ewá:lí than for

[18] This number could total 14 occupations if Hiqelem is confirmed through future work to have two occupations representing Periods IIa and IIb, as accounted for in the modeling of options for this settlement.

Hiqelem due to differences in the completeness of the data collection at these two sites.[19] It is likely that these settlements developed during Period II (900-1450 cal B.P.) and are thus situated in this chronology as their point of origin, recognizing that the occupations of both settlements extended into Period III. Unlike Th'ewá:lí, however, I do suspect the emergence of a distinct Period III occupation among the northern group of housepits at Hiqelem not well mapped or investigated at the time of this study.[20]

As for Welqámex, Features 5, 6, and 9 were assigned to the contact period as determined by Graesch (2006; personal communication) based on their direct association with early contact-era artifacts. Conversely, Feature 1 at DiRi-48 (Eyxel), while sharing a similar radiocarbon profile, was determined to be a precontact feature associated with Period III based on a lack of contact-era artifacts within the feature and throughout the site. A factor affecting the resolution of radiocarbon dating along the Period III-Contact Era boundary is the loss of resolution of the calibrated radiocarbon curve (Stuiver et al. 2005). Classification of features in this age range required taking this into consideration and using multiple sources of information (e.g., stratigraphy, artifact assemblages) supplementing radiocarbon ages.

Multiple occupations were defined at four settlements including DjRi-14 (Xelhálh), DiRj-1 / 1a (Sxwóxwiymelh), DiRi-15 (Welqámex), and DiRj-30 (Shxw'ow'hamel). A Colonial Era occupation was defined at Xelhálh consisting of Features 1 and 2 (Schaepe, Blake,

[19] Additional radiocarbon and stratigraphic data collected by Morgan Ritchie and Dana Lepofsky in subsequent investigations of Hiqelem were not available at the time of this analysis. The treatment of Hiqelem in this study is limited to the temporal and spatial data collected as of 2005 which focused mainly on the cluster of housepits at the southern end of the site. The housepits at the northern end of the site were only partially mapped. None of these features were tested at that time. I include Hiqelem in this study recognizing the southern cluster of housepits as well documented in contrast to the northern cluster of features, and that current research is underway that will add data and clarity to the description of the site as a whole.

[20] I address the lack of clarity affecting these relationships by generating a number of options for temporal relations between the two groups of housepits. Which of these options proves to be the most accurate depiction of changes in the composition of Hiqelem through time will be informed by Ritchie's analyses supported by additional spatial and temporal data. Greater clarity about the relationships between housepits at this site will be generated in the Ritchie's subsequent investigations and analyses. The options I produce in this study are ideas to be tested in future research.

Formosa, and Lepofsky 2006; Appendix III). Given that these two housepits fall beyond the temporal range of this study, they were excluded from subsequent analysis. The housepits at Shxw'ow'hamel were sorted between the Period I and Period II occupations of this settlement based on radiocarbon, stratigraphic, and spatial analyses.

Lack of radiocarbon dates and mapping data for features at Sxwóxwiymelh and Welqámex created some degree of uncertainty at these three sites, though less so for Welqámex which had more dates available for study (Lenert and Lepofsky 2005, 2006; Graesch 2006). Some questions yet remain about the temporal placement of Features 16-18 at Sxwóxwiymelh in relation to either DiRj-1 (south) or DiRj-1a (north), Feature 8 at Welqámex, and Features 12-14, and 16 at DhRl-T2 as comprising elements of separate occupations. The housepits in the northern and southern portions of DhRl-T2 (Hiqelem) posed classification problems based on mapping and dating. Given that Hiqelem was only partially mapped at the time of this study (Sanders and Ritchie 2006; Ritchie n.d.) the number of housepit features constituting this settlement within Period II is somewhat uncertain. I addressed this situation by developing options defining maximum and minimum estimates of the housepits associated with each possible occupation. I applied this strategy in addressing similar types of ambiguity in the relationship between the northern and southern portions of DhRl-T2 (Hiqelem) and DiRj-1/1a (Sxwóxwiymelh North/South). The placement of DiRi-15-Feature 8 with the Period IIIb occupation of Welqámex remains, also, to be verified.

Some degree of uncertainty affects the chronological placement of a number of housepit features, specifically: DiRj-1-F16, F17, F18; DhRl-T2-F12, F13, F14, F16; and DiRi-15-F8. Only additional, more detailed investigation of these features -- as per the work conducted by Graesch (2006), Lenert (2008), Lenert and Lepofsky (2005), Ritchie (n.d.), and Springer (n.d.) -- can help clarify these issues. While future research is expected to refine the results of this analysis, the temporal framework developed and applied here serves to effectively provide a broad-banded representation of time. This chronology provides generally high level of confidence in temporally classifying the housepit features and settlement occupations sampled in this study.

5.3 Chronologies of Rebuilding and Disturbances Affecting Housepit Form

Fitting housepits into a chronology negotiates the static spatial imaging of housepit dimensions captured in the surface maps and the life history of housepit construction and settlement development. Not all housepits within any one settlement were simultaneously constructed. Sequences of housepit construction are developed in this study based on available radiocarbon and stratigraphic data from housepits within each settlement. Multiple occupations, separated by periods of hundreds of years, are identified in the patterning of housepit construction in at least two settlements, including DiRj-30 (Shxw'ow'hamel) and DiRj-1/1a (Sx̱wóx̱wiymelh North and South).

Some houses, or other disturbances, may have impacted the form of housepits from a prior period. Intrusive relationships between features can be identified by examining the settlement maps. The construction of Feature 1 at DhRl-15 (Qithyil Island) appears, for example, to have intruded slightly into Feature 2 as they both share a rim (Figure 3.3). Graesch (2006) notes similar relationships in the tightly clustered arrangement and sharing of rims between housepits at DiRi-15 (Welqámex). A number of features at Xelhálh, including Feature 15, were affected by subsequent disturbances -- as noted in Chapter III. I recognize the changes to feature form caused by rebuilding, subsequent settlement development, and disturbances as potential sources of error. With the exception of those features with impacts too great to be used in this study (e.g., DjRi-14-F12), the few cases with alterations to the form of housepits included in this analysis are too minor to significantly affect the broad patterns defined in the results of this study.

Table 5.2. Chronological Classification of Housepit Features and Settlement Occupations by Period.

Period	**Age (cal B.P.)**	**Settlement & Occupation (Name / Site Number)**	**Associated Features**	**Note**
Period I	2550-2000	Sx̲wóx̲wiymelh Ai / DiRj-1Ai (max)*	DiRj-1-F1, F2, F4, F5, F6, F7, F8, F9, F10, F15, F16, F17, F18, F21, F22, F23	Option - DiRj-1 Occupation A (max)
	2550-2000	Sx̲wóx̲wiymelh Aii / DiRj-1Aii (min)*	DiRj-1-F1, F2, F4, F5, F6, F7, F8, F9, F10, F15, F21, F22, F23	Option - DiRj-1 Occupation B (min)
	2550-2000	Shxw'ow'hamel A / DiRj-30A	DiRj-30-F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F17, F18, F21	
Period II	1400-950	Th'ewá:lí / DgRl-17	DgRl-17-F1, F2, F3, F6, F7, F8, F10, F11, F12, F13, F14, F15, F16, F18, F19, F21, F23	
	1400-950	Hiqelem / DhRl-T2 (max)**	DhRl-T2-F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, F12, F13, F14, F16	Option - DhRl-T2 - single occupation (max)
	1400-950	Hiqelem A / DhRl-T2A**	DhRl-T2-F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11	Option - DhRl-T2 - Occupation A
	1400-950	Shxw'ow'hamel B / DiRj-30B	DiRj-30-F13, F14, F15, F16	
Period IIIa	550-100	Qithyil Island / DhRl-15	DhRl-15-F1, F2, F3,F4, F5	
	550-100	Sqwa:la / DhRl-6	DhRl-6-F2, F3, F4	

Period	Age (cal B.P.)	Settlement & Occupation (Name / Site Number)	Associated Features	Note
Period IIIa	550-100	John Mack Slough / DhRl-T1	DhRl-T1-F1, F2. F3, F4, F5, F6, F7, F14, F15, F16, F18, F36	
	550-100	Hiqelem B / DhRl-T2B**	DhRl-T2-F12, F13, F14, F16	Option - DhRl-T2 - Occupation B
	550-100	Welqámex A / DiRi-15A	DiRi-15-F1, F3, F4, F7, F10	
	550-100	Eyxel / DiRi-48	DiRi-48-F1, F2, F3, F4	
	550-100	Sx̱wóx̱wiymelh Bi / DiRj-1Bi (max)***	DiRj-1-F16, F17, F18, F19a, F19b, F20	Option - DiRj-1 Occupation B (max)
	550-100	Sx̱wóx̱wiymelh Bii / DiRj-1Bii (min)***	DiRj-1-F19a, F19b, F20	Option - DiRj-1 Occupation B (min)
	550-100	X̱elhálh / DjRi-14	DjRI-14-F10, F13, F15, F16, F17, F19, F23, F25, F26, F27, F28	
Period IIIb	150-100	Welqámex B / DiRi-15B	DiRi-15-F1, F2, F3, F4, F5, F6, F8, F9, F10	

* denotes optional classification of settlement composition - as either minimum or maximum groups of associated housepits.

CHAPTER VI - ANALYSIS LEVEL I: INVESTIGATING HOUSEPIT AND HOUSEHOLD VARIATION

A central assumption of this study is that change in housepit form over time indicates change in social organization. Data describing housepit form derive from the actions of people building and inhabiting houses. The relationship between housepit size and household organization is a particularly important link between material culture and social organization. In this analysis I aim to classify housepits according to two basic elements of their form: size (m^2) and shape. My investigation of housepit size focuses on two objectives: (1) developing and applying a framework for classifying housepit features by size (area [m^2]); and (2) sorting housepits by age. Applying the chronology defined in Chapter V, I explore these data intending to define changes in housepit form through time. Findings from these analyses provide insight into household organization and changes in social structure over the 3,000 years preceding colonial contact.

I focus my analysis on the attributes of 114 housepits from 11 Upriver Group settlements located in the Central Fraser Valley (including the lower Chilliwack and Harrison rivers), Upper Fraser Valley, and Lower Fraser Canyon (see Figure 3.1).[21] Housepit area calculations were made from feature polygons using ArcGis 3.2. This method accounts for differences in feature shape and provides an accurate means of determining feature area. The area calculations are based on the polygons defined for each of the 114 housepits as depicted in the associated maps. Sources of potential error in the area calculations stem mainly from the

[21] The 114 housepits included in the Upriver Group sample represent those features with the overall greatest physical integrity and thoroughness of mapping, derived from a slightly larger sample associated with the 11 mapped settlements. A number of features which had suffered major disturbance from later site development were excluded from this study (e.g., DjRi-14-F12, F4, and F16; DiRj-1-F11 - F14). The area values of a few, less significantly disturbed features are slightly underestimated, including DhRl-15-F2 and DjRi-14-F15. A number of features thought to represent plankhouse depressions or platforms -- including DgRl-17-F17, DgRl-17-F20, DjRi-14-F32, DhRl-15-F6, and DiRi-15-F6 -- were excluded from this analysis, although are discussed in Chapters VIII-VI. Three very large anomalous features at Sx̲wóx̲wiymelh (i.e., DiRj-1-F28-30) were excluded as presumed modern pipe-line construction-related disturbances (D. Lepofsky, personal communication, 2005).

process of defining feature polygons entered into ArcGIS. Area measurements for the housepits included in this analysis are presented in Appendix I. This set of housepit area measurements was analyzed as a single group of data. Variation in housepit size through time was, thus, investigated using a comparable set of size values. The analyses in this chapter used EDA methods. Patterning of values and the identification of possible break-points within the between these sub-groups were also explored using box-plots, stem-and-leaf graphs, and histograms with different bin widths.

6.1 Comparing Housepit Areas (m^2) and Classifying Housepits Sizes

There is considerable spread in the distribution of area values among the 114 Upriver Group housepits (range = 21-178 m^2, inter-quartile range = 54-91 m^2, median = 70.8 m^2, mean = 75.9 m^2) (Figures 6.1 and 6.2). Numerous possibilities existed for sub-dividing these data. I pursued an iterative process whereby a number of options were pursued and results viewed across at least two levels of analysis (i.e., housepit and settlement patterning) in attempting to find a meaningful and logical way of ordering of these data. Judgmental decisions were informed by EDA results. These data were grouped at least eight different ways to from various iterations of size categories. I evaluated options that included splitting the group by the central value; inter-quartile range; and modes -- separately or in combination. Too many size categories brought confusion to the patterning of housepits in each settlement. Too few categories resulted in too little differentiation. The rendering of data described below resulted in the clearest patterning across all three levels of analysis describing inter-housepit to inter-settlement relationships.

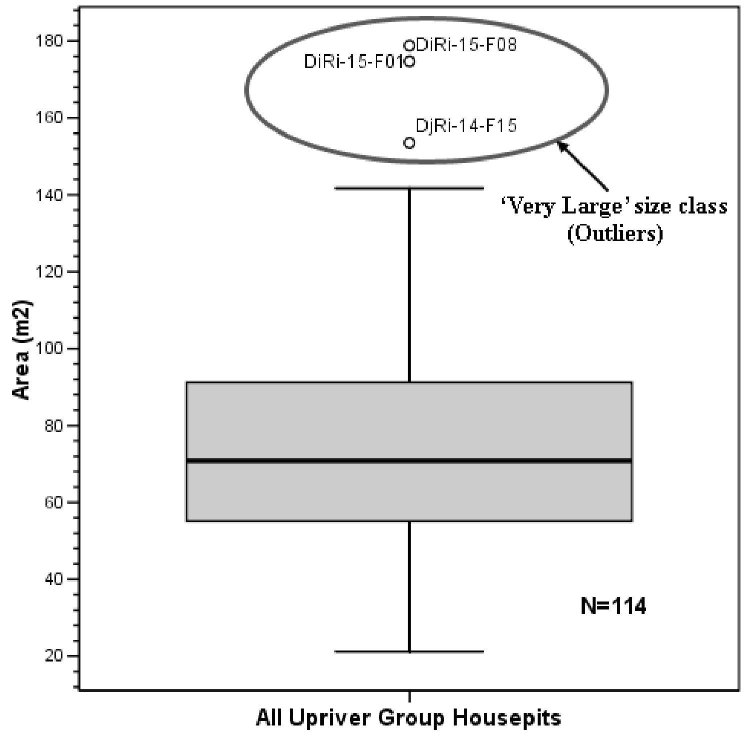


Figure 6.1. Box-plot of illustrating the mid-range, inter-quartile range, and median area measurements (m^2) for of the total Upriver Group' sample of 114 housepits, identifying three outliers as the largest ('Very Large') category of house sizes.

The shape of the Upriver Group is non-normal, with multiple peaks and a set of outliers. The inter-quartile range is tightly clustered around a central peak (Figure 6.1). The overall distribution is positively skewed, as affected by three outlying values located beyond the range of the upper-most quartile (93-141 m^2) and a distinct sub-group of values between 128-141 m^2 tightly clustered around a secondary peak (Figure 6.2). Guided by the distribution of these values (e.g., Figures 6.1 and 6.2) three sub-groups were established**,** including: (1) three extreme cases (area >= 154 m^2) defined by EDA box- and stem-and-leaf plots, associated with housepits at Welqámex (DiRi-15-F1 and F8) and a X̲elhálh (DjRi-14-F15) (Figure 6.1); (2) a group of seven features with areas ranging between 128-141 m^2, and (3) the remaining majority of housepits (n=104) with areas ranging between 21-117 m^2, representing a normal-shaped group shown in Figures 6.2 and 6.3. These first two sets were separated into distinct groups of

‘Very Large’ (Class VI) and ‘Large’ (Class V) size classes with frequencies of 3 and 7 housepits, respectively. As illustrated in the distribution of associated values in the histogram in Figure 6.4 (grouped by 3 m bin-widths), breaks of approximately 10 m^2 separate both Large and Very Large housepit groups from each other and from the rest of the group. Forming two distinct size classes, Large and Very Large size values were removed from the total group.

```
Area (m2) Stem-and-Leaf Plot
  (N=114 housepit features)
Frequency    Stem & Leaf
            -------------------
   5.00      2 . 16799
   5.00      3 . 11334
   9.00      4 . 022555678
  14.00      5 . 01112334457888
  23.00      6 . 01111223345666777788888
  20.00      7 . 00023333445566677788
   8.00      8 . 14556678
   9.00      9 . 011345566
   5.00     10 . 15689
   6.00     11 . 012337
            -------------------
   1.00     12 . 8
   5.00     13 . 02377            - Large Size Class
   1.00     14 . 1
            -------------------
   3.00 Extremes    (>=154)       - Very Large Size Class
            -------------------

Stem width:   10.00
Each leaf:     1 case(s)
```

Figure 6.2. Stem-and-leaf plot illustrating the shape and spread of area measurements (m^2) for all 114 Upriver Group housepits, identifying the two largest size categories --‘Very Large’ and ‘Large’ -- as groups of values respectively representing outliers and a distinct mode.

The structure of the remaining truncated sample (n=104; area < 120 m^2) was examined in isolation. This truncated group forms an overall normal though complex shape, with minor sub-set modes particularly apparent at its ‘bounding’ or opposite ends (Figure 6.3). These data represent three sets of values including upper (r=100-117 m^2, n=11), central (r=40-99 m^2, n=83), and lower (r=21-34 m^2, n=10) groups, as defined within the body of the stem-and-leaf graph in Figure 6.3. The lower and upper modes are also labeled in the margin illustration of

Figure 6.3. The central group, with an overall normal shape and primary, central peak at 68 m^2, is bounded by two minor sub-peaks at 54 and 88 m^2 (Figure 6.3).

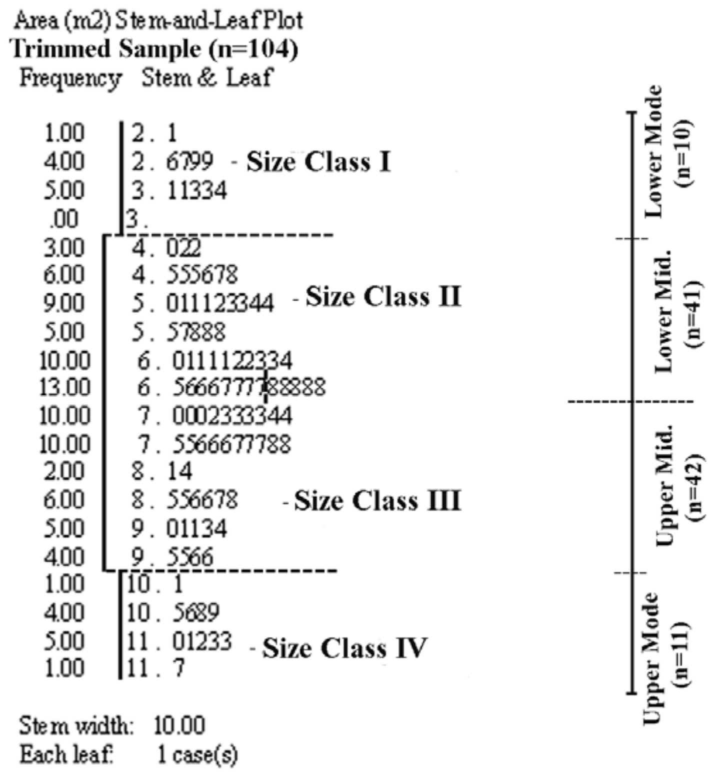


Figure 6.3. Stem-and-Leaf plot showing the distribution of area (m^2) area measurements and definition of size classes among the truncated sample of 104 housepits.

Given its overall normal shape, relatively compact clustering, and the fact that this central group includes the majority of housepits in the Upriver Group (n=83; 73%), I further divided this group. I separated these data at their median value (between 67 and 68 m^2) to form 'lower mid' and 'upper mid' groups of 41 and 42 features, with respective internal ranges of 27 and 28 m^2. This options maintains robust groups based on an approximate 50-50 split between the lower (r=40-67 m^2, n=41) and upper (r=68-99 m^2, n=42**)** halves of the central group. This sorting of data established four additional size classes representing Size Classes I-IV (Figure 6.3). A total of six housepit size classes (Figures 6.4 and 6.5) resulted from analysis of the areas of all 114 Upriver Group housepits. The histogram presented in Figure 6.4, using 3 m^2

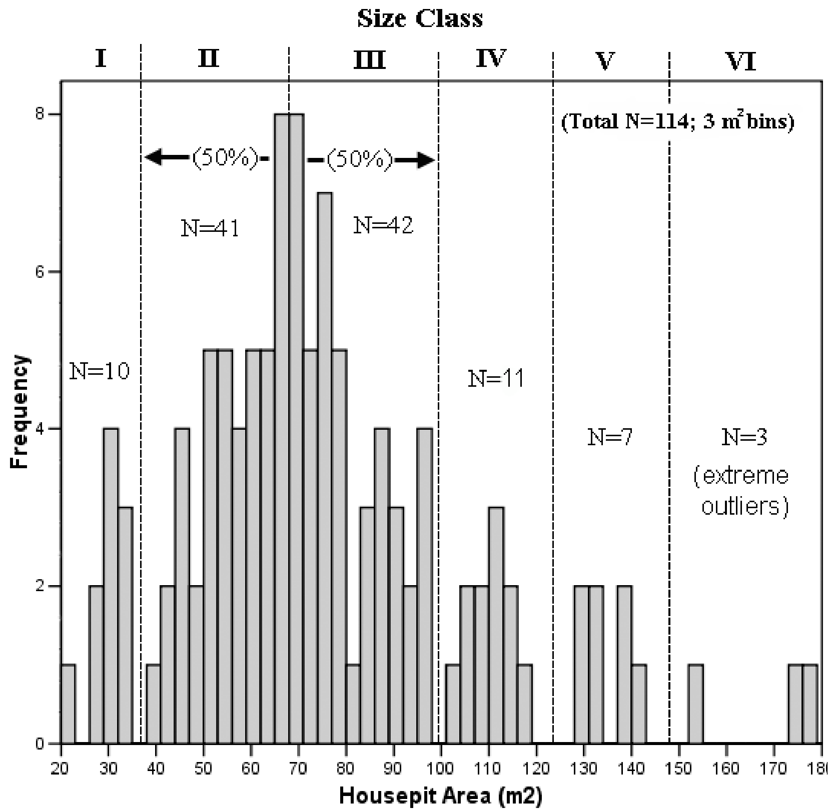


Figure 6.4. Histogram illustrating the distribution of area (m^2) measurements for all 114 Upriver Group housepits -- defined as Size Classes I-VI.

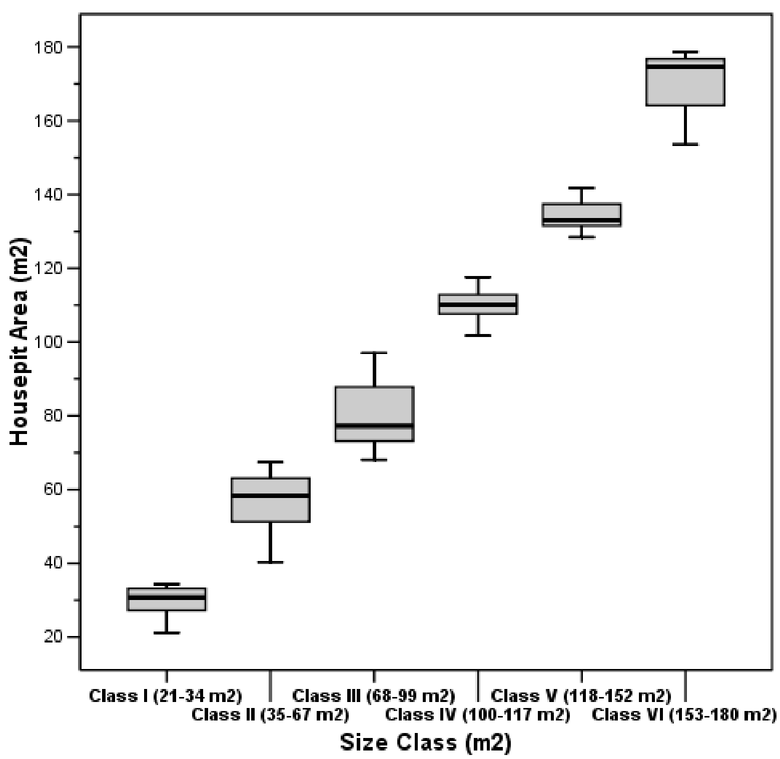


Figure 6.5. Box-plots illustrating the range, inter-quartile range, and median area (m^2) of Size Classes I-VI, including all 114 Upriver Group housepits.

bin-widths, most clearly identifies the break points and spaces between these groups. The six size classes defined in this analysis provide a practical classification useful in exploring the patterning of housepits across multiple dimensions of analysis, within and between settlements.

The metric attributes describing the area, shape, center, and spread of housepits within Class I-VI size categories are presented in Figures 6.5 and Table 6.1. Figure 6.5 shows the distribution of housepit areas by size class for all 114 housepits in the Upriver Group sample. Summaries of housepit measurements (mean, median, range, and inter-quartile range) by area, maximum length, and maximum width for each size class are presented in Table 6.1. The metric attributes of these six size classes display a wide range of variation in the size of housepits in the upriver portion of the region. The two largest size categories (Classes V and VI) represent only 9 % of the total sample (Figure 6.6). The next section addresses the question: how are housepits representing Size Classes I-VI distributed through time?

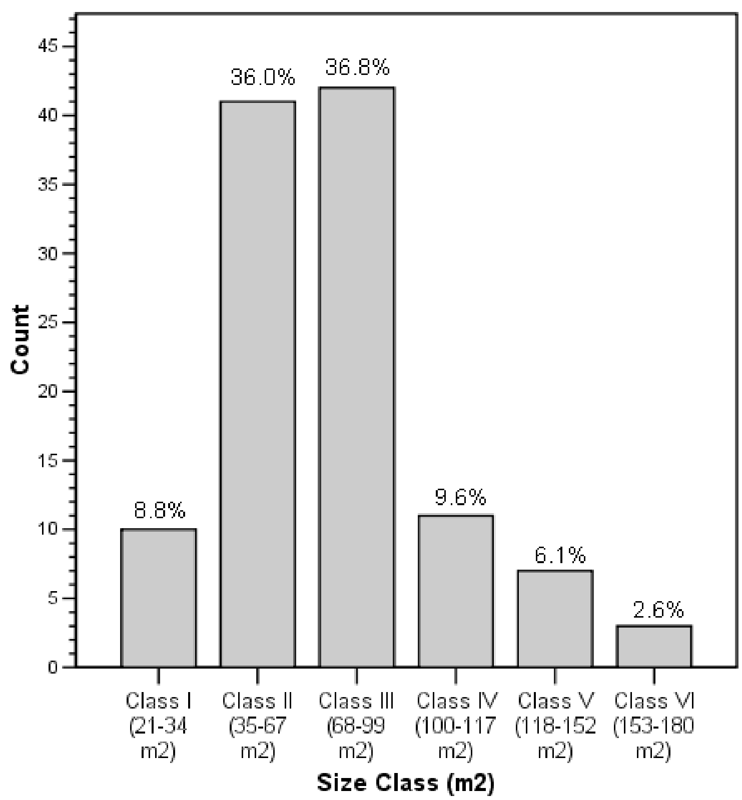


Figure 6.6. Frequencies and proportions of Upriver Group housepits by Size Classes I-VI.

			Area (m^2)				Max. Length (m)				Max. Width (m)			
Size Class	**N**	**%**	**Mean**	**Median**	**Range**	**IQR**	**Mean**	**Median**	**Range**	**IQR**	**Mean**	**Median**	**Range**	**IQR**
Class I	10	8.8	29.91	30.80	21.23-34.32	6.15	6.19	6.29	5.08-6.63	0.32	5.36	5.13	4.72-6.14	0.81
Class II	41	36.0	56.71	58.29	40.35-67.37	12.45	8.74	8.82	6.89-10.80	1.23	7.39	7.35	5.70-9.01	0.92
Class III	42	36.8	80.19	77.22	68.03-96.99	14.95	10.21	10.03	9.06-12.40	1.03	8.92	8.98	7.18-10.80	1.28
Class IV	11	9.6	110.06	110.12	100.80-117.60	6.39	12.02	11.86	11.60-13.50	0.30	10.91	10.92	9.69-11.90	1.13
Class V	7	6.1	134.45	133.06	128.38-141.75	7.49	13.07	13.00	12.70-13.60	0.41	12.01	12.07	10.70-12.60	0.36
Class VI	3	2.6	169.00	174.72	153.51-178.78	n/a	15.13	15.13	14.80-15.50	n/a	13.72	13.87	12.90-14.50	n/a

Table 6.1. Frequency, proportion, range (minimum-maximum), and inter-quartile range (IQR) values for area, maximum length, and maximum width measurements associated with Housepit Size Classes I-VI, based on 114 Upriver Group housepits.

6.2 Sorting Housepits by Size through Time

The sizes of all 27 dated Upriver Group housepits are not evenly distributed through time (Figure 6.7). The range of housepit sizes in Period III is much larger than the size ranges for Periods I and II. While housepits with areas ranging between about 36-100 m^2 are found across all periods of time, those ranging in size from 100-180 m^2 (Classes IV-VI) are found only in Period III. Median area values show that housepit area steadily increases through time as a fairly linear, positive relationship, doubling between Period Ia and Period IIIb (Figures 6.8). The differences in median values between Period Ia (median=51.6 m^2), Period Ib (median=59.8 m^2), and Period II (median=67.5 m^2) are small, but increases incrementally by about 8 m^2 per

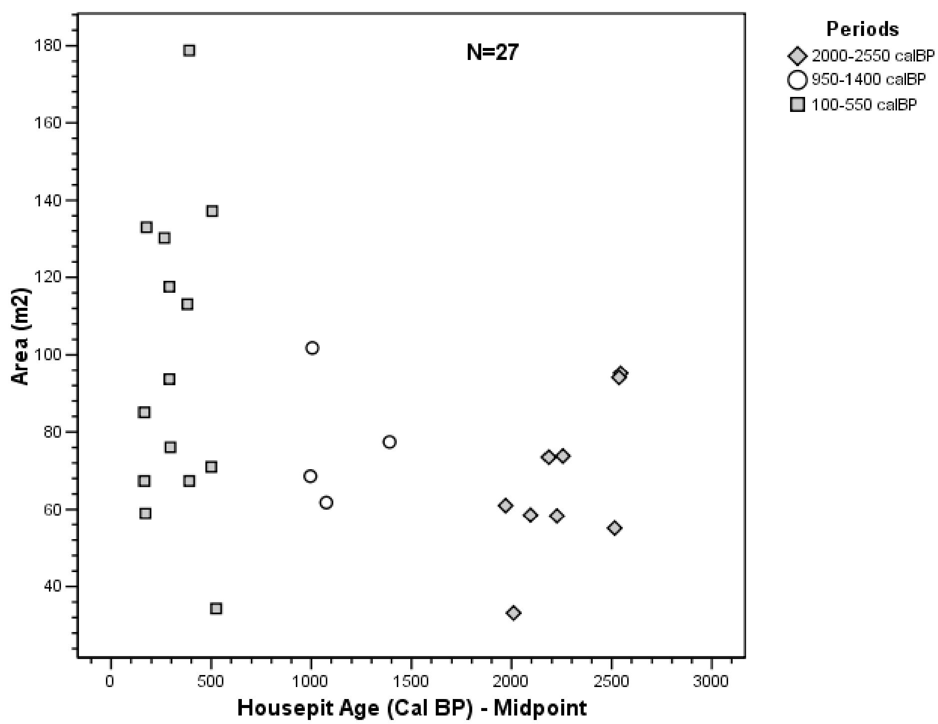


Figure 6.7. The distribution of housepit area values (m^2) by radiocarbon age midpoints for all dated housepit features (n=27) showing multi-hundred year gaps between clusters of housepits representing Periods I-III, and a wide range of housepit sizes particularly between 100-550 cal B.P.

500-750 year period.[22] Larger gaps describe the differences in median area values between the groupings of Periods II and Period IIIa (median=90.0 m^2), as well as in the transition to Period IIIb (mean=112.5 m^2). The range and median area values in Periods IIIa and IIIb are by far the greatest of these groups. I reserve testing for statistical significance in the differences between housepit area values of these periods until further examining these data and forming final groupings.

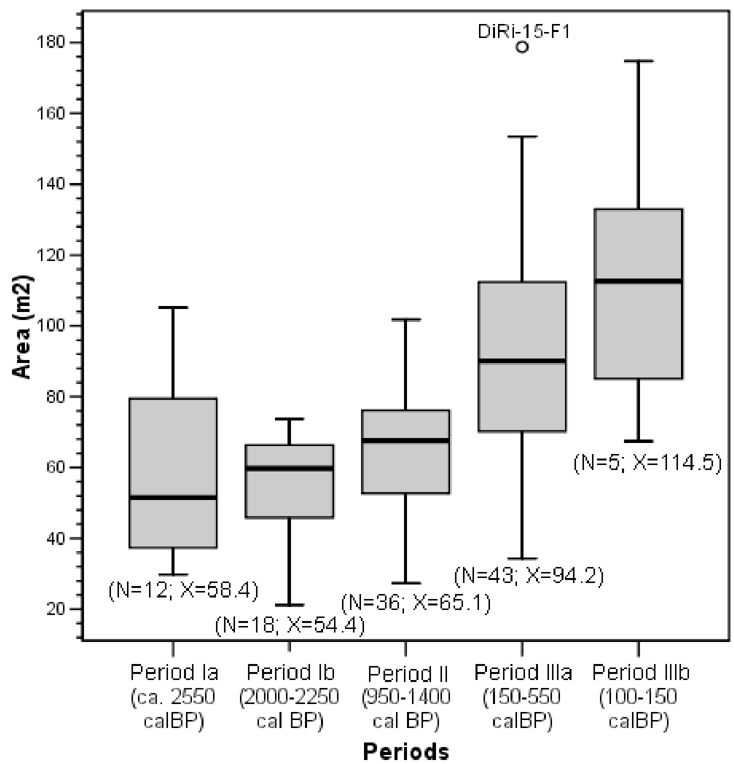


Figure 6.8. Comparison of inter-quartile range, mid-range, and median housepit area values (m^2) through Periods Ia-IIIb for all Upriver Group housepits (n=114), showing a progressive, step-wise increase in housepit sizes through time.

Patterning in these relations emerges within a simplified three-part chronology (Figure 6.9) including Periods I (2550-2000 cal B.P.), II (1400-950 cal B.P.), and III (550-100 cal B.P.).

[22] The downward skewing apparent in the box-plot for Period Ib, is caused, in part, by the inclusion of the smallest feature in the Upriver Group -- Feature 17 at Shxw'ow'hamel (DiRj-30). At only 21.23 m^2 and given it's somewhat peripheral location in the alignment of housepits at Shxw'ow'hamel it may be that this feature is not a housepit. Further investigation of this feature is needed to address this question. While I maintain this feature in the upriver group sample, the potential removal of this feature from the sample does not affect the overall patterning defined in this analysis.

The frequencies of housepits within each of the Periods I-III (n=30, 36, and 48, respectively) provide a sound quantitative foundation generally supporting statistical comparison(s) of variability among these or even further consolidated groups, here-on-in, without concern of deriving invalid results due to insufficient group sizes. Individual groups sizes of 30 or more are generally recognized as sufficiently robust to support valid statistical operations.[23] Consolidation of housepits into these three groups, thus, addresses this concern about sample size as a potential factor limiting the use of parametric statistical operations.

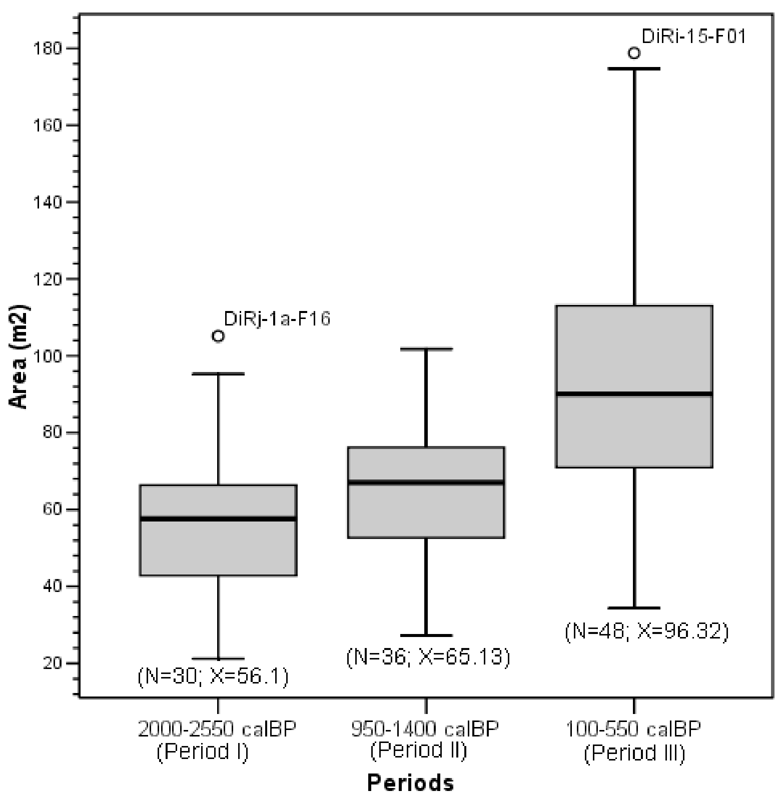


Figure 6.9. Comparison of inter-quartile range, mid-range, and median housepit area values (m^2) of all Upriver Group housepits (n=114) arranged by age, showing an increasing trend in housepits sizes through Periods I, II, and III, with a particularly large increase between Periods II and III.

The progression of median housepit areas between Period I (median=57.7 m^2), Period II (median=67.5 m^2), and Period III (median=90.6 m^2) is most off-set between the two earlier groups and the later-period features. While only 9.8 m^2 separates the median area values of

[23] When $n > 30$, the Central Limit Theorem can be applied to obtain an approximate 95% confidence interval (Bernstein and Bernstein 1999:145).

Period I and Period II, a 23.1 m^2 difference separates Periods II and III. Given their similarity of area values and minimal degree of change over the extensive period of time they represent, Periods I and II can be further consolidated to simplify this analysis and draw the most striking illustration of patterning in housepit areas through time.

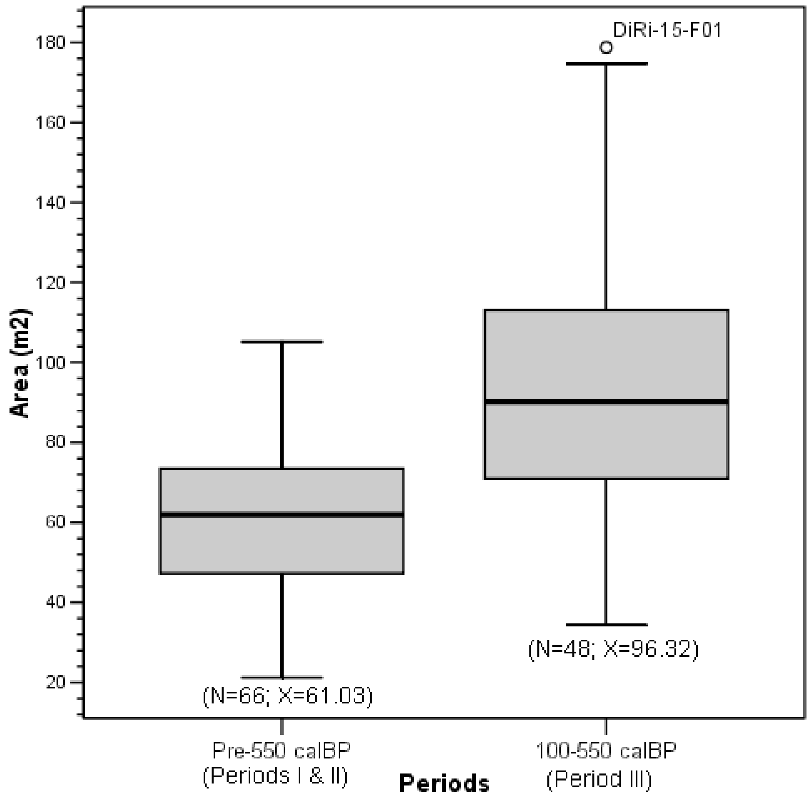


Figure 6.10. Box-plot comparing of housepit area values (m^2) for all 114 Upriver Group housepits arranged by age, illustrating significant difference between housepits sizes in pre- and post-550 cal B.P. periods.

Two age groups -- pre-550 cal B.P. ('Early Period') and Post-550 cal B.P. ('Late Period') -- were formed from the original five age categories to simplify things and define clearer patterns. The median area of pre-550 cal B.P. ('Early Period') housepits is 62.0 m^2 while that of post-550 cal B.P. ('Late Period') housepits is 90.6 m^2 (Figure 6.10). The difference of 28.6 m^2 separates these groups represents a 146 % increase between the Early and Late periods. Slightly more than 25 % of Late Period housepits fall completely outside the upper range of sizes associated with earlier pre-550 cal B.P. housepits. The one outlier in the Late Period sample -- Feature 1 at Welqámex -- is the largest housepit in the entire region measuring 16.13 m x 13.87 m (178.78 m^2).

Figure 6.10 shows that the area values of both groups are normally distributed with nearly equal median and mean values, justifying the use of parametric statistics in their analysis. The results of an Independent Sample T-test show a statistically significant difference ($t= -6.79$; $p < .001$; $\sigma = .05$) between the area values of Early and Late Period groups. The Early and Late Period housepit groups thus represent two distinct populations of housepits based on their ranges of area values. This finding has significant implications for interpreting the socio-economic structures of settlements in the region, which will be discussed in Chapter IX.

6.3 Investigating Social Organization at the Housepit / Household Level

In this section I develop a graphic representation of social organization based on the relative proportions of housepit size classes in each time period as a proxy for social structure. Ethnographers have suggested that differences in shape of the distribution of different social classes, whether normal (e.g., diamond-, circular-, or oblong-shaped) or skewed (e.g., pear-shaped), correlate with varying degrees of complexity as expressions of social organization (Suttles 1958, 1987:11-14; West 1945). Social complexity, measured on a vertical axis of social stratification, is recognized as increasing relative to the degree of skewness in the shape of a population. Skewness, in this sense, increases relative to social stratification. More pronounced social stratification, inferred from wide-ranging differences in household organization (i.e., inferred from wide-ranging differences in housepit sizes), results in an irregular ‘pear-shaped’ representation of social structure -- formed by a small ‘neck’ protruding from large, rounded base (see Figure 1.1 as an example of an inverted pear-shape). Societies with greater similarity between households (i.e., a limited range of housepit sizes), are represented by a more normal-shaped (e.g., circular or diamond) depiction of social structure.

I use the percentage of houses in each size class to represent social groups -- assuming each size class corresponds, roughly and hypothetically, to a social group within each settlement. The hypothetical social structure is reflected in the shape of the resulting graph of percentages of each housepit size class. The primary objective, here, is to examine differences in the 'societal shapes' formed by the relative proportions of housepit size classes through time.

This analysis, like that in the preceding section, explores the distribution and relative frequencies of housepit size classes through time, aiming to define the clearest patterns of change based on the most robust samples. Based on the classification of housepit sizes at the outset of this chapter, the results of this analysis parallel those in the preceding section that identify changes in housepit sizes through time based on actual area values. This maximizes the measurement scale of those data. Size classes, however, provide a better representation of household organization on a vertical axis of relations (i.e., stratification) between similar sets of housepits / households correlating with basic units of social stratigraphy.

A visible upward jump in the distribution of housepit size classes differentiates Periods Ia/b-II and Periods IIIa/b (Figures 6.11 and 6.12). The steepness of this upward jump becomes more visible as I group together and reduce the number of periods in the course of this analysis from five to two (Figures 6.13-17). Housepits of the two largest Size Classes (V and VI) are exclusively associated with Periods IIIa/b -- post 550 cal B.P. All but two Size Class IV housepits (n=11) are likewise associated with Periods IIIa/b. Feature 16 at Sx̲wóx̲wiymelh (DiRj-1a-F16) and Feature 1 at Hiqelem (DhRl-T2-F1) and was identified in Chapter V as among those features with uncertain age determinations. If not from Period I (ca. 2000-2550 cal B.P.) then F16 is likely part of the other distinct occupation of Sx̲wóx̲wiymelh associated with Period IIIa -- 150-550 cal B.P. (Lenert and Lepofsky 2005, 2006). DiRj-1a-F16 is located in close physical proximity to and included in a group of features with F19a, F19b, F18 -- dating to 490-290 cal B.P. (Lenert and Lepofsky 2005, 2006) -- and F17, that are "somewhat out of alignment" (Lepofsky and Lenert 2006:14; Schaepe et al. 2006:46-47) with the earlier houses at this site. As the only (questionable) Size Class IV housepit in Period I, DiRj-1a-F16 measures only 6.14 m^2 above the Size Class III cut-off (99 m^2) at 105.14 m^2 in area. DiRj-1a-F16 stands out as an uncertain anomaly in Figure 6.11. DiRj-1a-F16 is identified as an outlier contributing to the slight upward skewing apparent in the box-plot for Period I (Figure 6.9).

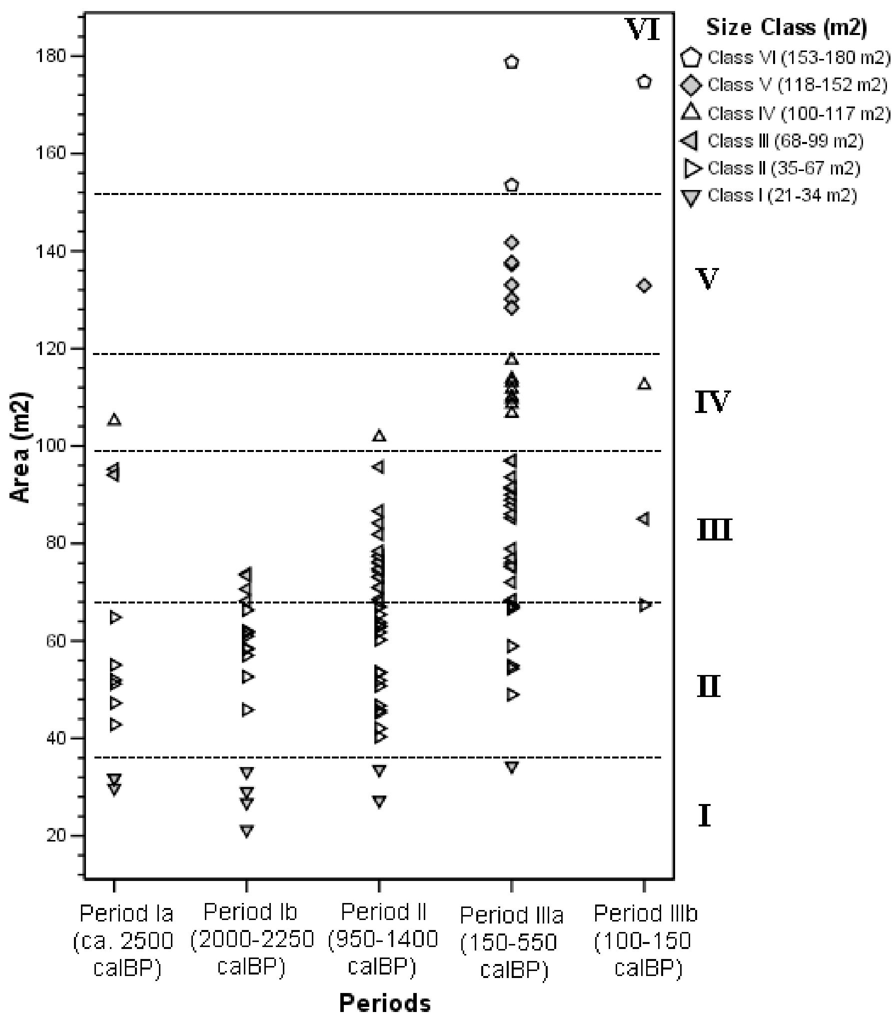


Figure 6.11. Plot showing the distribution of housepit area measurements (m^2) by Size Class through time, across Periods Ia-IIIb.

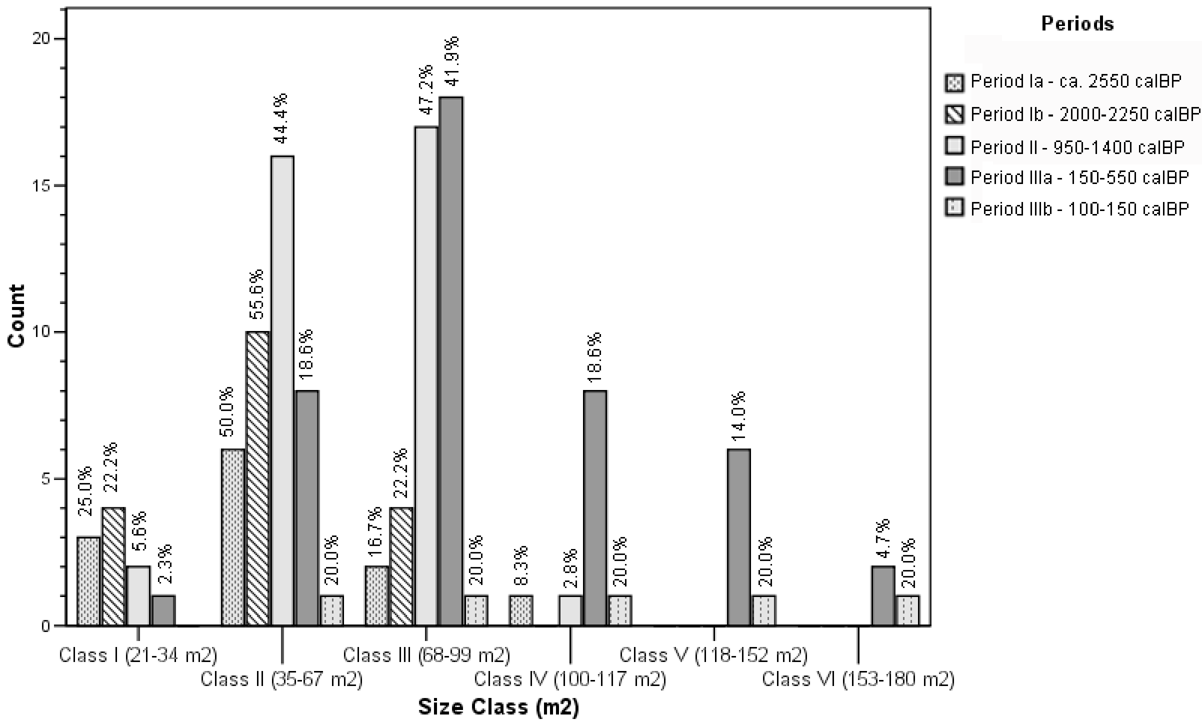


Figure 6.12. Histogram comparing the relative frequencies of housepit Size Classes I-VI through time, across Periods Ia, Ib, II, IIIa, and IIIb. Bar percent values indicate the percentage of housepits of each size class within each period.

Feature 1 at Hiqelem (DjRl-T2-F1), while somewhat more securely anchored in time, is the largest housepit in Period II with an area of 101.8 m^2. As the only other pre-550 cal B.P. housepit larger than Size Class III, DhRl-T2-F1 is situated on the borderline between Classes III and IV, measuring only 2.8 m^2 above the Class III cut-off. Otherwise, Periods Ia/b-II are entirely comprised of Size Class I-III housepits. Differences in the proportions of Size Class III housepits in Periods Ia/b (16.7% and 22.2%, respectively) and II (47%) indicate some differences in the composition of housepits between these periods, even though they share a similar range of size classes (Figure 6.12). It is also apparent from this figure that small samples sizes affect both Period Ia and Period Ib.

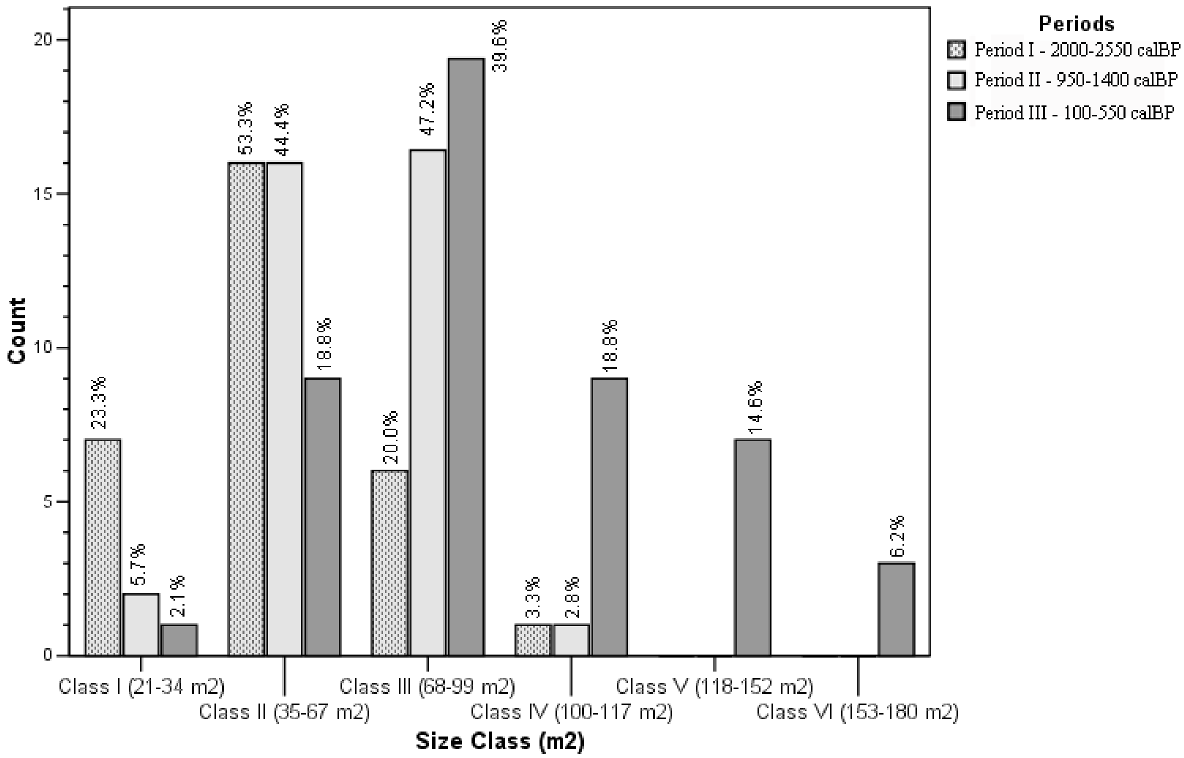


Figure 6.13. Histogram comparing the relative frequencies of housepit Size Classes I-VI through time, across Periods I, II, and III. Bar percent values indicate the percentage of housepits of each size class within each period.

Consolidating this image into three basic time-periods -- Period I, II, and III -- increases the robustness of these data and highlights the patterns emerging from the first round of analysis (Figures 6.13 and 6.14). While differences in the frequencies between Periods I (2550-2000 cal B.P.) and II (1400-950 cal B.P.) diminish somewhat, differences in the relative proportions of housepits in Size Classes I and III remains as a subtle distinction. The relative proportions of Size Class II housepits are similar between Periods I and II, at 53.3 (n= 16) and 44.4 % (n=16), respectively. Size Class I and III housepits on the other hand respectively account for 23.3 % (n=7) and 20.0 % (n=6) of Period I housepits, versus 5.7 % (n=2) and 47.3 % (n=16) of housepits in Period II. Small frequency values still plague the quantification of housepit Size Class I. Comparison of the somewhat more robust Size Class III shows an increase of 27.3 % between Periods I and II. This finding is consistent with the step-wise increase in median housepits sizes through time illustrated in the previous section (Figure 6.9). This difference is associated with the increased percentage of Size Class III housepits moving through time from Periods I to II -- roughly pre- and post-1400 cal B.P. These more subtle findings are overshadowed by the significant difference in the distribution of housepit size classes between both Periods I/II (2550-950 cal B.P. combined) and Period III (550-100 cal B.P.).

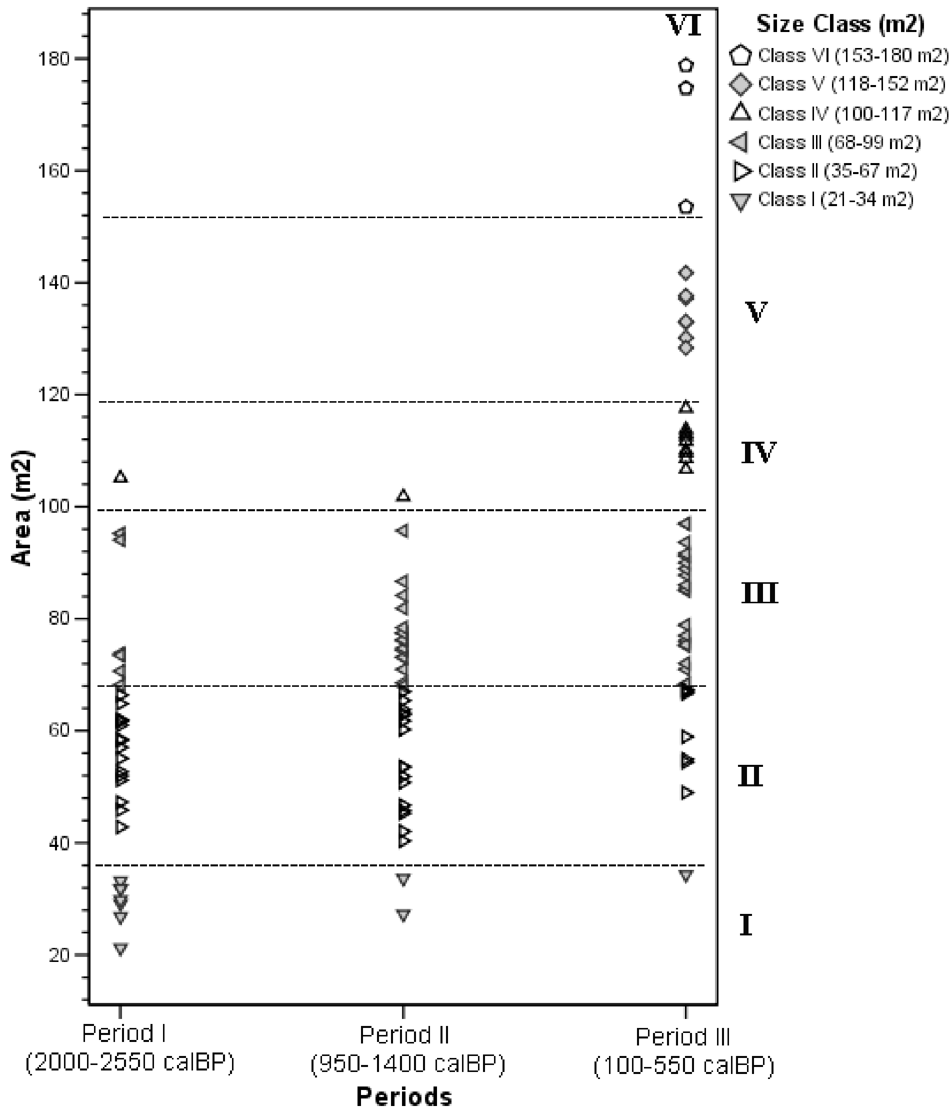


Figure 6.14. The distribution of housepit area values (m^2), defined by Size Class and chronologically grouped into Periods I, II, and III -- showing a dramatic increase in the range of housepit sizes associated with Period III (100-550 cal B.P.).

Exploring relationships between housepit populations with the greatest differences leads to a comparison of features from pre- and post-550 cal B.P. (Figures 6.15 and 6.16). This analysis highlights the most statistically significant, quantifiable changes in housepit sizes through time. Figures 6.16 and 6.17 show that Size Classes II and III include the vast majority (83.4 %) of the Early Period housepits. Nearly half of these features are classified as Size Class II, the most predominant category. The proportional distribution of Early Period housepit sizes forms a normal shape, including sizes ranging between Classes I-VI.

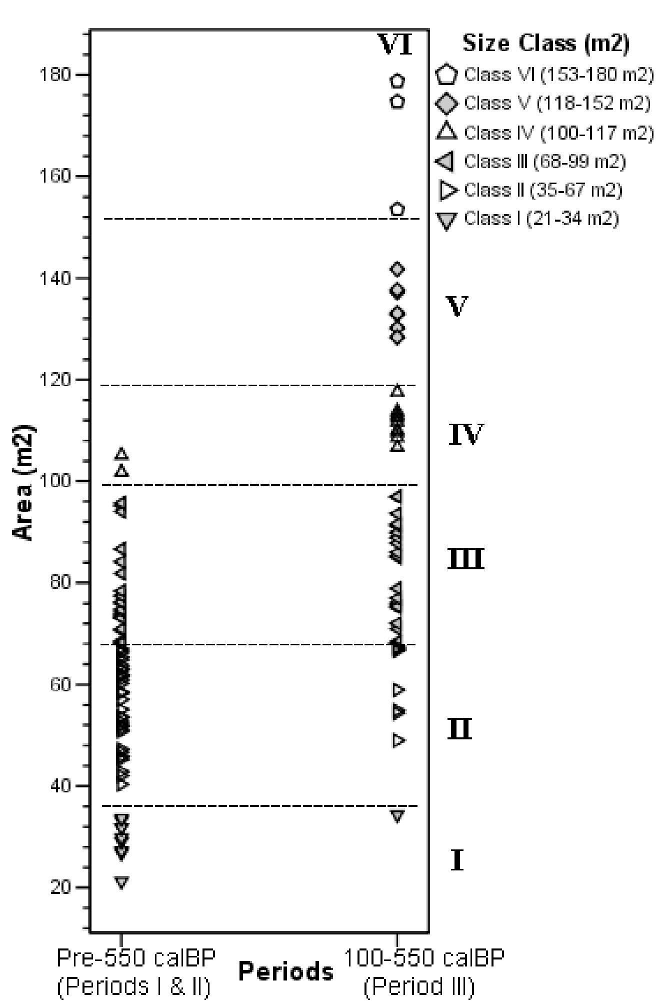


Figure 6.15. Distribution of area measurements (m^2), by Size Class, for all Upriver Group housepit features (n=114) showing a marked difference in the distribution of Class V and VI features between pre- and post-550 cal B.P periods.

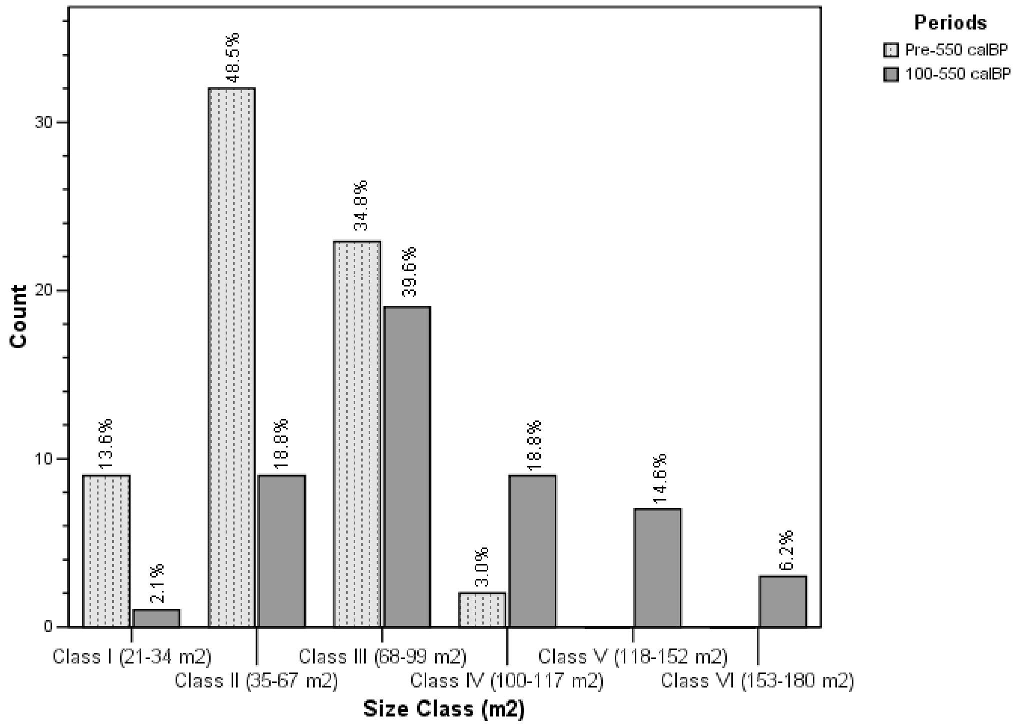


Figure 6.16. Comparison showing differences in the relative frequencies of pre- and post-550 cal B.P housepit size classes, forming respectively normal and upwardly skewed shapes. Bar percent values indicate the percentage of housepits of each size class within each period.

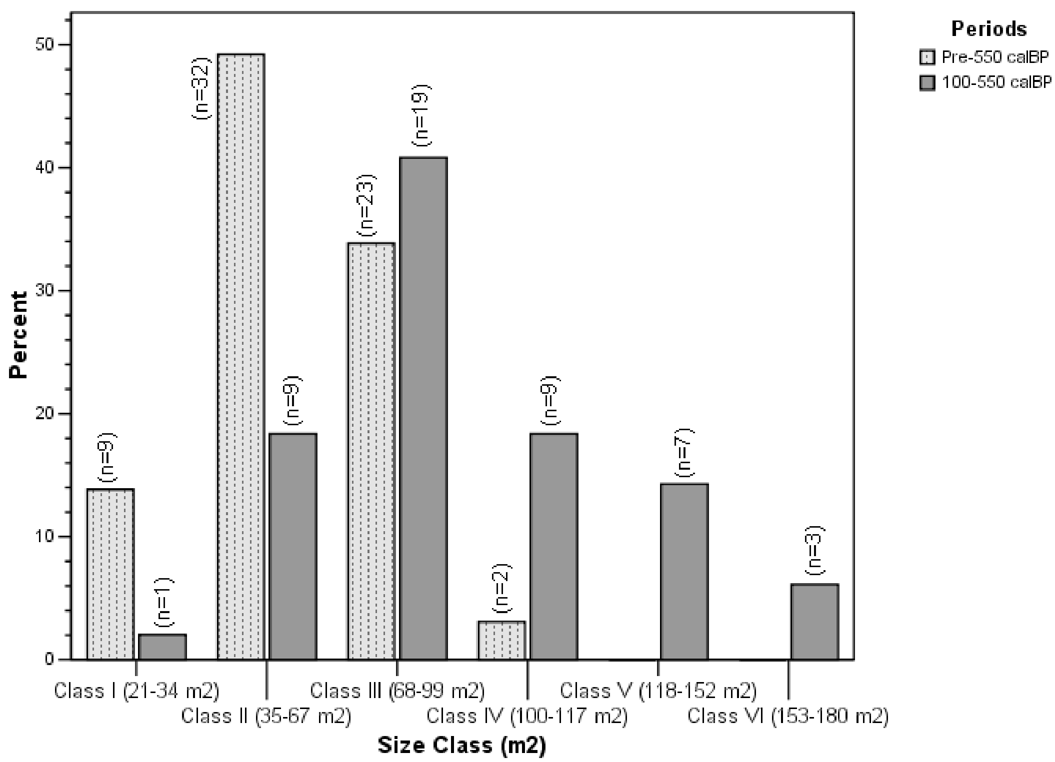


Figure 6.17. Histogram comparing the relative proportions of housepit Size Classes in Pre- and Post-550 cal B.P. time periods. Bar frequency values indicate the number of housepits of each size class within each period.

In contrast, Late Period housepits range primarily between Size Classes II-VI. The proportional distribution of Late Period features is upwardly skewed and dramatically influenced by the three largest classes (Figure 6.17). Nearly 40 % of housepits in the Post-550 period range between Size Classes IV-VI, whereas housepits of these sizes are essentially absent in the Earlier Period. Class III features represent the predominant Late Period categoryof housepit sizes (34.8 %). The two largest housepit size classes (V and VI) are found exclusively in the Late Period. Only one Class I housepit is found in the Late Period. These relationships represent the most striking differences between pre-550 cal B.P. and post-550 cal B.P. (Late Period) housepits.

Table 6.2. Cross-tabulation of housepit sizes and ages (Periods I-III).

	Housepit Size Class						
Periods (cal B.P.)	**Class I (21-34 m2)**	**Class II (35-67 m2)**	**Class III (68-99 m2)**	**Class IV (100-117 m2)**	**Class V (118-152 m2)**	**Class VI (153-180 m2)**	**Total**
Period I (2550-2000)	7	16	6	1	0	0	**30**
Period II (1400-950)	2	16	17	1	0	0	**36**
Period III (550-100)	1	9	19	19	7	3	**48**
Total	**10**	**41**	**42**	**21**	**7**	**3**	**114**

The frequencies in Table 6.2 provide a basis for examining associations between housepit Size Classes I-VI and Periods I-III. The low expected values ($n<5$) in many of the table's cells invalidate the use of the chi-square test for association. I again used the Independent Sample T-test for independence, satisfying the normalcy assumptions for the use of parametric tests, to examine difference (if any) between housepit size classes and ages. While the difference in housepit sizes between Periods I and II is of only borderline significance ($t= -1.96$, $p= 0.054$, $\sigma = .05$), changes in the frequencies of Size Classes I and III do occur between the two periods. The frequency of Class I housepits diminish while that of Class III housepits increases in Period II compared to the earlier Period I. This shift marks a trend that increases in magnitude in Period III. Housepit sizes increases significantly ($t = -5.75$, $p = 0.000$, $\sigma = .05$) between Periods II and III. This shift is marked a drop in the frequency of the smallest (Class I) housepits and an increase in the frequency of upper mid-range (Class IV) housepits compared to Periods I and II; as well as the emergence of the largest (Classes V and VI) housepits which are altogether unrepresented in the two earlier periods. These findings confirm, indirectly, a significant association between the three largest housepits size classes (Classes IV-VI) and the Late Period (post-550 cal B.P.).

The shapes of both the Pre- and Post-550 cal B.P. housepit populations are more readily recognizable when viewed as battleship curves, based on the relative proportion of size classes within each group. Figure 6.18 was created by turning the previous bar graph (Figure 6.17) on-end and creating a mirror image of each bar, split evenly along a centre line. The resulting image, accentuated by dashed outlines, provides a geometric representation of the proportional relationships between Size Classes I-VI in each time period.

The two time periods are represented by sharply contrasting shapes. The Early Period group is oval-shaped while the Post-550 cal B.P. group is pear-shaped. As hypothetical proxies to social order, these shapes may represent two different political economic systems characterized by differences along a vertical axis of relations. The pear-shaped social structure (Late Period) equates to more pronounced social stratigraphy and wider-ranging differences in household organization in comparison with an oval-shape. That a statistically significant difference and a distinct upward trend in housepit sizes characterize pre- and post-550 cal B.P. periods is confirmed by the findings of these analyses. These findings provide strong evidence of a major shift in the organization of ancient Stó:lō-Coast Salish society beginning around 550 cal B.P. Patterning in the variation of housepit sizes indicates the Late Period emergence of pronounced social stratification and marked differences between households far greater than at any other time in Stó:lō-Coast Salish pre- colonial history.

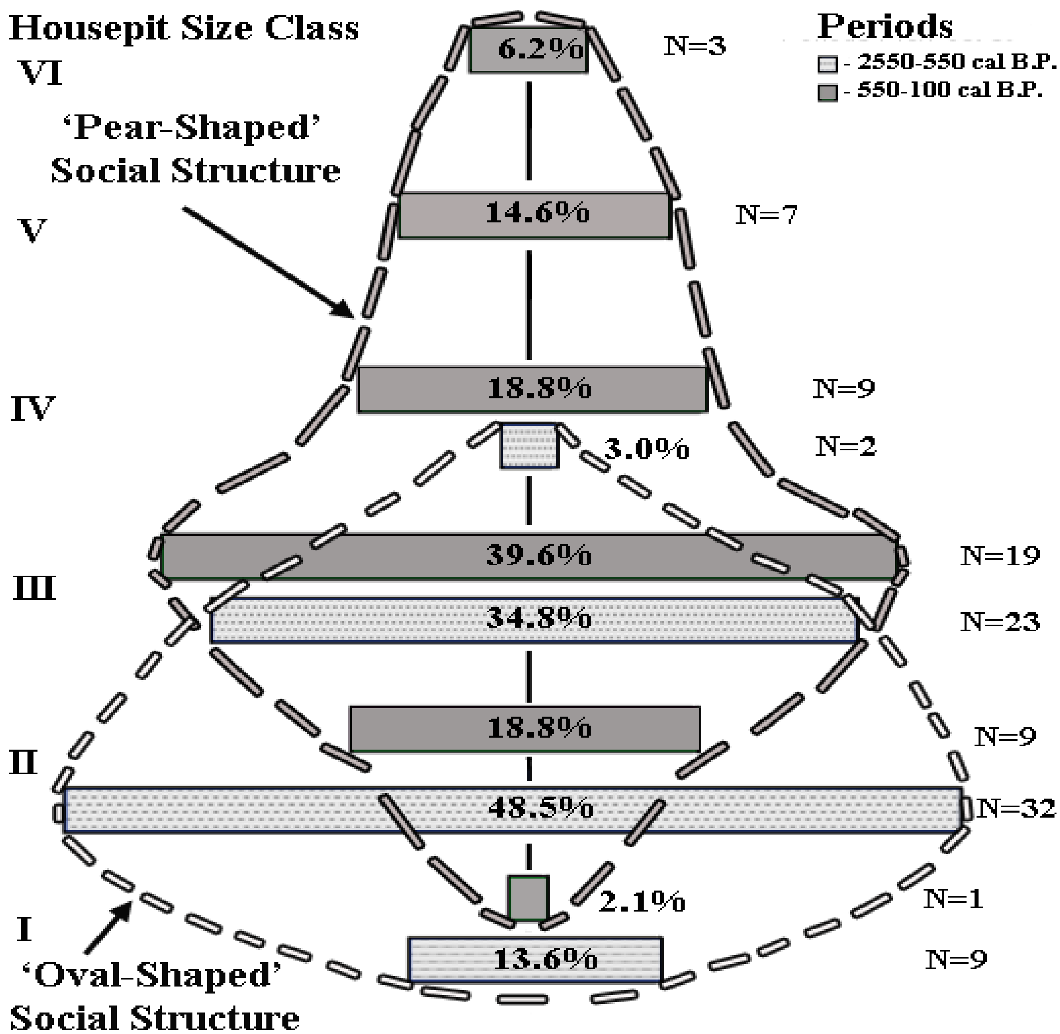


Figure 6.18. Comparison of the relative proportions of housepit size classes as proxies showing 'oblong' and 'pear-shaped' social structures and indicating differences in social stratification and household relations along a vertical plane of relations in pre- and post-550 cal B.P. time periods.

6.4 Investigating Housepit Shapes through Time

House shape is another variable of house form, in addition to size, by which differences between households may be expressed. House architecture is highly visible and has the potential to convey a great deal of meaning and political capital in the negotiation of household status and authority (Bourdieu 1973). Different house shapes may carry symbolic meaning and value differentiating households within the broader community. The development and perpetuation of differently shaped pithouses has implications tied to the political economy of house form. House architecture plays into the processes by which communities are negotiated and formed, as discussed in Chapter II. In this section I will first systematically evaluate basic housepit shapes (circular, square, or rectangular/oblong) and then explore changes in housepit shape through time in relation to housepit size.

Visual assessment of housepit shape is problematic, whether in-field or map-based, and can be highly subjective and unreliable. Housepit shapes were often difficult to determine because they were obscured by vegetation and could only be viewed at an oblique angle. Determining housepit shapes through visual assessment of our detailed surface maps was also frustrated by taphonomic forces affecting the polygonal shapes defined in Chapter III (Appendix II). For the purposes of the present analysis, I developed a quantitative method using length, width, and either diameter or where appropriate corner-to-corner measurements to determine each housepit's shape as a tendency to be circular, square, or rectangular/oblong.[24]

My approach to developing this shape-based typology of housepits relies on basic geometry. Geometry describes the forms noted above as values derived from the relationship between width/length and width/diagonal (or diameter) measurements. Housepits with equal width and length measurements must be either circular or square.[25] The proportional value of the width-to-length ratio (i.e., width divided by length) for both circles and squares is 1.0. These shapes are differentiated by their respective proportional values of width-to-diagonal measurements (width/diagonal) which equals 1.0 for circles and 0.71 for squares. Alternately,

[24] Length defines the maximum long axis measurement; width defines the maximum short axis measurement; and the diagonal measurement defines the maximum dimension (e.g., corner to corner) -- based on rim-crest to rim-crest measurements for each feature derived from the polygons (outlines) defined in the figures in Appendix 3.1.
[25] I exclude triangles from the realm of possible housepit shapes.

housepits with increasingly divergent width/length and width/diagonal values increase in their tendency to be rectangular/oblong.

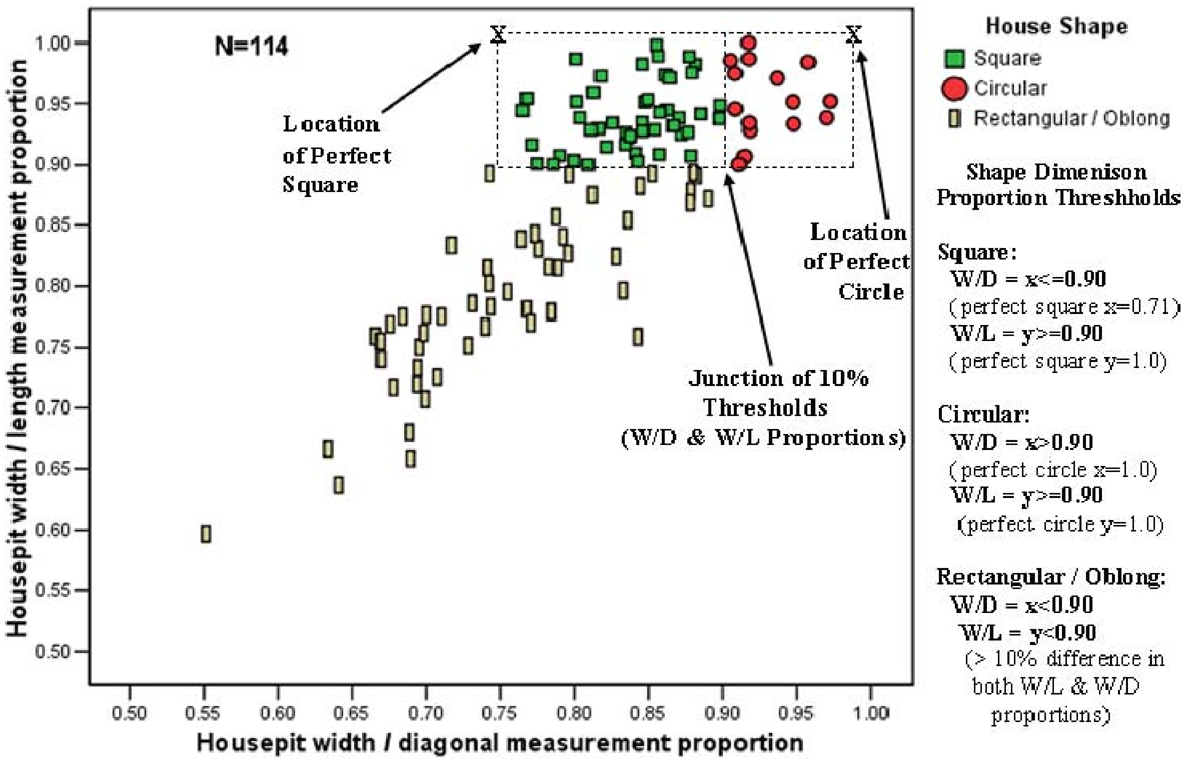


Figure 6.19. Scatterplot defining square, circular, and rectilinear/oblong shape characteristics of 114 Upriver Group housepits from all time periods, based on length/width (W/L) and width/diagonal (W/D) measurement proportions.

The relationship between each of these two sets of values, indicating tendencies in shape, becomes apparent when plotted on a scatterplot (Y=width/length; X=width/diagonal) (Figure 6.19). Housepits with X and Y values approaching 1.0 tend to be circular. Housepits with X values approaching 1.0 and Y values approaching 0.71 tend to be square. In this analysis I established a Y-axis cut-off point for both circular and square shapes limiting width/length variation to no more than 10 % (i.e., Y>=0.90). Values below this point (i.e., greater than 10 % variation between width and length measurements) reflect divergent dimensions tending to represent rectangular/oblong forms. I likewise established an X-axis cut-point separating circular and square shapes, limiting circular shapes to those with less than 10 %

variation in width/diagonal measurements (i.e., X>0.90). Square shapes otherwise included the broader range of X-values less than 0.90, resulting from width/diagonal variation greater then 10 %. Thus, shape category thresholds for circular housepits were set at X>0.90 and Y>=0.90, and for square housepits at X<=0.90 and Y>=0.90. X- and Y-values exceeding these combined thresholds were classified as tending to be rectangular/oblong (i.e., X<0.90 and Y<0.90). Plots of the 114 Upriver Group housepits thus provided an array of proportionate values characterizing the shape of each feature, based on their relation to known anchor points founded in basic geometry.

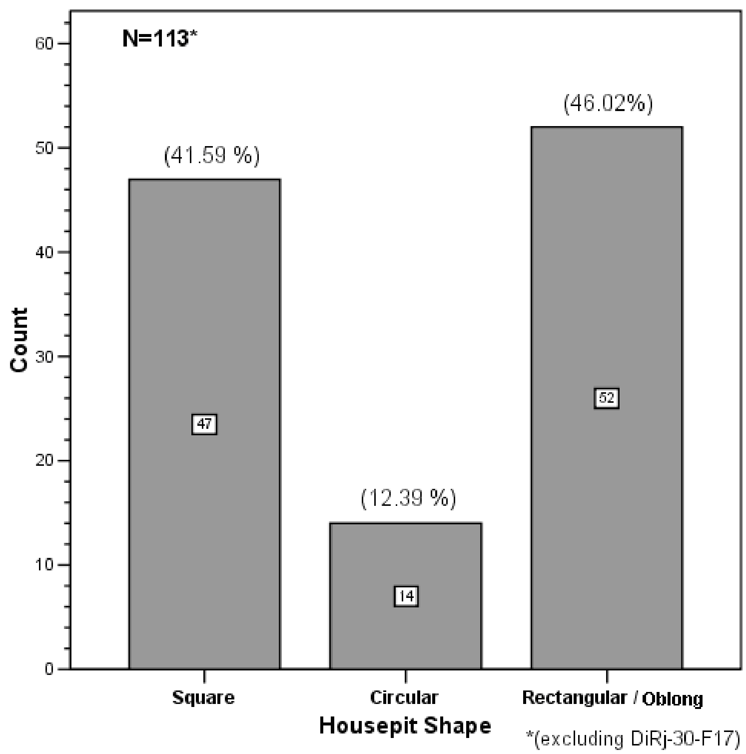


Figure 6.20. The relative percentages of square, circular, and rectangular/ovoid-shaped housepits for 113 Upriver Group housepits throughout all time periods, excluding DiRj-30-F17 as an uncertain feature type. Bar percent values indicate the percentage of housepits of each shape.

This analysis shows that rectangular/oblong (46%; n=52) and square (42%; n=47) shapes are the two most prevalent forms among Upriver Group housepits (Figure 6.20).[26]

[26] Feature DiRj-30-F16 was excluded from these figures due to its uncertainty as a housepit.

Circular housepits represent a minority of the population (12%; n=14). Of these, two features classified as circular are questionable in various ways. DiRj-30-F6, as noted before, is a questionable housepit feature. DiRj-1a-F16 is questionably situated in time. Each of these features are variously identified in or discounted from the following analyses exploring relationships between feature shapes and time, as well as size, as possibly affecting their outcomes.

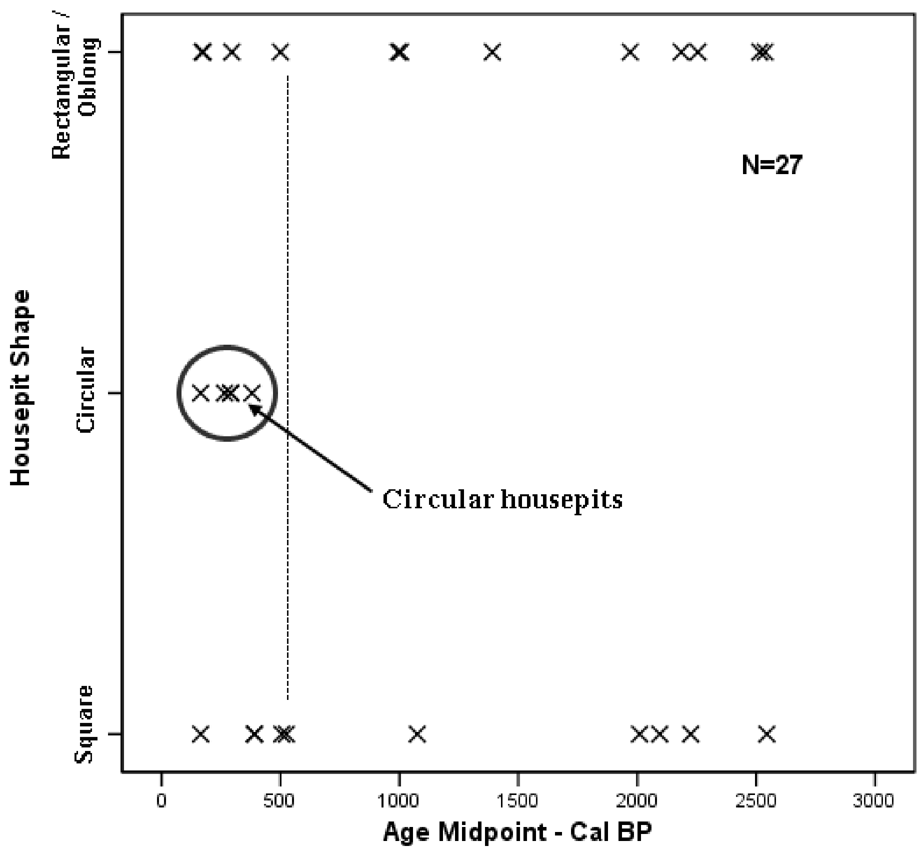


Figure 6.21. Plot of 27 radiocarbon-dated Upriver Group housepits (mid-points) by shape, showing the age distribution of circular house shapes as clustering within the Late Period / Period III (550-100 cal B.P.), whereas square and rectangular/oblong housepits are present in all three time periods.

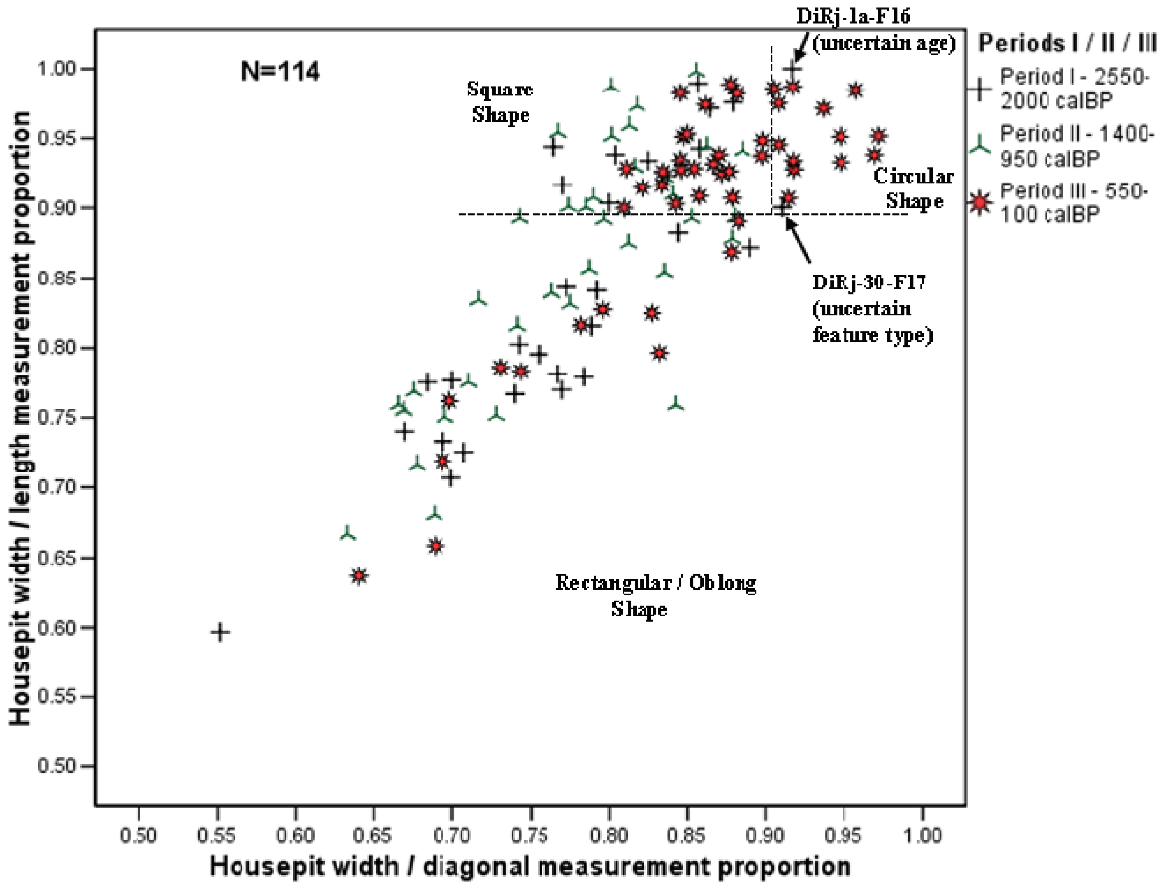


Figure 6.22. The distribution of housepit length/width and width/diagonal measurement ratios, and related shapes for all 114 Upriver Group housepits, corresponding with Periods I-III; two features (DiRj-1a-F16 and DiRj-30-F17) are uncertain as to their age and feature type.

Not all housepit shapes are equally represented through time (Figures 6.21-6.23) (also Appendix I). While square and rectangular/oblong housepit forms are found throughout all three time periods (Periods I-III), circular shaped housepits (i.e., those with the most certain circular shape tendencies) occur only in the Late Period, post-550 cal B.P. This pattern is visible in the distribution of housepit shapes through time based on radiocarbon-dated features, of which all circular forms (n=4) are from the Late Period (Figure 6.21). Linking the age of all 114 housepits relative to their dimensional proportions (Figure 6.22) shows that all but two Period I and II features (n=14) fall within the range of square or rectangular/oblong shapes -- both of these representing uncertain features associated with Period I (Figure 6.23a).

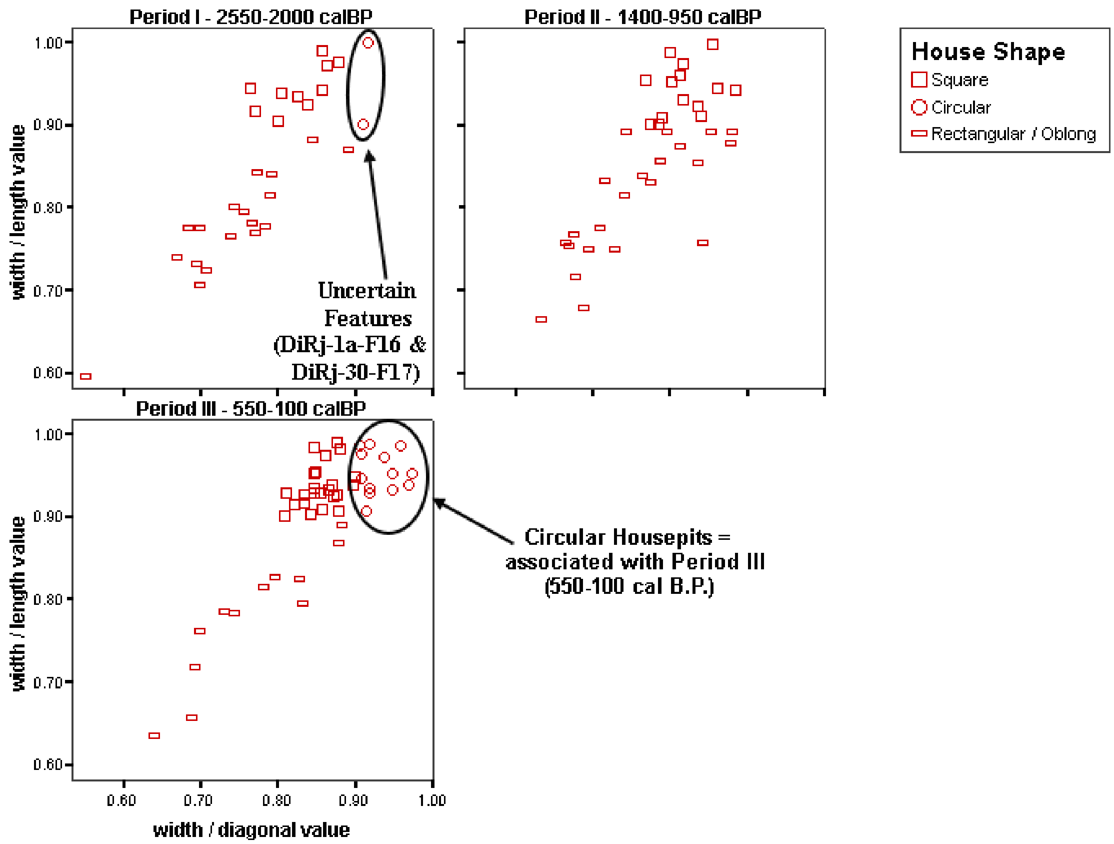


Figure 6.23a-c (clockwise from top-left). Comparison of housepit shapes through time plotting the distribution of housepit shapes within Periods I-III and showing a cluster of all but two circular features in Period III (noting the location of the two uncertain Period I features otherwise classified as circular).

Comparing frequencies and proportions of housepits shapes through time, excluding both uncertain cases, provides additional insight into the relationships between circular-, square-, and rectangular/oblong-shaped features (Figures 6.24-25). Rectangular/oblong forms are similarly represented as the most common housepit forms in Periods I and II, comprising 64 and 62 % of features in each period, respectively. The Early Period (pre-550 cal B.P.) is otherwise made up of square housepits. These proportions change in the Late Period in which square-shaped housepits come to predominate (48%), while circular-shaped housepits (27%) appear in nearly equal proportion to rectangular/oblong-shaped features (25%). One-hundred percent of housepits with the most certain temporal and functional classifications are associated with the Late Period (Figures 6.25).

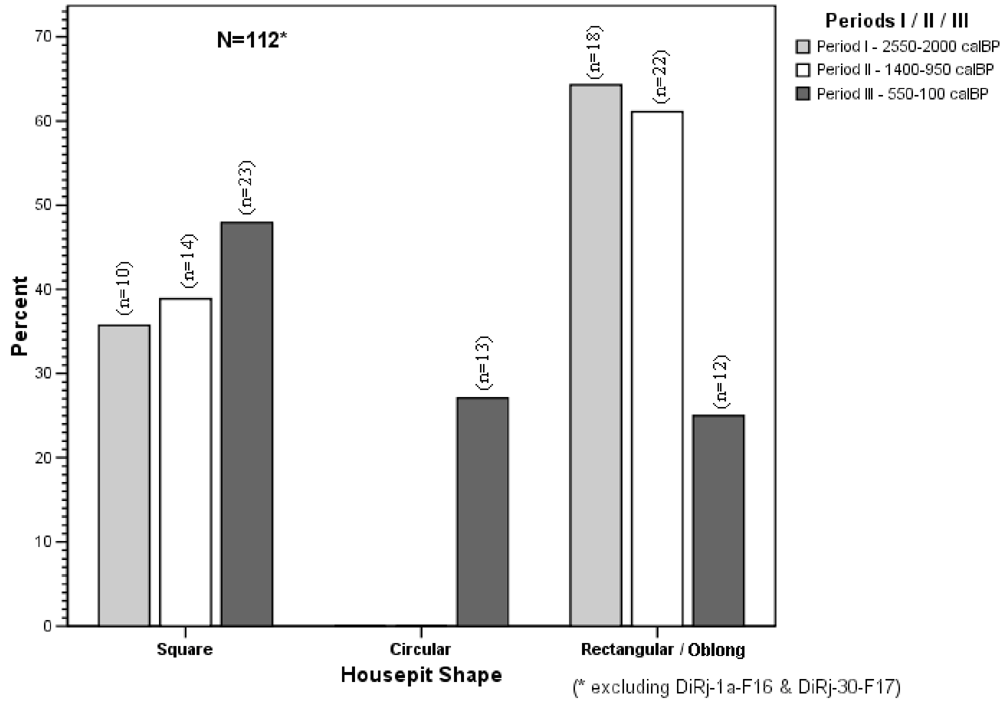


Figure 6.24. Relative proportions of square, circular, and rectangular/ovoid housepits associated with Periods I-III (excluding DiRj-30-F17 and DiRj-1a-F16 as uncertain features in this context). Bar frequency values indicate the number of housepits of each shape within each period.

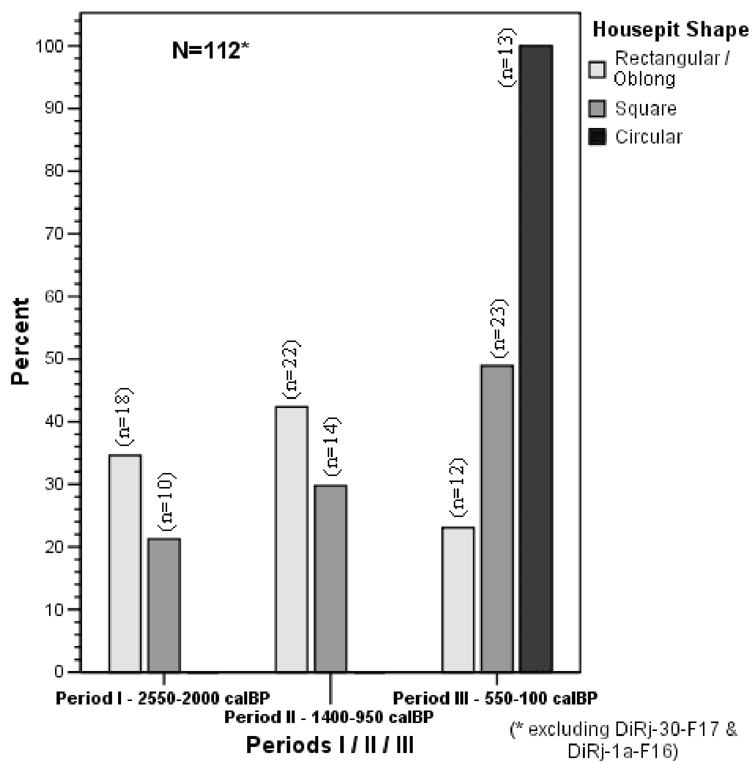


Figure 6.25. Percentages of rectangular/ovoid, square, and circular-shaped housepits associated with Periods I-III, showing that all circular features are associated with Period III (excluding DiRj-30-F17 and DiRj-1a-F16 as uncertain features in this context). Bar percent values indicate the percentage of housepits of each shape within each period.

Frequencies of housepit shapes within Periods I-III are shown in Table 6.3, based on these 112 most certain housepit features. Table 6.3 shows a clear and very strong association between circular housepits and Period III (post-550 cal B.P.), being otherwise absent from earlier periods. While square and rectangular/ovoid shapes are common throughout all three periods, there is a significant association between square and rectangular/ovoid housepits through time (x^2= 7.287, df= 2, p= 0.026), when assessed independent of circular forms. Examining subset relationships between specific time periods demonstrates a statistically significant, although not very strong, association between square and rectangular/ovoid housepits and Periods II and III (x^2= 5.117, df= 1, p= 0.024). No such association exists in Periods I and II (x^2= 0.068, df= 1, p= 0.795). This pattern is explained by the increased proportion of square housepits between Periods II and III relative to rectangular/ovoid housepits. These findings identify patterns of change in housepit shape through time. Rectangular/ovoid and square forms are common in the earlier Periods I and II. In the Late Period, this relationship shifts on two counts: (1) in association with increased construction of square housepits, and (2) the development of circular housepits, uniquely, in Period III (i.e., the Late Period, post-550 cal B.P.).

Table 6.3. Cross-tabulation of housepit shapes and ages, based on 112 housepit features.*

	Housepit Shape			
Housepit Age	**Square**	**Rectangular / Ovoid**	**Circular**	**Total**
Period I (2550-2000 cal B.P.)	10	18	0	**28**
Period II (1400-950 cal B.P.)	14	22	0	**36**
Period III (550-100 cal B.P.)	23	12	13	**48**
Total	**47**	**52**	**13**	**112**

* Excluding DiRj-30-F17 and DiRj-1a-F16 as uncertain.

Sorting housepit shapes by size (Table 6.4; Figure 6.26) shows no clear relationship between these two variables. A weak level of independence exists between housepits size and shape when considering only square and rectangular forms and based on area measurements (m^2) (t= 1.67, p= 0.099, σ = .05).[27] This finding appears to relate to subtle differences in the frequencies (Table 6.4) and proportions (Figure 6.26) of square and rectangular/ovoid housepits between size classes. Both types of housepit shapes are represented by housepits of all six size classes. Square housepits, however, show a slightly greater representation, and slightly bi-modal distribution, among larger housepit size classes (Classes IV-VI) than rectangular/ovoid housepits. Five of the seven documented Size Class V housepits are classified as square, comprising 71 % of that size category. The largest size class (Class VI) is equally represented by circular-, square-, and rectangular/oblong-shaped housepits.

Table 6.4. Cross-tabulation of housepit size and shape, based on 113 housepit features.*

	Housepit Shape			
Housepit Size Class	**Square**	**Circular**	**Rectangular / Ovoid**	**Total**
Class I (21-34 m2)	4	0	5	**9**
Class II (35-67 m2)	17	2	22	**41**
Class III (68-99 m2)	18	3	21	**42**
Class IV (100-117 m2)	2	7	2	**11**
Class V (118-152 m2)	5	1	1	**7**
Class VI (153-180 m2)	1	1	1	**3**
Total	**47**	**14**	**52**	**113**

* Excluding DiRj-30-F17 as uncertain.

While low frequencies of circular housepits preclude their inclusion in confirmatory testing, some insight may be gained about their relationship to housepit size from reviewing Table 6.4 and Figure 6.26. Circular housepits are represented by housepits of all but those of Size Class I (excluding uncertain cases). A spike marks the proportional relationship between

[27] These data satisfied the assumption of normalcy supporting the use of the Independent Sample T-Test.

circular housepits (n=7; 50 %) and Size Class IV relative to the other size categories; also relative to square and rectangular/ovoid housepits (n=2; <5 %) (Figure 6.26). Of the 11 documented Class IV housepits, 64 % are circular.

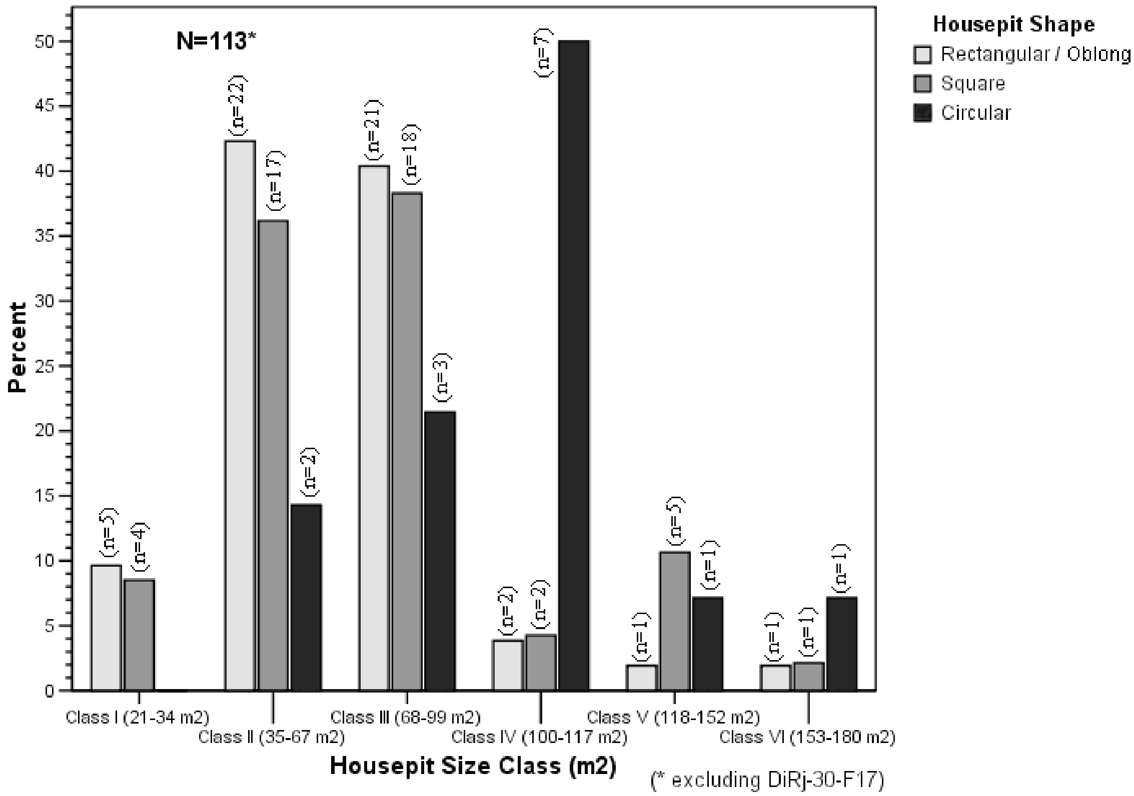


Figure 6.26. Bar graph showing the distribution of housepit shapes by size as percentages of rectangular/ovoid, square, and circular-shaped housepit types associated with Size Classes I-VI (excluding DiRj-30-F17 as an uncertain feature in this context). Bar frequency values indicate the number of housepits of each shape within each size class.

6.5 Summary of Analyses of Relationships between Housepit Size, Age, and Shape

These analyses of relationships between housepit size, age, and shape, resulted in a number of findings that contribute to the discussion of Stó:lō-Coast Salish community organization. The post-550 cal B.P. period witnessed the emergence of larger and more varied housepit shapes than had existed in earlier times. A statistically significant difference describes the relationship between pre- and post-550 cal B.P. housepits based on their size. Housepit size is significantly associated with age, increasing through time. Large housepits (Classes V and VI), particularly, are significantly associated with the Late Period.

The increase in housepit sizes associated with the Late Period coincides with a shift in housepit architecture creating three co-existent housepit forms -- circular, square forms, and rectangular/oblong. While square and rectangular/ovoid housepits are common throughout the last three millennia, square forms become more predominant in the Late Period. Circular housepits, rather, are solely associated with the Late Period. These data strongly support the conclusion that the construction of circular housepits in the upriver portion of the mainland Gulf of Georgia Region is a phenomenon that dates exclusively to the Late Period (ca. 550-100 cal B.P.). While square and rectilinear forms persisted over a 3,000 year period, the construction of circular housepits appeared during the Late Period as phenomenon among the Stó:lō.

These findings demonstrate that the majority of Upriver Group housepits are square or rectangular / oblong. While circular housepits were built in this region, they represent a minority of overall housepit types. Although significant, a weak level of independence describes the relationship between square and rectangular/ovoid housepits and size differences. Square housepits show a slightly greater representation among larger housepit size classes (Classes IV-VI) than rectangular/ovoid housepits. The largest size class (Class VI) is equally represented by circular-, square-, and rectangular/oblong-shaped housepits. Circular housepits are represented in all but the smallest of size classes (Class I), with a notably disproportionate concentration in Size Class IV. These findings contradict a long held and pervasive understanding that housepits in the mainland Gulf of Georgia Region were primarily circular in shape. Circular housepits did not replace, but rather augmented earlier housepit forms. The initiation of this change in housepit design preceded European contact as an indigenous development, signifying a shift in societal relations.

Detached from the region's communicative landscape and without spatial context the patterns of change in housepit size and shape identified in this chapter do not, of themselves, provide much insight into pre-Colonial Stó:lō-Coast Salish community organization. These findings demonstrate an upward cline in housepit, and by extension *household*, sizes through time. This pattern is particularly pronounced in the transition to the Late Period (post-550 cal B.P.). Differences in housepit / household sizes, ranging from very small to very large, suggests a diversification of basic social units associated with the Late Period. Differences in housepit shape through time -- tending to shift from rectangular and square to more predominately square shapes, and adding circular housepits -- supplement these shifts in the diversification of housepits and households in the Late Period.

Linking back to this study's political economic framework, the house features explored in this chapter represent capital; elements of negotiation in a field of political-economic interactions. That we find statically significant differences in housepit size and shape through time -- particularly striking as a growth in size and diversity of shape of pithouses built during the Late Period as opposed to earlier times -- implies a diversification in the range of available capital. If pithouses represent capital as expressions of household wealth, then the widening range of housepit sizes and shapes in the Late Period suggests a diversification of this system of capital carried forward from earlier times. The emergence of very large pithouses implies the addition of a level of wealth and available capital -- like adding larger values to an existing currency -- not before held or expressed by Stó:lō-Coast Salish households prior to 550 cal B.P. Differences in wealth and available capital provide an opportunity for households of varying sizes to negotiate, determine, and represent their positions in community, in part, by the spatial placement of pithouses within settlements.

The following chapters address how housepits of varying sizes, used as capital by households of varying sizes, are distributed through space. The following analyses add dimension and depth to the place and placement of these features within community as factors of inter-households organization and political-economic negotiation. The socio-economic and socio-political implications of changing housepit sizes and shapes identified in this chapter will be further explored in Chapter IX. I turn now to the investigation of housepits as a basic unit of intra-settlement social-spatial relations.

CHAPTER VII - INTRA-SETTLEMENT HOUSEPIT RELATIONS

The three basic objectives in this chapter are to: (1) quantify the range of variation in size of housepits within each settlement as a key descriptor of each settlement's composition; (2) plot the spatial arrangement of housepits in each settlement based on the occupations defined in Chapter IV (Table 5.1) and as coded by the Size Classes defined in Chapter VI; and (3) explore settlement-level organization based on the layout and arrangement of housepits within each settlement. 'Layout' describes the shape (e.g., linear, curvilinear, clustered) of each housepit settlement. 'Arrangement' describes social-spatial relations (e.g., center/periphery relations between large and small features) deduced from the spatial relationships between housepits and the surrounding landscape and points of access (e.g., waterways). These analyses include both quantitative and qualitative assessments of intra-settlement patterning and change in intra-settlement organization though time.

The analysis of settlements involves two fundamental sets of community relations -- those within households and those between households. These two dimensions examined together help us develop a broader understanding of community organization based in the relations of (households) housepits both within and between settlements. In this chapter I focus on analyzing intra-settlement relationships between housepits (as proxies for households). While focusing on intra-settlement relations among housepits, this chapter simultaneously ventures into a broader set of inter-settlement comparisons; a lead into an area of analysis explored in greater detail in Chapter VIII. Results of these analyses support the comparison of housepits and settlements through time and across space at a middle-range scale of analysis between the feature and the region.

7.1 Defining Settlements and Occupations

The spatial relationships between the 114 housepit features in the Upriver Group, when plotted by their individual UTM coordinates, represent 10 distinct clusters (Figure 7.1).[28] Evident at this broad scale is a pattern of clustered housepits distributed across the landscape, similar to the plots produced in Chapter IV. Housepits cluster together, often no more than a few meters apart, and define settlements. Figures 1.3 and 3.1 (Chapters I and III) provide a geographic backdrop within which to situate these settlements within the landscape.[29] These clusters of housepits were sorted by age and grouped according to the chronology developed in Chapter V (Table 5.1) to define a framework of apparent coexistent households. Each of these settlements is labeled by their *halq'eméylem* place name (e.g., Th'ewá:lí) and roman numeral notation of their occupation (e.g., I or II) in cases where more than one occupation was defined (e.g., Sx̱wóx̱wiymelh I and II, Shxw'ow'hamel I and II, and Welqámex I and II. The occupation of Welqámex forms a continuum beginning in Period IIIa and continuing into Period IIIb.[30] Sx̱wóx̱wiymelh and Shxw'ow'hamel each have distinct occupations separated by hundreds of years. Sx̱wóx̱wiymelh I, itself, appears to be a multi-component settlement, though was grouped together into a single Period I component in this analysis.

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[28] The geographic location of each feature based in its center-point.

[29] While Welqámex and Eyxel are located in very close proximity and appear to comprise what could be considered the same site, they are separated by a narrow channel of the Fraser River. Welqámex, like Qithyil Island, is located on an island. The contexts of Th'ewá:lí and Xelhálh are somewhat different from the other settlements being, either completely (e.g., Xelhálh) or in part (Th'ewá:lí), located on hill-top landforms overlooking river channels. All the other settlements in this study are situated on river-bank landforms. Based on the clustering of housepits in space, Sx̱wóx̱wiymelh is defined as a single site with two arbitrary parts separated by an area of modern disturbance. Detailed geomorphological descriptions of each of these settlements is beyond the scope of this study and are provided in other sources (Graesch 2006; Lenert 2008; Lepofsky et al 2005; Sanders and Ritchie 2006; Schaepe et al. 2006).

[30] Based on Graesch's work (2006), I defined two distinct occupations at Welqámex serving to provide detailed time seriation and distinction between the composition of housepits in pre- and post-contact periods.

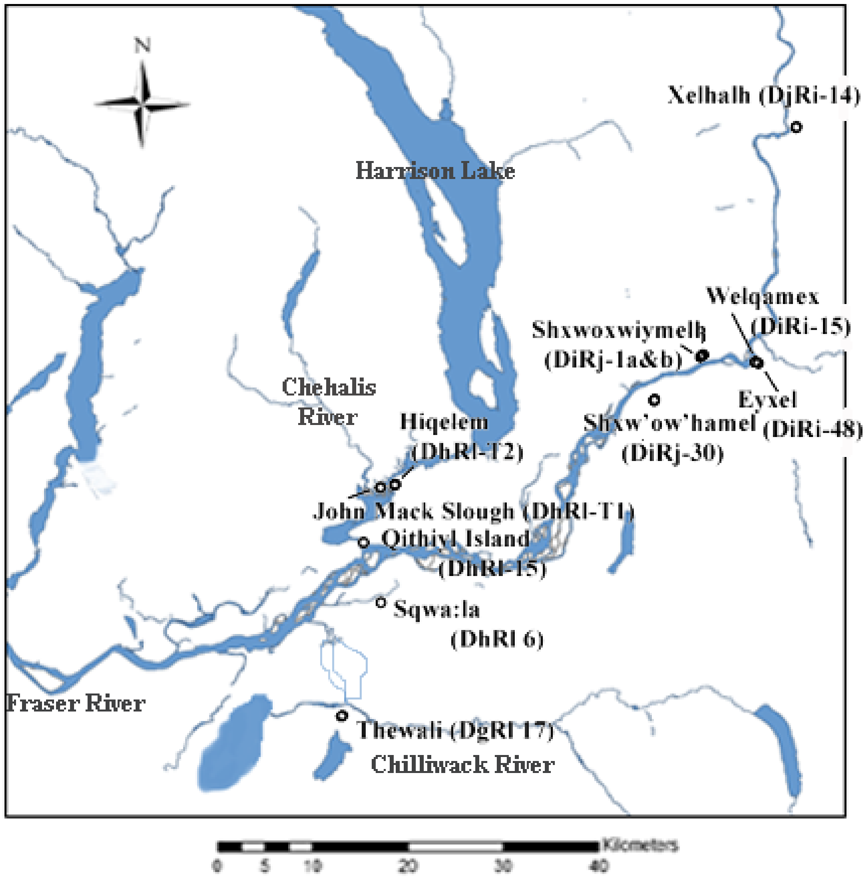

Figure 7.1. Regional map showing the spatial distribution and clustering of Upriver Group housepit features -- comprising 10 distinct archaeological sites.

In two additional instances I developed optional settlement and occupation scenarios providing for a range of possibilities, given uncertainties in the definition of ages for features at Hiqelem and Sx̲wóx̲wiymelh I and II.[31] I provide three options for Hiqelem including the total set of features associated with a Period II settlement, and the differentiation of the initial occupation of those features commencing in either Period II (Hiqelem I) or Period IIIa (Hiqelem II). I provide two optional sets of values for Sx̲wóx̲wiymelh I and II describing minimum and maximum counts of housepits for occupations in Periods I and IIIa as a means of addressing difficulties in defining their composition. Table 5.1 (Chapter V) thus defines the

[31] A number of housepit features associated with Sx̲wóx̲wiymelh I, and possibly II, were severely damaged or destroyed prior to being mapped or tested. The characterization of Sx̲wóx̲wiymelh I, particularly, must be viewed as an absolute minimum set of values representing this settlement.

composition, by housepit feature and age, of each of the 13 settlements/occupations included in analysis. A total of 17 settlement/occupation variations result from the inclusion of optional scenarios for Hiqelem and S<u>x</u>wó<u>x</u>wiymelh.

7.2 Measuring Intra-Settlement Variation

Intra-settlement variation showing social stratification (i.e., on a vertical plane of relations) is measured as a factor of variability in housepit size. A primary measure of intra-settlement variation, or index of spread, is provided by the Co-efficient of Variation (CV). CV values are commonly used in comparative studies of settlements (e.g., Acheson 1995, 2005; Archer 2001) as a measure of intra-settlement composition and variation in house size based on the comparison of house feature areas. Each CV value quantifies the relationship between all coexistent houses within a settlement by dividing the standard deviation of all floor areas by their mean value. This value is then multiplied by 100. The product provides an index signifying the degree of variability in house floor areas, serving as a proxy for variability in household sizes describing intra-settlement composition. The larger the CV value, the greater the degree of variation in house/household composition. Greater variation equates to greater social difference or stratification in the composition of a settlement. Conversely, small CV values indicate less variation in intra-settlement house/household composition and therefore lesser degrees of social stratification. While it is not my immediate objective to compare relationships between settlements (Chapter VIII), measures of intra-settlement variability provided by CV values provide a useful quantitative basis for pursing that purpose. The CV values presented in Figures 7.2 and 7.3 (also Table 7.1) provide a basis for comparing the attributes of the 17 settlement/occupations options defined in this study.

Caution must be used when interpreting figures depicting CV values. The mean, standard deviation, and CV -- as parametric statistics -- are powerful indicators of variability but are also affected by anomalous data including skewed data-sets and data-sets with outliers (Drennan 1996:32). As a result, these values may not be particularly representative of the characteristics of data-sets thus affected, such as those associated with Shxw'ow'hamel I and Xelhálh which show differences in relationship between median and mean values. Alternately, insight into variability within a group is also provided by the relationship between the median value and the range, as well as the inter-quartile range (IQR), which show expressions of variation around the center. These values, as non-parametric statistics, are less affected by anomalous data (e.g., outliers) and are included for reference in Table 7.1, providing a quantitative summary of the frequencies, center (median, mean), range, and IQR values for housepits in each settlement. Five settlements/occupations (Table 7.1) are noted as having low sample sizes of four or fewer housepits.

Taken at face value, the CV values describing each of the Upriver Group settlements (by occupation) range from 16.91 to 37.97 and fluctuate through time in a patterned way (Figures 7.2 and 7.3). The earliest, Period I (2550-2000 ca; B.P.) settlements have the highest CV values, ranging from 31.09 to 37.97. Period IIIa (550-150 cal B.P.) settlement have the lowest CV values, ranging from 16.91-22.72 -- with two exceptions including Xelhálh (CV=28.11) and Sxwóxwiymelh IIi (CV=28.12).[32] CV values of Period II (1400-950 cal B.P.) settlements fall in between the ranges of both earlier and later periods. A CV value of 30.22 describes Welqámex, the only Period IIIb (100-150 cal B.P.) settlement, indicating an increase in intra-settlement variation slightly above the values associated with Xelhálh and Sxwóxwiymelh IIi.

[32] These two values overlap as Period IIIa points in the scatterplot in Figure 7.2.

Table 7.1. Quantitative definition of housepit settlement attributes.

Age (cal B.P)	Sttlmnt. Name / Occupation	Site No. / Occupat.	No. of Hs Pits	HsPit Size (m^2) *Median*	HsPit Size (m^2) *Mean*	HsPit Size (m^2) *Min-Max.*	Range (m^2)	IQR	Stand. Dev. (*s*)	CV
Period I (2550-2000)	Sxwóxwiymelh Ii	DiRj-1Ai (max)*	16†	59.98	61.70	29.81-105.14	75.33	29.78	23.22	37.63
	Sxwóxwiymelh Iii	DiRj-1Aii (min)*	13†	55.09	58.87	29.81-95.21	65.40	36.30	22.35	37.97
	Shxw'ow'hamel I	DiRj-30 I	14	57.66	49.69	21.23-66.35	45.12	29.53	15.45	31.09
Period IIa (1400-950)	Shxw'ow'hamel II	DiRj-30 II	**4**	61.65	61.81	40.35-84.18	43.83	40.91	22.20	35.92
	Hiqelem (total)	DhRl-T2 (max)**	15†	67.00	67.62	33.65-101.80	68.15	23.93	18.67	27.61
	Hiqelem I	DhRl-T2 I**	11†	63.79	65.91	33.65-101.80	68.15	19.60	20.16	30.59
	Th'ewá:lí	DgRl-17	17	68.03	63.73	27.27-81.88	54.61	22.68	14.48	22.72
Period IIIa (550-150)	Hiqelem II	DhRl-T2 II**	**4**†	79.91	72.32	58.78-86.68	35.90	27.70	15.28	21.13
	Qithyil Island	DhRl-15	5	113.79	116.71	87.80-137.21	49.41	35.39	19.73	16.91
	John Mack Slough	DhRl-T1	12	73.72	78.26	54.39-113.09	58.70	23.98	16.43	20.99
	Sqwa:la	DhRl-6	**3**	88.93	90.91	75.18-108.63	33.45	--	16.81	18.49

Age (cal B.P)	Sttlmnt. Name / Occupation	Site No. / Occupat.	No. of Hs Pits	HsPit Size (m^2) *Median*	HsPit Size (m^2) *Mean*	HsPit Size (m^2) *Min-Max.*	Range (m^2)	IQR	Stand. Dev. (*s*)	CV
	Welqámex I	DiRi-15 I	5	128.38	131.41	109.62-178.78	69.16	44.60	28.21	21.47
	Eyxel	DiRi-48	**4**	51.96	49.29	34.32-58.94	24.62	--	10.79	21.89
	Sxwóxwiymelh IIi	DiRj-1 IIi (max)***	6	76.30	80.22	51.99-106.70	54.71	43.89	22.56	28.12
	Sxwóxwiymelh IIii	DiRj-1 IIii (min)***	**3**	85.24	86.43	67.36-106.70	39.34	--	19.70	22.79
	Xelhálh	DjRi-14	11	93.64	103.81	68.26-153.51	85.25	58.76	29.18	28.11
Period IIIb (150-100)	Welqámex II	DiRi-15 II	9	112.52	122.16	67.37-178.78	111.41	56.49	36.91	30.21

* denotes settlement / occupation option. CV = Coefficient of Variation

† denotes incomplete count (i.e., minimum values). IQR = Inter-quartile Range

- bold values represent settlements with low sample sizes.

These CV values indicate that higher levels of variability commonly describe Upriver Group housepit settlements in both the earliest and latest periods. It would appear that lower levels of intra-settlement variation describe the mid-age settlements including those in both Periods II and IIIa (exceptions noted). Figure 7.2 shows intra-settlement variation in Period I housepit settlements to be among the highest of the three periods. Housepit sizes in Period II settlements tend to be more cohesive, with less variation. Period III has settlements with both large and small degrees of variation in housepits sizes.

When viewed through time (Figure 7.3), the CV values describing these individual settlements form a U- or V-shaped pattern. Two opposing linear relationships meet at their base to create this shape. Settlements associated with Periods I, II, and III are independently circled in this scatterplot, illustrating the relationships between these groups and overall trends in settlement CV values through time. CV values describing Period I and Period II settlements begin at the high end of a strongly negative linear relationship (qualitatively estimated and plotted in Figure 7.3) with values decreasing through time. Intra-settlement variability steadily decreases between 2550 and 550 cal B.P. Conversely, CV values describing Period III settlements represent a strongly positive linear relationship. Intra-settlement variability steadily increases through time or otherwise becomes more diversified to include both high and low CV values between 550-100 cal B.P.

The CV values in Figure 7.3 must be more fully interpreted with respect to variation in the housepit size classes defined in Chapter VI, in order to avoid being misleading. A significant potential error in basing judgment of intra-settlement variation on CV values, solely, is that they do not provide information on the order of magnitude of variation in housepit sizes. The CV value assumes that the range of variation measured among housepit sizes within a settlement is based on a range or order of magnitude shared between settlements, that is, of the

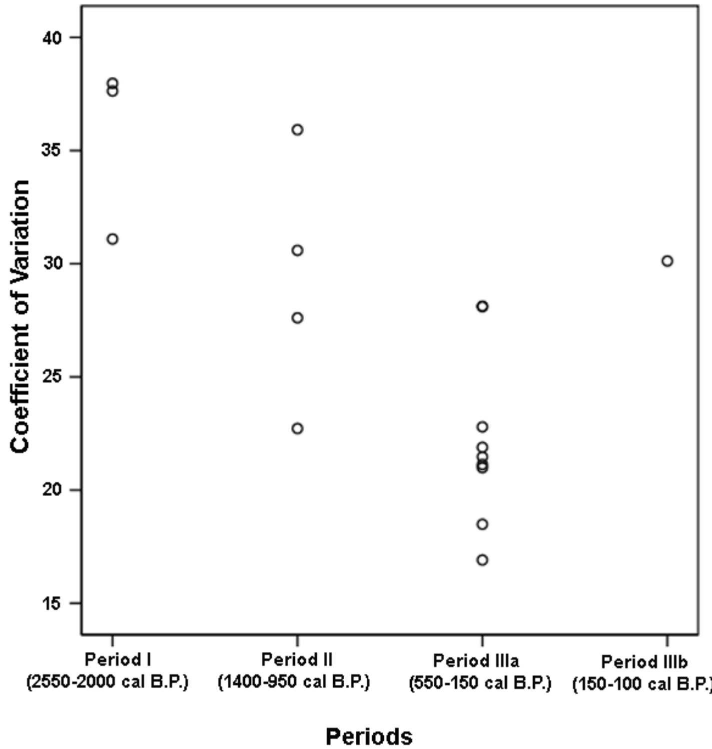

Figure 7.2. Plot showing a downward trend in Coefficient of Variation (CV) values of all 17 settlement options, grouped by time period.

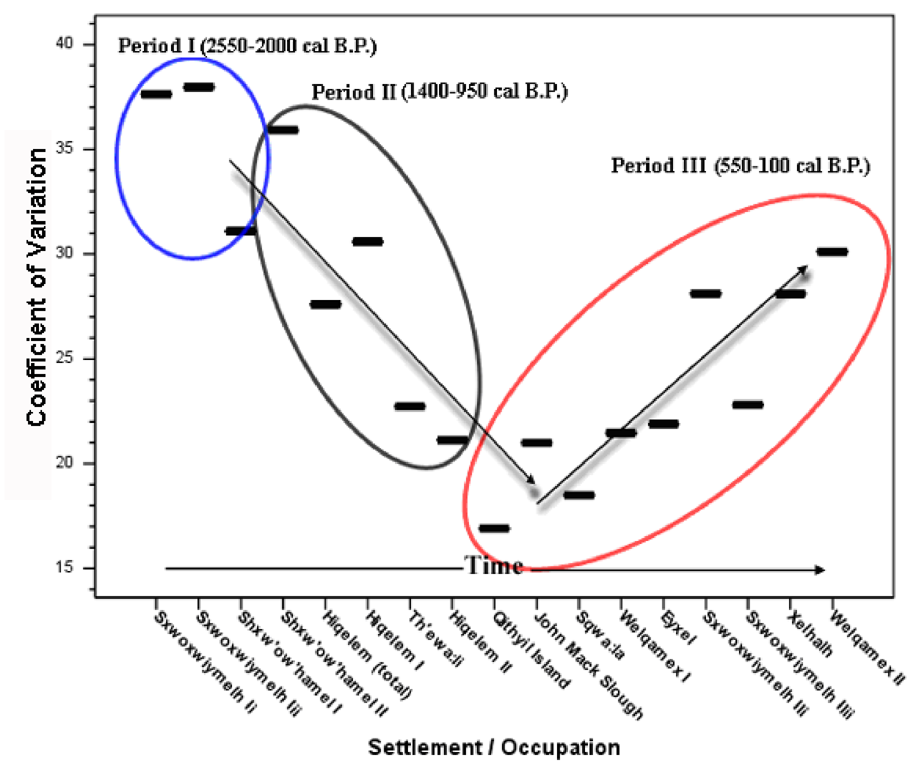

Figure 7.3. Comparison of the Coefficient of Variation values (CV) by settlement, arranged chronologically from oldest to youngest (Period I-III), showing a 'V-shaped' pattern and trends through time.

same population of size values (i.e. within a single mode). In this case, however, two different populations of housepits were defined based on differences in size (i.e., comprised of two modes). Thus, two orders, or modes, of magnitude affect the range of variation among housepits measured in this study. Variation within a population of housepit Size Classes V and VI is already an order of magnitude greater than that describing a population of Size Class I-IV housepits -- as a factor of variation. The CV does not account for variation across multiple modes or orders of magnitude and does not recognize differences distinguishing populations of housepits as, in this case, determined by size. More complete assessment of variation within these settlements requires multiple dimensions of analysis beyond what can be provided solely by the CV measurement.

The housepit Size Class scale provides a basic point of reference and framework within which to gauge a more complete interpretation of CV values. Cross-referencing the CV value with housepit Size Class is an essential step in describing and understanding settlement composition and the range of variation at an intra-settlement level.

Distinct patterns are evident when intra-settlement variation in housepit areas is shown as a series of box-and-whisker plots set against a framework of size classes (Figure 7.4). Settlements are notably differentiated not only by their degree of internal variation but by their housepit size composition. All pre-550 cal B.P. housepit settlements are limited to a range of features within Size Classes I-IV -- as noted in Chapter VI. Consistency in the composition of Period I and Period II settlements is illustrated by the similar sized circles encompassing these groups (Figure 7.4). The composition of Period III settlements varies across a much broader range of housepit size classes, as illustrated by the much taller circle encompassing this group. While housepits in these settlements range across all six size classes, variation of this magnitude is not found in any one settlement.

Expressions of intra-settlement differences between the Early and Late Periods are consistent with the different societal shapes (i.e., single versus multi-modal) representing these two periods. Intra- and inter-settlement variation of housepits in Late Period (III) settlements represent inter-household relations expressed over a broader plane of vertical relations (i.e., within a more highly stratified society) than in the Early Period (I). These findings describe a shift in intra-settlement relations and social organization between pre- and post-550 cal B.P.

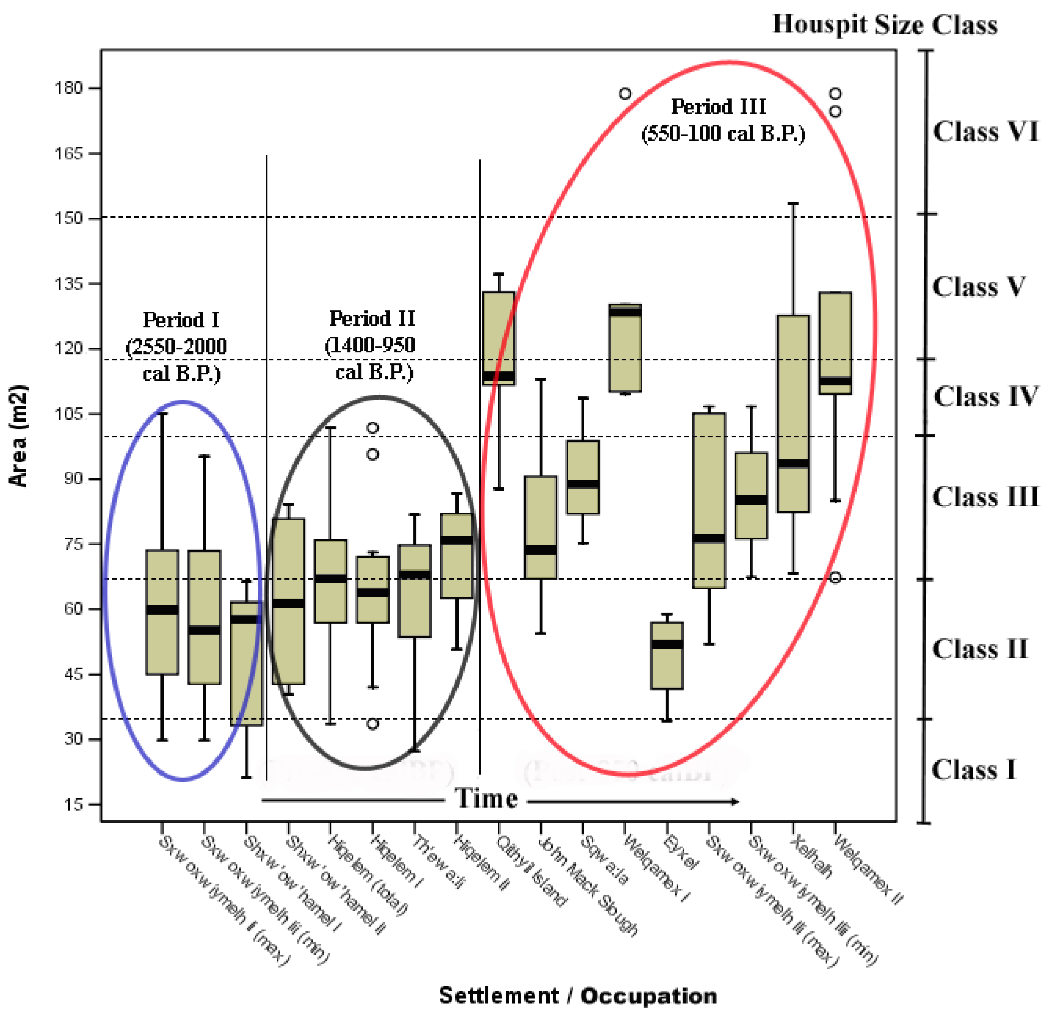

Figure 7.4. Comparison of variation in housepit areas with box-plots showing intra-settlement variation and relationships between settlements between Periods I, II and III settlements compared to the earlier periods -- Period III settlements having the widest range of intra-settlement variation in house sizes.

7.3 Exploring Settlement Layouts and Arrangements

The final objective of this chapter is to explore differences in the intra-settlement layout and arrangement of housepits in each settlement representing relations across a horizontal (i.e., social-spatial) axis. Schematic settlement plans were created using individual feature polygons, coded by size class, and shape (Figures 7.5 through 7.18). These figures, presented in chronological order, illustrate the relationships between housepit size, shape, and placement.[33] Intra-settlement relationships describing each settlement/occupation are summarized in Table 7.2.

This analysis involved two steps including both qualitative and quantitative methods. Settlement layouts were visually assessed using the schematic plan maps. I applied a form of quantitative spatial analysis involving the definition of central locations (i.e., 'centroid analysis;' SPSS statistics package) to four settlements: Th'ewá:lí, John Mack Slough, X̲elhálh, and Welqámex.[34] I applied this analysis to supplement the purely visual assessment of the settlement maps and to test for the presence of centrality, if any, in the relationships between housepits.

Centroid analysis, serving as a spatial averaging function in the definition of central places within each settlement where it was applied, proceeded as follows. Maps of each

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[33] These schematic settlement maps are representational and lack geo-morphological context. De-contextualizing these settlements from their surroundings, while perhaps counterintuitive, serves the basic purpose of simplifying these otherwise complex images and drawing attention to the spatial relationships between housepits as the focus of this analysis. Cross-referencing these schematics with the detailed surface and topographic maps presented earlier provides a means of re-contextualizing the layout and arrangements of these settlements within the surrounding landscape. Square and circular housepits are labeled; unlabelled features are rectangular/oblong, based on the results of the shape analysis presented in Figure 6.22.

[34] Welqámex was depicted in its totality including all the housepits at this settlement -- representing a maximum settlement plan combining Welqámex I and II. The linear arrangements of the other settlements limited the usefulness of this type of analysis, which works best in defining patterns of centrality and 'front-back' types of relationships among housepits within settlements with some depth (i.e., multiple-rows) to their layout. Small sample size, as with Shxw'ow'hamel II, Sx̲wóx̲wiymelh II, Eyxel and Sqwa:la (see Table 7.1), also limits the utility of this analysis which acts as an 'averaging' function.

settlement were created by plotting each housepit by its central UTM coordinates (i.e., mE and mN) and coded by size class. Individual points are defined as the central location between groups of housepits of the same size class within each settlement. These central points are calculated as an average set of UTM coordinates for each group of housepits so that individual points were established describing the point central to the three classes of housepits at Th'ewá:lí, for example. The central points of each size class are graphically depicted by the convergence of lines (spikes) connecting the central point to each housepit of a specific class (e.g., Size Class II). These central loci, and the graphic connections between housepits, allow us to characterizing each settlement's arrangement. Centroid analysis visually illustrates the composition of housepit settlements. This permits investigation of centrality in housepit arrangements manifest as front/back and center/side sets of spatial relations. 'Central arrangements' describe the location of housepits situated in center or front locations. 'Peripheral arrangements' describe the location of housepits situated in side or back locations.

The orientation of Stó:lō settlements is important in this analysis. Orientation is generally factored in relation to the primary point of access typically based on frontage to a waterway (Bierwert 1986; Lepofsky et al. *in press*). Settlement access is typically associated with an upriver-oriented approach, relative to an approaching party paddling upriver towards a settlement. The outlook from the settlement itself is directionally opposite to this primary approach, providing a generally downriver perspective. Descriptions of each settlement layout and arrangement are presented below within each schematic (Figures 7.5-7.18) and, including landform descriptions, summarized in Table 7.2.

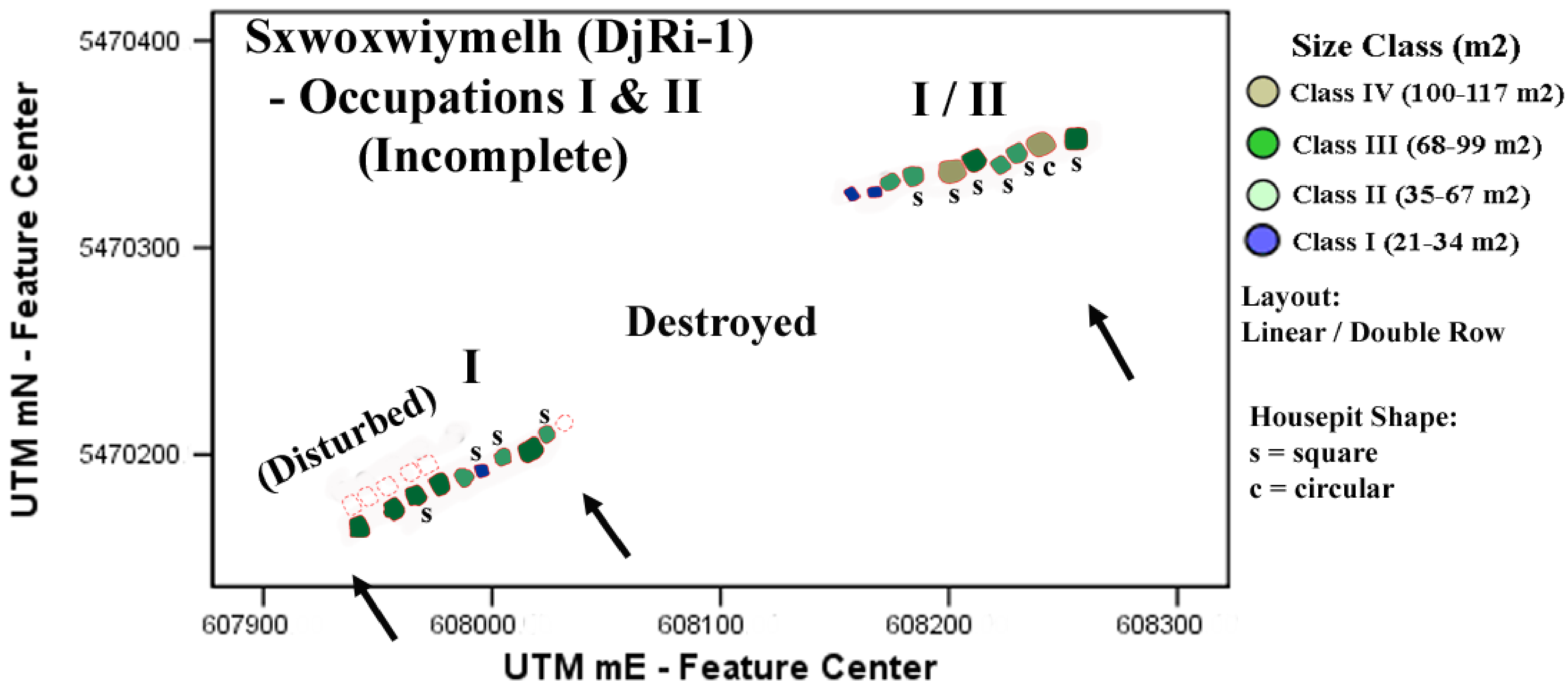

Figure 7.5. Schematic plan showing the linear, double-rowed layout of housepits at Sxwóxwiymelh I and II, noting the direction of access from the Fraser River (arrows). Dotted outlines indicate highly disturbed and incompletely mapped housepits.

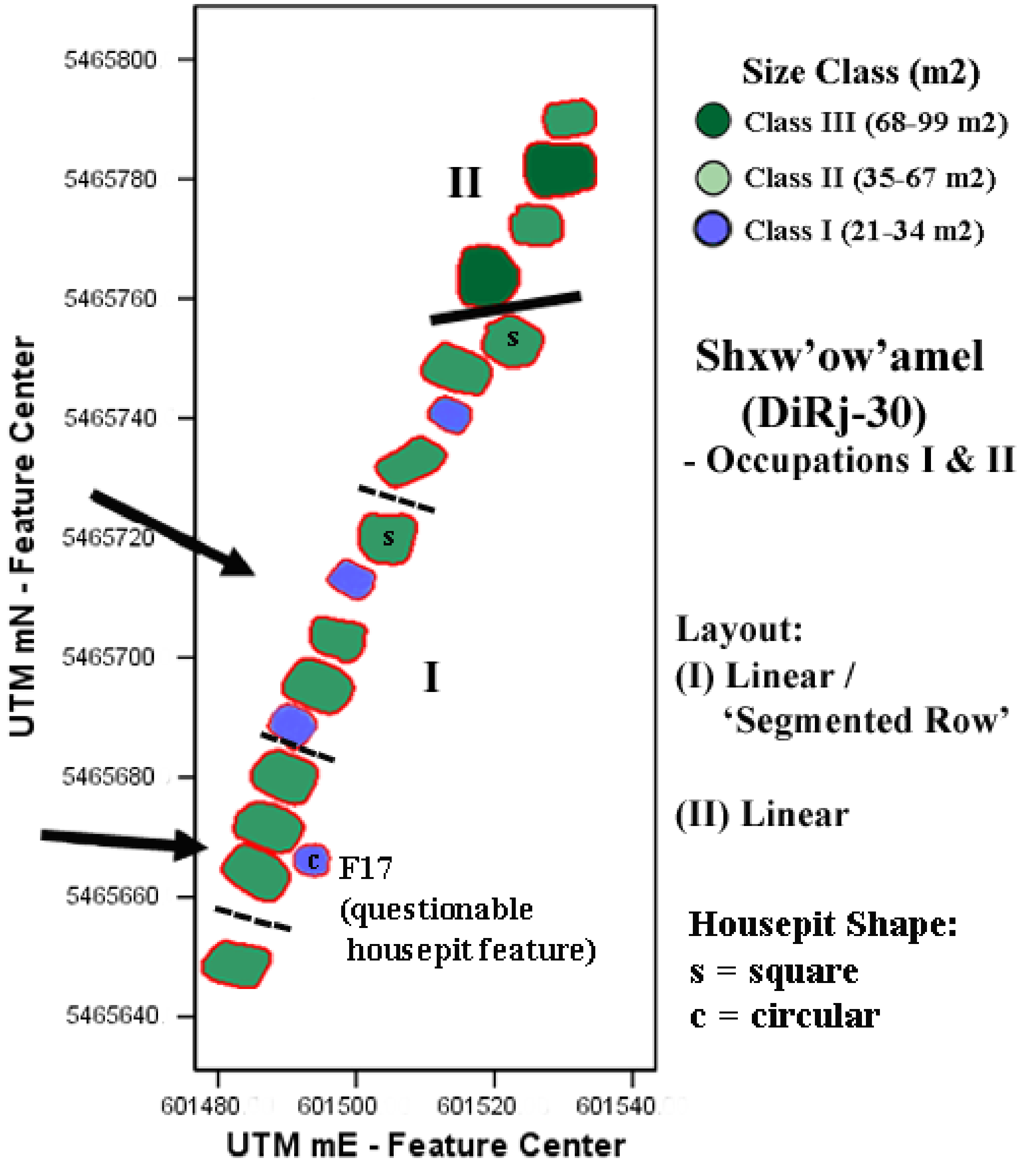

Figure 7.6. Schematic plan showing the linear, single-row layout of housepits at Shxw'ow'hamel I and II, noting the direction of access from an adjacent slough channel (arrows).

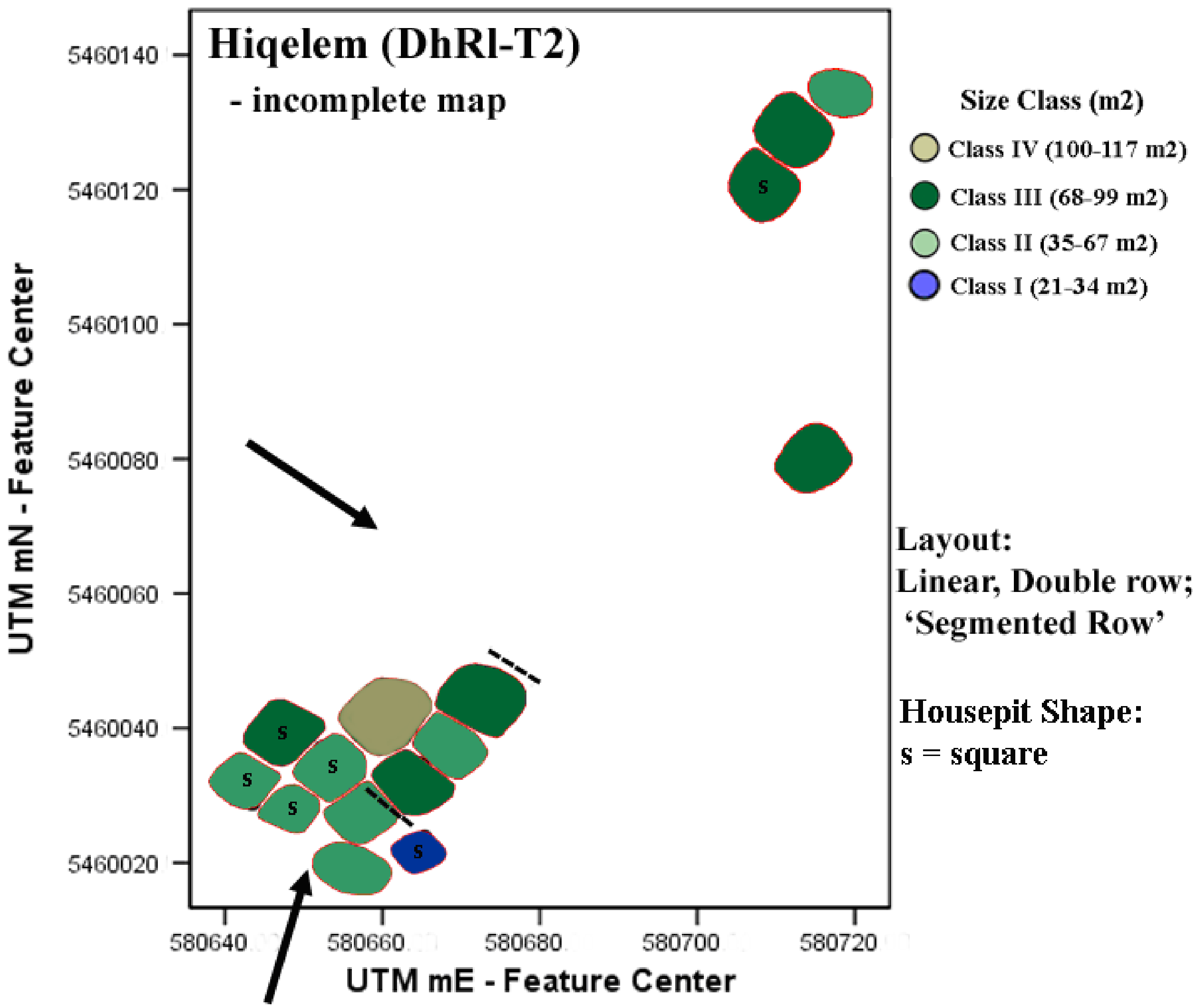

Figure 7.7. Schematic plan showing the segmented, double-rowed, linear layout of housepits at Hiqelem (total), noting primary routes of access from the Harrison River (arrows).

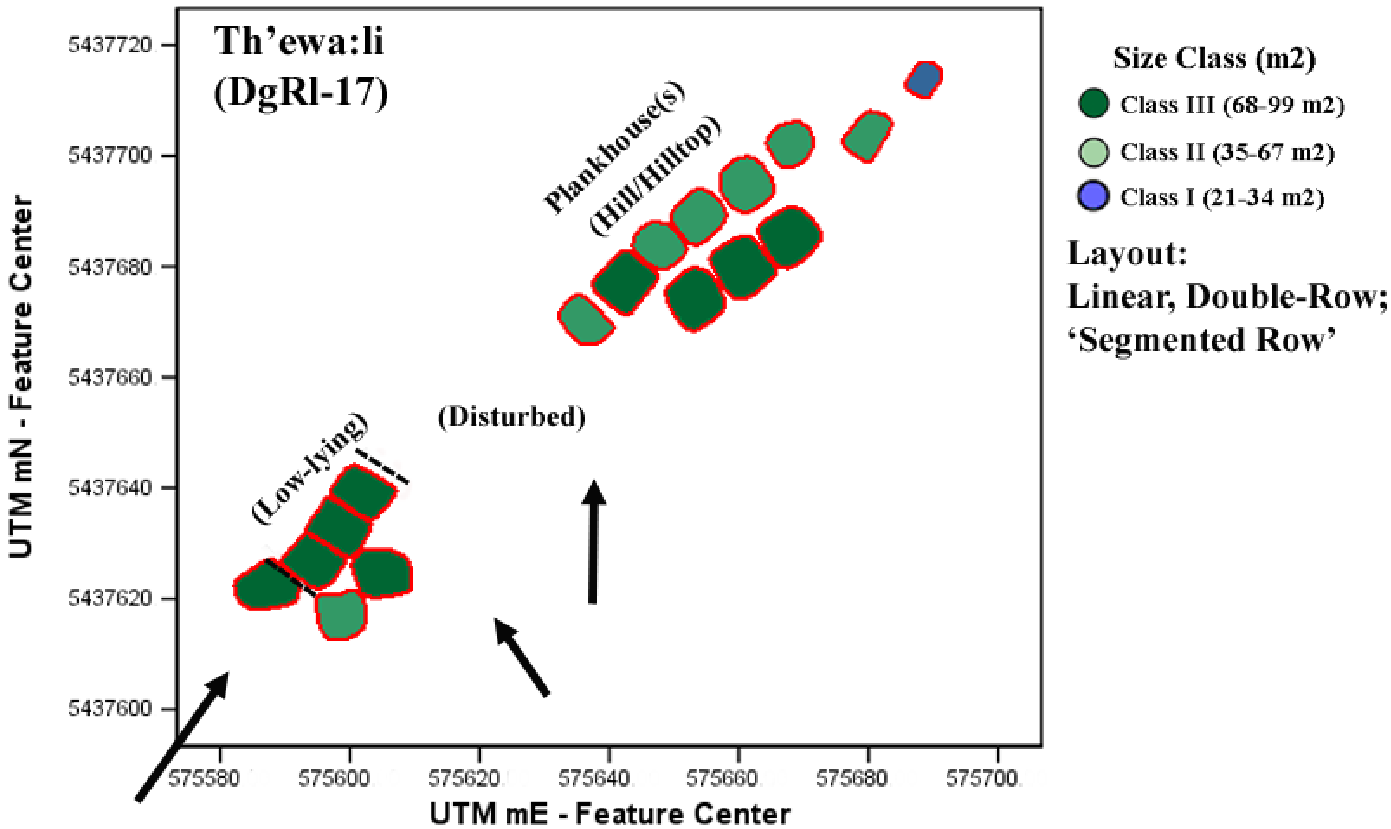

Figure 7.8. Schematic plan showing the segmented, double-rowed, and linear layout of housepits at Th’ewá:lí, noting probable plankhouse feature locations and primary routes of access from Sweltzer Creek (arrows).

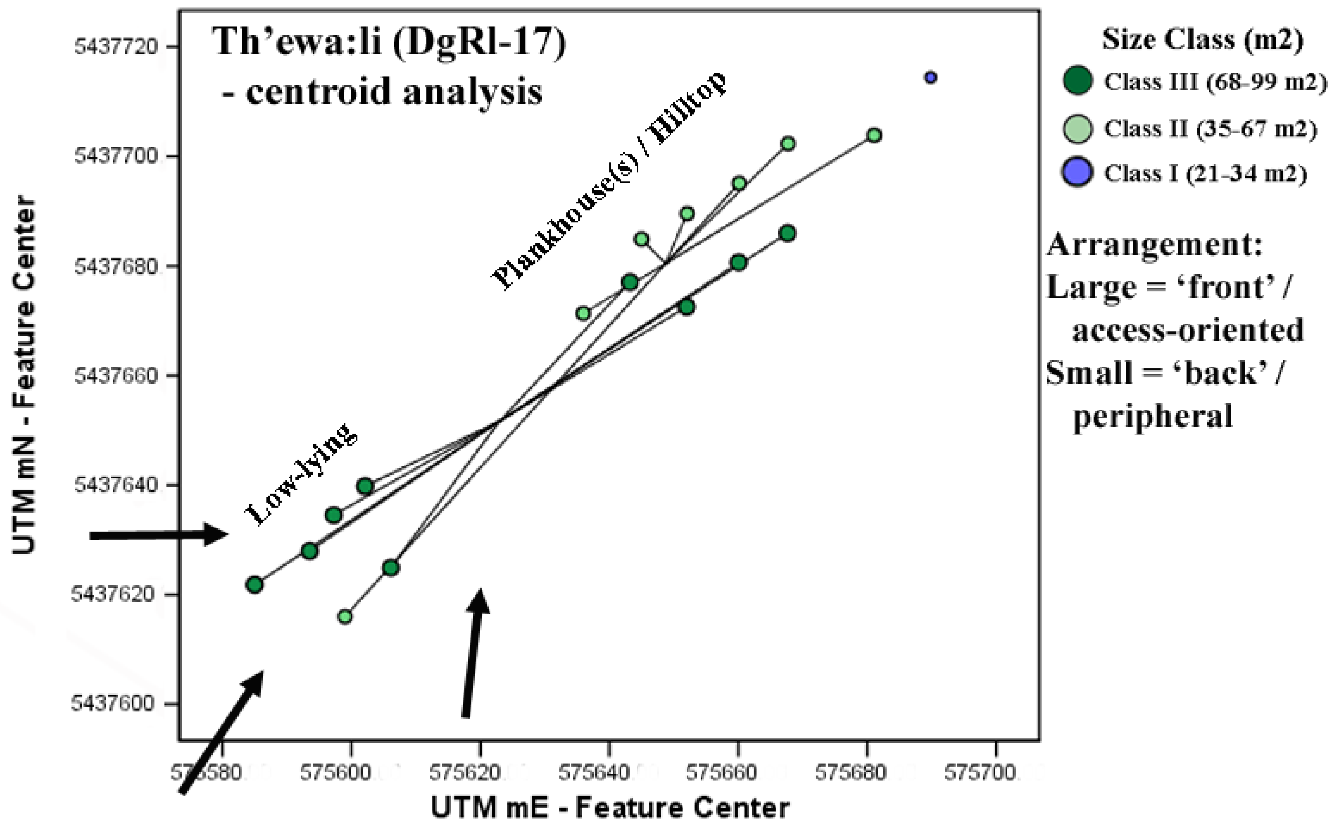

Figure 7.9. Centroid analysis showing a ‘front-back’ arrangement in the plan of housepits at Th’ewá:lí, based on size, noting primary routes of access (arrows).

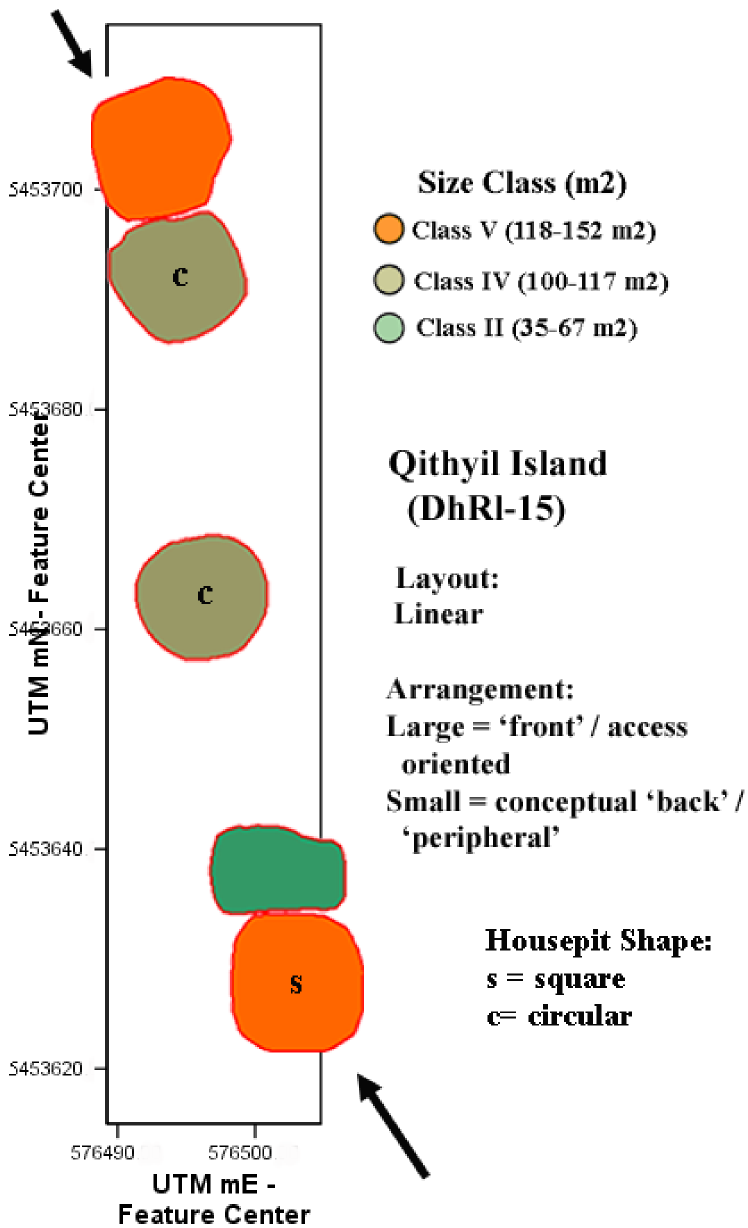

Figure 7.10. Schematic plan showing the single, row linear layout and conceptual 'front-back' arrangement of housepits at Qithyil Island, noting primary points of access from the Harrison River (arrows); also depicted are housepits with square, circular, and rectangular/oblong shapes (note: these features directly 'back' a probable plankhouse feature located directly to the south).

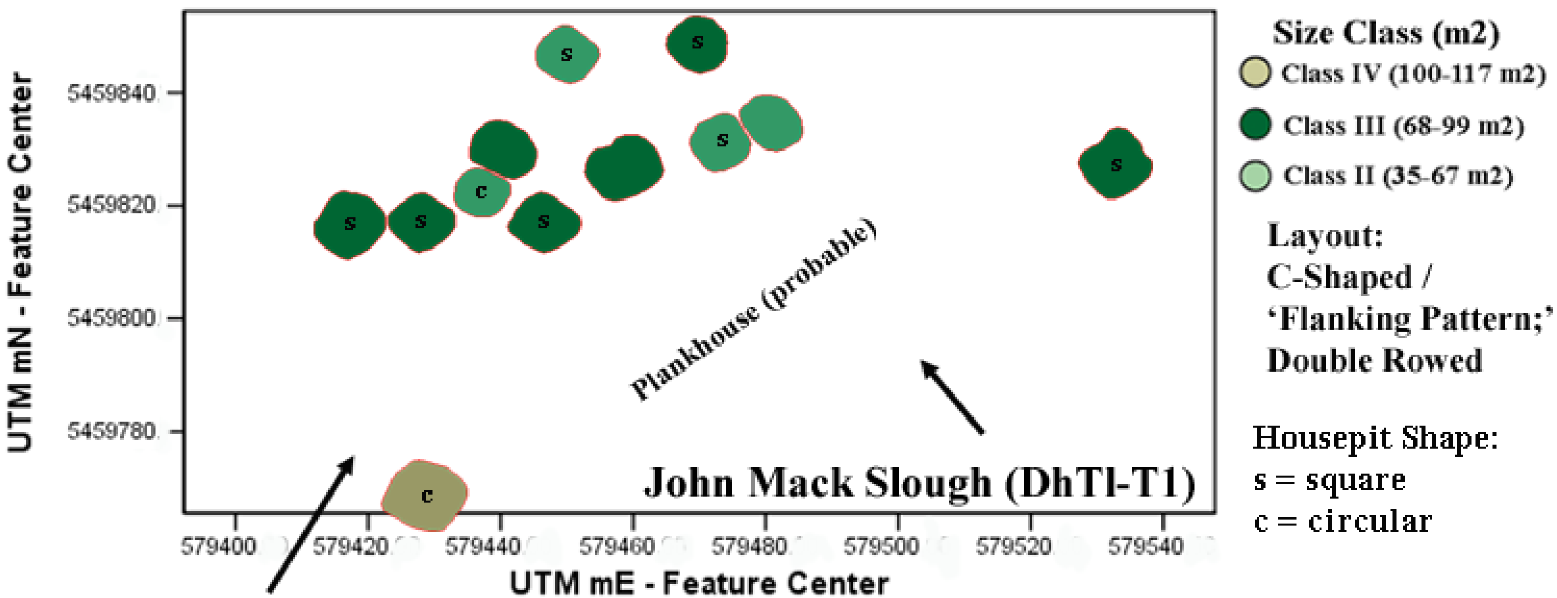

Figure 7.11. Schematic plan showing the double-row 'C-shaped' or 'flanking pattern' layout of housepits at John Mack Slough surrounding a probable plankhouse feature, noting primary routes of access from the Harrison River (arrows).

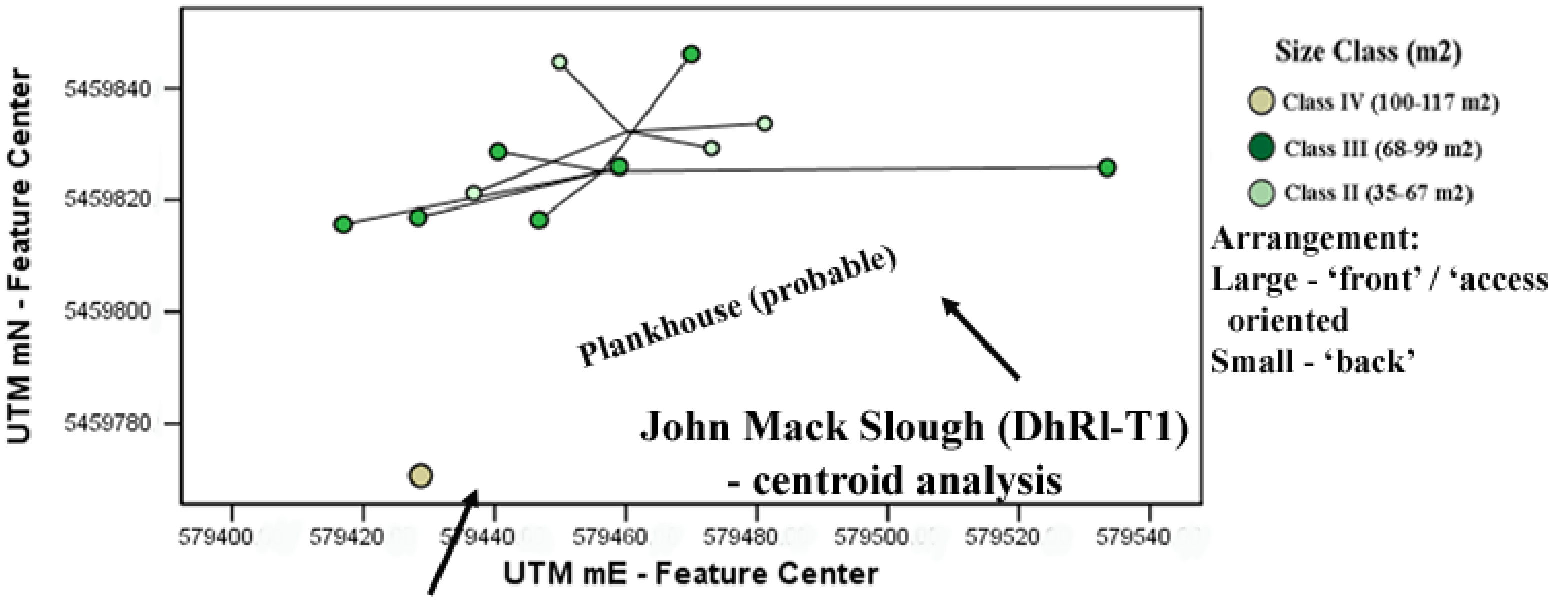

Figure 7.12. Centroid analysis showing the 'front-back relations' in the plan of housepits at John Mack Slough, based on size, showing access routes (arrows).

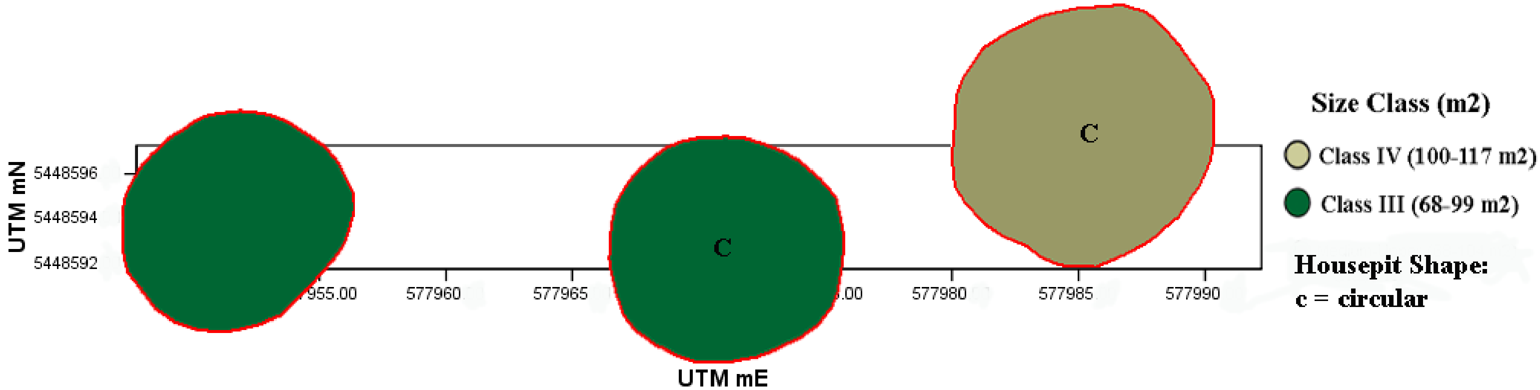

Figure 7.13. Schematic plan showing the (slightly curvi-) linear layout of housepits at Sqwa:la paralleling Hope Slough; also depicting the generally circular shapes of these features.

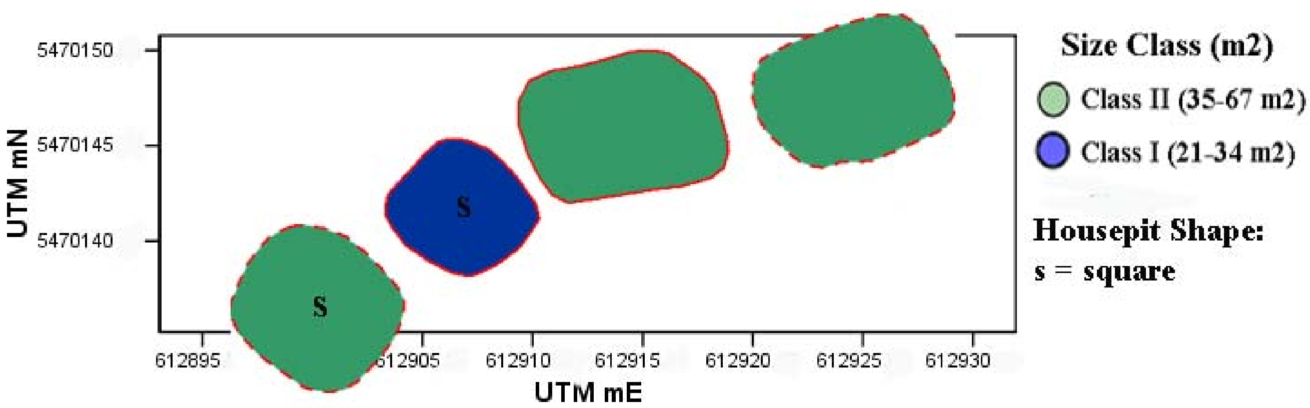

Figure 7.14. Schematic plan showing the (slightly curvi-) linear layout of housepits at Eyxel, overlooking the Fraser River, opposite Welqámex.

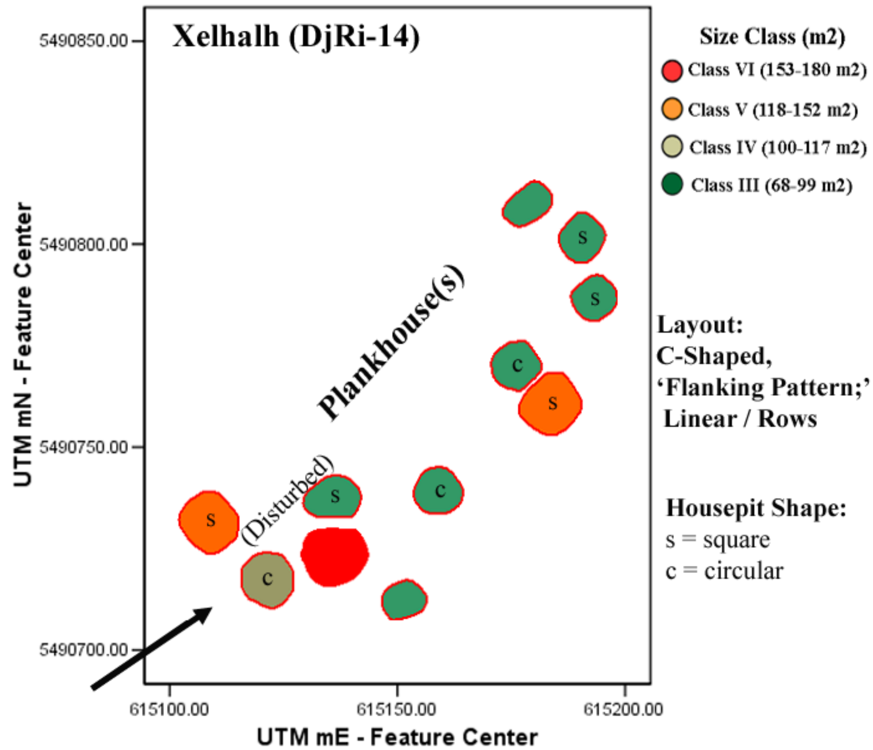

Figure 7.15. Schematic plan showing the linear-row 'C-shaped' or 'flanking pattern' layout of housepits at X̲elhálh surrounding a probable plankhouse feature(s), noting the primary route of access to this hill-top settlement from X̲elhálh Bay (arrow).

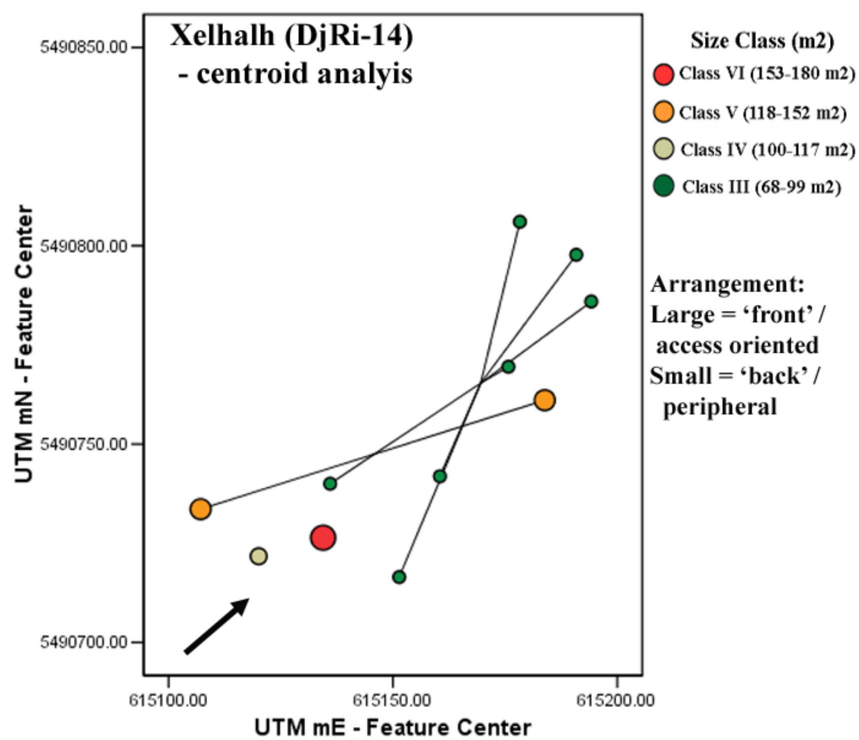

Figure 7.16. Centroid analysis showing 'front-back relations' in the plan of housepits at X̲elhálh, based on size, showing direction of access (arrow).

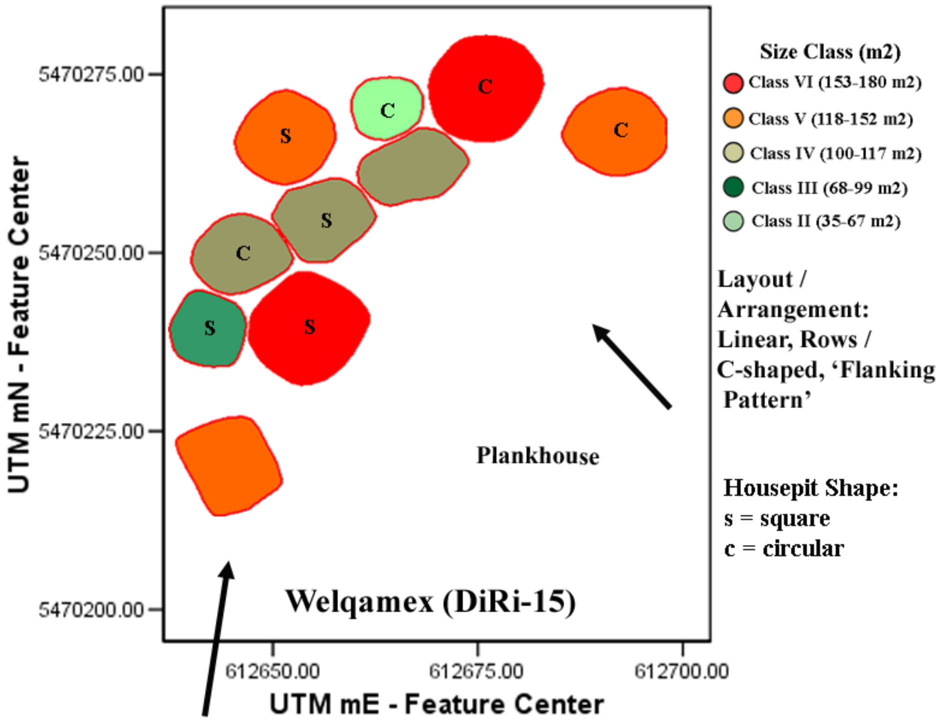

Figure 7.17. Schematic plan showing the linear-row 'C-shaped' or 'flanking pattern' layout of housepits at Welqámex I and II surrounding a probable plankhouse feature, noting the primary routes of access to this from the Fraser River (arrows); also noting square, circular, and rectangular/oblong-shaped features.

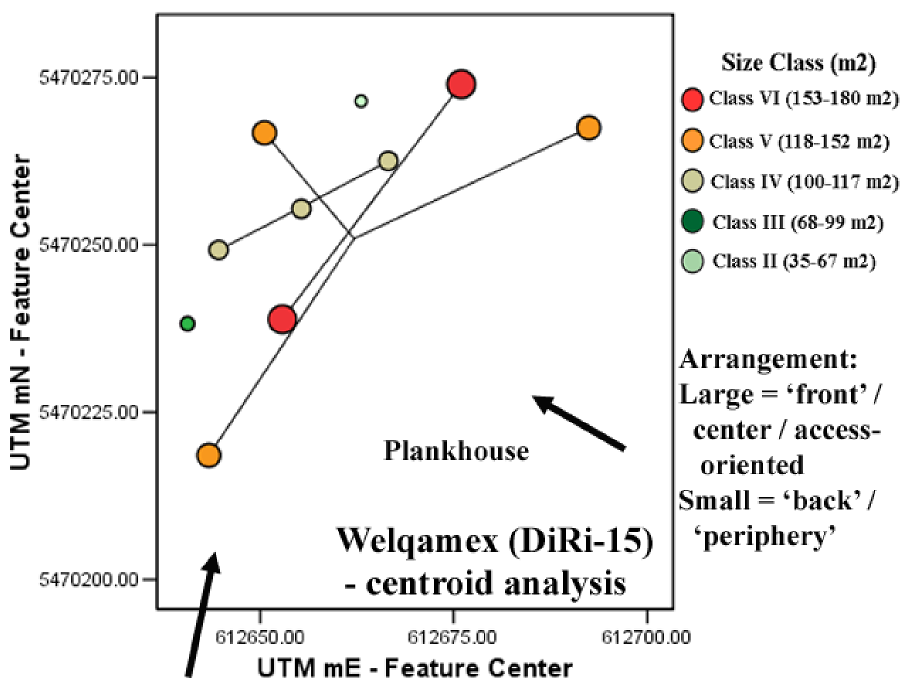

Figure 7.18. Centroid analysis showing 'front-back / center-side relations' in the plan of housepits at Welqámex I and II, based on size, showing primary directions of access (arrows).

Table 7.2. Summary descriptions of housepit settlement layouts and arrangements.

Age (cal B.P)	Sttlmnt. Name / Occupation	Site No. / Occupat.	No. of Hs Pits	Settlement Layout	Settlement Arrangement	Landform	Notes
Period I (2550-2000)	Sx̱wóx̱wiymelh I	DiRj-1Ai (max)*	16†	linear; double row	--	river-side terrace / valley bottom	disturbed
	Shxw'ow'hamel I	DiRj-30 I	14	linear; single, segmented row	--	slough-side terrace / valley bottom	
Period II (1400-950)	Shxw'ow'hamel II	DiRj-30 II	4	linear; single row	--	slough-side terrace / valley bottom	
	Hiqelem	DhRl-T2 (max)*	15†	linear; double, segmented row	--	large, river-side, outwash fan	in-complete mapping
	Th'ewá:lí	DgRl-17	17	linear; double, segmented row	centralized; larger houses in front, smaller houses in back and to the side (peripheral)	creek-side, hill-top terrace	
Period III (550-100)	Hiqelem II	DhRl-T2 II*	4†	arrears linear	--	large, river-side, outwash fan	
	Qithyil Island	DhRl-15	5	linear; single row	centralized; larger houses in 'front' (access-oriented; both ends of island), smaller houses in conceptual 'back' (center of island)	long-narrow, island	

Age (cal B.P)	Sttlmnt. Name / Occupation	Site No. / Occupat.	No. of Hs Pits	Settlement Layout	Settlement Arrangement	Landform	Notes
	John Mack Slough	DhRl-T1	12	C-shaped / flanking pattern; double row with outliers	centralized; larger houses in front (access-oriented), smaller houses in back	large, riverine outwash fan	
	Sqwa:la	DhRl-6	3	linear; single row	--	slough-side terrace, valley bottom	
	Eyxel	DiRi-48	4	linear; single row	--	small, riverside bluff-top terrace	
	Sx̲wóx̲wiymelh II	DiRj-1 II (max)*	6	linear; single row	--		in-complete mapping
	X̲elhálh	DjRi-14	11	C-shaped / flanking pattern; multiple rows (2-3)	centralized; larger houses in front (access-oriented), smaller houses in back and to the side (peripheral)	large, riverside, hill-top terrace	
	Welqámex (I & II)	DiRi-15	10	C-shaped / flanking pattern; double row	centralized; larger houses in front and center (access oriented), smaller houses in back and to the side (peripheral)	moderately-sized, island	includes houses from Periods IIIa & IIIb

* denotes settlement / occupation option.

† denotes incomplete count (i.e., minimum values).

7.3.1 Settlement Layout

Spatial relations in the layout of housepits, as settlements, take two basic forms -- linear rows (single and double) and linear C-shaped or ‘flanking’ patterns. Settlements with variations of linear row patterns of housepits include Sx̲wóx̲wiymelh I and II, Shxw’ow’hamel I and II, Th’ewá:lí, Hiqelem, Qithyil Island, and Eyxel. Single, double, and possibly triple row patterns are exemplified by these settlements. Where variation in landform (e.g., island; river- or slough-side terrace; hill-top bluff) is a factor limiting the possible size of some settlements (e.g., Qithyil Island, Eyxel), it is appears to be a factor in settlement layout only where space is limited (e.g., Qithyil Island, Eyxel). The narrow island landform on which the settlement of Qithyil Island is located, and the small, terrace bluff-top associated with Eyxel are the most spatially constraining landforms, detailed descriptions of which are presented in Schaepe, Blake, Formosa, and Lepofsky 2006.

Linear, two row villages, such as those described above, are recognized as a “distinctive Northwest Coast development which did not arise in the rest of Cascadia” (Ames and Maschner 1999:161; also Schaepe 2001). The linear row pattern originates in the Earlier Period, pre-1400 cal B.P., and continues into the Later Period along with additional and complex layouts and arrangements. All pre-550 cal B.P. settlements are linear, with either a single or double-row of housepits. ‘Segmented’ groups of housepits appear as clusters within the layout of at least three settlements including Shxw’ow’hamel I, Hiqelem, Th’ewá:lí, and possibly at Sx̲wóx̲wiymelh I.

The ‘segmented row’ pattern in the layout Shxw’ow’hamel I, Hiqelem, Th’ewá:lí, and possibly at Sx̲wóx̲wiymelh I require explanation. Descriptions of this pattern are extracted from Schaepe, Blake, Formosa, and Lepofsky (2006), as presented below:

> The clear impression gained from these structures [at Th’ewá:lí] -- as rows of largely conjoined features -- is that they are highly interconnected. The housepits here are interconnected to such an extent that they may represent segments of a larger, encompassing structure within which the depressions are differentiated as

> 'chambers' - as opposed to individual houses. The 'triad' formed by F12-F10-F8 demonstrates this pattern of interconnected construction most clearly forming, possibly, a single structure with three internal chambers (e.g., family or living quarters) set on the same axis and surrounded by a relatively flat bench… Indications of such structures can be found in the ethnographic literature and oral history of the Stó:lō (e.g., interviews with Bob Joe; Marian Smith fieldnotes)… (Schaepe, Blake, Formosa, and Lepofsky 2006: 32)
>
> …At Shxw'ow'hamel the features in these 'row house' arrangements are generally rectilinear in shape, set very close together, and separated often by only a low shared berm, many of which are saddle-shaped and semi-open to their adjoining house (i.e., immediately abutting one another). Like at Th'ewá:lí [and Hiqelem], these housepit features lack rims and instead are surrounded by relatively flat surfaces… Shxw'ow'hamel seems have row-groups or row-subsets of between three or more conjoined housepits (e.g., F3-F5 or F3-F6; F7-F9; F10-F11). These housepits are interconnected to such an extent that they may represent segments of a larger, encompassing structure within which the depressions are differentiated as 'chambers' - as opposed to individual houses. These row-groupings, like the 'triad' formed by F12-F10-F8 at Th'ewá:lí, demonstrate a possible pattern of interconnected construction forming a possible single structure with internal chambers (e.g., family or living quarters), set on the same axis, surrounded by a relatively flat bench, and potentially covered by a single superstructure… this 'conjoined row-house' or 'triad' arrangement may represent a pattern not previously recognized in the archaeological investigation of houses in the region -- i.e., plankhouse-like structures with recessed floors and segmented living quarters.
> (Schaepe, Blake, Formosa, and Lepofsky 2006: 55-56)

A 'C-shaped' or flanking pattern emerged in the Late Period as an innovation in settlement layout. This pattern is illustrated by the relationship of housepits at John Mack Slough, X̲elhálh, and Welqámex I and II.[35] In these settlements, apparent plankhouses are represented by an unnaturally flat area or platform feature, sometimes bounded by linear berms, occupying the front and central portion of each settlement. Housepits are arrayed around these features. Housepits in these settlements are aligned, for the most part, in a linear arrangement as a row backing areas thought to be the remains of plankhouses. Housepits set forward and laterally to each side or flank of the plankhouse area extend off the back row, thus constituting a C-shape. This C-shape settlement layout pattern originated in the Late Period around 550 cal

[35] A C-shape, flanking pattern of housepits is hinted at in the arrangement of housepits at Hiqelem although such patterning remains unclear given the incomplete mapping at the time of this analysis.

B.P. Feature 6 at Qithyil Island appears to be another plankhouse feature within a Late Period settlement. An additional, well-defined plankhouse feature with a recessed foundation and an apparent suspended wooden floor was also noted, though not pictured here, at X̲elhálh (F32; Figure 3.10).[36]

7.3.2 Settlement Arrangement

Investigation of settlement arrangement by both visual means and centroid analysis identified a level of centrality in the patterning of housepits at five settlements -- Th'ewá:lí, Qithyil Island, John Mack Slough, X̲elhálh, and Welqámex. Within each settlement, the spatial relationship between large and small housepit features is expressed as two sets of oppositional relations including front/back and center/side positioning. I found that large housepits tend to occupy central locations at the front and center of each settlement, while smaller housepits tend to occupy peripheral locations at the back and/or sides of settlements. This is pattern of large houses is also found in Nuu-chah-nulth and Haida settlements and other regions of the Coast (Mackie and Williamson 2003; MacDonald 1983), whereas this pattern is not characteristic of Interior settlements (Wilson and Carlson 1980; Hayden 1997; Prentiss et al. 2008). Expressions of centrality are most literally represented in the spatial arrangement of housepits at Welqámex (see Figures 7.17 and 7.18). Plankhouses, inferred from the field investigations, occupy what are arguably the most central places at Welqámex, John Mack Slough, and X̲elhálh depending

[36] Feature 32 at X̲elhálh, evident in the surface map of this settlement, is a nearly square-shape depression with a flat internal surface. Large fieldstones remains situated in three of the depression's corners representing foundation supports for what was likely a suspended wooden floor. This feature is remarkably similar to those associated with suspended-floored plankhouses that I observed in the contact period Haida settlement of Kiusta. Testing within F32 found no evidence of an earthen floor stratum, supporting the inference of a suspended floor. The peripheral location and distinct architecture of this feature indicates that it may have served a particular function distinct from the ground-level plankhouse that is suspected to have occupied the central space in the 'C-shaped' settlement layout.

upon points of access and the visual landscape of approach. Points of access appear to affect settlement arrangements.

Definitions of centrality in housepit arrangements require locating the ‘front’ of each settlement as a primary point of reference. I associate ‘front’ as the primary point of water-based approach and access by canoe. This way of orienting settlements is consistent with Stó:lō perspectives embedded in the *halq’eméylem* language (Lepofsky et al. *in press*).

Considering access as a social-spatial factor it became clear in these analyses that spatial perspectives and relations may not always be based on a literal topographic view of the landscape. For example, the settlement on Qithyil Island has two fronts, associated with both upriver and downriver points of access. The middle of the island was probably the conceptual back of the settlement -- backing the housepits at each end of the island while literally centrally located. Steep bluffs determined points of access to both hill-top settlements, X̲elhálh and Th’ewá:lí. In Figures 7.5-7.18 I have included directional arrows indicating what I consider to be the most likely approach(es) to each settlement.

At Qithyil Island, Th’ewá:lí and X̲elhálh, centrality in housepit arrangements is strongly expressed but more reliant on interpreting access and settlement frontage. While the plankhouses at Th’ewá:lí and X̲elhálh occupy the most prominent locations overlooking the most likely points of water access, they are not centrally located in relation to the most direct points of access. At X̲elhálh, the largest housepits occupy the primary pathway of access to the settlement. These houses, however, would likely not even be visible compared to a large ‘fronting’ plankhouse viewed from a river approach. Th’ewá:lí is similar in that the ‘high rise’ plankhouses perched on this hilltop would be most visually prominent, yet spatially set back from the two front rows of housepits. Direct access again brings first contact with what are generally the largest houses in the settlement, prior to reaching the plankhouse.

In relation to the two-ended layout of Qithyil Island, as noted above, the patterns of centrality identified here are consistent but somewhat skewed by topographic factors. The middle of the island appears to occupy the conceptual back or periphery of the settlement as the location of the smaller, less accessible housepit features in the settlement. All five housepits there are situated behind the plankhouse feature occupying the most literal front of the settlement from an upriver approach.

The most centrally-oriented arrangements of housepits are associated with Late Period settlements. Centrally arranged housepits appear in Period II (1400-900 cal B.P.) and becomes more common in Period III (550-100 cal B.P). This arrangement correlates most strongly with the C-Shaped linear pattern evident at Welqámex, X̲elhálh, and John Mack Slough.

7.4 Summary of the Findings in the Analysis of Intra-Settlement Relationships

I find that intra-settlement spatial relationships are complex because space is both literal and conceptual and requires accepting a multiplicity of perspectives in defining measures of centrality. Centrality can be measured differently (and reckoned simultaneously) depending upon the definition of the social-spatial relationships linking space, access, and orientation. Centroid analysis proved very helpful in quantitatively identifying relationships of spatial centrality. These relations, while in some cases identified quantitatively, are flexible and negotiable as elements of social order. The negotiation of space as part of a figurative landscape speaks to a larger issue of reckoning 'landscape' as an expression of social spatial relations. Housepits and settlements must be viewed as arrangements within both literal and conceptual space.

It would be only partially true to say that the negotiation of intra-settlement social-spatial relations becomes more complex through time. In fact, the complexity of intra-settlement relations at S<u>x</u>wó<u>x</u>wiymelh I (Period I) and at Shxw'ow'hamel II (Period II), S<u>x</u>wó<u>x</u>wiymelh II, Sqwa:la, and Eyxel (Period III) decreases. This finding parallels the variation in CV values and size class for each settlement. Variability increases through time, though representing a wider range of expressions. The Late Period settlements of S<u>x</u>wó<u>x</u>wiymelh II, Sqwa:la, and Eyxel appear to retain some of Early Period settlement attributes while co-existing with settlements like Welqámex and <u>X</u>elhálh.

A continuity of basic elements of Stó:lō settlement layout and arrangement persist throughout all three periods. Core elements of linear layout characterize all the settlements in this study including Sxwóxwiymelh I and II, Shxw'ow'hamel I and II, Sqwa:la, and Eyxel -- settlements of mixed ages representing all three periods.[37] Differences in the layout and arrangement of housepit at Welqámex, <u>X</u>elhálh, John Mack Slough, Qithyil Island, and Th'ewá:lí are therefore not chronological.

Increasingly complexity of social-spatial relations of housepits in Period II and III settlements shows a shift towards increasing social stratification, played out across an increasingly wide-ranging plane of horizontal relations. The relationship between large houses -- including both pithouses and plankhouses -- and central location becomes more evident. Increasing contrasts in settlement organization are expressed in the frequency and location of large housepits (fewer in number and occupying central places) and smaller features (greater in number and occupying more peripheral locations).

Intra-settlement composition described by housepit layout and arrangement becomes more diversified in the Late Period (post-550 cal B.P.). Increasingly complex expressions of intra-settlement social-spatial relations result in the Late Period from increasingly complex inter-household negotiations dealing with a widening, vertical plane of relations. The Late

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[37] Hiqelem remains too incomplete at this point in time to substantively add to these results.

Period witnessed a diversification in the architectural style of in-ground housing indicated by the definition of circular, square, and rectangular/oblong housepit shapes. All three types of housepits are found coincidentally at Qithyil Island, John Mack Slough, X̲elhálh, and Welqámex. Alternately, the three housepits at Sqwa:la are similarly all circular in shape. The introduction of circular house shapes during the Late Period adds another dimension to the set of intra-settlement relations beyond those of the Early Period.

The spatial and temporal co-existence of pithouses (*sqémél*) and plankhouses (*s'iltexwáwtxw*) is unquestionably demonstrated as a pattern of Stó:lō settlement composition from at least the Period II onward. Previous investigations at the Scowlitz site (DhRl-16) suggest the emergence of this relationship in the third millennium B.P. (Lepofsky et al. 2000). Plankhouse platforms are evident at the Period II settlements of Th'ewá:lí (F17, F20) and possibly Hiqelem. While Th'ewá:lí most certainly demonstrates the co-existence of pit- and plankhouses in the 1400-950 cal B.P. period, their position appears to change as part of the reformation of social-spatial arrangements expressed in some Late Period settlements. By 550 cal B.P., plankhouses come to occupy -- either literally or conceptually -- the most prominent front and central places at a number of Stó:lō settlements, as exemplified at X̲elhálh, Welqámex, and Qithyil Island. I discuss the relationship between co-existent pit- and plankhouses in Chapter IX.

CHAPTER VIII - INTER-SETTLEMENT RELATIONS

This final set of analyses (Level III) provides the broadest level of investigation in this study, addressing inter-settlement relations encompassing inter-household and intra-settlement dynamics. The core questions I try to answer are: How do the physical characteristics of housepit settlements relate through time and space, as regional groupings? What types of differences mark relations between settlements on a vertical scale of relations describing stratification? Where are different sized settlements situated throughout the landscape, on a horizontal plane of relations? How do these set of relations fit together to form the societal shapes defined in Chapter VI?

I shift the scale and focus of this analysis from the housepit to the settlement as a basic unit of study. As groups of housepits form individual settlements, groups of settlements form a 'regional group' -- including, in this case, the Upriver Group of housepits. Intra-regional relations between settlements, as a regional group, form a specific level of political-economic dynamics. I investigate the dynamics of the Upriver Group of housepit settlements as a broad, collective set of community relations. The objectives of this chapter, paralleling Chapter VI, are to define and examine relations between housepit settlement size classes through time and space. Units of time are defined by the three-period chronology developed in Chapter V. Space is defined by the landscape of the upriver portion of the Gulf of Georgia Region. These findings lead us back to a more detailed view of the broad patterns arising from analyzing settlements within a landscape of intra-regional transportation and communication routes (Chapter IV).

Stó:lō-Coast Salish expressions of community organization are not limited to a bounded set of intra-settlement household relations, within a local or even regional level (Miller 1989a, 1989b; Elmendorf 1971). It is not a requirement that households act harmoniously as a collective constituting a village or settlement. Inter-settlement relations, rather, constitute an avenue by which individual households can potentially expand their networks beyond the settlement of which they are a part. Inter-settlement relations thus constitute potentially critical points of connection in an expanding framework of community organization. The political dynamics of this framework can be described, somewhat simplistically, as either more corporate (more closed) or more network (more open) in nature (Feinman et al. 2000).

Community, as I define it, allows for multiple sets of relations at household and settlement levels to exist simultaneously within a broader regional framework extending beyond the village group. Differences between households and settlements can be measured through degrees of stratification and social-spatial relations. Such differences allow us to examine corporate- or network-type relations supporting political economic units; thus defining the relationships between individual households and broader collective groups within the regional set of relations. The housepit settlements examined here provide a proxy for exploring relations at the inter-settlement and intra-regional level. These analyses provide a basis for exploring and understanding systems of region-scale relations between Stó:lō people as they developed and changed over nearly 3,000 years preceding colonization.

8.1 Housepit Settlement Sizes and Size Classes

Data supporting these investigations represent a culmination and synthesis of findings from Chapters V-VII dealing with housepits (Level I analysis) and settlements (Level II analysis). I examine three basic variables in this investigation -- settlement age, size, and location -- as indicators of social-spatial relations. I examine inter-settlement relations first on a vertical plane exploring stratification between settlements, and then on a horizontal plane of spatial relations. Age and location classifications are based on my analyses in earlier chapters.

Table 8.1. Housepit frequencies, roofed area values, and settlement size classes -- for all 17 Upriver Group housepit settlement / occupation options, arranged chronologically.

Age Range (cal B.P)	Settlement Name / Occupation	Site # / Occupation	No. of Hs Pits	Roofed Area (m^2)	Settlement Size Class
Period I (2550-2000 cal B.P.)	Sxwóxwiymelh Ii	DiRj-1Ai (max)*	16†	987	III
	Sxwóxwiymelh Iii	DiRj-1Aii (min)*	13†	765	III
	Shxw'ow'hamel I	DiRj-30 I	14	696	II
Period II (1400-950 cal B.P.)	Shxw'ow'hamel II	DiRj-30 II	4	247	I
	Hiqelem (total)	DhRl-T2 (max)**	15†	1,014	IV
	Hiqelem I	DhRl-T2 I**	11†	725	III
	Th'ewá:lí	DgRl-17	17	1,083	IV
Period IIIa (550-150 cal B.P.)	Hiqelem II	DhRl-T2 II**	4†	289	I
	Qithyil Island	DhRl-15	5	584	II
	John Mack Slough	DhRl-T1	12	939	III
	Sqwa:la	DhRl-6	3	273	I
	Welqámex I	DiRi-15 I	5	657	II
	Eyxel	DiRi-48	4	197	I
	Sxwóxwiymelh IIi	DiRj-1 IIi (max)***	6	481	II
	Sxwóxwiymelh IIii	DiRj-1 IIii (min)***	3	259	I
	Xelhálh	DjRi-14	11	1,141	IV
Period IIIb (150-100 cal B.P.)	Welqámex II	DiRi-15 II	9	1,100	IV

* / ** / *** denotes settlement-occupation option.
† denotes incomplete count (i.e., minimum values).

I assess settlement sizes based on roofed area measurements for each settlement, the number of housepits per settlement, and settlement size classes, using EDA to categorize settlements based on their roofed areas. Roofed area is calculated as the sum of contemporaneous housepit areas for each settlement/occupation, using the same framework established in Chapter VII. Given only 17 settlements (five of which are optional occupations), the size classifications defined below serve a more heuristic than analytic purpose in illustrating the relative sizes of settlements. This approach helps to show patterns of inter-settlement relationships through time and across space.

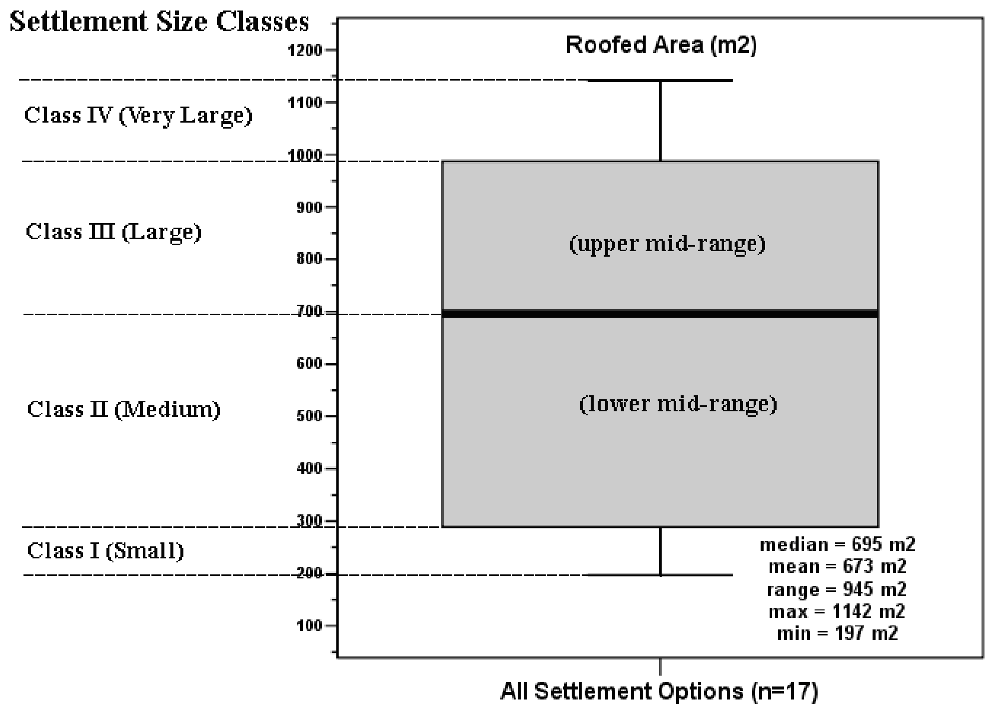


Figure 8.1. Box-plot of the distribution of roofed area measurements for all 17 Upriver Group settlements/occupations -- defining a normal shape and showing the breakdown of settlement size classifications coinciding with each quartile.

Four settlement size classes were defined based on roofed area values of all 17 settlement options (Table 8.1; Appendix VII). The population of roofed area values forms a normal shape, though slightly upwardly skewed as indicated by the relationship between median (695 m^2) and mean (673 m^2) values, with a slightly higher median (Figure 8.1). Roofed area values are widely spread between 1142 m^2 and 197 m^2 (r=945 m^2). The small sample size (n=17) limits the range of methods applicable in classifying settlement sizes. Quartiles shown in the box-plot in Figure 8.1 provide logical break-points defining four settlement size classes, each representing 25 % of the total population: Class I (n=5) the smallest settlements associated with the lowest quartile ('Small'); Class II (n=4) the lower mid-range ('Medium'); Class III (n=4) the upper mid-range (‘Large’); and Class IV (n=4) the largest category associated with the upper-most quartile (‘Very Large’)(Table 8.2).

Table 8.2. Settlement Size Class descriptive statistics.

Settlement Size Class	Statistic	Roofed Area (m2)
Class I (<300 m^2) / basal quartile (n=5) ‘Small’	Median	259
	Mean	253
	Std. Deviation	35
	Minimum	197
	Maximum	289
	Range	92
Class II (300-695.9 m^2) / lower mid-range (n=4) ‘Medium’	Median	620
	Mean	604
	Std. Deviation	94
	Minimum	481
	Maximum	695
	Range	214
Class III (696-999.9 m^2) / upper mid-range (n=4) ‘Large’	Median	852
	Mean	854
	Std. Deviation	128
	Minimum	725
	Maximum	987
	Range	262
Class IV (>=1000 m^2) / upper quartile (n=4) ‘Very Large’	Median	1091
	Mean	1085
	Std. Deviation	53
	Minimum	1014
	Maximum	1142
	Range	59

Intra-settlement diversity in roofed area increases through time (Figure 8.2). Large settlements (Class III) are present throughout the complete 2550 to 100 cal B.P time span. The later periods, post-1400 cal B.P., have both the smallest (Class I) and largest (Class IV) settlements. The range of housepits sizes diversifies through time, simultaneously increasing and decreasing in area, beginning in Period II (1400-950 cal B.P.) and continuing to increase in the scale of differentiation in the Late Period (i.e., Periods IIIa/b, post-550 cal B.P.) (Figure 8.3; Table 8.3). The occupations at Th’ewá:lí (Very Large) and Hiqelem (Large-Very Large)

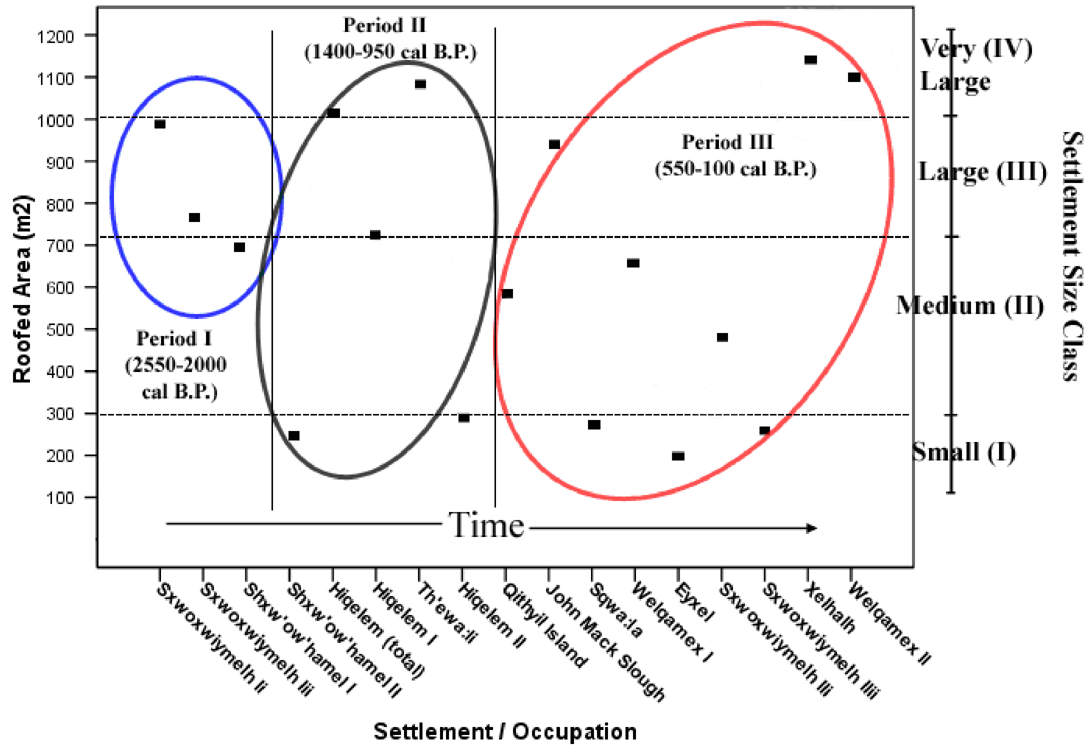


Figure 8.2. Comparison of roofed area values by settlement indicating the trajectories of change and increasing diversification of settlement sizes through time, over Periods I, II, III.

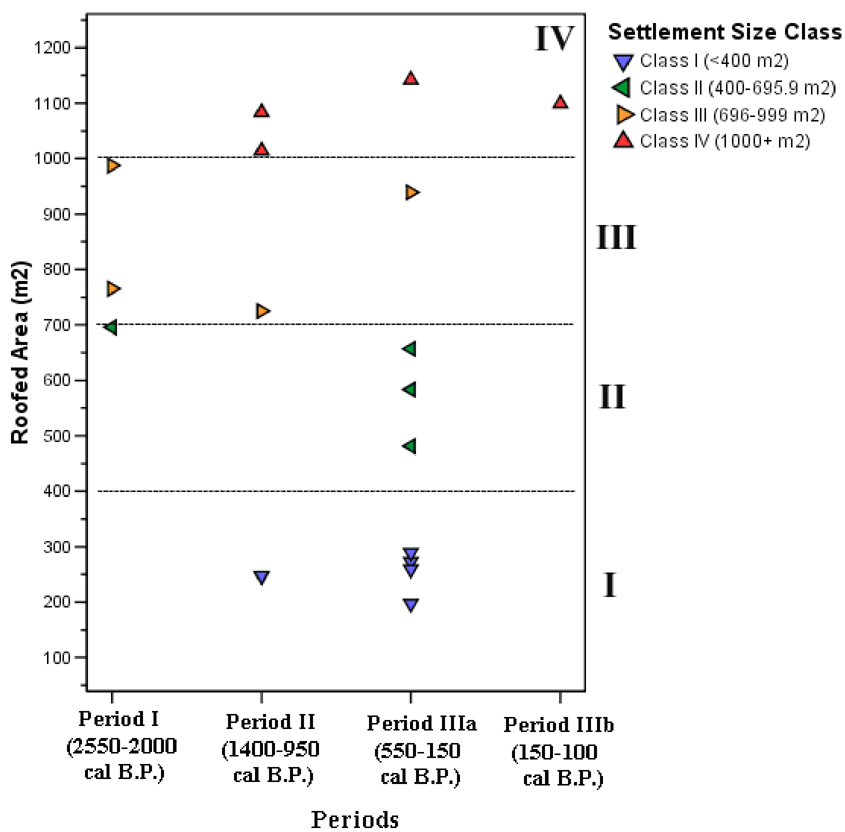


Figure 8.3. The distribution of roofed areas by settlement size class sorted by Periods I, II, IIIa, and IIIb, showing increasing variation through time.

Table 8.3. Cross-tabulation of settlement sizes and ages (Periods I-IIIb).

Settlement Size Class	Period I (2550-2000 cal B.P.)	Period II (1400-950 cal B.P.)	Period IIIa (550-150 cal B.P.)	Period IIIb (150-100 cal B.P.)	Total
Class I (<400 m2)	0	1	4	0	**5**
Class II (400-695.9 m2)	1	0	3	0	**4**
Class III (696-999.9 m2)	2	1	1	0	**4**
Class IV (1000+ m2)	0	2	1	1	**4**
Total	**3**	**4**	**9**	**1**	**17**

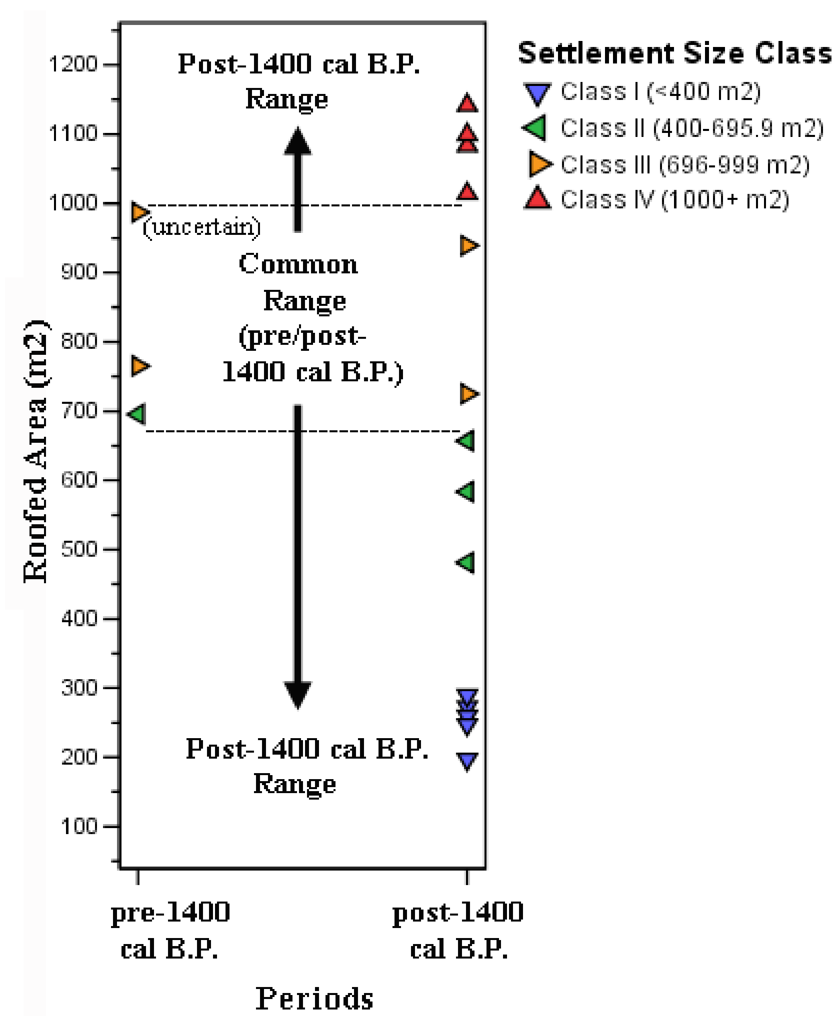


Figure 8.4. The distribution of roofed areas by settlement size class showing increasing variation between pre- and post-1400 cal B.P. periods, from a commonly large group of early and late period Class II and III settlements (noting DiRj-1i [max. option] as uncertain).

both span Periods II and III (Figure 8.3)[38]. When settlements are grouped into two periods (pre- and post-1400 cal B.P.), these trends are even clearer (Figure 8.4).[39] Settlement sizes are most diversified in Period III (a and b).

The relationship between housepit frequency and roofed area shows additional patterning revealing how settlement composition changed through time (Figure 8.5). A moderate positive correlation (r=0.691) describes the relationship between settlement size and housepit frequency.[40] However, there are major differences in this relationship when we

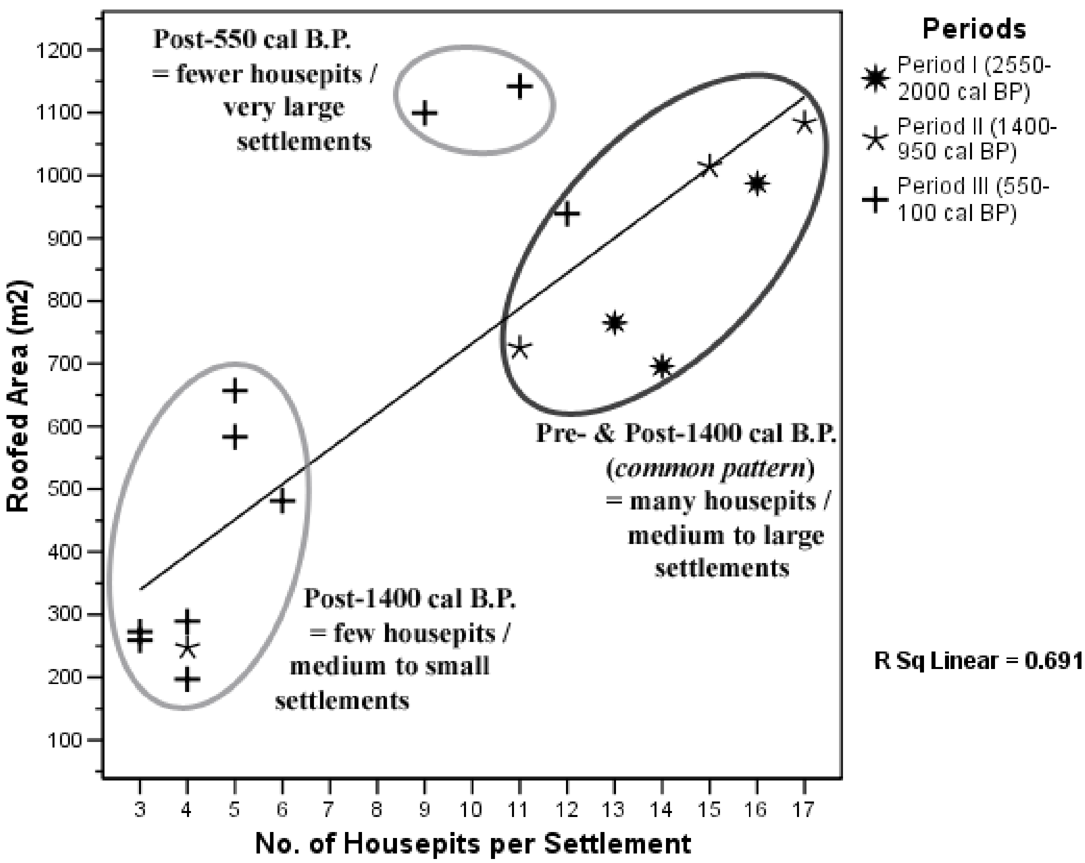


Figure 8.5. Comparison of roofed area values and housepit frequencies per settlement/occupation with a regression line showing a positive relationship between settlement size and housepit frequency and defining both common and divergent (pre- and post-1400 cal B.P.) forms of housepit settlement composition.

[38] The comparative utility of Period IIIb (the contact period), associated with only Welqámex II, suffers from a very small sample size.
[39] Small sample size precludes statistically testing the association between settlement size class and age.
[40] The strength of the linear correlation between roofed area and number of housepits increases (r=0.844) after excluding the effects of the two post-550 cal B.P. Class IV settlements (Xelhálh and Welqámex II).

compare pre- and post-1400 cal B.P. settlements. Medium- to Large-sized settlements have between 11 and 17 housepits. While such settlements occur in all three time periods, Period I settlements fall entirely within this size range and are composed of at least 13-16 medium- to small-sized housepits. This pattern is illustrated by Shxw'ow'hamel I and Sxwóxwiymelh I(i/ii) each of which have at least 14 housepit small- to medium-size housepits forming a medium- to large- settlement.[41] This pattern persists in the composition of some post-1400 B.P. settlements including Th'ewá:lí, Hiqelem, and John Mack Slough, each of which have at least 12 housepits.

Two additional groups associated with both Small and Very Large size classes appear in the post-1400 cal B.P. period (Figure 8.5). Small settlements, including Eyxel, Shxw'ow'hamel II, and Sqwa:la, have fewer than five housepits with relatively homogenous sizes and shapes (e.g., DhRl-6). Small settlements are found throughout Periods II and III. Very Large settlements are found only in Period III of the broader post-1400 cal B.P. period. The Very Large (Late Period) settlements of Xelhálh and Welqámex II include 11 and 9 housepits, respectively; fewer than would be expected based on the linear patterning of the sample (Figure 8.5). Whereas Th'ewá:lí has 14 medium size housepits, fewer housepits at Xelhálh and Welqámex II yield a similar roofed area because they have larger housepits (Class V and VI). The composition of very large Late Period settlements is more diverse than those of earlier periods. The largest housepits are associated with the largest settlements -- another pattern that occurs only in the Late Period. This pattern suggests increasing stratification at two levels of relations, both within and between Upriver Group housepit settlements, as measured by this variable.

[41] The roofed area and frequency of housepits at Sxwóxwiymelh may be somewhat higher than calculated given the extensive damage to and destruction of the mid-portion of the settlement. Stó:lō community members recall there being a total of 36 housepits at this settlement prior to its disturbance in the 1970s -- including both Early and Late Period features.

Overall, the patterns defined in this exploration of roofed area and housepit frequencies parallel the differences in settlement size and composition that appeared in Period II (1400-950 cal B.P.) and became more pronounced in Period III (550-100 cal B.P.). Roofed area values in Period III range from 197m^2 (Eyxel) to 1,141m^2 (X̲elhálh), with a difference of 579 % between the sizes of these settlements (Table 8.1). Respective settlement population estimates range from 49 (Eyxel) to 352 (X̲elhálh) (see Appendix VII).[42] The patterns identified in the exploration of settlement size classes and composition indicates pronounced and continuous change over the last 2,500 years of community organization. Fully appreciating inter-settlement patterning requires synthesizing all three levels of analysis: linking Level I (housepit) and II (intra-settlement) analyses with those of Level III (inter-settlement). Changes manifest in multiple ways across multiple levels as differences in housepit / household size classes and measures of intra-settlement variation. These differences act to simultaneously define and distinguish settlements by their composition at all three levels. These findings raise questions about the regional distribution of settlements, differentiated by size. I turn now to the second section of this analysis focusing on the horizontal plane of social-spatial relations between housepit settlements.

8.2 The Regional Distribution of Housepit Settlements

Inter-settlement relations of size and location across the landscape serve as proxies for community organization, measured on a horizontal plane. Where, then, are small, medium, large, and very large settlements located on the landscape? Are patterns evident in the distribution of settlements across the landscape? Do those patterns change through time? What

[42] A range of population estimates (Appendix VII) were developed based on calculations of *minimum* (75% roofed area x 3 m^2/person) and *maximum* (80% roofed area x 2.5 m^2/person) of values.

can such patterns tell us about community organization as expressed across the landscape? Exploring these questions is the aim of this section.

Ten percent of the region's housepit settlements, differentiated by size class and time periods (2550-100 cal B.P.), comprise the sample shown in Figure 8.6. Each of the 17 Upriver Group settlements/occupations was coded by their size classification and plotted by a central UTM coordinates to produce a regional settlement plan. Size class symbols representing Small through Very Large settlement are respectively graduated in size as an intuitive guide to interpretation. All 17 settlements/occupations are visible, some partially overlaying one another. Over-laid symbols indicate one (or more) of three things: (1) there are multiple occupations of a single settlement (i.e., separated in time but sharing the same physical location) -- such as at Welqámex (I and II), Shxw'ow'hamel (I and II), and Sxwóxwiymelh (I and II); (2) two or more settlements are located in close proximity to one another and overlap due to the small scale of the map (e.g., relationships between Welqámex / Eyxel and Hiqelem / John Mack Slough); and/or (3) there are two or more settlement size options portrayed for a single settlement -- such as at Hiqelem and Sxwóxwiymelh.

This image reveals a direct association between the locations of all Class IV (Very Large) settlements and central transportation and communication 'hubs' identified in Chapter IV (see Figure 4.23). The locations of Period III settlements Xelhálh and Welqámex II coincide with the respective locations of Hub 3 (Lower Fraser Canyon) and Hub 2 (Upper Fraser Valley). These points define places of high connectivity within the regional system of transportation and communication. Th'ewá:lí, the other most certain very large settlement, is also situated at the junction of three major travel systems, near the 'headwaters' of the lower

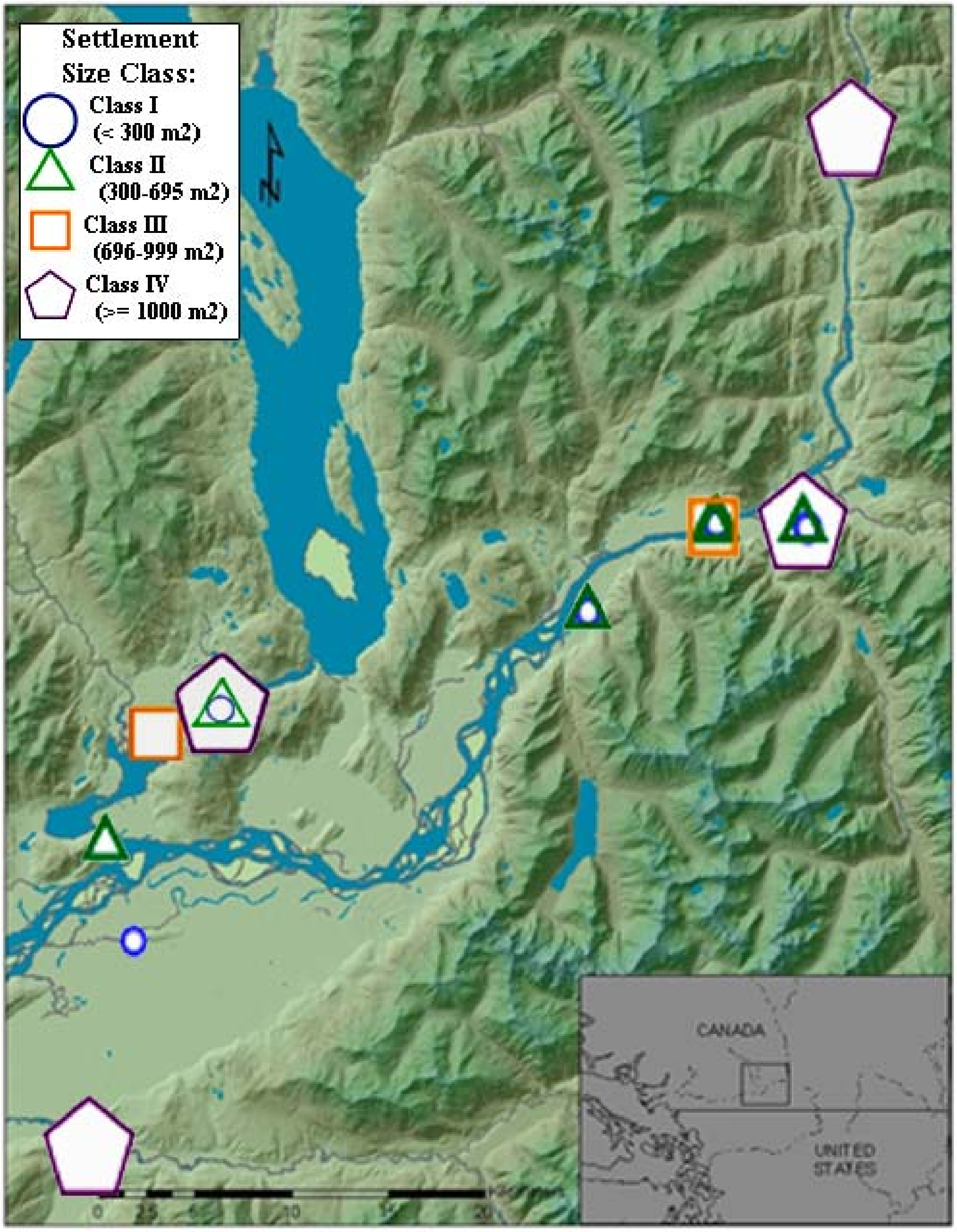


Figure 8.6. Spatial relationships between settlements/occupations differentiated by size and set within the landscape of the Upriver Group, showing a strong association between very large settlements and central locations (hubs) of communication and transportation (Note: overlapping symbols occur as a result of change through time such as at Hiqelem and Shxw'ow'hamel, and settlements in close proximity such as Welqámex and Eyxel, and S<u>x</u>wó<u>x</u>wiymelh I and II).

Chilliwack River (Chilliwack River Watershed, Columbia Valley, and Fraser Valley).[43] This locale is a significant place in the regional transportation and communication network though, unlike Hubs 2 and 3, is set back from the Fraser River. The same is true of Hiqelem, though its designation as a Class IV settlement is less certain, located at the confluence of the Chehalis-Harrison River Watersheds.[44] These settlements are 'regionally-situated' -- that is, located at the few most strategic points of connection within the upriver region's network of transportation and communication.

Subtle distinctions in location within this particular landscape show an apparent shift through time from more locally-oriented to more regionally-situated settlements. This shift is revealed by comparing the relationship between the placement and composition of settlements in this study's Early, Middle, and Late Periods. The Early Period (2550-2000 cal B.P.) settlements of Sxwóxwiymelh I and Shxw'ow'hamel I are both medium- to large (Classes II and III) and relatively undifferentiated housepit settlements (particularly the later). Furthermore, both are located in areas of high resource availability rather than at intra- or inter-regional points of connectivity (i.e., transportation and communication standards).[45]

Sxwóxwiymelh I, for example, appears to have been a settlement specializing in production of nephrite tools (Brown et al. 2008; Lenert 2008). It is located directly adjacent to a gravel-bar landform known in *halq'eméylem* as 'Chawathil' (McHalsie 2001) providing

[43] The place where Th'ewá:lí is located is very near the point of transition from water- to land-based modes of terms of transportation and communication as one travels up the lower Chilliwack River system from the Fraser River (i.e., the 'headwaters' of the lower Chilliwack River). Stó:lō Elder and oral historian Albert Louie (Wells 1987:160) used the term *Ts'elxwí:qw* (i.e., *Ts'elxwéyeqw* or 'Chilliwack') meaning "as far as you can go with a canoe… It's what they call 'far as your canoe can go': and they call that *Ts'elxwí:q*" in describing this portion of the Chilliwack River system.

[44] Verification of Hiqelem's description as a Very Large settlement is required through additional mapping and testing. Only the maximum option (Hiqelem - total), as I define it, accounts for Hiqelem as a Very Large settlement.

[45] Lenert (2008) identifies Sxwóxwiymelh I as a settlement specializing in the procurement and production of nephrite tools. It is located directly adjacent to both a gravel-bar landform known in halq'eméylem as 'Chawathil' (McHalsie 2001) with abundant lithic resources; as well as back-eddy of the Fraser River that would have been an excellent fishing location prior to being destroyed in the 1970s. Sxwóxwiymelh (I and II) is also located near the confluence of the Fraser River and the entrance to the now derelict slough channel that runs inland and around the base of the mountain defining the landform on which the settlement(s) is located.

abundant lithic resources. Nearby, a prominent back-eddy in the Fraser River would have been an excellent and very stable fishing location prior to its destruction in the late 19th or early 20th century. S<u>x</u>wó<u>x</u>wiymelh (I and II) is also located near the confluence of the Fraser River and the entrance to the now derelict slough channel that runs inland and around the base of the mountain defining the landform on which the settlement(s) is located -- providing access to a range of locally available resource sites and pathways to the mountains. Shxw'ow'hamel is set back from the Fraser River, mid-way along a large slough channel similar to that on which S<u>x</u>wó<u>x</u>wiymelh is situated.

Settlement patterning in the Middle Period (1400-900 cal B.P.) shifts to a wider range of housepit settlements, from small to very large sizes (Classes I-IV). Variation in housepit size and shape remains limited. The largest of these settlements -- Th'ewá:lí and Hiqelem -- are situated in places characterized not only by access to abundant local resources (e.g., salmon) but also well situated within the regional communication / transportation system. These settlements are located at the intersections of tributary systems of the Fraser River (i.e., secondary systems) rather than within the primary system of the Fraser River itself. In contrast, Shxw'ow'hamel II -- a small Period II settlement -- maintains the Early Period pattern in its location on the landscape and household composition.

While housepit sizes increase between the Early and Middle Periods, growth in settlement size occurs only with settlements located at the main communication hubs. Shxw'ow'hamel II, for example, remains 'locally' situated and is by far the smallest of the Middle Period settlements, unlike both Th'ewá:lí and Hiqelem. Th'ewá:lí and Hiqelem, with double rows of housepits and central arrangements, are also more organizationally complex than Shxw'ow'hamel II. These three settlements illustrate the emergence of Middle Period trends in housepits settlements correlating growth in size and organizational complexity with more communicative positions on the landscape.

Late Period (550-100 cal B.P.) settlements illustrate the trajectories of change beginning in the Early and Middle Periods. Late Period settlements continue to be simultaneously differentiated by housepit and settlement sizes, arrangements, and internal household composition, within and between settlements. Unique among all three time periods, diversity in the Late Period is clearly expressed at both intra- and inter-settlement levels.

The first Very Large settlement, X̲elhálh, was founded during the precontact Period IIIa, while Welqámex I was a formative Medium size settlement. Evidence from X̲elhálh indicates that it quickly developed to become one of the most complex, strategically-situated, and by far the largest settlement in the region -- as a fortified, hill-top settlement (Schaepe 2006; Schaepe, Blake, Formosa, and Lepofsky 2006). Both X̲elhálh and Welqámex illustrate the development of 'C-shaped' or flanking patterns of housepit arrangements. Large houses, including plankhouses, form the centers of these settlements. At its zenith, X̲elhálh maintained a clear and singular place of prominence as the settlement of distinction in the region. Connections to X̲elhálh (e.g., trade and exchange; warfare) extended throughout the Coast Salish world to Vancouver Island and more broadly to the Central Coast (Schaepe 2006). Based on Graesch's (2006) detailed analysis, Welqámex developed into a very large settlement between Periods IIIa and IIIb as an established place of distinction in the region -- by its extraordinary size and complexity -- shortly after the decline of X̲elhálh in the late 18th century smallpox era (Schaepe et al. 2006).

X̲elhálh and Welqámex have the largest and most diverse groups of housepits, including wider ranges of housepit sizes and shapes. Both settlements are situated at very prominent places in the intra-regional transportation and communication system defined by travel along the Fraser River. The placement of these settlements constitutes the expression of a nexus socio-political to material influences, providing access to numerous resources. X̲elhálh, for example, is notably located at what is perhaps the most productive salmon fishing and processing location in the entire pre-contact Northwest Coast; not to mention being centrally located in a significant, spiritually charged locale (McHalsie, Schaepe, and Carlson 2001; Schaepe 2006). The later developments at Welqámex are associated with the establishment of a nearby Hudson's Bay Company trading fort (Fort Hope) in the early contact period -- presenting a new source of resources and interactions (Carlson 2003; Graesch 2006).

A notable change in Late Period settlement patterning is the occupation of islands in the Fraser and tributary rivers (e.g., Harrison River), exemplified by Welqámex and Qithyil Island. Qithyil Island is the first settlement in the Upriver Group to be strategically located on an island, in this case at the mouth of the Harrison River Watershed (confluence with the Fraser River). Late Period settlements, more widely differentiated by location, size, and form than in previous periods, are innovations of a built landscape that develops around persisting Middle Period settlements such as Th'ewá:lí and Hiqelem. Elements of these earlier forms persisted and eventually mixed with newer forms of layout, arrangement, and composition in settlements like John Mack Slough, Qithyil Island, Eyxel, and Sqwa:la. Qithyil Island, for example, forms a mid-range settlement characterized by a small number of large housepits. Such Medium- to Small-sized settlements were situated in a mix of locations. These settlements perhaps represent 'specialized' units within a web of community relations that becomes increasingly complex between Middle and Late Periods.

A 'hub-' or 'center-satellite' relationship is suggested by the relationships between a number of co-existent settlements of different sizes (Figures 8.6 and 8.7) -- particularly very

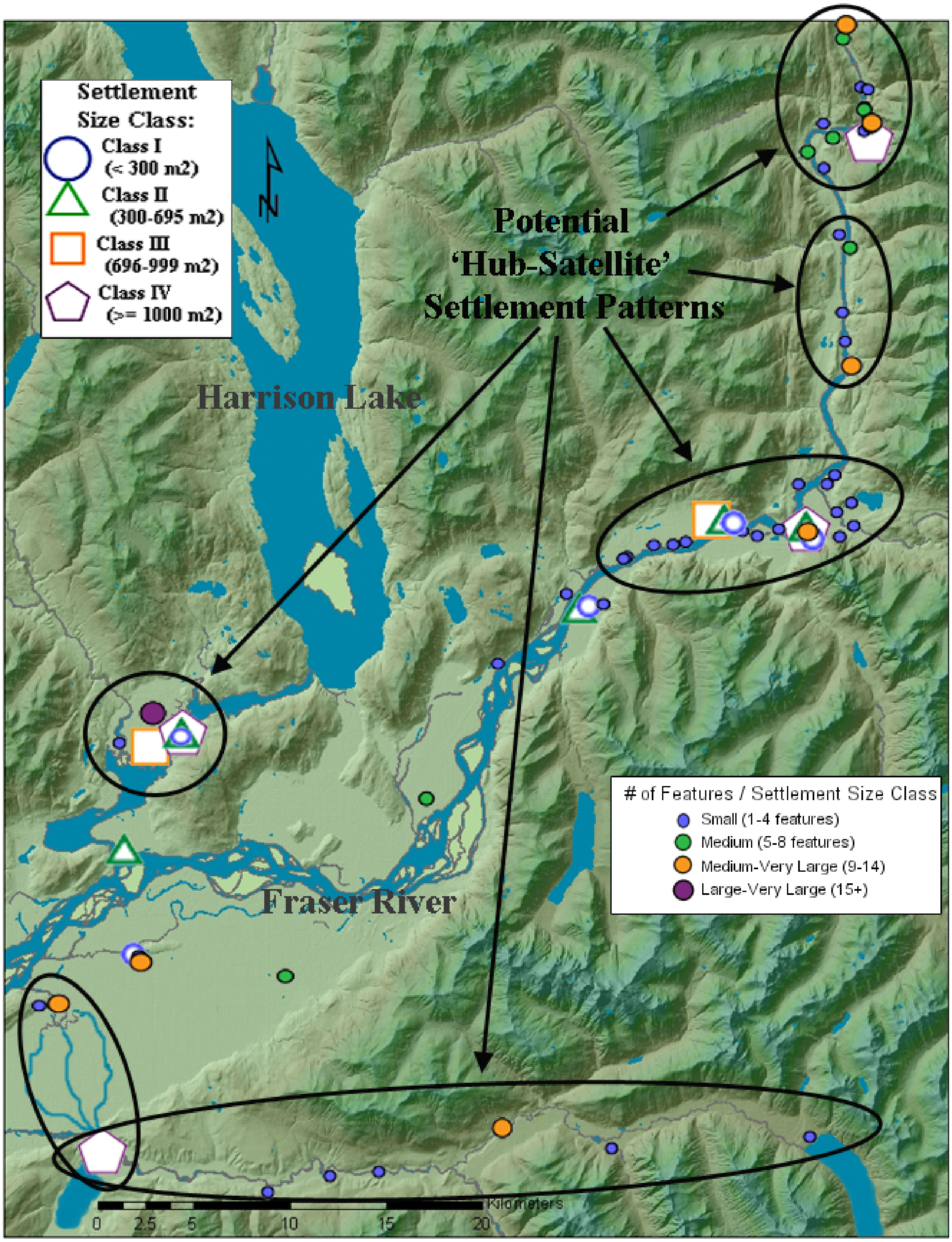


Figure 8.7. Spatial relationships between Upriver Group settlements differentiated by size class and other upriver housepit settlements classified by numbers of features, suggesting a set of 'hub-satellite' relationships between small-to-medium sized settlements surrounding Very Large settlements occupying central places in the 'communication landscape.' (Temporal issues need to be addressed in clarifying relationships between settlements in this image).

large and small settlements -- located in close proximity to one another.[46] Eyxel, for example, is a small settlement with limited internal differentiation located peripherally and in very close proximity to a Very Large settlement at a more strategic locale, Welqámex. Eyxel and Welqámex are located on opposite sides of a narrow channel of the Fraser River. Eyxel is located on a small bluff-top overlooking the channel with a clear view to Welqámex. Sqwa:la is another example of a settlement situated mid-way along the Hope Slough system in the Central Fraser Valley, similar in nature to the geographic context and composition of Shxw'ow'hamel I / II. Whereas Shxw'ow'hamel I / II appears to be isolated, Sqwa:la was presumably located nearby to what was likely a large settlement, for which the little information that exists implies a co-existent relationship.[47] A similar set of center-satellite relations existed between numerous small- to medium-size settlements recorded in and around the Lower Fraser River Canyon in close proximity to X̲elhálh.

8.3 Summary of Findings in the Analysis of Inter-Settlement Relations

Stó:lō-Coast Salish housepit settlement patterns become more diverse and more centralized through time. Centrality is expressed at both intra- and inter-settlement levels and repeated across at least two dimensions, expressed in relations between housepits both within and between settlements. Spatial relations between pithouses of difference sizes reflect a field

[46] Figure 8.7 is a preliminary figure. It includes the Upriver Group settlements sampled in this analysis and a large sample of upriver housepit settlements extracted from the analyses in Chapter IV. Only those settlements with the highest level of certainty as recorded sites and counts of housepit features are projected in this image. The classification of these additional settlements is based on their relative numbers of features as a general indication of their sizes - per Figure 8.5. While still affected by a lack of temporal discrimination, the distribution of these settlements provides some insight into the regional patterning of housepit settlements by size and location. Based on findings presented in Chapter VII, the small and medium-sized settlements with low frequencies of housepits are most likely of Middle or Late Periods. This figure provides a basis for directing future research aimed at sorting out the spatial and temporal relations between settlements of different sizes as a factor of centralization suggested in this image of regional settlement pattern.

[47] The 'Little Mountain School' site, located within a kilometer of DhRl-6, was recorded in the 1960s as having numerous housepits. Serious disturbance of the site in 1992 revealed very large archaeological deposits indicating a long-term occupation of this settlement, likely extending into the late precontact period.

of negotiation between households using their houses as capital. Settlements with the most central internal arrangements are also most centrally located within the landscape of external relations (e.g., Xelhálh and Welqámex). These locations providing connection to the broader settlement landscape as centers of interaction and hubs of negotiation of practical modes of knowledge (Bourdieu 1977). Over 2,500 years of relations between Upriver Group settlements a show continuity of change. Patterning of change indicates the development of increasingly complex community organization through time, centering on the Fraser River's connective hubs of regional communication and transportation.

Settlement patterns identified in this analysis illustrate a shift through time between the Early and Late Period in which specific landforms located directly in (on islands) and along the Fraser River are occupied by newly established 'high ranking' settlements. Changes in housepit settlement sizes and locations occurring between 2550 and 100 cal B.P. provides evidence of an expanding field of negotiation and community organization, transitioning from more locally- to more to regionally-oriented spheres and centers of social, political, and economic relations. Late Period settlement patterning suggests the emergence of inter-connected center-satellite relations between groups of different sized housepit settlements. As an outcome of negotiations at the inter-settlement level, settlements themselves appear to assume a form of capital. This level of capital supplements that of (pit)houses at a broader level of negotiation beyond households and between settlements. Capital of this type, of groups of households and houses, can be used in negotiating community relations for those households able to achieve such a high, multi-level possession of wealth, prestige, and influence on the practical mode of knowledge.

CHAPTER IX - CONTINUITY AND CHANGE IN THE ORGANIZATION OF STÓ:LŌ-COAST SALISH HOUSEPIT COMMUNITIES

The objectives of this chapter are to provide an interrelated summary, synthesis, and discussion of findings, supporting the development of a model Late Period Stó:lō-Coast Salish community organization. I use a political-economic framework of community organization exploring the role of figures of authority. I develop my interpretations as an integrated form of community and settlement archaeology. A primary goal of this chapter is to present an archaeologically-generated model of community organization among the pre-colonial Stó:lō-Coast Salish between 2550 and 100 cal B.P. Material differences in housepits -- clustered in settlements -- serve as archaeological proxies for once living households and the basic elements of community. Political-economic relations are manifest in differences among housepits and settlements along vertical and horizontal planes of interaction. ‘Mapping’ these differences across space and through time provides a means of modeling and interpreting changes among pre-colonial Stó:lō-Coast Salish (pithouse) communities over the last 2,500 years.

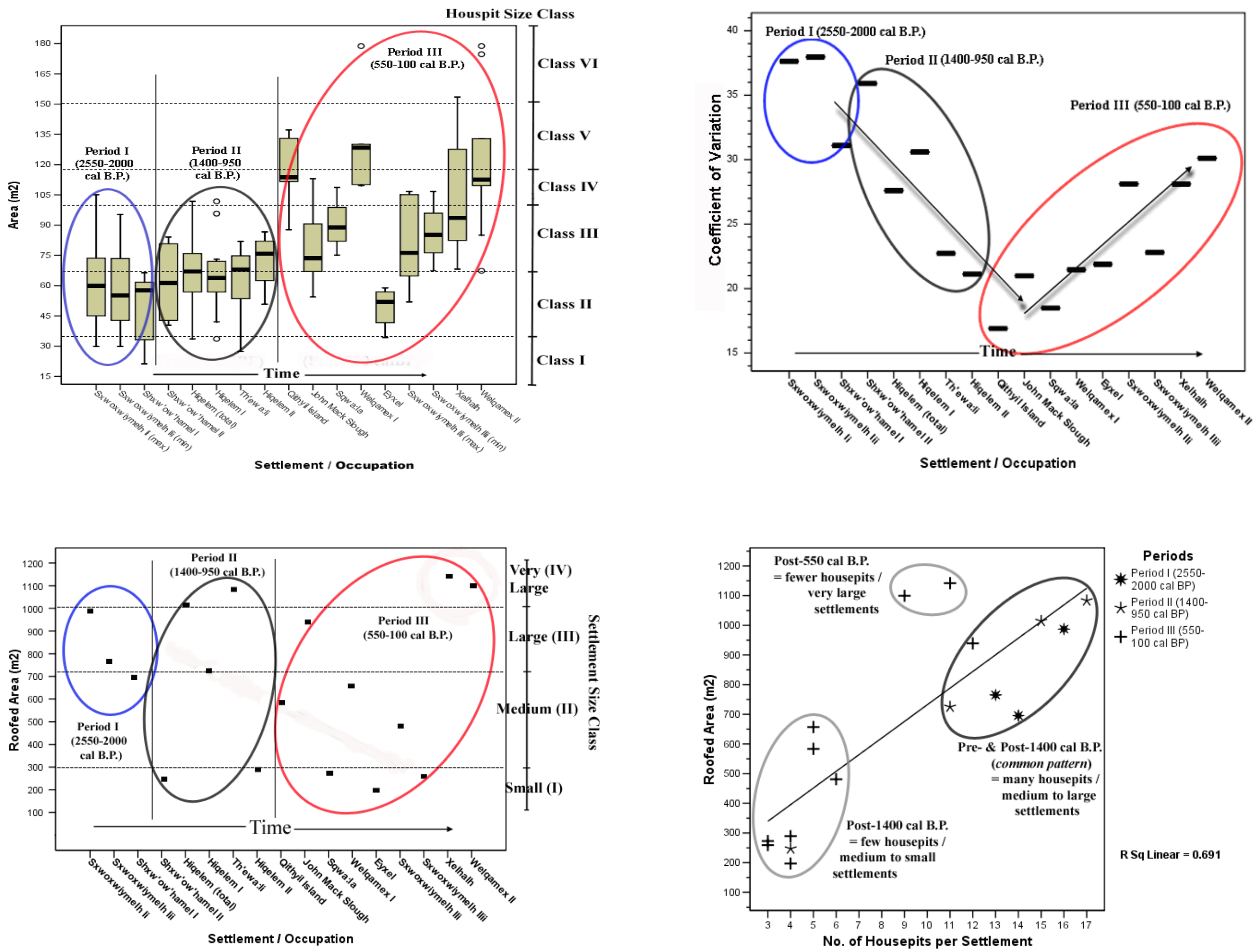
I develop this interpretative narrative or synthesis as a sequence of sections beginning with quantitative results and moving into a discussion of social and political meaning based on the patterning shown in those analyses. I present and discuss three schematic diagrams illustrating trajectories of change among different aspects of community relations through time. I characterize these trajectories as shapes that, as with the classification of housepit settlement size in Chapter VI, assist in discussing long-term trends of continuity and change among the Stó:lō-Coast Salish.

Four of my primary analyses quantifying differences in relations between housepits and settlements through time (reproduced in Figures 9.1a-d) provide the foundation for the series schematics that follow. I present three schematics illustrating these findings. The first schematic (Figure 9.2) summarizes variation in housepit and settlement form through time. The second schematic (Figure 9.3) portrays interaction along a vertical plane of relations and describes changes in social organization (i.e., stratification ranging from heterarchy to hierarchy). The third schematic (Figure 9.6) portrays a horizontal plane of relations representing forms of political-economic organization (i.e., corporate or network). Information presented in these three schematics is cumulative and can be integrated as a set of overlay 'maps,' each representing a different, though inter-connected, set of elements defining Stó:lō - Coast Salish community organization.

9.1 Schematic I - Modeling Social Relations through Time

Chapters IV-VIII modeled long-term changes in the socio-political organization of Stó:lō-Coast Salish housepit communities. Integrating these findings requires simultaneously thinking across multiple dimensions and levels of analysis, constituting both vertical and horizontal planes of relationships. The foundation for the social narrative derived from these results is represented in Figures 9.1a-d, and depends on their being read simultaneously rather than reckoned individually or sequentially.

This narrative begins at a point in the more distant past preceding and connecting with this study; a point associated with the transition from what archaeologists refer to as late Locarno Beach/Baldwin to Marpole/Skamel phases (Carlson 1983:16-17). Society at this time (around 2,500 B.P.) is generally though of as organized around independent though highly interactive corporate groups (Matson and Coupland 1995). Central Coast Salish society of this period is recognized as having ascribed social classes, multi-family households, and large, permanent villages (which may or may not have been continuously occupied) dependent upon large-scale storage capability (ibid.). These interpretations of Marpole Phase society draw



Figures 9.1a-d (clockwise from top-left). Results of key analyses illustrating changes in housepit / settlement relations through time.

heavily on ethnographic sources (Grier 2007:291). Among North Coast peoples around 2,500 B.P., Ames and Maschner (1999; also Ames 2001) describe social relations as ranging from ranked to stratified, associated with slavery, stable interaction spheres, and a range of household-to-village level organization and modes of production. These brief descriptions provide local and broader Northwest Coast perspectives of social relations the way they are believed to have existed at a point in time at the beginning of this study.

The period between 2,550 and 100 cal B.P., i.e., from Marpole onward, witnessed significant change in social organization among the Stó:lō-Coast Salish, as shown by the results of this study. Measurable differences between housepits and settlements, illustrating a trajectory of continuity and change over the course of these three millennia, demonstrate that the upriver Stó:lō-Coast Salish were not fixed within a 'Developed Northwest Coast Pattern' between the Marpole era and contact with Europeans.

Differentiation among both housepits and settlements increases through time (Figure 9.2). Both housepit and settlement trajectories of change move upward through time, illustrating increasing variation. Period I is typified by large settlements with many households showing a limited range of variation in composition (i.e., numbers of extended families) associated with houses of a limited range of sizes classes and shapes (Figures 9.1a, c-d; also see Figures 6.14 and 6.25).[48] Housepits of this age tend to be rectilinear in shape, not circular as was commonly assumed. The highest degree of variation is expressed as intra-settlement variation (Figure 9.1b), but within a limited range of variation compared with the Period III.

Social differentiation during Period I is constrained *relative* to the sequence of change that follows (e.g., Period III), bringing up questions about the relationship between measures of intra-settlement variation and social stratification. What are the benchmarks for the ranked

[48] The small sample size of settlements of this age affects the certainty of this description.

versus stratified, or achieved versus ascribed status of individuals and households indicated by measures of intra-settlement variation between households (Acheson 1995; Archer 2001)? Does such a benchmark exist? What kind of evidence is required to substantiate the explicit definition of those relationships? The difficulty in addressing these questions is considered into the following discussion of social organization.

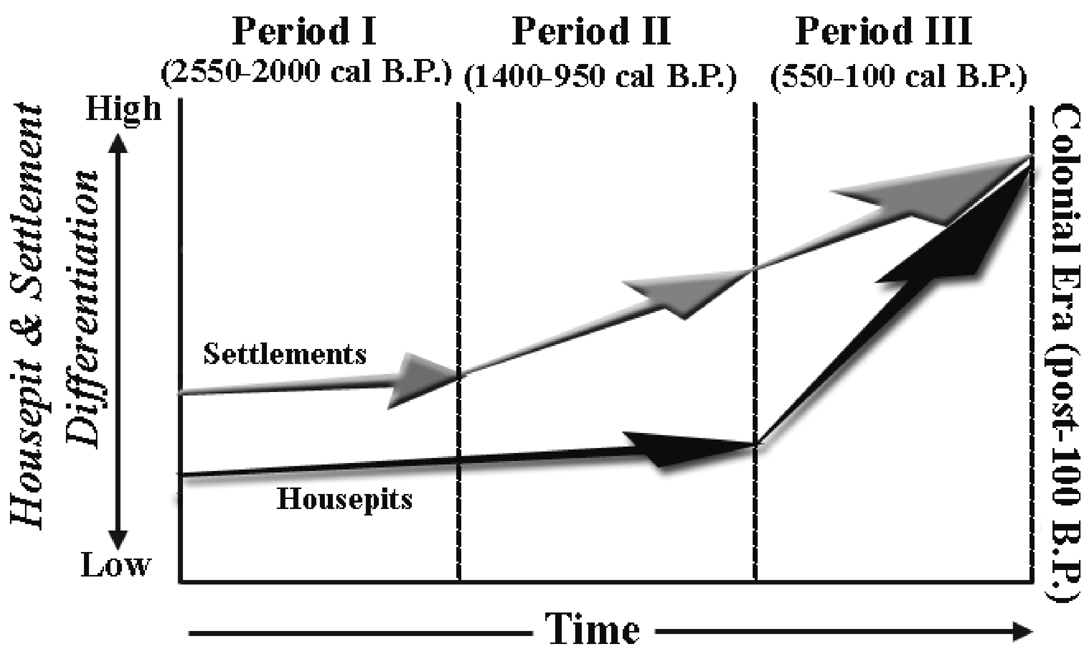


Figure 9.2. A schematic framework showing individual trajectories of housepit and settlement differentiation through time.

The shift from Periods I and II describes a pattern of change where-by social differentiation occurs first at the broader collective level of the settlement and only later at the level of households.[49] Variation among housepits remains limited and consistent (see Figure 9.1a). Settlement diversity is represented by differences in size (i.e., roofed area) and frequency of housepits. While housepit form remains constant, settlement diversity increases. This shift constitutes expanding diversity forming an upward flare in the illustration characterizing Period

[49] I use the term 'initially' as applying only within the scope of this study and not including changes that occurred during earlier periods of time (i.e., pre-2550 cal B.P.).

II (Figure 9.2) and signaling the beginning of a divergence in the horizontal and vertical planes of relations.

Social changes between Periods I and II show up as inter-settlement variability. Within Period II, settlements become increasingly differentiated in both size and number of households (Figures 9.1c and 9.1d). This shift is caused by the emergence of a set of both very large and very small-sized settlements not present in Period I. The range of settlement types expands in Period II, including some very large and more complex settlements and some very small and more homogenous settlements. Variation between housepits and households within small Period IIa settlements decreases in comparison with Period I settlements (Figures 9.1a-b). Inter-settlement differentiation widens across both the vertical and horizontal planes of relations.

Social stratification (vertical plane of relations) in Period II increases at a collective level not recognized between individual households, i.e., the range of housepits sizes remains constant. Stratification is first noticeable only at the settlement level, among the clustering (or segmenting) of household groups forming a range of small to very large settlements. Settlement types diversify by size and household composition becomes more compartmentalized. Formative changes also appear to be taking place among inter-household relations both within and between settlements, suggesting a subtle shift toward centrality in settlement arrangement in some of the larger settlements (e.g., Th'ewá:lí).

Beginning around 550 cal B.P., changes among both *households and settlements* illustrate a fundamental shift in Stó:lō community organization. Changes in the Late Period are measurable on *both* horizontal and vertical scales *and* on two levels among both households and settlements. Developing from patterns first recognized in Period II, Period III sees the emergence of the largest housepits in combination with the largest settlements. Differences between large and small households and settlements become more pronounced, growing and shrinking in both directions, forming both the largest and smallest housepits and settlements ever built by the Stó:lō.

Period III is period of innovation and expansion of social organization. Social change during this period forms a dramatic upward flare in the model particularly among the vertical scale of relations (stratification), illustrated by differences in housepit sizes (Figure 9.2). The scale of differences between settlements increases in an upward direction to include the very largest settlements of X̲elhálh and Welqámex, and downward to include the very smallest settlements (e.g., Eyxel). A common mid-range of settlement sizes continues to be occupied (e.g., Hiqelem) between periods or are newly developed (e.g., John Mack Slough; Qithyil Island). These measures are expressed simultaneously in social differentiation within and between settlements. Centrality within and between households and settlements distinguishes the horizontal relations of the Late Period, discussed in greater detail in the following sections.

Stratification in Period IIIa produced a wider range of household sizes and housepit forms. The range of households expands from what was previously known to include large and very large categories and to include small households as well. New architecture developed, especially the circular housepit form, augmenting the square and rectangular/oblong forms of the earlier periods.

The co-existence and household organization of *s'iltexwáwtxw* and *sqémél* in Period II and III settlements requires explanation. Where they exist together, *sqémél* represent a more discreet expression and externalization of household relations contained more collectively and internally within the physical structure of *s'iltexwáwtxw* as a single house. A commonly understood seasonal factor underscores this relationship, with sqémél representing dwellings used mainly in the winter season at least by those who could afford to build them (e.g., Barnett

1955:55). Complementary functions emerge from the co-existence of these two types of houses. *S'iltexwáwtxw* accommodate large-scale public gatherings and ceremonial potlatching far more effectively than *sqémél*. In some cases, as specialized structures, that is all they may have been used for. Pithouses are better suited to conducting more private activities. Within a Coast Salish education model (Snyder 1964), *sqémél* provide a discrete, private space and controllable setting within which to regulate and dispense private knowledge. The regulation of knowledge plays an important role in the political economy of communities.

The social-spatial relationship between *s'iltexwáwtxw* and *sqémél* involves the negotiation of a series of dualities -- inside/outside; public/private, secular/ceremonial, in-ground/above ground. The negotiation of such dualities appears as 'centrality' in the positioning of housepits at settlements with *s'iltexwáwtxw* (e.g., front/back, center/side spatial relations). Social and political tensions within this system are materialized and perhaps balanced within a centralized social arrangement.

Household social-spatial relations in settlements with both *sqémél* and *s'iltexwáwtxw* reveal a strong and consistent tendency towards centralization of the largest housepits. These features occupy a central place in relation to those immediately clustered around them and more broadly as points of access to these settlements. Centrality of location is expressed in the negotiation of spatial relationships between households, mediating spatial oppositions and dualities (forward and back; center and side). The largest housepits/households form a point of connection -- acting as front and center -- to the surrounding world. This arrangement signifies a hierarchical socio-political order. Political economic cohesion among groups of households forming settlements coalesces around these central figures of authority. Cohesion, as noted by Suttles (1958), is an important factor of community formation. Social differentiation within settlements thus incorporates and operates on multiple levels simultaneously.

The actions of two sets of socio-political forces, household and settlement units, led to increasingly complex sets of relations within and between them (forming the upward 'flare' of this socio-political model). The trajectory and expression of these patterns of relations persist beyond precontact times, through the introduction of smallpox and into the early contact era of the late 18th and early 19th centuries (e.g., the continuous development of Welqámex I and II). The maintenance of this pattern throughout the early contact period implies the persistence of long-standing, robust, and vigorous indigenous social structures.

9.2 Schematic II - Modeling Social Organization through Time

Modeling Stó:lō-Coast Salish social organization based on changes in household demographics through time results in an upwardly sloping line indicating increasing stratification (Figure 9.3). This interpretive layer focuses heterarchical and hierarchical forms of social structures. Heterarchical organizations have differences in rank or class (i.e., social strata) and dispersed or de-centralized authority (Feinman 1998, 2000). Heterarchies are not to be confused with egalitarian systems, which lack clearly defined social strata. Instead they have social orders in which differences are limited, both vertically and horizontally (i.e., 'localized'). Heterarchical structures, if represented by a shape, would be oval, round, or diamond-shaped (i.e., single modal) -- reflecting a normal shape and distribution of household sizes. Hierarchically structured organizations are not an opposite of heterarchies. Rather, the transition to hierarchies constitutes a consolidation of authority among fewer people (or households), centralized in fewer places -- often termed stratified (Feinman 2000). Demographically, hierarchical structures represent non-normal, multimodal shapes (e.g., pear- and/or inverted pear-shaped) that can be modeled from differences in housepit sizes.

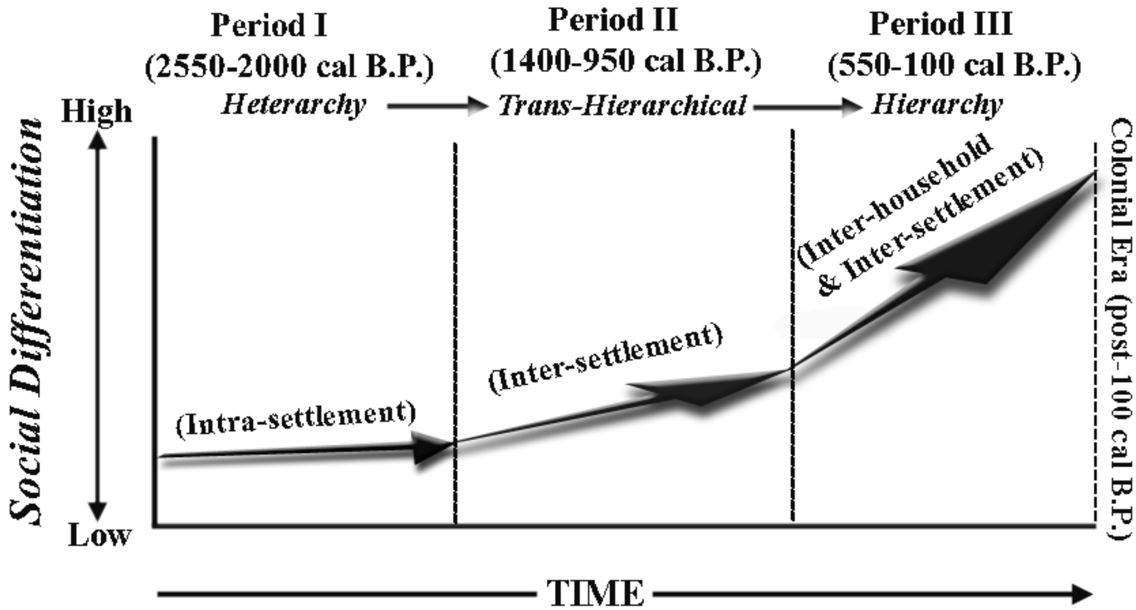


Figure 9.3. A framework of stratification and changes in the vertical plane of relations through time expressed in heterarchical and hierarchical terms.

The analyses presented in the previous sections suggest that Period I social organization was heterarchical in nature, where socio-political structure was broad-based with de-centralized relations of authority (vertically and horizontally). Some degree of intra-settlement variation and possible stratification is indicated by the high CV values for settlements of this period (Figure 9.1b). The range of this variation, though, is expressed only within the lower order of housepits size classes, the majority ranging between Class II and III (Figure 9.1a). The single row layout of Shxw'ow'hamel I housepits, particularly, limited the number of social-spatial dimensions in which more centralized authority could be expressed. The location of Sx̱wóx̱wiymelh I and Shxw'ow'hamel I in more resource-focused (localized) and less 'communicative-'oriented (regional) areas of the landscape indicates a higher degree of self-sufficiency of the households in these settlements. Household variation in Period I manifests most recognizably on an intra-settlement level. The limited range of variation illustrated by Period I settlements points to a heterarchically structured social arrangement.

Patterning in Period II describes a 'trans-heterarchical' form of social structure; that is, demonstrating elements of both heterarchical and hierarchical qualities, in a shift toward hierarchical patterning. This organizational form is characterized by increasing diversity in the range of settlements (e.g., large and small settlements), while the range of inter-household differences remains unchanged. Changes in settlement composition in Period II, as described above, illustrate increasing inter-settlement stratification; along with some more noticeable intra-settlement differentiation within settlement layouts and arrangements. The increasing distinction between settlements in this period (particularly the development of small, homogenous settlements) may an example of what Snyder (1964) describes among the Coast Salish as 'fissioning.' Through fissioning, "communities would segregate into upper and lower class and then split to form two separate communities, each of which again become stratified" (Suttles 1987:11). The result of fissioning described by Suttles correlates with the description settlement patterning in Period II. In Period II, the pattern of settlements across the landscape marks a step toward greater social-spatial stratification, moving toward a hierarchical arrangement.

Beginning in Period III, changes in settlement patterning demonstrate social stratification both within and between settlements, associated with a multi-modal distribution of housepits sizes. This social framework forms a hierarchical set of relations represented by social stratification evident both within and between settlements. Social stratification in the Late Period is suggested by six housepits size classes. The two largest housepits size classes are unique to the Late Period, suggesting increased social hierarchy during this period. Very large housepits are found only within very large settlements. Authority appears to be held within a reduced number of (very large) households and (very large) settlements. This subset of very large households is strategically situated at hubs along the Fraser River corridor -- central places in the regions' communicative framework.

9.2.1 A Comparison of Ethnographic and Archaeological Models of Social Organization

In this section, I compare Suttles's ethnographic model of Stó:lō-Coast Salish socio-political organization with a model developed from these archaeological data (Chapter VI - social shape). I use this comparison as a means of addressing the question: Did political and economic organizations capable of maintaining large populations develop among the Stó:lō-Coast Salish?

Suttles's model continues to maintain its position a commonly held anthropological view of Coast Salish socio-political organization (e.g., Kennedy 1995). While the underpinnings of this model are not universally held (see Elmendorf 1971), it does remain influential in the interpretation of Central Northwest Coast archeological data (Grier 2007). Examining Suttles's model serves to address its utility in interpreting Stó:lō-Coast Salish community organization.

Suttles (1987:12) developed his inverted pear-shaped model as an ethnographically-based illustration of "stratification in a Coast Salish community;" a society that had "a large upper class of good people [*smelá:lh*], a smaller lower class of worthless people [*st'éxem*], and a still smaller class of slaves [*skw'iyéth*]" (Suttles 1987:11; *halq'eméylem* notation added). Situated vertically above *smelá:lh* was a group of "leaders [*sí:yá:m*] with greater wealth and prestige" (Suttles 1987:12, *halq'eméylem* notation added). He diminishes the scale of this vertical plane of relations in this model by stating that "there were neither clear divisions within the upper class, nor a series of ranked individuals" (Suttles 1987:11). While recognizing that "there was a fairly clear line dividing the upper class from the lower class, especially when they were spatially separated" (ibid.), Suttles effectively obscures the clarity of that dividing line by inferring that "perhaps all families had… links" between high and low status relations. Coast Salish communities, he implies, had only a "poorly-developed system of ranking… for individual, and none for local groups.. [and] there were no social units larger than the local group" (Suttles 1987:13). Suttles goes so far as to suggest avoiding using the term community "since it often implies a social unit with a high degree of cohesiveness, in-group feeling, internal social control… and Central Coast Salish villages *may* not have been such a unit" (ibid.; emphasis added).

These views appear to be based on an understanding of Stó:lō-Coast Salish settlements as quite small and comprised of "one or more extended families" (Suttles 1960, 1987:17) in the range of 35-50 people (Duff 1952:85). Duff (ibid) states that "in pre-white times…. it would appear that very few Upper Stalo [sic] villages had populations of more than 50." This estimated range of figures is dramatically inconsistent with the archaeologically-based settlement populations inferred in this study. Duff's and Suttles's perceptions, representing only the smallest of settlements in the Middle and particularly Late Periods (e.g. Eyxel), may be more representative of a post-Colonial Era (i.e., post-1858) demographic structure.

I find that the shape of Suttles's ethnographic rendition of Coast Salish social structure does not articulate well with the shapes of either of the two housepit-based archaeological models (Figure 9.4). The ethnographic model forms a very different shape than that of the pre-550 cal B.P. (Early Period) model. The two do not fit together. The best fit between models is within the lower half of the post-550 cal B.P. (Late Period) model of social structure (associated with the distribution of the three or four smallest housepit size classes; see Figure 6.18). Suttles' model, however, fails to account for the upper 'neck' of the Late Period model (associated with the largest housepit size classes), a distinctive feature of social organization characterizing the period between 550-100 cal B.P. The gap between model results from the Late Period social shape forming an inversion of Suttles's model, creating a 'pear-shaped' image of social organization opposed to Suttles' 'pear-shaped' image. The archaeological, pear-shaped model is multi-modal, with a pronounced upper bulge associated with a small number of large and very large housepits / households. Another less pronounced bulge emerges from the base of the mid-section. This differs from the (normal) shape of the more heter-

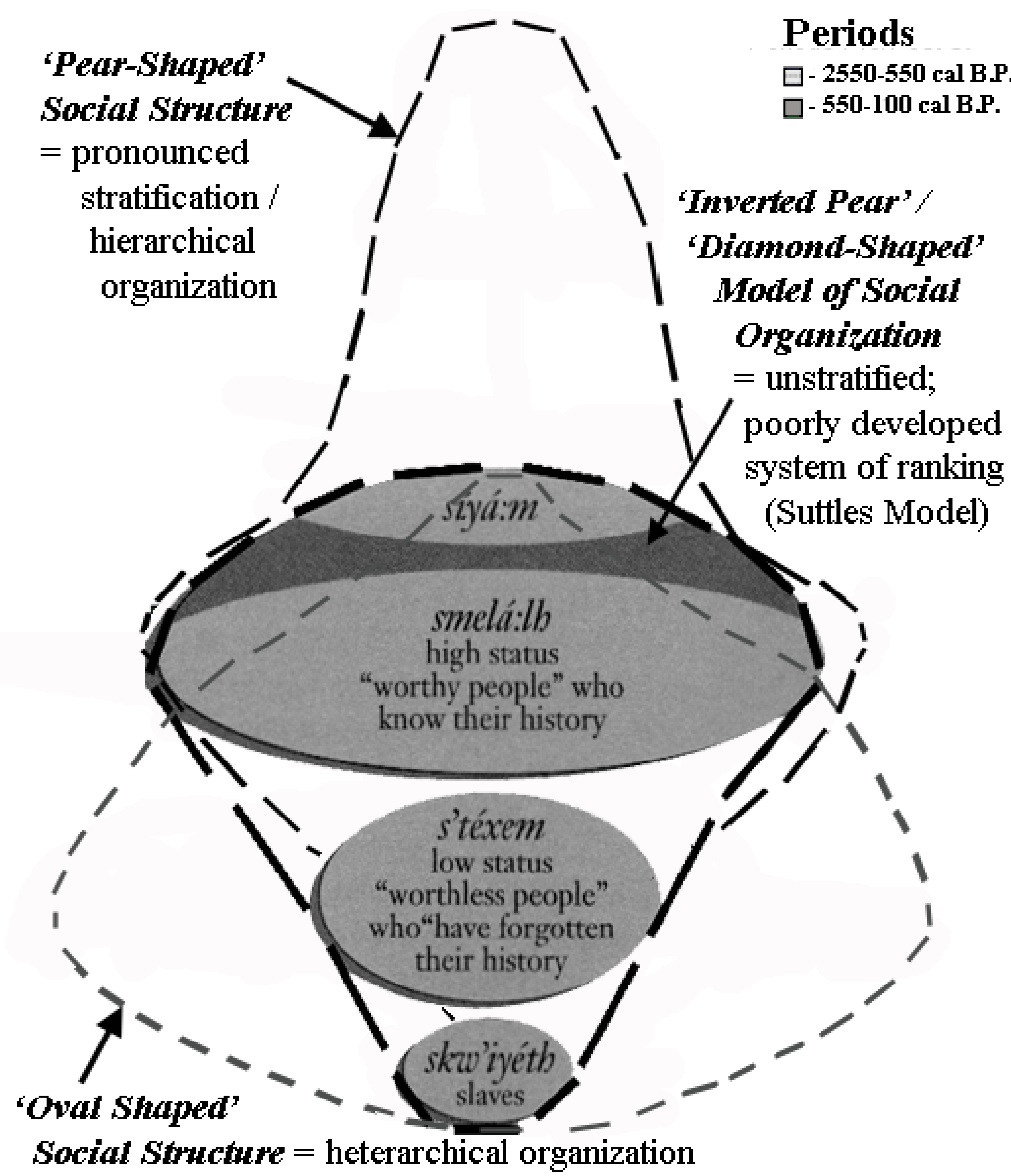


Figure 9.4. A comparison of ethnographic and archaeological models of Stó:lō-Coast Salish social stratigraphy and organization (ethnographic model figure based on Suttles 1985:12, per Carlson 1997b:90; archaeological model figures based on Figure 6.18).

archically structured Early Period model of social organization. Late Period society, more stratified, has a more hierarchically ordered form of social organization.

Fitting Suttles's model into the Late Period social shape -- filling the gap in its upper neck or mode -- synthesizes the ethnographic and Late Period archaeological findings describing the Stó:lō (Figure 9.5). *Smelá:th* and particularly *siyá:m* strata are set apart from the rest of society, fit, as wealthy households and leaders, within the upper strata of this model in

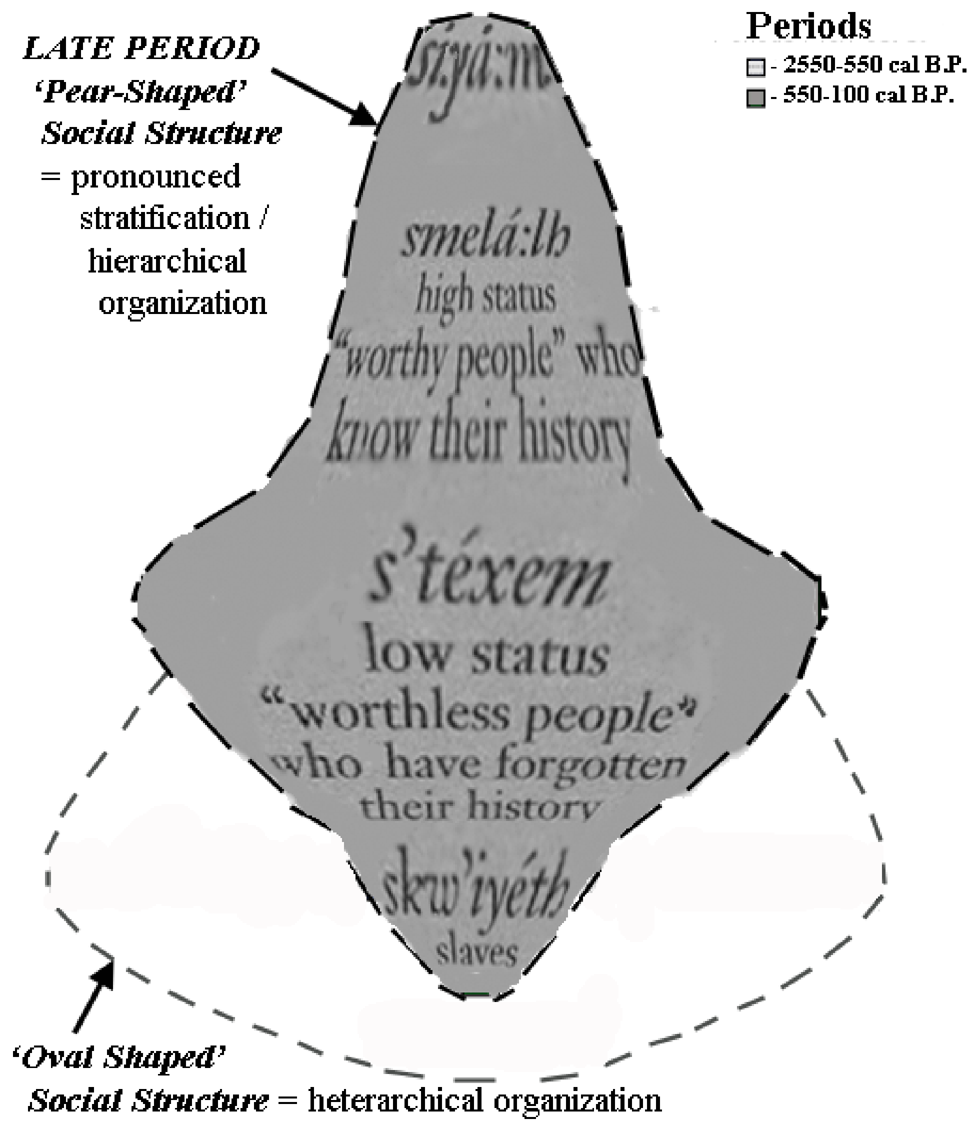


Figure 9.5. Suttles's ethnographic model of social organization adjusted to fit the archaeological Late Period framework of social structure (based on Figure 6.18).

direct association with the two or three largest classes of housepits. This relationship between housepits and households portrays a model of social organization as it appeared about 550 years ago. The composition and shape of this model is previously unrecognized in either ethnographic or archaeological interpretations of Stó:lō-Coast Salish social organization.

I consider the changes in housepit and settlement organization associated with the transition between the 'Early' and Late periods to be the manifestation of a 'Sí:yá:m Age.' I define the Late Period Sí:yá:m Age as an indigenous development characterized by a social order with a high degree of stratification and a strong implication of centralized authority extending across a widely spread set of relations. Centralized relations are embedded both within and between households, and within and between settlements.

The timing for the emergence of a Sí:yá:m Age, based on these findings, is associated with the escalation of wide-spread warfare (Moss and Erlandson 1992; Schaepe 2006) among the Coast Salish and the development of burial practices within the region indicating ascribed status (Lepofsky et al. 2000; Thom 1995).[50] This Sí:yá:m Age also coincides with a coalescence in the development of a Coast-wide interaction sphere, slavery, and prestige economy (Ames 2001; Ames and Maschner 2001), all of which appear to emerge from earlier times, but which become more pronounced in the Late Period. This coalescence of factors, together with the societal transformations identified among the Stó:lō-Coast Salish, suggests a profound change in social relations on a Coast-wide scale in the Late Period. Many of the characteristics of the Sí:yá:m Age are associated with relations extending across the lower Fraser River region, particularly between *siyá:m* households and between *siyá:m* settlements.

[50] The presence of an earthen burial mound (F25) built on the rim of one of the housepit features (F11 / F24) at Th'ewá:lí associates the initial development of this settlement with the institution of burial mound construction (see Schaepe, Blake, Formosa, and Lepofsky 2006:29-36). A significant burial mound complex is also recognized as factor in the relationship between Qithyil Island and Qithyil, otherwise known as the Scowlitz site (Blake 2004; Lepofsky et al 2000).

Housepits are only one part of a complex of possible objects illustrating diversification associated with the emergence of complex political-economic relations and forms of social organization (e.g., hereditary status and wealth; control of labour; social stratification). While housepit data indicates the manifestation of Sí:yá:m Age characteristics (e.g., centrality within and between housepit settlements) by 550 cal B.P., examining a broader complex of artifacts and features (e.g., burial mounds and cairns; fortifications) could contribute to a better understanding the timing and expression of the Sí:yá:m Age. A range of factors including the influence of warfare, potentially even environmental change, may have influenced the manifestation of patterns recognized in this study, such as the apparent congregation of settlements, the settlement of islands in the Fraser River, and the centrality of housepit arrangements in large settlements. It is ultimately possible that the Sí:yá:m Age begins earlier in time. Given the multiplicity, complexity, and range of political-economic relations characterizing the Sí:yá:m Age it is predictably certain to be represented by a wide range of things and expressed in ways not dealt with here. The political-economy of *sí:yá:m*-based communities certainly manifest in things other than houses.

Burial and warfare practices provide two strong candidates for archaeological consideration in examining a broader range of possible influences on and expressions of the Sí:yá:m Age, alternative to and supplementing these housepit data. While I do not specifically treat these here, they stand out as viable and potentially fruitful avenues of future research on Stó:lō-Coast Salish community organization. Considering and synthesizing alternate sources of information and treating a broader set of theoretical perspectives is beyond the scope of this study. Additional insight into the development of Late Period social dynamics from a political-economic perspective comes from examining a final set of relations: the Early-to-Late Period transition from corporate to network-mode relations.

9.3 Schematic III - Modeling Political-Economic Relations and Community Organization through Time: Developing an Hypothesis

The location of power is a key part of community formation. The negotiation of power, who has it and where it is housed, is manifest in the settlement patterns defined in this study. Communities are defined by these relationships, the expressed of which is materialized in house forms and arrangements. Community organization is affected by relations of power negotiated and expressed within the construction and placement of pithouses in settlements, and settlements within the region. Recognizing these relationships, this study provides a basis for understanding changing political-economic relations and community organization.

My model questions long-held assertions like Underhill's (1945:174) that Coast Salish peoples "had no idea of belonging to a large group beyond [their] own village of plank houses" and that political leadership was lodged within locally autonomous villages prior to European contact; and Mitchell's (1983b:103) statement that "Although harmony was sought… there was no formal supra-village political order." The results of this study, describing the evolution of housepit settlements in this region, cast uncertainty on the validity of these and other such statements.

The political-economic negotiations supporting community organization forming a ramage incorporate a dynamic process of seeking, achieving, validating, and maintaining socio-economic status -- embedded, in part, in the construction of pithouses. Housepits are 'negotiated features'-- their form and placement not fixed or determined but are negotiated to accommodate a household's political-economic needs in relation to their neighbors. They literally materialize in the earth, as in-ground houses, the relations of power among with those who reasoned and built them. A core part of the interpretive framework of this study, then, expands on commonly accepted associations and incorporates the perspective that political-economic processes, negotiated and played out in the construction of houses, are also correlates of archaeological house features (e.g., Bourdieu 1973).

Housepits are 'the material structure of political action' (Marshall 1989) imbued with symbolic capital active in the negotiation of status differentiation among polities. I correlate housepit dimensions with labour requirements vested in their construction, control over which is a key factor in describing the socio-political structure of egalitarian, transegalitarian, and hierarchical or chiefly societies (Ames 2001; Blake and Clark 1999). In situations with co-existent large and small houses, the larger houses stand as measures of greater household wealth and power. Wealth and power are expressed in houses as control over the social, economic, political resources and lands required for their construction. Large houses hold more people potentially available as laborers and defenders. Large houses have more storage space for food and belongings, and provide more floor space for hosting guests and important social, economic, ceremonial, and political gatherings -- such as potlatches. Large houses are structurally more prominent and visible in their signaling of stature and identity. Large houses have greater value on multiple levels including social (household size), economic (storage capacity; labour pool), and political capital (power, prestige, and stature).

House-construction is an activity in which the exertion of decision-making power and authority is negotiated, as exemplified in the historical actions of Wileliq the Fifth. Oral history provided by noted *Ts'elxwéyeqw* (Chilliwack) historian Bob Joe (Carlson 2003; Duff 1952:43-44), Wileliq the Fifth -- the *Yewal Siyá:m* (i.e., highest ranking siyá:m and primary leader) of the *Ts'elxwéyeqw* (Chilliwack) people in the early 1800s -- provides an excellent example of the operational results of this *sí:yá:m*-based system. Joe recounted how, as part of the process of moving downriver from the upper Chilliwack River Valley and connecting with people (and communities) of the Fraser River Valley following the small-pox epidemic, Wileliq the Fifth built a large and completely new form of plankhouse called Qoqolax̱el (Watery Eaves). Qoqolax̱el had an inverted gable formed from two back to back shed-roof plankhouses. He strategically enlisted the help of other high status families from surrounding areas of the Fraser Valley in building his house at the junction of the Chilliwack River and Fraser valleys, located downstream and in front of Th'ewá:lí. As described, this central place was surrounded by a number of other settlements set behind Qoqolax̱el within the Chilliwack Valley that were also established in the process of this movement. Wileliq the Fifth's actions and gestures, with regard to both his Fraser Valley neighbors in one direction and also with respect to the long-standing settlement of Th'ewá:lí in another direction, exemplify the *sí:yá:m* system and patterning of political-economic relations deduced from the archaeological record. The emergence in the archaeological record of, for example, large or circular pithouses likewise constitutes innovation in forms of symbolic capital perhaps meaningfully tied to the strategies operating within this network of relations.

Competitive political-economic process involving the production, distribution, consumption, and reproduction of knowledge manifests in the material structure of pithouses and their arrangement within settlements. Houses of a particular size, shape, and placement represent rank and file in particular social and political order (Barnett 1955; Miller 2007). People's differences in knowledge and power are practiced and reinforced in pithouse construction, and settlement layout and arrangement. Variation among housepit features over time signifies change in the relations of power and, potentially, social order. Such points of change can constitute break-through moments in history. A household or group of households may succeed in negotiation (via warfare; inter-marriage for example) an outcome to an on-going political-economic contest that shifts the institutions of society and the balance of power in their favor. Successfully maintaining such a shift in power and patterning of houses and/or settlements over time requires affecting other community members in such a way that they consume, incorporate, and reproduce those newly established sets of relations.

I directly correlate houses, knowledge, authority, and power. Houses physically embody, integrate and display the relationship between control of (specialized) knowledge, control of labor (Ames 1996), the possession of wealth, and the access to resources needed to build them. House size and location manifest and 'visualize' a household's level of control and possession of these resources. They speak a common unspoken language describing household-level social standing. Relations between houses become cemented in the composition of commonly consumed elements of society and cultural practice -- such as the construction of small, medium, large or very large house; of square or circular forms; located in the center or side / front or back of a settlement. Successful manipulation of cultural practice is, in this case, expressed in the adaptation and persistence of changes in house form and their composition within and/or between settlements. Understanding variation in housepit and settlement forms in these terms adds a dimension of political dynamism to the framework(s) of change outlined above.

I admit that it is difficult to distinguishing *sí:yá:m* (i.e., leaders) households from the broader range of *smelá:th*-level (i.e., wealthy) households -- especially using only surface mapping data. Are wealth and leadership expressed differently in the archaeological record? Do these represent the difference between Class IV and Class VI housepits? Does the subtle relationship between Class IV sizes and circular forms of housepits that developing in the Late Period indicate the emergence of *smelá:th* households? I do not have the data necessary to answer these questions.

Based on my analysis, I suggests that, in Late Period Stó:lō society, *sí:yá:m* -- wealthy individuals of high status holding positions of authority as leaders -- stood as central figures around which community coalesced. In this framework, they were social nexus points; central nodes in a set of nested hierarchical relations and social structures. These leaders provided a 'meeting place' integrating socio-cultural, socio-political, and socio-economic relations; the knot in a series of threads forming a community fabric. A flexible community fabric peaked at these points, pushed upward and stretched vertically over time.

Siyá:m settlements -- places of occupancy and power -- appear to have set as anchor points amidst a dynamic field of players. Constant competition for prestige affected a field of co-existent *sí:yá:m*, engaged in a wide-spread interaction sphere and potlatch system. Completion for prestige tested their ability to maintain a high-standing in society and negotiate the relations of power (i.e., maintain control of a political-economic process) that served as their primary means of support.

The patterning in Upriver Group housepits and settlements in the Late Period suggests the engagement of wide-spread political-economic relations at strategically located hubs. These hubs constitute central places within a region-wide system of transportation and communication on the Fraser River, and major junctions of tributary systems. These socio-geographic hubs or nodes (Miller 1989a) provided 'meeting places' serving to integrate a number of lines of socio-cultural, socio-political, and socio-economic relations, bonded by *siyá:m* households and *siyá:m* settlements.

Evidence of the appearance of these nodes is most striking as the emergence of what appear to be *siyá:m* settlements at Qithyil Island (an island at the confluence of the Fraser and Harrison rivers); Welqámex (an island in the Fraser River centrally located in the Upper Fraser Valley); and X̲elhálh (at a head or terminus of the Gulf of Georgia-Fraser River water-borne travel corridor). *Siyá:m* households may be associated with housepit features F1 and/or F5 within Qithyil Island; F1 and/or F8 within Welqámex, and F15 and/or possibly F13 within Xelhálh.

While central tendencies are apparent in these settlements' arrangements, the location of authority within them may alternate between households through time, possibly obscuring any such differences. Alternately, leadership and authority may be shared between households constituting larger forms of polities with larger political-economic groupings such as ramages, as indicated in the ethnographic references provided below (Smith 1945). Continuing to explore issue of relations between authority and wealth expressed archaeologically, future studies should focus on the investigation of internal differences among the largest housepits, in addition to their relationships to small housepits within individual settlements (e.g., Graesch 2006; Lenert 2008).

At the settlement level, socio-political cohesion, an important principle in community formation (Suttles 1958), is expressed in the centrality of the largest housepits based on relations of size, such as at Qithyil Island, Welqámex, and Xelhálh. Structuring of social order among households within settlements motivates local cohesion and political-economic solidarity. Such solidarity is supported with a hierarchical relationship and maintained as a set of dualities in the spatial relationships between households -- forward - back; center - side; near - far (extending to a broader set of oppositional political-economic relationships including anchored - mobile; private - public; knowledge - habitus; innovation - practice; production - consumption).

The trajectory of change in political-economic relations defines a framework of community formation (Figure 9.6), showing the Early to Late Period shift from corporate to network modes of relations (Feinman 1998, 2000). The figurative shape of this framework simultaneously remains flat *and* flares upwards through time indicating an increase in the dimensions and complexity of community relations representing both corporate and network relations in the Late Period. Neither housepits nor households appear as individual, self-sufficient units in this framework. Rather, settlements represent the basic unit accommodating the negotiation of a broad or 'total' set of socio-economic and socio-political relations.

Elmendorf (1971) defines Coast Salish community as a total "social field" of relations. "Field" in this sense constitutes "the social or interactional space around a given individual social aggregate, treated as a referent unit… defined for a specific social unit referent and a particular set of activity forms" (Elmendorf 1971:356, 364; paraphrasing Lewin [1951]). The social relationships and the structural arrangement of the networks by which they are asserted are mutually interdependent.

Elmendorf used the concept of network as the "the totality of all the units connected by a certain type of relationship" (Jay 1964:138). He defined networks within a General Systems Theory model much akin to Mauss's (1925) Total Social Phenomena, and linked to Barth's (1969) relational manner of defining ethnic units. The co-resident winter-time house group (i.e., village versus household) constitutes the basic and most stable Coast Salish social unit and "primary community unit in the network system" (Elmendorf 1971:357). Villages (i.e., what I refer to in this study as settlements), he suggests, are not socially or economically self-sufficient units but rely on relations established through inter-village networks to maintain these local units. The findings of this study support this assertion.

Period I is represented by a narrow scale of measure characterizing the horizontal plane of political-economic relations practiced at this time (Figure 9.6). A form of settlement-based corporate structure, or mode of production, is suggested by the structure of Period I (2550-2000 cal B.P.) settlements represented by S<u>x</u>wó<u>x</u>wiymelh I and Shxw'ow'hamel I.[51] The inhabitants of S<u>x</u>wó<u>x</u>wiymelh I appear to have acted in a collective and coordinated manner, characterizing a corporate group structure. They worked together to produce nephrite goods that were then widely distributed throughout the region (Lenert 2008; Brown et al. 2008).

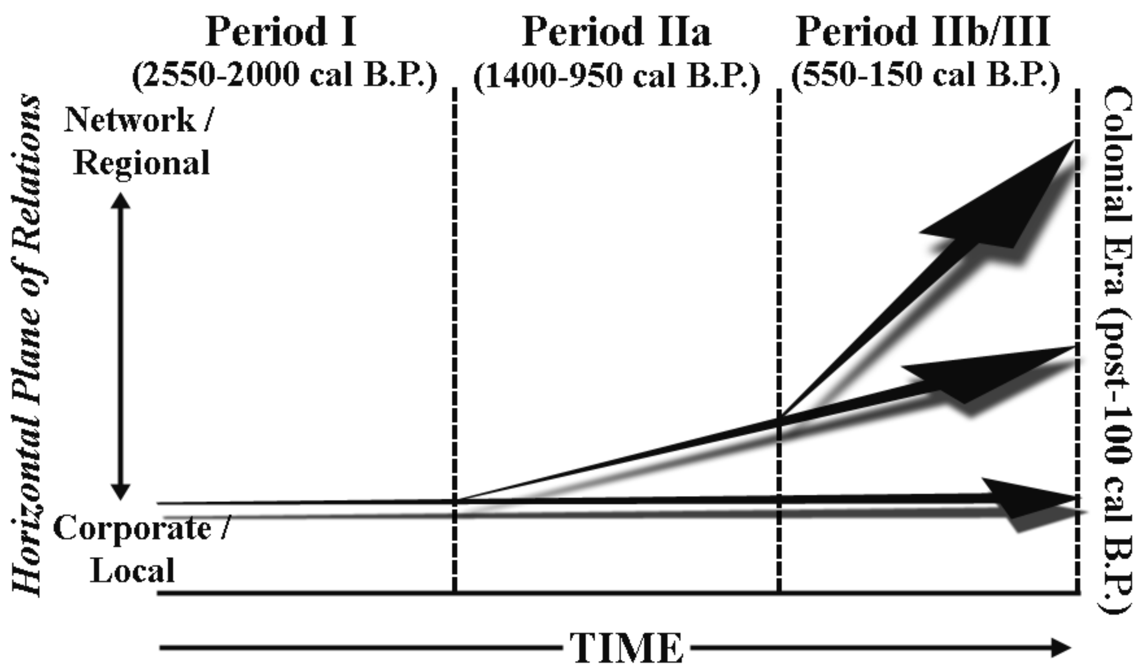


Figure 9.6. A framework of community development and changes in the horizontal plane of relations through time.

A settlement-based view of political-economic relations and interactions during Period I constitutes neither a cap nor a limiting factor in the economic and social interactions of this or any other period. Archaeological evidence supports the interpretation that economic (and other forms of) interaction extended throughout and beyond the Gulf of Georgia Region for thousands of years, preceding and continuing throughout the scope of this study (Borden 1975; Burley 1980; Carlson 1994; Grier 2003; Pratt 1992). A broad range of interactions including trade, exchange, and warfare are recognized as continuing throughout Periods I-III as a backdrop to

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[51] Findings from the recent detailed archaeological investigation of housepits at S<u>x</u>wó<u>x</u>wiymelh I support this interpretation (Lenert 2008; Lenert and Lepofsky 2006).

this study. This discussion brings focus to housepit settlements as one of the ways in which, as Mitchell (1971) synthesized, "such movements and positions relative to the Fraser River have defined.. economic strategies for almost two millennia" (Grier 2007:302; also Lepofsky et al. 2005). As Grier (ibid.) states --

> the same point has been made by Suttles (1987), and I (Grier 2004) have argued that widespread and regular interactions across the Gulf of Georgia have characterized at least the last two millennia. During this time the Fraser River has acted as a conduit that connects Coast Salish-speaking peoples economically, socially, and politically (see also Brown 1996). The critical point is that journeys by [Coast Salish] peoples to the Fraser River area have been taking place for many millennia, but the context, frequency, and objectives of those movements have changed as a result of developing regional and local circumstances. We must understand the regional ebb and flow as a historically evolving system..

The description of continuity and change in political economic relations in this study serves to highlight the ebb and flow of the regional system.

The shape of community organization changes through time (Figure 9.6). In Period I (2550-2000 cal B.P.) it is defined as a narrow band of horizontally restricted political-economic relations. The profile of vertical relations in this period is also restricted. Trends developing throughout Period II (1400-950 cal B.P.) expand this shape outwardly with an increasing scale of relations along the horizontal axis. This expansion of relations adds another layer around the corporate structure characterizing Period I. Community shape transforms into a widely flared shape with multiple layers in Period III (550-100 cal B.P.). The Late Period, preceding colonial influence, constitutes a social transformation into a network mode of political-economic relations and expressions of community.

Figuratively slicing through at the flared intersection of Period III and the Colonial Period creates a social-spatial model of outwardly expanding concentric rings. Moving from the inside to the outside of this ring-work one moves from the local to the regional level of interactions (Figure 9.7). This framework of political relations is similar to Jay Miller's (1999) model of anchored radiance and can be interpreted as incorporating elements of Bruce Miller's (1986) family corporate groups and social-spatial models of exchange theory (Miller 1989a, 1989b; also see Mooney 1976). The outermost strata of political-economic interactions and relationships extends across a stratified landscape space from local (e.g., intra-settlement) to broader regional (e.g., inter-settlement) levels. Community (ies) forged of these relations exist simultaneously, as a nested hierarchy of political-economic relations similar to ramage and constituted by multiple formations of polity.

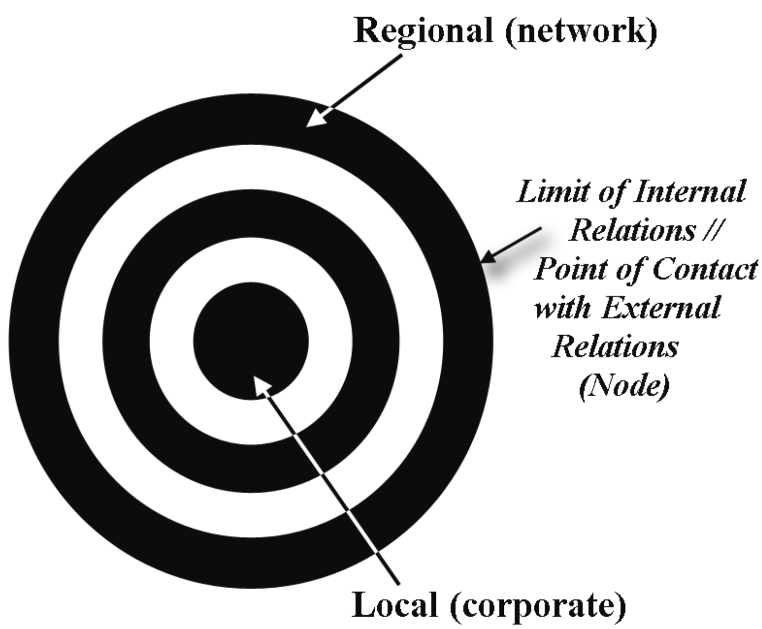

Figure 9.7. A social-spatial model of community relations.

This interpretation complements and supports Elmendorf's network model as an element of the change in practices presented above. Social-spatial distance models of Central Coast Salish reciprocity and interaction developed by Cathleen Mooney (1976) and Bruce Miller (1989) also support this interpretive framework. Miller's use of communication theory stimulates new thought about the place of communication and transportation as a central aspect of regional social structure. Miller (1989:271) states that "interaction in the region was not random, and this point takes on ethnographic significance because the structure exhibits some longevity." This statement is supported by the archaeological patterns shown in the previous chapters.

Between Periods I and III, political-economic power -- influence over the economy and habitus of knowledge and cultural expression -- changed from being vested in a number of local corporate communities to an interrelated network of communities of households and settlements. I find centrality expressed not only within settlements, but more widely implied in the relationships between settlements strategically connected to the Fraser River corridor. Strong centrality, Miller (1989:274) finds, is associated with relations between closely-tied settlement groupings. This pattern develops throughout Periods II and is even more clearly expressed in Period III.

On the North Coast, Coupland, Martindale, and Marsden (2001) link trade and exchange to the development of local group rank rather than population or resource abundance. In the Stó:lō-Coast Salish area, Elmendorf (1971) and more recently Carlson (2003), also emphasized the importance of travel between settlements and watersheds by individuals of high social status. Relations between high / low class are defined and differentiated in respective terms of extra-local / local relations; controlling / controlled access and knowledge; prestige / survival (i.e., habitus or practice). Authority, class and power are vested in the control of knowledge and communication as much as in the control of materials and labor. "Although other sources of power exist, it is knowledge of power (or powerlessness) as presented [*in the form of houses*] and experienced [*within settlements*] on a daily basis that makes it real to people and determines their actions" (Earle 1997:35-37; italicized notes added). I use this point to suggest that the potlatch system may have developed during Period III as an aspect of inter-household and inter-settlement relations serving as a mechanism for controlling knowledge and communication.

Miller suggested that a maximization strategy of resource extraction and use tied into intercommunity relations “applies not to individual tribes [i.e., settlement groups] or villages, but to the network as a whole” (Miller 1989a:273). This strategy relies on a political-economic process in which individual *siyá:m*, located throughout the region, would serve as the main points of connection in this network of relations. Their houses and settlements would serve as central places of more intensive interaction: political, economic, and social. These places of power would have brought together and focused material and ideological relations in the political-economy of culture. This maximization strategy or process plays a particularly important role in the potlatch system that, according to current archaeological evidence (Ames and Maschner 1999; Carlson 1994), is theorized to have developed along the Coast within the last 500 to 1,000 years.

Potlatch systems provide mechanisms for negotiating prestige, power, and indebtedness within society. As Kan (1989) notes for the nineteenth century Tlinget funerary potlatch system, symbolic capital, such as houses, served as a primary medium used in negotiating prestige and power within and between households and settlements. This interplay between material culture and symbolic meaning constitutes the politics of culture.

Following Mauss’s notion of the potlatch as a symbolic structure, Kan (1989:209) elaborates:

> the exchange of potlatch food and gifts was a rich and complex system of communication, in which material objects carried metamessages about eschatology, power, and rank, as well as success in subsistence activities, trade, warfare, and key cultural values and structural principles. Using the artifacts circulating in the potlatch system, the participants negotiated their social and power relations as well as expressed their feelings and attitudes toward each other.

Kan supports Mauss's idea that material goods are imbued with "some element of the giver's personhood" (ibid.) embedding the concept of indebtedness deeply within the politics of culture, and weaving it deeply within the societal fabric of the time.

The potlatch system, as a locus of interaction in the political economic 'field,' is quite plausibly linked to the political-economic relations represented in Period III household and settlement patterns. Kan (1989:218) states, "In the course of the potlatch, the hosts presented their opposites with an interpretation of the distribution of power and prestige in the social universe and tried to make them accept it, without antagonizing them." The use of war symbolism and rhetoric paralleled the preparation for potlatches -- scenes of mock warfare or raiding upon arrival of guests; a transition to peace upon the Chief host's 'losing the war' upon arrival (Kan 1989:222-224). Similar descriptions come from accounts of Central Coast Salish potlatches provided by Elmendorf's Twana informants (Elmendorf 1993). This political-economic dynamic resonates with Suttles's (1987) that the two most important topics in Coast Salish anthropology include issues of authority and warfare.

The negotiation of social-spatial tensions occasioned by a group of guests arriving at and approaching a settlement for a potlatch is a critical power play, and a point of political interaction. Such events are significant aspects of the competition for social prestige and power and the interplay between fighting / feasting and warfare / peacemaking. Political economic values are expressed in the negotiating of social-spatial relations embedded in the larger of the Period III settlement arrangements (e.g., X̲elhálh, Welqámex, Qithyil Island) and enacted potlatching that more than likely occurred within these spaces.

Bierwert (1986:223-225) records similar patterning and socio-political values in the arrangement of individuals in ceremonial Stó:lō longhouse settings:

> This [longhouse] arrangement is a microcosm of the settlement patterns of the reserves. Within the hall, the groups are segments, just as the villages or

> reserves are segments apart from one another. As segments, they have little relationship caused by their position next to one another, except that they are equivalent to each other. The spatial composition of each group resembles that of the reserve. At the forefront is the representative of the group, the one who receives others. Arranged alongside are the supporters of another, the relatives. Altogether, the people back up the leader, and in so doing form a unit or group.. The supportive flanking also a common feature of ritual action.

The C-shaped or flanking pattern creates a form of "enclosure" and expresses a form of group unity. Bierwert notes that "using the metaphor 'standing up for each other' is widely used to express cooperation. The phrase is colloquial in English, but when used by Stó:lō people it connotes the action which takes place in ritual contexts, alignment, and flanking" (Bierwert 1986:226). She continues:

> Spatial symbolism organizes Stó:lō peoples' interactions in that people can respond accurately to formal behavior in each other. Examples of side-by-side and face-to-face interactions show us how spatial paradigms repeat in different contexts. Within a group, leadership is inconspicuous, being mediated.. by spatial alignment (flanking). Between groups, leadership is conspicuous, being.. at the front (Bierwert 1986:274-75).

The household relationships expressed in housepit patterning at Welqámex, X̲elhálh, John Mack Slough, and Qithyil Island represent conspicuous representations of leadership in pre-contact and pre-Colonial settlement settings -- based on the physical manifestation of the spatial symbolism Bierwert describes above. These patterns are repeated in broader-scale relationships between intra-and inter-settlement variability (e.g., housepit frequencies, housepit sizes, settlement sizes), layout, and arrangement on a regional scale.

Sí:yá:m are power figures in the relations of production of knowledge in this system; the community being the means of production; the potlatch being the mode of production. *Siyá:m*-and-community relations are not necessarily aggressive or aggrandizive in nature. Rather, *siyá:m* act as a central point in a network of relations connecting between objects, meanings, and values and distributing meaningful and valuable objects. This process is supported by a community that feasts from a common platter of meaning. What motivates and justifies the expense of resources and energy needed to produce of mountain goat wool blankets, worn by *sí:yá:m* (Duff 1952)? What benefit derives from accessing the distant alpine areas of the rugged Cascade Range for this purpose? *Sí:yá:m* manage the meaning of such things, consolidating and redistributing objects and labour and in so doing accumulating symbolic capital, status and prestige.

Contra functionalist and cultural ecologist perspectives, the potlatch is, within a political-economic paradigm, not an economic system by nature. Presumed to operate on the same principles Coast-wide, the potlatch is "not a struggle over material wealth but over symbolic capital -- reputation, prestige, and honor… The potlatch's economic function, if any, was secondary and indirectly increased subsistence activities and trade which generated the necessary surplus food and items of value" (Kan 1989:247-48). A flaw in cultural ecological and materialist explanations of the potlatch, then, is a "failure to recognize the multivocality of the food and gift items which served as a mode of communication…[carrying] messages about the immediate strategies, concerns, and emotions of their donors as well as.. fundamental cultural values… the artifacts served the same purpose as words" (Kan 1989:249). Pithouses of the Late Period (post-550 cal B.P.), appear to have served a similar purpose as architectural messengers features that spoke constantly in political-economic terms of one's household and settlement standing in Stó:lō-Coast Salish society.

Speaking this political language was a practice of the wealthy and powerful. This was a *siyá:m* language, spoken in part quite literally through a dialogue of houses (Coupland 2006). Simply hearing and understanding this language served to bond people in the practice of a common political culture ending often in the habitus of indebtedness. Socio-political cohesion developed through time in a number of ways coincident with the transition from corporate to network modes of relations; possibly encouraged or reinforced by the advent of a potlatch system. Potlatches served to consolidate power within a network of social relations and simultaneously encouraging a stable population of cohorts working as laborers within this system.

During the transition from Period II to III, the social relations between households and settlements come to form a ramage; a regional community constituted by a number of hierarchically structured inter-household and inter-settlement relations replicated throughout the region. As a social system, multiple communities interacted simultaneously as part of a socio-political group attached to a *siyá:m*, incorporating both corporate and network modes of relations associated with inner and outer rings of relations (Figure 9.7).

Figure 9.8 illustrates relations between multiple, intersecting socio-political groups which coalesce at a point associated with *sí:yá:m* authority. While each group (i.e., Group A, B, C) forms a community in and of itself, each is made up of a number of sub-communities.

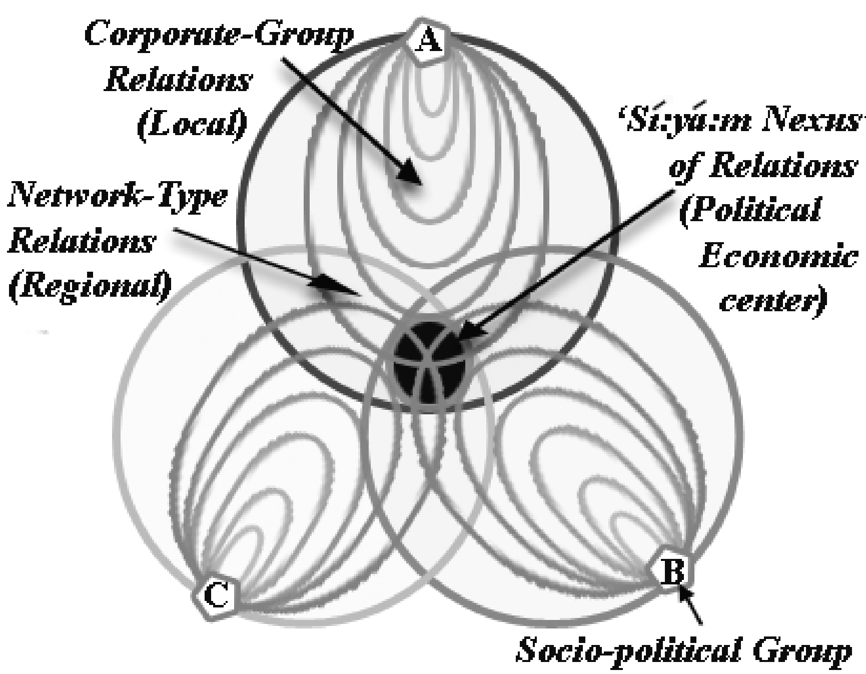

Figure 9.8. A political-economic model of inter-and intra-group relations and community organization.

Localized corporate communities of households and settlements are situated at one end of the political-economic spectrum. At the other end of the spectrum are households and settlements which, in approaching the nexus point, constitute communities with a wider range of relations. *Siyá:m* households and/or settlements constitute a community unto themselves engaged in the broadest set of relations. Social distance increases between households and settlements engaged in corporate and network relations, as spatial distance also increases. Upon reaching the nexus point in this model (Figure 9.9), socio-political relations transition from a localized or tributary watershed-based system to an extensive, regionally-based system associated with the Fraser River corridor. *Sí:yá:m* relations cross-cut the spectrum of communities that are articulated within their own socio-political group; as tributaries running perpendicular to the Fraser River.

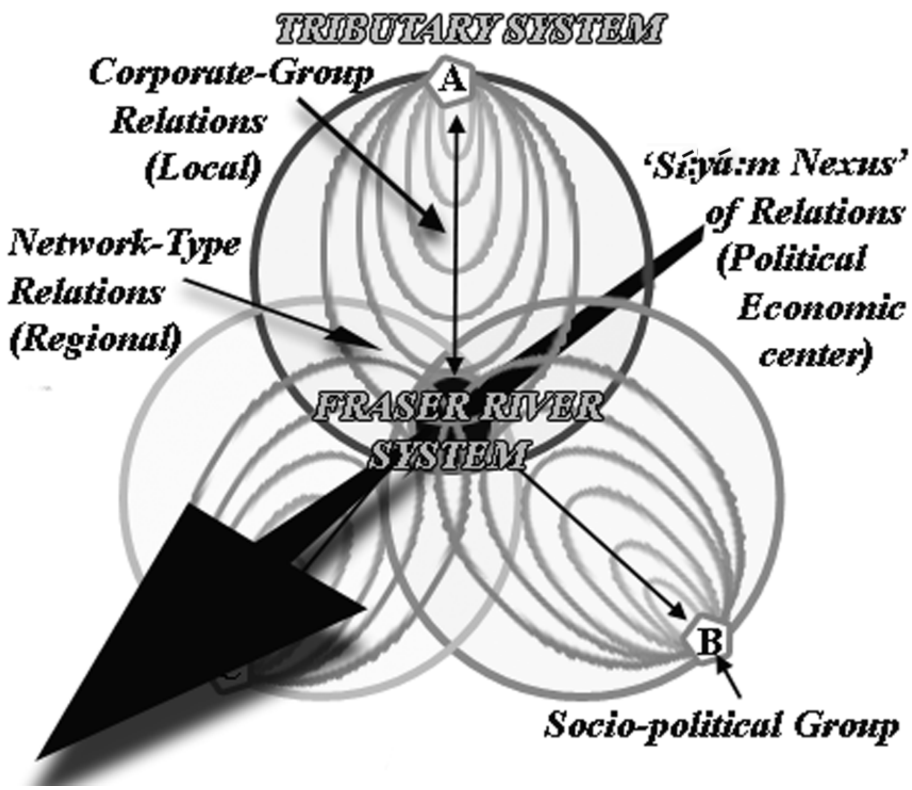

Figure 9.9. A political-economic model of inter-community spatial relations conjoined as a network by the Fraser River communication and transportation system.

These tributary units may represent literal (e.g., Harrison River; Chilliwack River; Chehalis River; Sumas River) or figurative (e.g., *Ts'ó:kw'em* or Fraser Canyon area) socio-geographic watersheds (see Carlson 2003).

Sí:yá:m relations connected a community of *siyá:m* households and settlements located within and distributed throughout the Fraser River system. In the Late Period, this community stretched from Xelhálh at the entrance of the lower Fraser Canyon, to Welqámex at the center of the Upper Fraser Valley, to Qithyil Island in the center of the Central Fraser Valley and beyond. The social-geography of this community may be figurative to some degree, possibly including Th'ewá:lí and Hiqelem as nodes in this system. The Fraser River system would thus expand as "the River of Rivers" (as told to Charles Hill-Tout by a Stó:lō informant; Carlson 2003:55) to include the open waterways of the Harrison and Chilliwack Rivers. As a political-economic parallel to the Fraser River system, this *sí:yá:m* system of relations was the regional community of communities brought to bear through a well connected network that "(permitted) movement both horizontally and vertically between a hierarchy of centers on a regional landscape" (Santley 1991:199).

Stó:lō oral history provides support for the existence of broad-based system of hierarchical settlement arrangements and leadership in this region, as recalled by Stó:lō community members in the mid-20th century: "Pelek was chief at Yale. Chief of a group of villages and all worked together" (Interview with Mary Charles, Marian Smith Fieldnotes, MS 268:1, p.15, 1945). Liquitem was the name of the "head man" who lived during the early-to-mid 19th century (Carlson 2003:187-189) in a village near Yale (possibly X̲elhálh) that was considered "the main headquarters from here to Maria Slough" in the Central Fraser, coincident with the Tít tribal area Valley (Interview with Bob Joe [?], Marian Smith Fieldnotes, MS 268:3:2, No. 10, 1945). "In each tribe, one main leader. Head governor of that tribe. Also village headman. Whatever happened there was reported to main leader…. Liquitem was headman over 60 years" (Interview with Patrick Charlie, Wilson Duff's Fieldnotes, Notebook #1, p. 86-87, 1950). "The old chief at Yale was boss of the whole river… there were subsidiary chiefs all along the Fraser" (Interview with Mary Charles, Marian Smith Fieldnotes, MS 268:4:1, p.6, 1945).

The social-spatial relationship within such a community order forms a tension of binary opposition between high and low status people and households. Using the commonly recognized ethnographically-based social structure fit, in this study, into a precontact Late Period framework, *siyá:m* , *smelá:l*h, *st'éxem*, and *skw'iyéth* represent the gamut of social standing. *Sí:yá:m* occupy the top wrung, or one pole of this model. *Skw'iyéth*, as slaves, occupy the base of the socio-political scale and the opposite pole of this model. These two socio-political stations are represented in the diagrams of inter-community relations presented above; *si:yá:m* as the nexus and *skw'iyéth* as the smallest of rings in the nested hierarchy of intra-community relations. These sets of relations are supported by Carlson's (2003) ethnohistoric study of 'supra-tribal' Stó:lō relations extending back to the early contact period.

Sí:yá:m have limited mobility, yet wide-spread authority. While a *siyá:m* is anchored to a specific locale of residence (by the nature of their status and being typically adult males) they maintain far-reaching connections to other settlements (see Carlson 2003; Elmendorf 1971; Miller 1999). *Siyá:m* households exert the most authority over the political-economic system. *Skw'iyéth* are equally anchored to a place of residence yet maintain no authority and, in fact, are typically female and/or child imports from other political economic systems altogether. They have no independent mobility and no authority; they represent pure habitus, i.e., nothing more than actors in the production process. These two 'poles,' while socially-spatially disparate are often physically resident in the same settlement if not the same house. *Skw'iyéth* are part of higher status households and most likely helped make up the larger numbers of people in the larger housepits associated with *smelá:lh* and *siyá:m* (i.e., generally wealthy) households recognized in Period III. Some *skw'iyéth* also likely lived outside *siyá:m* residences, *skw'iyéth* in which case they may have occupied smaller houses situated in more peripheral locations. This possibility could be tested in future archaeological research in the region.

Between this bi-polar *siyá:m*-*skw'iyéth* relationship was a dynamic set of actors that ranged between *st'éxem* ('poor' or 'worthless people') and *smelá:lh* ('wealthy' or 'worthy people'). *St'éxem* households did not hold, regulate, or have access to knowledge. Not 'knowing their history,' they were disconnected from both 'place and authority' and therefore could be highly mobile -- within the political-economic system of the community. Their objective was to negotiate this system, moving laterally between households and settlements, to enhance their chances of increasing their status to the level of *smelá:th* and, potentially, into a position of authority as a *siyá:m*. These relations ebbed and flowed within the political economic system suggested by the arrangement of and variability between housepits and housepit settlements studies in this project.

Cohesion was founded within this political-economic system as a form of tension between social strata. Social bonds formed between those with political economic power that helped to shape culture (residing at the outermost ring of a social-spatial distance model; Figures 9.7-9.9) and those without power that largely practiced the habitus of culture. Each was dependent upon the other. Tension and bond were maintained, and supported by, a hierarchical relationship between a widely spread set of *siyá:m* households and their constituent households. The broader range of community members between *st'éxem* and *smelá:lh* were limited in their relations and movements to more locally defined corporate-type networks (i.e., situated within the inner rings of the social-spatial distance model; Figures 9.7-9.9).

A key social principle at work here is the development of multiple and simultaneous expressions of community. These findings suggest that Stó:lō-Coast Salish communities developed in a cumulative and stratified manner between Early and Late Periods. Through time, community relations expanded outward with the development of hierarchical social organization. Newly established points of connection among emerging social strata incorporated new, more elite communities and broadened the scale of the horizontal plane of relations. In the Late Period, this totality of communities constituted a complex set of socio-political interactions characterized by a hierarchically ordered network of inter-household and inter-settlement relations. *Sí:yá:m* communities consolidated and negotiated power at the highest level of this political-economic order. These communities formed a socio-political landscape of interaction and cohesion that is unparalleled within the Coast Salish world because of its ability to support intra-regional and inter-regional transportation and communication -- the Stó:lō (or Fraser River) between the Canyon and Gulf. These communities remain actively represented by the ancestral footprints of pithouses that continue to occupy the cultural landscape.

My research contradicts a common notion that "the tribe… did not constitute a political or economic unit until the second half of the nineteenth century" (Kennedy 1995:51). Rather, my findings suggest an opposite trend ending in a period in which the Colonial government effectively collapsed the vertical axis of power and reduced the extent of vertical and horizontal relations established in the precontact era. Because this process continues to this day, this study may contribute to our understanding of contemporary native-newcomer relations in the Gulf of Georgia Region of southwestern British Columbia.

CHAPTER X - CONCLUSION

This study addresses questions about Stó:lō-Coast Salish socio-political relations and community organization over the last three millennia through the archaeological investigation of housepit settlements. These quantitatively-based analyses found strong patterning and trends in variation within and between housepits and settlements, increasing in the scope of variability along vertical and horizontal planes of relations through time. These patterns represent change in socio-political relations among the Stó:lō-Coast Salish inhabitants of these houses and settlements over the 2,500 years preceding the colonial influences that affected them after AD 1858. This framework is based on patterning deduced from a sample of 10 to 15 % of all known housepit features, and approximately 10 % of all recorded housepit settlements the 'upriver' portion of the mainland Gulf of Georgia Region.

Major themes addressed in this study include the political-economic definition of community organization; the relationship between settlement and community archaeology; the use of ethnographic data in archaeological interpretation; and methodologies of household and settlement analyses. I situate community within a framework of political economy and practice tied to the negotiation of authority. This study engages the emerging field of community archaeology and provides social and political theory supplementing the long-standing tradition of settlement archaeology. The practice of an integrated community-settlement archaeology blends materialist and ideationist perspectives in the interpretation of artifacts and features. In searching for meaning in Stó:lō-Coast Salish housepits, I merge top-down and bottom-up approaches to investigating households and settlement patterning, social organization, and community relations. Multiple levels of relationships are examined within a landscape of interconnected people, places, and things. This study is exploratory in nature. It is intended to raise questions and provide a framework for future research.

10.1 Household Archaeology, Settlement Studies -- Methodological Implications

This study contributes to the handful of archaeological settlement pattern studies so far undertaken on the Northwest Coast (Acheson 1995, 2005; Archer 2001; Mackie 2003; Mitchell 1983b). Far more attention has been paid either to (1) house and household analysis of a single feature or at a single site (e.g., Ames 1998, 2006; Coupland 1996, 2006; Hanson 1973; Grier 2000; Mason 1994; Matson 2003b; Mitchell 1963; Lepofsky et al. 2000; Schaepe 1998); or (2) analysis of inter-site assemblage variability of artifact types and frequencies between sites within a region (e.g., Burley 1980; Grier 2003; Clark 2000; Pratt 1992). Both types of study lie within the encompassing scope of 'regional analysis' (Tabor 2004). We owe a great deal of thanks to those who committed to and carried out work these works. This dissertation serves to link these previous studies and contribute to our understanding of another element of data -- housepits -- across a continuum of multiple scales and temporal rhythms (Smith 1992).

Enabling this study were methodological innovations and technological advances of the last decade. Significant advances in mapping technology and sampling strategies provided significant new radiocarbon data, detailed stratigraphic data, and precise spatial data useful in describing housepits and settlements. These data were gained as part of this study carried out between 2003 to 2006 in association with the Fraser Valley Archaeology Project (e.g., Lepofsky, Schaepe, Blake, and Arnold 2003; Schaepe, Blake, Formosa, and Lepofsky 2006). Data collected from this fieldwork served to augment the data set developed over the previous 50 years and provide a means of effectively controlling time and space. The use of high precision technology in locating and mapping housepits and settlements -- as part of the Fraser Valley Project-- proved highly successful as a non-destructive and accurate means of collecting primary data. The maps produced here provide a level of resolution for studying housepit sizes, shapes, and arrangements; data that were heretofore unavailable.

These new data were used to effectively address and overcome the uncertainty, lack of detail, and data issues previously limiting the study of housepits in the region. Digital mapping methods proved to be remarkably versatile and useful in establishing a basis for extracting an accurate and reliable new dataset. The process for extracting housepit sizes, shapes, and locations are described and presented as a reliable and replicable procedure using commonly available mapping (i.e., Surfer) and geographic information systems (i.e., ArcView) software. The reliability of this procedure provides opportunities for on-going evaluation, testing, and augmentation of these results as additional data are produced. The quantitative analyses carried out in this study benefited from, and in fact were made entirely possible by, the application of these advances in data collection and analysis technologies.

10.2 Implications for Political-Economic and Material Economic Relations

A goal of this study was to integrate materialist and ideationist perspectives in the archaeological investigation of community. Recognizing economy as a system of production, distribution, consumption, and reproduction (of things; of knowledge; of meaning) works into an explicit discussion of the relations of power and community organization (as well as identity) within archaeology (Bourdieu 1977; Foucault 1972; Roseberry 1988). While I focus on political-economic, I do not dismiss 'economy' in its more commonly understood and applied materialistic sense. Without doubt, the material characteristics of 'natural' resources requirements, of nutritional value and biological needs, factors into the negotiation of social relations and affects the competition for social standing as elements of the 'field' of interacting forces affecting practical reason and the logic of practice (Bourdieu 1984; 1977). Changes in settlement patterns identified in this study indicate a shift in orientation from placement within resource rich locations to more strategically situated communicative locations, at least among the upper class of Stó:lō-Coast Salish society.

The valuation of resources and objects, beyond meeting biological needs, is heavily influenced by a political-economic system that transforms functionality into ideation, material into symbolic capital -- as symbolic capital vested in pithouses, plankhouses, and settlements along broader and multiple scales of currency. Communication, as a factor Bourdieu's (1977, 1984) *field* and *practical mode of knowledge,* is a key means by which the material-economic valuation of materials and objects is brought into the realm of political-economy and transferred into capital, wealth, prestige, and socio-political status.

The results of this study complement the investigation of other forms of economic systems, such as the material-economy (e.g., trade and exchange; tool production; see Graesch [2007] for a discussion of ground-slate knife production at Welqámex; Blake [2004] discusses trade and exchange); symbolic-economy (e.g., artwork and funerary features); social-economy (e.g., names; family relations and reckoning of genealogical relations); communicative-economy (e.g., linguistics); religious-economy (e.g., cultural landscapes; transformer narratives; ceremonial relations); and military-economy (e.g., fortifications). The political-economy -- as the negotiation of residence of authority and power -- defines the central place and means by which these economies are integrated, understood (or contested), and acted out in the competition for power (i.e., control over these economies) and the formation of community.

A central assertion supporting the interpretation of findings in this study is that community in pre-state societies coalesces around figures of authority wielding power over the political-economy. People, as actors within and enactors of the political-economy, define the existence and meaning of resources, objects, and places through practice (Anderson 1983; Bourdieu 1977; Pauketat 2001). The centrality of place within a system of communicative networks -- which this study demonstrates to have developed within Late Period Stó:lō-Coast Salish society both locally and regionally, within and between households and settlements -- represents the manifestation of control over interaction; authority within the political-economic system; and central points of power in the formation and organization of community.

Our archaeological connection to political economy relies on exploring and developing social theory that improves our understanding of links between functional, material, and ideational perspectives (Trigger 1967; Hodder 1989; Canuto and Yeager 2000). Controlling time and space (Chapters 4-8), at multiple scales, is an essential part of our methodology in developing an integrated community-settlement archaeology. The approach developed in this study, drawing on a social theory developed by Bourdieu (1977, 1984) and Roseberry (1988, 1989) and others (e.g., Sahlins 1976), recognizes knowledge and economy, time and strategy, power and habitus, tradition and competition, and interrelationships and transformation as essential elements of community formation.

As a result of this study, I understand community as not entirely imagined (Anderson 1983) yet not entirely economically or environmentally determined. A community is not necessarily limited to a spatially clustered group of households or houses. Rather, communities have the potential to be manifestations of broad-based socio-political-economic relations affected by access to knowledge, wealth, prestige, and power consolidated in figures of authority. In Stó:lō-Coast Salish terms, wealth, power, and prestige integrate economic, political, social, and spiritual relations (Bierwert 1986; Elmendorf 2003; Miller 1999). These relations are interconnected, integrating access to and control over resources, knowledge and meaning, social networks, and spiritual relations. The interconnectedness of people, places, and things in this worldview constitutes a total set of relations. Communities are not necessarily local and isolated in scale nor otherwise extensive and broadly interactive but can be, as demonstrated in this study, stratified and operating simultaneously at multiple scales in an integrated manner. Communities are not static, yet they are observable in a static form through the relations of housepit features through time and space.

The dynamic ‘political-economic’ practice of seeking, achieving, validating, and maintaining socio-economic status -- strongly tied to spirituality in the Coast Salish world (Elmendorf 1971; Suttles 1963; Miller 1999) -- is expressed by individuals and families in the construction of housepits and settlements as media of socio-political capital: symbolic capital. These archaeological features speak to social standing and authority as material elements of an ancient language of power. This language that can be interpreted through the measurement and analyses of housepit attributes like size, form, and location when compared through time and at a regional level. This view of community integrates materialist and ideational perspectives understanding communities as built upon relations of power actualized in material form, a common feature of which is the house or specifically housepits (and plankhouses) as in this case.

Tradition, understanding, and recognition affect the development of a socio-cultural dimension of landscape, comprised of interconnect places, within which people lived and interacted (Ashmore and Knapp 1999; Zedeno 2000). Descriptions of archaeological features are brought into meaning through the application of these layers of geographic, environmental, socio-cultural, and cultural landscapes -- individually and as a group or groups of dynamic and interconnected features and theaters of political-economic interaction. This view underlies my choice of data, my analyses, and my exploration and interpretations of community. The scope of my study goes beyond ‘localized’ house- or settlement-level expressions of community to explore broader expressions of inter-settlement and regional-level socio-political organization and community formation.

Settlements are formed of groups of households that decided to build houses and live near one another at a particular place for a period of time. Housepits of obviously different sizes and shapes, as emerged in the Late Period, represent different household forms -- from nuclear, to extended, to multi-family kin, and perhaps non-kin, units (Ames 2006). Interaction between households provides a basic unit of inter-household relations. These relations correlate with the spatial and temporal arrangements of housepits as a basic element of community imprinted on the landscape. Reason, meaning, and socio-political relations underlie the arrangement of housepits forming those settlements, as factors of practice and political-economic relations (Bourdieu 1973, 1977; Pauketat 2001). Investigating the patterning of housepits within and between settlements, on a large scale, provides a means of exploring the reasoning and logic expressed in those relations, as a political economy of power, meaning, and symbolic capital. Central themes of investigation include the relationships between houses, households, and settlements (e.g., Feinman 2000; Hayden 1994, 2000; Hayden and Cannon 1992; Mehrer 2000; Muller 1997; Pauketat 2000; Prentiss and Kuijt 2004; Sobel, Gahr, and Ames 2006; Steponaitis 1978).

The house, itself, is emerging in recognition as a basic medium and means by which households relate to one another, defining social relations, and affect community organization. Relations between house structures and socio-political Houses and households are discussed at great length in the anthropological literature (Bourdieu 1973; Coupland 2006; Sobel, Gahr, and Ames 2006; Levi-Strauss 1982). Houses are a factor of household prestige, and vise versa (Sobel 2006). Levi-Strauss (1982) recognized this within his concept of House Societies and house-based social organization. Houses act as powerful influencers on and of people in the course of their interactions, embodying symbolic capital as 'the material structure of political action' (Marshall 1989). House dimensions, for example, correlate with labour requirements vested in construction, control over which is a key factor in describing the socio-political structure of egalitarian, transegalitarian, and hierarchical or chiefly societies (Ames 2001; Blake and Clark 1999).

Central to our collective archaeological success in continuing to explore and improve our understanding of community organization is our ability to link material and social forms, such as houses, households, and polities and to understand how they operate together (Trigger 1967; Canuto and Yeager 2000). We need to improve our ways of recognizing and measuring communication as a means of linking these features of society (Chapter 4). Ancient households, families, and communities constitute an interconnected socio-political web of relations forming a political-economic network. Interactions of this socio-political substance are expressed physically and made real to archaeologists in the material forms and manifestations of their relations. The control and transmission of information, as knowledge, is a central element of community formation recognized and addressed in this study (Anderson 1983; Bourdieu 1977; Cohen 1985; Delanty 2003). In this study, I attempted to incorporate elements of these views of community and integrated them into settlement archaeology in an effort to improve our methods and understanding of this emerging field of study. I discuss my conclusions about community-settlement archaeology below, after first talking more about community.

10.3 Implications about Community

The ethno-archaeological narrative describing community organization among the Stó:lō exists within a historical context that connects to broad Coast-wide trends, recognized well beyond the mainland Gulf of Georgia Region. For example, trends in increasing house size are similarly found in other regions of the coast (Acheson 1995; Ames 2006; Archer 2001;

Johnstone 2003; Smith 2006). Other trends include wide-spread trade and exchange, warfare, and interaction perhaps most significantly engaging in a Coast-wide potlatching system that appears to have developed and persisted over the last 1,000 years (Ames 2001; Ames and Maschner 1998; Blake 2004; Carlson 1994; Matson and Coupland 1995). Engagement of and involvement in far-reaching interactive systems creates a similarity of experience shared by many other indigenous societies living elsewhere on the Northwest Coast (Tveskov 2007) and more broadly, affected by a colonial experience (Cormaroff 1996; Cormaroff and Cormaroff 1991). These shared experiences and Coast-wide political-economic phenomena lead us away from a vision of 'small-world' community relations (Kolb and Snead 1997). As this study provides evidence of a regional form of community organization that emerged at least within the Late Period, I, like Yeager and Canuto (2000), reject the formulation of an reductionist perspective (i.e., one that associates community only with local villages) in the development of Stó:lō housepit communities.

The changes in Stó:lō community organization around 550 cal B.P. coincides with broader patterns of change all over the Northwest Coast. These changes were affected by political-economic interactions that are historical rather than functional in nature (Pauketat 2001). Stó:lō community organization both affected, and was affected, by external developmental forces including the practice of balancing peace and warfare by an increasingly small and well-defined group of elites -- locally emergent as *sí:yá:m* (wealthy, respected leaders) -- constituting loci of power.

Underlying these forces are value systems that tended towards maximizing prestige in a nested-hierarchy of network relations. This strategy was built out of the densely populated, resource rich, and highly interactive landscape of the region; a landscape of interconnected socio-religio-political-economic relations. It is a logical scenario that elite households strived to negotiate and sustain control over cultural capital within a shared political-economy. Prestige was manifest in this form of economy through the integration of material and meaning built into the landscape in the form, for example, of pithouses and settlements. This strategy fueled the production, distribution, consumption, and, most importantly, the re-production of [political] culture documented as the history of change among Stó:lō-Coast Salish housepit settlements.

Cohesion forms in this system through the dependent relationship between *siyá:m* households and settlements to the constituent members of their community; i.e., those who practice that culture and produce the material goods of exchange; those indoctrinated in and in some cases striving to influence *habitus* (Bourdieu 1977; Delanty 2003). A prestigious *siyá:m*, like Wileliq the Fifth (Chapter IX), equates with greater community health enhancing connections to a broader range of relations and access to a wider range of food, materials, and goods. This is important at a basic level of survival among those community members of lower social standing; those largely practicing cultural tradition. *Habitus* is rewarded and sustained by those *sí:yá:m* that controlled the political economy and gained or at least maintained a high level of prestige among fellow *sí:yá:m*. Community relations, and a cohesion of sorts, is also effectively maintained by the bonds of indebtedness that link together *sí:yá:m* and other households within a political economic community. The conclusion reached in this thesis, in comparison with other possible theories (e.g., evolutionary; functionalist; culture-ecological), is that political-economy and practice theory support an interpretive framework that effectively helps make sense of the archaeological patterning of housepits as change in cultural practices defining Stó:lō-Coast Salish housepit communities.

As a broad comment on the history of pithouse communities in the upper Fraser River, this study highlights significant shifts in social relations first among the collective, settlement-based polities and second among households. Changes take place simultaneously within the context of expanding relations at both household and multi-household (i.e., settlement) levels forming a dynamic of relations characteristic of Stó:lō community organization. This finding, alone, is significant to the study of cultural complexity and the development of social inequality and helps answer the basic question, 'where does this process start?' The archaeological assemblage of housepit features of Stó:lō-Coast Salish hunter-gatherer-fisher peoples in this region shows a record of community development and restructuring that is rarely seen so clearly.

10.4 Implications for an Integrated Community-Settlement Archaeology

"What is important is that settlement archaeology forces us to think through problems from a new angle -- that of social relations" (Trigger 1967:158). One of the most significant changes in archaeology over the last 40 years is our development of not just the social- but also the political-economic-side of archaeology. This change in archaeology has helped move through and beyond both processualism and post-processualism to develop new paradigms incorporating elements of both.

An outcome of thinking through things 'from a new angle' is the recognition of agency, power, and scales of social relations. It has also become clear that knowledge emerges as a key factor of authority and power. Knowledge, contra the ideationist perception of community, is not an 'imagined' thing but rather a powerfully practiced thing and an integral feature of authority as a product of continuous negotiations. Knowledge is found, too, all throughout the archaeological record in the process of production and procurement by which people interact with their surroundings as, for instance, the landscape and resources (e.g., in the process of ground slate fish-knife production so intensively practiced among the households at Welqámex [Graesch 2007]).

Within a system free of the limits of household- or settlement-based modes of production, knowledge itself becomes perhaps the most valuable commodity. Though infrequently discussed by archaeologists, the 'growth' and transfer of knowledge (i.e., an economy of knowledge; a political economy) is embedded in both change and continuity.

The control of knowledge, as perhaps the most significant resource of wealth, is a power possessed by elites. Possessing the power to control this resource ebbs and flows through time as a factor of negotiation among actors in the political-economy (e.g., *sí:yá:m*). Changes in these dynamics may be expressed as changes in a politicized form of material culture (e.g., housepit form). Meaning is embedded in objects through the process of knowledge creation and production systems (e.g., Bourdieu 1973; Foucault 1972; Hodder 1982, 1989). Objects, like houses on the Northwest Coast, speak a political language of meaning that they broadcast to by a community educated to recognize and understand those terms (Coupland 2006). Views of temporality of use and the functional longevity of houses -- pithouses or otherwise -- takes on new meaning in these terms.

Temporality and functionality are commonly linked to the physical occupation of houses, both ending with 'abandonment.' This understanding changes in the view of houses as speakers of a political economic language. Once built, houses operate in this way whether or not physically occupied, even long after they are 'abandoned' in the sense used by most archaeologists. Houses, even as housepits, carry meaning and continue to symbolize and 'speak' to others of social standing and position as long as they persist within a community that understands that form of language. This study shows a wide range of temporality in the occupation of pithouses ranging from short term (e.g., John Mack Slough, Qithyil Island) to very long term inhabitation (e.g., Th'ewá:lí; Hiqelem). It must be noted that the short term occupations of pithouses at John Mack Slough and Qithyil Island, however, were conjoined with long-lived occupations of immediately adjacent plankhouses. Physical occupation forms only one functional aspect of the utility of and rationale for building *sqémél* or *s'iltexwáwtxw* in the first place serving also, for example, to mark territory in the Stó:lō-Coast Salish land tenure system. Reaching this conclusion develops from a shift in paradigms bridging materialist an ideationist perspectives of human behavior. It also emerges from an understanding of things, like pithouses, as part of an interconnected world of people, places, and things -- all of which are invested with life.

The integration and situation of ideation and material culture within a realm of power and relations of authority uncouples us from an understanding of community as purely 'imagined' (e.g., Anderson 1983). I argue that communities are founded on sets of relations anchored to points of power and authority. These relations are in fact substantial to the point where 'community' can -- under the right circumstances of material culture and preservation -- be investigated using the archaeological record.

To what extent does the archaeological record of housepit depressions in the region support these interpretations? Is it possible to bridge the inferential gap between housepits and households, between settlements and communities? An objective of this study is to explore these questions through the application of current social theory and archaeological methods that focus on the evolution of housepit communities (e.g., Arnold 2004; Feinman et al. 2000). My interpretations are grounded with quantitative data. These data are brought into an initial realm of social meaning through an analytic process involving three levels moving from discrete housepit features to regional settlement patterns.

Throughout each level of this study I realized that it was necessary to carry out these analyses simultaneously: both literally and conceptually. Moving from housepits to intra- and then inter-settlement levels of analysis poses a danger with regard to the compounding of errors.

The greatest threat of this type of error emerges from using a single data set as the basis for moving progressively between levels of analysis (i.e., feature - settlement - inter-settlement).

As a safeguard against that form of compounding error I diversified my approach and developed multiple data-sets describing housepits in different ways using a variety of Exploratory Data Analysis techniques (stem-and-leaf graphs, box-plots, histograms) (Drennan 1996; Hartwig and Dearing 1979; Tukey 1977). I applied multiple sets of data, in multiple ways and over multiple levels, describing the relationships between housepit size (e.g., area, length, width), shape (e.g., rectangular/oblong, square, circular), location (e.g., UTM coordinates, layout, arrangement), and range of variation (e.g., house size classifications, Co-efficient of Variation values, settlement composition). I simultaneously examined the relationship between housepit size classes (based on polygonal area) and patterning between features and within settlements as a way of determining the best fit of these data into Level I and Level II analysis given the range of classificatory options that existed; while maintaining the integrity of the structure of the data as determined using EDA. I used formal statistical methods to test the patterns that I found in EDA.

To a certain extent, I found that Level II, or intra-settlement analysis, fits awkwardly between Levels I (housepits) and III (inter-settlement). Contextualizing Level II analyses with data from Level I, such as housepit sizes classes, significantly altered the outcome of intra-settlement variation based solely on CV values (i.e., values describing the range of variation between houses within a settlement). This methodology brings uncertainty to interpretations of social organization based on CV values alone. The multiplicity and simultaneity of the analyses in this study represent a methodological strategy that effectively minimizes the drawbacks of a more rigid bottom-up or top-down approach to regional studies.

One difficulty is apparent in engaging either Level II or Level III settlement analyses without having a broad-based understanding of the basic unit of analysis at the level of the feature (i.e., housepit). Understanding variation at this basic level provides a context for understanding the order of magnitude associated with variation at Levels II and III, of which housepits, in this case, are integral elements. In practice, each of these levels (I-III) fed into each other. The historical framework of this study, assessing long-term trends and patterns of change, forced this type of interpenetration between levels analysis and comparison of housepit and settlement relations across space and through time.

The historical narrative (i.e., discussing change in settlement patterns through time) presented as a series of individual diagrams in Chapter IX must be viewed as a single, multi-dimensional framework. Illustrating such a diagram exceeds my technical abilities. A basic conclusion to this regional exploration points to the benefit and practical necessity of viewing data portrayed in a range of ways and over a range of levels of analysis not in a uniformly progressive way but in a more 'simultaneous' and integrated manner. I frame variation evident in housepits and settlements (across vertical and horizontal planes of relations) with forms of social organization (e.g., heterarchical; corporate relations). I address social organization in terms that redirect our way of thinking about and describing social organization away from a long-held vocabulary of terms like chiefs, bands, tribes, chiefdoms, and states (e.g., Fried 1967; Kennedy 1995; Service 1962). This shift is part of a current political-economic process of knowledge production and change within the field of archaeology, incorporating new social theory within a shifting paradigm.

At this level of interpretation, archaeological features are interpreted as socio-economic and political groups. Housepits stand for households; settlements stand for local communities -- neither necessarily accounting for the full range of community organization. This study shows a trajectory of change that over the last 2,500 years towards complex forms of socio-political organization and interaction; i.e., community formation. These data suggest a transition from a more locally situated set of corporate-groups and heterarchically distributed socio-political relations to a system of network relations within a more hierarchically ordered society (Crumley 1987, 2001; Feinman 2000). I argue that these changes involve the development of hierarchically ordered groups of households within and between settlements interacting as a broad regional network. This finding causing us to rethink our understanding of precontact Stó:lō-Coast Salish community organization and related theory.

Communities as I frame them are socio-politically related groups of households arranged in various locations forming settlements. This view, particularly applicable to Period III, supersedes the constraints of the functionalist-based relationship between 'settlement and community.' The social-spatial positioning of these community strata relative to one another are defined by their situation along two basic axes: horizontal and vertical planes of relations. This scope of relations is shared by Yeager and Canuto (2000:5) in their definition of *community* as "…supra-household interactions that are structured and synchronized by a set of places within a particular timespan."

This previously unbridled realm of 'interaction' residing at the core of community organization is brought into focus, here, as a continuum of heterarchical-hierarchical and corporate-network relations. These interrelated axes of relations (Arnold 2004; Feinman et al. 2000) provide a more refined forum of interaction around which community is negotiated and reckoned. These planes of relations attach to the social negotiation of authority and power addressed outside the paradigms of archaeology by Bourdieu (i.e., practice theory) and Roseberry (i.e., political economy). Within these sets of interactions, social strata and community organization form within the relations of authority and around centers of power.

10.5 Implications for Landscape Archaeology

Considering an emic perspective of the Stó:lō-Coast Salish, I treat the landscape in this study as a conceptual, socio-cultural 'place' (Zedeno 2000) -- a cultural landscape formed by sets of interdependent landmarks (e.g., housepits; settlements), waterways, and pathways. Landscape is seen as a cultural unit in and of itself comprised of meaningful attributes, such as transportation routes and indigenous places of power (Basso 1996; Bierwert 1986; McHalsie et al 2001; Miller 2000). This landscape both affects and is affected by the interactions of people who, in basic social units (i.e., households), chose places to live, build houses, and arrange themselves within the context of larger social arrangements and aggregates (i.e., settlements) (e.g., Cannon 2002). Adopting a concept of cognitive and interactive 'place' versus geographically defined and isolated 'space' (Binford 1982; Bender 2002; Zedeno 2000) serves to bring Northwest Coast settlement archaeology together with current ethnographic treatment of aboriginal peoples of the Northwest Coast, and elsewhere (e.g., Basso 1996; Bierwirt 1985, 2001; Kan 1998; Ortiz 1967).

The Fraser River is a hydraulic system in a 'natural world' affected by human reckoning. Transforming this waterway (or set of watersheds) into 'Stó:lō' is the result of cultural practice. This transformation happens differently among people holding different positions in community and having different types of connections to and experiences with the regional river system. It carries different meanings for different people depending upon their position within that set of relations. The persistence of meaning is subject to the maintenance of the political-economic process and set of actors promoting it. One particular form of meaning, among a range of possible meanings (e.g., as influenced by colonial factors), must be successfully (re-)produced, distributed, consumed, over and over again in order to be maintained. Legitimacy equates with power, negotiated within the relations of power and the political economy of meaning (Snyder 1964; Bierwert 1986). Perhaps the most significant contest to 'legitimacy' of meaning facing the Stó:lō today comes from the reshaping of meaning at the hands of a Colonial government.

I made efforts to recognize and situate this study within the specific context and characteristics of the lower Fraser River Watershed -- recognized by the Stó:lō as the "river of rivers" (Charles Hill-Tout; in Carlson 2003:55). I avoided representing this region as an undifferentiated plane as might be found in most economic models based on graph and network theory. Rather, I build on others' initial attempts (e.g., Ames 2002; Burley 1980) to develop a socio-geographic landscape of landforms, waterways, and routes of transportation and communication specific to this region. Setting this backdrop serves the purpose in this exploratory study of drawing attention to the relationship between the locations of housepits, settlements and the primary means of communicating between the occupants of settlements located throughout the region -- the Fraser River (i.e., Stó:lō) and its tributary system of rivers and sloughs.

The development of a geo-cultural backdrop, while formative, provides an important link between people and place in the flow of information within a political-economic system of relations. The means of communicating is directly tied to the reckoning of power within and between the population of Stó:lō-Coast Salish households and settlements populating this area and practicing this system of relations. This connection is an integral tenant of my interpretive framework viewing interaction as a political-economic and practice-based phenomenon associated with the control of knowledge and negotiation of power. These influences affect the formation of communities as a connected to places of power within this system.

Prior to early 20th century means and modes of transportation, the Fraser River provided *the* primary means of intra- and inter-regional transportation and communication. Stó:lō people gradually through time developed technology and skill to better navigate this water highway. The development of large canoes as a mode of travel on this waterway, for example, serves not only to more effectively transport and distribute a larger load of things as objects of material trade and exchange (Ames 2002); they also carried the meaning of those things more widely within and between more communities. The Fraser waterways carried and communicated meaning, knowledge, authority, and power in forms both peaceful and violent as an element of an integrated and total system of relations. Much of this system converges in the nexus of households and houses as perhaps the most intimate connection between people, places, and things. The world is meaningless without a political-economy: a meaninglessness affecting those whose indigenous political-economy has been forcibly supplanted by that of an 'other.'

The framework for investigating community in this study, thus, provides a particularistic perspective that moves toward and respects an emic understanding of the development of Stó:lō-Coast Salish pithouse communities in the lower Fraser River Watershed. It serves to address broad humanistic questions about history and the development of complex social structures, organization, and relations through time and space. Community organization is a process of a human kind. It is differentiated by various culture-historical experiences in landscapes. I recognize in this study that Stó:lō-Coast Salish community development is a product of long-term occupation and experience within the lower Fraser River Watershed.

10.6 Implications for Stó:lō-Coast Salish Community Organization

From a Stó:lō perspective, there is no clear boundary separating what are commonly perceived from a Western perspective as distinct people, places, and resources (Schaepe et al. 2004). Cast in this light, houses must be viewed as personified rather than objectified things. *Sqémél* speak, as personified things in a language of meaning, reasoning, and practice independent of their physical occupation. It is their persistence on the cultural landscape, like burial mounds, that is important as a significant element of their functionality and effectiveness. This functionality ceases with the erosion of the landforms in which they are built; the erasing of their existence by other, more humanly activated, means; or a shift in political economy that reconstitutes knowledge and meaning.

The 'pithouse communities' modeled from these analyses become increasing socially layered with a set of elites, or *sí:yá:m*, occupying central places of power within the Stó:lō system. Socio-political groups backing into tributary watersheds intersect at points along the Fraser River, especially at Qithyil Island, Welqámex, and X̲elhálh. These elite points of connection extend from the lower Fraser Canyon (i.e., X̲elhálh) downriver to the Fraser River delta where Barnett (1938:128) recorded the ownership of in-ground houses among the wealthy in the settlement at Musqueam (see the regional distribution of housepits mapped in Chapter 4). The network of elite households were directionally oriented up and down the river, quite literally, as a form of community unto themselves. Relations between elite households and their constituent communities form settlement arrangements suggesting the cohesion, support, and backing of siya:m by their constituents. The support and cohesion of political groups surrounding and backing centrally located leaders manifests as settlements clustered around or literally backing large, centrally located settlements. In some cases settlements form a string of settlements extending up tributary watersheds with a large settlement at its head (e.g., the Fraser Canyon, and the Chilliwack and Chehalis valleys) and in other cases they surround a settlement at one or another hub in the Stó:lō social-spatial network (e.g., as around Welqámex).

The built landscape of pre-colonial housepit settlements illustrates the physical expression of political support around centralized authority. These physical expressions of political support in the spatial arrangement of things -- signifying a group of individuals (or households) backing their leader -- forms patterns recognizable today within Stó:lō cultural institutions such as the winter dance (Bierwert 1986). Perhaps these expressions of pre-colonial Stó:lō political-economic structure survived in forms of Stó:lō cultural practice, like the winter dance, maintained over the years in secrecy, hidden from colonists and Indian Agents (Bierwert 1986; Harris 2002).

An effect and objective of colonialism here, and worldwide, was to achieve to a shift in the knowledge and an erasure indigenous meaning. The colonial government worked systematically to change the understanding of things as originating from within a Stó:lō-Coast Salish paradigm and political-economic system. Life was divested from the material and spirit was removed from things. Rupturing the glue to bound together this system of knowledge constituted an erosion of what, over the last 3,000 years, developed into a Stó:lō political-economy and community organization. The cohesion of that community was severely impacted resulting in the formation of independent Indian Act Bands as opposed to the *sí:yá:m* system of interconnected system of households and settlements of indigenous origin (Harris 2002). The loss of the archaeological record, including housepits and other settlement remains in the lower Fraser River Watershed, contributes to this process. Those that survive continue to speak.

While the late-18th century effects of small-pox took its toll on the Stó:lō (Harris1997), their deeply rooted, complex, and indigenous formulation of social organization and community relations -- vertically and horizontally stratified -- persisted and shifted locations from places like X̲elhálh to Welqámex. Colonialism, surely, was by far a more virulent event in its impact on the indigenous socio-political structure of the Stó:lō (Carlson 2003; Duff 1956). Political-economic controls exerted by Colonial powers after 1858 figuratively straightened, flattened, and literally minimized and boxed-in the pre-existing arrangement of social-spatial relations describing a broad-based and complex political-economic system and form of community organization established by the Stó:lō. Indigenous political-economic networks were dislocated. The power and authority of *sí:yá:m* was replaced by and reconnected to an officer of the colonial government in an attempt to consolidate and subsume Stó:lō community within a colonial system.

A foreign political-economy was forcibly introduced to the Stó:lō by way of Assimilation Policy (Carlson 1997b). Colonial authority replaced indigenous authority; church and Indian Act-based leadership was established; colonial-based Bands or 'reserve communities' replaced indigenous community organization. Education was controlled by outsiders and indigenous knowledge was replaced through the residential school system. Colonial authorities attempted to relegate the Stó:lō within a political economic position recognizable from an indigenous perspective as something akin to *s'téxem* or *skw'iyéth* in nature. As elsewhere, strategies of colonial assimilation and Stó:lō resistance to such subjection can be traced out in the ongoing evolution of Stó:lō housing and political organization beyond 1858 (Schaepe et al. 2001; Tveskov 2007)

The collapse of Welqámex in the late 1800's marks the dramatic break-up of an indigenous, late pre-contact socio-political structure that developed over the course of the previous three thousand years. The *síyá:m* and *smelá:lh* households of this island settlement paddled to shore and turned their backs on the lower-status residents and slaves, allowing them to leave and disperse (Albert McHalsie [Stó:lō cultural historian], personal communication, 2003; also see Graesch 2006). Just after this event, Welqámex was established as a reserve -- Greenwood Island I.R. 14 -- in 1879 (Albert 'Sonny' McHalsie, personal communication, 2007). The living community moved away, replaced by an ancestral community of relatives whose burials they transferred from a cemetery that lay across the narrow channel of the Fraser River. Likewise, ancestors of the settlement at X̱elhálh continued to be brought back there for burial into the 1920s (Albert McHalsie [Stó:lō cultural historian], personal communication, 2005). Perhaps these mortuary communities maintained the indigenous structure of households and settlements at these places, the ancestors holding in place the now disassociated communities of the living. The housepits of Welqámex, as with the other settlements included in this study, continue to speak of these ancestral community relations.

10.7 Implications for a Developed Northwest Coast Pattern

This study describes the period between 2,550 and 100 cal B.P. as a time in history when significant changes in Stó:lō-Coast Salish social organization took place. Relations between people, places, and things converged and removed any form of domestic economy or mode of production that might have otherwise regulated or limited socio-political differentiation within and between households (Sahlins 1972). This likely occurred as part of a change from a system of regulated underproduction to a process of intensification (ibid.) that appears to have begun in the Middle Period (ca. 5,500-3,500 B.P.) and which became well established by 2,000 B.P. Artifacts of this change are recognized archaeologically as Marpole-type characteristics found Coast-wide. Such change would bridge patterning between the early Middle Period (ca. 5,500-3,000 cal B.P.) and Period I (2550-2000 cal B.P.) of this study.

Patterning in the changes of housepit attributes and relations, on multiple levels, demonstrate that Stó:lō-Coast Salish society in the upriver portion of the region was not fixed or static. Within the temporal scope of this study, social organization underwent significant change from a minimal level of intra-settlement variation between households to variation expressed in differences of both housepit and settlement form (e.g., size, shape, layout, and arrangement). This process of change was followed by variation across two levels of relations punctuated by differences between both households *and* settlements. The development of a nested hierarchy of inter-household and inter-community relations coincides with a shift in settlement patterning in which the largest households and settlements occupied strategic places within the Fraser River system. This repetition of this pattern at multiple scales is formed by the positioning of the highest levels of status and authority at central places amidst a regional network of communities and inter-community relations.

Stó:lō-Coast Salish social organization changed beyond the 'Developed Pattern' which is suggested to have persisted largely unchanged over the last 1500 years (e.g., Matson and Coupland 1995). Differences between the ethnographic and archaeological models of Stó:lō-Coast Salish social organization (Chapter IX) demonstrate that significant changes occurred during the 1500 years between Marpole and 'contact' -- largely unrecognized in the ethnographic record. This study indicated that Stó:lō-Coast Salish society over the last 1,500 years was not static and that the archaeological remains of housepits demonstrate several stages of transformation in social structure and community organization.

Broad trajectories of changes reveal increasing complexity of Stó:lō socio-political relations from the Marpole/Baldwin Phase onward. Indigenous community structures persisted beyond the smallpox epidemic of the late 1700s and through a period of intensifying contact and trade with a newly arrived set of outsiders -- primarily Europeans -- during the early- to mid-1800s. Measurable differences in the relationships between housepits and settlements through time and across space strongly indicate continuity in the trajectory of change over the course of the three millennia between 550 B.C. and 1858 A.D.

10.8 Implications for Relations between Archaeology and Ethnography

In this study I question the relationship between ethnographic and archaeological interpretation of Central Coast Salish social organization. I found great utility in using ethnographic models filled with archaeological data as a means of addressing community organization. In doing so, I found significant differences between archaeological and ethnographic interpretations of Stó:lō-Coast Salish socio-political organization. These differences raise serious questions about the validity of ethnographic descriptions that are often accepted as representing 'traditional' forms of Stó:lō-Coast Salish socio-political organization projected into the past within archaeological interpretation (e.g., Kennedy 1995; also see Grier 2007).

I must first state Stó:lō-Coast Salish ethnography is, like archaeology, a progressive and evolving anthropological discipline (Miller 2007). Left in the wake of recent shifts in the orientation and focus of Stó:lō-Coast Salish ethnographic research are the largely untouched and intact broad-scale representations of social organization developed by the ethnographic efforts of Hill-Tout, Smith, Duff, Gunther, Snyder, Elmendorf, Suttles, and others. A gap in research focus and understanding separates current ethnography from mid-20th century ethnography such that there is much less of a single 'ethnographic record' by which to interpret archaeological findings than there was up until the 1980s.

The intent of this comment is to raise questions about the application of the ethnographic record to some sets of archaeological issues. Which set of ethnographic studies are we to look to, now, for insight into the archaeological record? Which ethnographic set best applies to what range of topics? What timeframe is most suited to elements of ethnographic analogy? Are there other sources of information that better serve this purpose? Ethnohistoric? Oral history? Is the relationship between Gulf of Georgia archeology and Stó:lō-Coast Salish indigenous oral history any different than that with ethnography? To what extent can oral history and archaeology be integrated? This study serves to address these questions.

From these findings, a real and significant 'contact barrier' (Schaepe 2006:672), now better defined as a 'Colonial Barrier,' does in fact exist as an obstacle to the application of ethnographic analogy in archaeological research. The barrier I refer to is a figurative though very real knowledge barrier. Looking back in time to describe human behavior and Stó:lō-Coast Salish social organization requires penetrating this knowledge barrier. Pre-and post-colonial periods were distinctly different in character, especially with respect to our anthropological knowledge. The pre-colonial period is very far from the reach of the ethnographic lens; at least as it was formulated by mid-century practice.

As a result, tremendous discord exists between these archaeological findings and a commonly accepted ethnographic portrayal of Stó:lō-Coast Salish authority, governance, and socio-political structure (e.g., Duff 1952). At its initiation in the 1890s, ethnography in this region captured and described a population vastly diminished by small-pox and at a peak of extreme Colonial-era subjugation under a federal Indian Act that consolidated many pieces of Indian Legislation, including the Civilization Act and the Anti-Potlatch Law (Carlson 1997b). The long-term process and trajectory of indigenous intra-and inter-community interaction and socio-political dynamics of the region intersected with the Contact-Era at a point in time in which housepit and settlement patterns express a complex, vertically and horizontally differentiated socio-political organization.

This complex form of social order describing the Late Period is very poorly represented, if not explicitly dismissed, within the majority of Stó:lō-Coast Salish-Coastal ethnographic literature -- with certain exceptions. It can be very misleading and inappropriate to indiscriminately apply ethnographic characterizations of village size and social structure [as so often done with the work of Wilson Duff for example (e.g., Duff 1952:85)] to the precontact -- particularly late-precontact -- and even early post-contact / pre-Colonial periods of the Stó:lō-Coast Salish of lower Fraser River Watershed.

This study shows that consideration of a 'developing' archaeological record is required to effectively break through the 'Colonial Barrier' as a means of regaining knowledge about the social organization of earlier times. Incorporating current ethnographic models into archeological interpretation is a worthwhile endeavor, when based on relevant social and political theory -- core parts of an integrated community-settlement Archaeology. A multi-disciplinary approach incorporating indigenous oral history, archaeology, written history, ethnohistory, and ethnography would certainly prove more effective in understanding the pre-colonial period (e.g., Carlson 2003) than the application of these disciplines in isolation. This approach, while cumbersome and complex, safeguards against carrying forward into my interpretation errors potentially inherent from a single line of comparative evidence and source of data.

10.9 Future Directions of Research

This study provides a basic framework constituting a *longue duree* of Stó:lō-Coast Salish housepit community evolution and development (Ames 1991; Smith 1992). This study is affected by limited data quantity rather than a lack of data quality. We only have data from two settlements and occupations from Period I (2550-2000 cal B.P.), albeit a large number of associated housepit features. Collecting more spatial and temporal data -- particularly serving to expand our Period I sample -- would support additional analyses and refinement of the interpretive frameworks presented here, if not serving to revise them altogether. Addressing the challenges and limitations of small sample size of radiocarbon dates and settlements is one of the primary tasks facing archaeologists working in the Gulf of Georgia Region today.

Additional mapping of housepit settlements (i.e., Level II analyses) would provide data useful in augmenting those compiled by the Fraser Valley Archaeology Project. Continuing to survey and investigate settlements in the tributary watersheds of the Fraser River will undoubtedly contribute significantly to our understanding of the region (e.g., Ritchie n.d.; Schaepe 1997).

I hope that the results of this study can provide reliable predictions of settlement locations useful for designing future surveys. One can expect to find Late Period settlements with high status attributes located on islands throughout the Fraser River system. Locations such as Qw'ó:ntl'an on McMillan Island, Sk'ewqéyl near the north end of Seabird Island, Lhilheltalets on an island near the mouth of the Coquihalla River, and Strawberry Island upriver of Hope are places that should be investigated in the future (Duff 1952:30-39; McHalsie 2001:136-153). Few of these places, unfortunately, remain intact. More broadly, we can also expect to find a Later Period pattern of settlement clusters including medium and small settlements surrounding large, high status settlements centrally located at places like X̲elhálh, Welqámex, and Qithyil Island. Dating, classifying, and mapping housepits in settlements surrounding these places will contribute to our understanding of the emergence of a hierarchically arranged, network system of inter-community relations.

The need refine our chronologies should continue to be one of the primary goals of archaeologists working in the Gulf of Georgia Region. A key part of this work will be obtaining additional radiocarbon samples from minimally destructive excavations, such as core and auger tests. Issues of data quantity remain to be addressed by future studies serving to augment both spatial and temporal fields of archaeological data collection. Maintaining high quality and comparable data is critical to methods and strategies used in this process.

Other areas of archaeological research linked to the broad framework and objectives of this study include addressing issues of housepit form, architecture, and issues of seasonality and temporarily of occupation. Addressing these issues requires conducting detailed areal excavations of housepits (e.g., Graesch 2006; Lenert 2008; Springer n.d.). A number of questions also arise with regard to the social-spatial relationships between households and housepits. Sampling the contents of housepits of different size classes in different locations within and between settlements will help address such questions by possibly refining our understanding of material correlates of social standing and improving our understanding of intra-settlement social organization. We need to carefully examine the relationship between housepit size and variation in artifact and other material assemblages that indicate differences in social standing between households.

A specific set of related questions can be directed towards investigating the relationship between *s'iltexwáwtxw* and *sqémél*. Plankhouse features were identified in this study at a number of Period II and III settlements (e.g., DgRl-17 - Period II; DgRl-15-F6 - Period III; DiRi-15-F11 - Period III; DjRi-14 - Period III; DgRl-T2 - Period III). Investigating these features provides an opportunity to address numerous questions about their changing use in Stó:lō-Coast Salish society.

10.10 Conclusion

This study was intended to raise questions and stimulate further research about the nature of housepit communities in the mainland Gulf of Georgia Region. As an exploratory analysis, this study provides a set of data and interpretations upon which to formulate new research questions concerning the organization of pre-colonial houses and households, settlements and communities within the Gulf of Georgia Region and throughout the broader Northwest Coast. This study provides a specific developmental framework that serves as a point of discussion and comparison as new data are generated. Continuing to explicitly address questions of authority and political organization will confront, head on, some of the most basic and long held understandings of Coast Salish and Northwest Coast socio-economic organization.

These results inform broad anthropological questions and dialogue concerning the history of complex social organizations among the hunter-gatherer-fisher peoples of the Northwest Coast -- societies that anthropologists have recognized as intermediate-level, pre-state societies. The peoples and societies of the Pacific Northwest have long been of interest to anthropologists because of stratified and diversified social structures that developed within the contexts of fishing-hunting-gathering resource economies. The processes by which complex social structures developed here provide insight into and help explain how complex social organization and social inequality developed elsewhere -- as a subject of global significance (Earle 1997; Crumley 1987; Haas 2001; Price and Feinman 1995; Sahlins 1972).

I hope that this work provides a useful resource to local aboriginal groups endeavoring to define frameworks of self-government and parameters for discussing land-claim issues based on traditional forms of intra- and inter-community relations and levels of authority. Archaeological housepit and settlement data presented in this study provide new perspectives about pre-colonial aboriginal relations and social dynamics within the Gulf of Georgia Region. The archaeological interpretations provided in this study tend to differ significantly from common ethnographic interpretations of political development among the Central Coast Salish.

This study may prove most useful, perhaps, to Stó:lō-Coast Salish groups working either within or outside the contemporary treaty process to detach from the Federal authority of the Indian Act governance. Many Canadian aboriginal peoples are working to assume governance over their own people. This requires defining governance frameworks and developing inter-governmental relations between the federal and provincial governments and surrounding aboriginal neighbors. Many obstacles stand in their way. For example, the inherent right of aboriginal self-governance is currently not recognized by the province of British Columbia. This study -- finding a wide-spread system of indigenous relations of power and authority by which the Stó:lō-Coast Salish organized and governed themselves prior to their subjugation under the Indian Act -- supports and speaks directly to the issue of self-governance as an inherent right of these indigenous peoples.

These findings also serve to inform the design of contemporary Stó:lō-Coast Salish governmental frameworks. Indian Act governance structures function as a restrictive yoke of imposed, foreign power and institution. If opposition the state is an elementary part of indigeneity (Miller 2003), then adopting state-determined political structures is counterintuitive and counteractive to the process of assuming indigenous self-governance (Miller 2003). Replicating Indian Act governance structures (i.e., Indian Act 'Bands') in the process of achieving aboriginal self-governance serves only to reconstitute and perpetuate that foreign institution with the political-economy of indigenous peoples; though no longer wards of the state. If a basic intent of developing aboriginal self-government is to reestablish more truly indigenous political economies; to achieve and sustainable forms of indigenous government truer to their own culture and traditions -- then fulfilling this intent requires re-connecting to, re-tooling, and building upon the traditional systems and relations of power, authority, and community organization of pre-Colonial times. Many 'authentic' indigenous institutions have persisted in resistance by aboriginal peoples to state authority, remaining intact and practiced today as discussed in this study (e.g., longhouse gatherings), although within a context of fragmented political-economic community organization. The outcomes of this study may provide assistance to the Stó:lō-Coast Salish in gaining recognition of the right to self-government; moving beyond resistance; and developing and implementing authentic, sustainable, and functional forms of government with which to replace that imposed by Canada.

The success of this study will be measured largely in its contribution to the understanding of social history among the Stó:lō-Coast Salish, by the Coast-Salish themselves as well as their non-aboriginal neighbors. Judgment of this work will rest on its ability to stimulate and generate research aimed at addressing and augmenting our understanding of questions of community formation, both broadly applied and particularly concerning changes in Stó:lō-Coast Salish social organization in pre- and post-colonial times. Data, analyses, and results of this study provide guidance in matching locales of future archaeological research with appropriate locations of study; and achieving means of better integrating archaeology with ethnography, ethnohistory, and indigenous oral history. If truly successful, this study will provide some assistance in reconciling torn relationships between communities and their enduring past; tears that affect indigenous peoples and newcomers alike, locally and worldwide. In the words of Stó:lō community-member and carrier of the *siyá:m* name *T'xwelátse* -- "we have to learn to live together in an good way."

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APPENDIX I - HOUSEPIT DATA FROM SAMPLED UPRIVER SETTLEMENTS - ARRANGED BY SETTLEMENT.

Feature	UTMeast	UTMnorth	D2	D1	Mid	Sample	P	Lth	Wth	Diag	Area	Circ	Sz	WL	WD	Shp
DgRl-17-F01	575660.13	5437695.09	.	.	.		3	9.01	8.51	9.87	65.41	29.09	2	.94	.86	1
DgRl-17-F02	575652.05	5437689.56	970	1180	1075	Beta-210179	3	8.68	7.82	10.10	61.78	28.68	2	.90	.77	1
DgRl-17-F03	575644.98	5437684.88	.	.	.		3	8.45	7.22	8.64	53.59	26.53	2	.85	.84	3
DgRl-17-F06	575667.61	5437685.99	.	.	.		3	9.44	9.42	11.01	78.43	32.20	3	1.00	.86	1
DgRl-17-F07	575681.06	5437703.85	.	.	.		3	8.55	5.70	9.00	45.74	25.63	2	.67	.63	3
DgRl-17-F08	575602.10	5437639.79	930	1060	995	Beta-210180	3	9.78	7.52	11.14	68.58	31.29	3	.77	.68	3
DgRl-17-F10	575597.25	5437634.51	.	.	.		3	9.72	7.38	11.09	70.97	32.61	3	.76	.67	3
DgRl-17-F11	575606.10	5437624.90	.	.	.		3	9.54	9.15	11.26	76.27	31.87	3	.96	.81	1
DgRl-17-F12	575593.51	5437627.96	.	.	.		3	9.28	7.74	10.80	68.03	31.34	3	.83	.72	3
DgRl-17-F13	575599.00	5437616.00	.	.	.		3	8.78	8.16	10.00	62.88	29.65	2	.93	.82	1
DgRl-17-F14	575660.04	5437680.63	.	.	.		3	10.0	8.92	11.20	81.88	33.21	3	.89	.80	3
DgRl-17-F15	575689.82	5437714.41	.	.	.		3	6.29	4.72	6.79	27.27	19.49	1	.75	.70	3
DgRl-17-F16	575667.70	5437702.32	.	.	.		3	7.84	7.38	8.34	46.70	24.64	2	.94	.88	1
DgRl-17-F18	575635.96	5437671.35	.	.	.		3	8.90	6.38	9.42	51.87	26.91	2	.72	.68	3
DgRl-17-F19	575643.20	5437677.05	.	.	.		3	9.43	8.28	9.43	74.77	32.54	3	.88	.88	3
DgRl-17-F21	575651.96	5437672.54	.	.	.		3	9.50	9.04	11.28	76.05	31.88	3	.95	.80	1
DgRl-17-F23	575585.00	5437621.80	.	.	.		3	9.90	9.13	10.92	73.14	31.51	3	.92	.84	1
DhRl-15-F01	576490.78	5453705.13	.	.	.		4	12.7	12.4	14.35	133.06	42.06	5	.97	.86	1
DhRl-15-F02	576492.74	5453692.47	.	.	.		4	11.8	11.6	12.79	113.79	38.87	4	.99	.91	2
DhRl-15-F03	576494.99	5453663.75	.	.	.		4	12.1	11.5	12.17	111.69	37.81	4	.95	.95	2
DhRl-15-F04	576502.64	5453626.67	470	540	505	Beta-217440	4	13.0	12.1	14.13	137.21	42.33	5	.93	.85	1
DhRl-15-F05	576500.54	5453638.46	.	.	.		4	12.4	7.88	12.30	87.80	36.15	3	.64	.64	3
DhRl-6-F02	577986.70	5448596.50	.	.	.		4	11.9	11.5	12.30	108.63	37.41	4	.97	.94	2
DhRl-6-F03	577972.50	5448592.50	.	.	.		4	10.9	10.2	10.73	88.93	33.99	3	.93	.95	2
DhRl-6-F04	577950.56	5448592.50	.	.	.		4	10.2	9.07	10.28	75.18	31.06	3	.89	.88	3
DhRl-T1-F01	579416.90	5459815.65	.	.	.		4	10.8	9.80	11.16	90.00	34.56	3	.91	.88	1
DhRl-T1-F02	579428.30	5459816.90	.	.	.		4	9.06	8.90	10.10	72.05	30.80	3	.98	.88	1
DhRl-T1-F03	579436.81	5459821.25	.	.	.		4	8.32	7.72	8.41	54.39	26.57	2	.93	.92	2
DhRl-T1-F04	579440.54	5459828.72	.	.	.		4	10.7	8.50	10.21	75.39	31.51	3	.80	.83	3
DhRl-T1-F05	579428.72	5459770.65	290	470	380	Beta-210181	4	11.6	11.4	12.44	113.09	39.65	4	.99	.92	2
DhRl-T1-F06	579446.76	5459816.48	.	.	.		4	9.60	8.88	10.19	77.02	32.13	3	.93	.87	1
DhRl-T1-F07	579458.99	5459826.02	.	.	.		4	11.6	9.60	11.60	96.93	35.95	3	.82	.83	3
DhRl-T1-F14	579449.87	5459844.68	.	.	.		4	9.05	8.49	9.76	67.10	29.55	2	.94	.87	1
DhRl-T1-F15	579469.98	5459846.14	.	.	.		4	9.30	8.82	9.82	68.36	29.69	3	.95	.90	1
DhRl-T1-F16	579473.10	5459829.34	.	.	.		4	9.00	8.56	10.10	66.89	29.56	2	.95	.85	1
DhRl-T1-F18	579481.18	5459833.69	.	.	.		4	9.90	8.08	10.33	66.68	29.48	2	.82	.78	3

Feature	UTMeast	UTMnorth	D2	D1	Mid	Sample	P	Lth	Wth	Diag	Area	Circ	Sz	WL	WD	Shp
DhRl-T1-F36	579533.44	5459825.81	.	.	.		4	10.3	9.58	11.33	91.23	35.34	3	.93	.85	1
DhRl-T2-F01	580660.86	5460045.15	940	1070	1005	Beta-208884	3	11.9	9.86	12.72	101.80	36.81	4	.83	.78	3
DhRl-T2-F02	580673.92	5460045.96	.	.	.		3	11.4	9.60	12.57	95.72	35.94	3	.84	.76	3
DhRl-T2-F03	580669.57	5460040.48	.	.	.		3	9.62	7.46	10.50	63.79	29.82	2	.78	.71	3
DhRl-T2-F04	580664.90	5460034.35	460	540	500	Beta-208883	3	10.1	7.65	11.44	70.98	31.51	3	.76	.67	3
DhRl-T2-F05	580657.64	5460028.87	.	.	.		3	8.40	7.50	10.10	60.24	29.01	2	.89	.74	3
DhRl-T2-F06	580652.32	5460036.93	.	.	.		3	8.99	8.16	10.33	67.00	30.18	2	.91	.79	1
DhRl-T2-F07	580645.23	5460037.09	.	.	.		3	9.30	8.46	10.06	73.12	31.69	3	.91	.84	1
DhRl-T2-F08	580643.45	5460029.03	.	.	.		3	7.86	7.50	9.77	53.52	27.06	2	.95	.77	1
DhRl-T2-F09	580647.81	5460029.68	.	.	.		3	6.89	6.80	8.49	42.06	23.91	2	.99	.80	1
DhRl-T2-F10	580665.38	5460023.87	.	.	.		3	6.31	6.14	7.51	33.65	21.10	1	.97	.82	1
DhRl-T2-F11	580656.00	5460021.50	.	.	.		3	10.8	7.33	10.65	63.11	29.23	2	.68	.69	3
DhRl-T2-F12	580718.00	5460135.50	.	.	.		3	9.25	7.02	8.33	50.78	25.82	2	.76	.84	3
DhRl-T2-F13	580711.30	5460129.10	.	.	.		3	10.6	9.24	11.38	86.68	33.56	3	.88	.81	3
DhRl-T2-F14	580707.00	5460121.80	.	.	.		3	9.75	8.78	11.18	74.36	31.60	3	.90	.79	1
DhRl-T2-F16	580714.10	5460079.80	.	.	.		3	10.2	9.08	10.65	77.45	31.94	3	.89	.85	3
DiRi-15-F01	612652.87	5470238.88	290	490	390	Beta-213529	4	15.1	13.9	16.63	178.78	48.22	6	.92	.83	1
DiRi-15-F02	612655.32	5470255.38	.	.	.		5	11.8	10.6	13.15	112.52	38.82	4	.90	.81	1
DiRi-15-F03	612650.55	5470266.74	.	.	.		4	12.9	12.0	13.85	128.38	40.61	5	.93	.87	1
DiRi-15-F04	612644.64	5470249.24	.	.	.		4	12.0	10.9	11.94	109.62	37.68	4	.91	.91	2
DiRi-15-F05	612640.61	5470238.23	60	270	165	Beta-213530	5	10.3	9.60	11.84	85.04	33.40	3	.93	.81	1
DiRi-15-F06	612643.37	5470218.54	60	290	175	Beta-213531	5	13.6	10.7	14.67	132.92	43.30	5	.79	.73	3
DiRi-15-F07	612692.46	5470267.50	60	470	265	combined	4	12.8	12.6	13.19	130.16	40.83	5	.98	.96	2
DiRi-15-F08	612675.98	5470274.00	.	.	.		5	15.5	14.5	15.75	174.72	47.25	6	.93	.92	2
DiRi-15-F09	612663.04	5470271.47	60	270	165	Beta-213533	5	9.24	9.01	9.92	67.37	29.42	2	.98	.91	2
DiRi-15-F10	612666.55	5470262.54	.	.	.		4	13.5	9.69	13.97	110.12	38.92	4	.72	.69	3
DiRi-48-F01	612914.00	5470146.50	170	280	170	Beta-210177	4	9.20	7.01	10.04	58.94	28.41	2	.76	.70	3
DiRi-48-F02	612906.30	5470142.35	500	550	525	Beta-210178	4	6.40	6.10	7.18	34.32	21.22	1	.95	.85	1
DiRi-48-F03	612899.25	5470136.50	.	.	.		4	7.84	7.26	8.70	48.99	25.25	2	.93	.83	1
DiRi-48-F04	612925.58	5470148.36	.	.	.		4	8.95	7.01	9.43	54.92	27.22	2	.78	.74	3
DiRj-1-F01	608015.34	5470201.61	2334	2741	2537	I-6191 (Calib)	1	10.8	9.54	11.30	94.08	35.52	3	.88	.84	3
DiRj-1-F02	608023.65	5470208.95	.	.	.		1	7.31	6.75	8.06	42.84	23.67	2	.92	.84	1
DiRj-1-F04	608004.75	5470198.84	.	.	.		1	7.43	7.35	8.58	47.26	25.05	2	.99	.86	1
DiRj-1-F05	607994.97	5470191.83	.	.	.		1	6.06	5.66	6.86	31.79	20.90	1	.93	.83	1
DiRj-1-F06	607987.47	5470188.90	2340	2690	2515	Beta-208885	1	8.82	7.69	8.64	55.09	27.87	2	.87	.89	3
DiRj-1-F07	607976.88	5470184.99	.	.	.		2	9.76	8.23	10.65	70.66	31.02	3	.84	.77	3
DiRj-1-F08	607965.96	5470180.26	.	.	.		2	9.23	8.34	10.43	68.18	30.55	3	.90	.80	1
DiRj-1-F09	607956.99	5470173.91	2050	2320	2185	Beta-208882	2	9.70	7.18	10.73	73.49	31.90	3	.74	.67	3

Feature	UTMeast	UTMnorth	D2	D1	Mid	Sample	P	Lth	Wth	Diag	Area	Circ	Sz	WL	WD	Shp
DiRj-1-F10	607941.35	5470166.24	2160	2350	2255	Beta-208881	2	10.1	8.46	10.68	73.80	31.94	3	.84	.79	3
DiRj-1a-F15	608256.49	5470352.29	2360	2730	2545	Beta-208879	1	10.5	9.87	12.28	95.21	35.81	3	.94	.80	1
DiRj-1a-F16	608240.95	5470348.28	.	.	.		1	11.6	10.4	11.42	105.14	37.16	4	.90	.91	2
DiRj-1a-F17	608229.92	5470344.52	.	.	.		1	8.69	8.48	9.65	64.86	29.37	2	.98	.88	1
DiRj-1a-F18	608223.65	5470338.00	.	.	.		1	7.68	7.25	9.48	51.99	26.65	2	.94	.76	1
DiRj-1a-F19a	608210.00	5470340.30	.	.	.		4	9.81	9.64	11.40	85.24	33.79	3	.98	.85	1
DiRj-1a-F19b	608200.35	5470335.75	.	.	.		4	11.7	10.6	12.58	106.70	37.63	4	.90	.84	1
DiRj-1a-F20	608183.30	5470334.24	290	490	390	Beta-208880	4	8.87	8.77	10.00	67.36	29.75	2	.99	.88	1
DiRj-1a-F21	608172.78	5470331.99	.	.	.		1	8.56	6.81	9.02	51.21	26.20	2	.80	.75	3
DiRj-1a-F22	608166.50	5470327.00	.	.	.		1	6.52	5.00	6.76	29.81	20.32	1	.77	.74	3
DiRj-1a-F23	608155.25	5470326.20	.	.	.		1	6.63	5.18	6.75	31.85	20.95	1	.78	.77	3
DiRj-30-F02	601482.05	5465648.11	.	.	.		2	8.95	6.94	10.15	57.03	28.14	2	.78	.68	3
DiRj-30-F03	601486.05	5465663.29	.	.	.		2	9.74	7.14	10.29	61.64	28.98	2	.73	.69	3
DiRj-30-F04	601488.22	5465670.63	1880	2060	1970	Beta-210170	2	9.87	7.16	10.12	61.00	28.69	2	.73	.71	3
DiRj-30-F05	601490.22	5465679.30	.	.	.		2	9.74	7.50	9.74	62.01	28.74	2	.77	.77	3
DiRj-30-F06	601495.22	5465693.81	.	.	.		2	9.83	7.66	9.77	66.35	29.75	2	.78	.78	3
DiRj-30-F07	601498.56	5465702.00	.	.	.		2	7.93	6.16	8.80	45.87	25.30	2	.78	.70	3
DiRj-30-F08	601498.00	5465711.00	.	.	.		2	6.28	5.04	6.79	29.12	20.02	1	.80	.74	3
DiRj-30-F09	601506.00	5465717.50	2120	2330	2225	Beta-201169	2	8.38	7.90	9.21	58.29	28.06	2	.94	.86	1
DiRj-30-F10	601509.00	5465730.00	.	.	.		2	9.70	5.79	10.50	52.68	28.00	2	.60	.55	3
DiRj-30-F11	601514.50	5465744.50	.	.	.		2	9.93	7.02	10.04	61.91	29.25	2	.71	.70	3
DiRj-30-F12	601523.91	5465749.19	1900	2290	2095	Beta-217438-39	2	8.11	7.88	9.12	58.50	27.97	2	.97	.86	1
DiRj-30-F13	601519.41	5465761.03	1300	1480	1390	Beta-210171	3	9.85	8.44	10.72	77.42	32.07	3	.86	.79	3
DiRj-30-F14	601526.75	546576837	.	.	.		3	7.70	6.88	7.82	45.28	25.11	2	.89	.88	3
DiRj-30-F15	601530.25	5465778.38	.	.	.		3	10.6	8.67	11.70	84.18	34.41	3	.82	.74	3
DiRj-30-F16	601530.75	5465790.39	.	.	.		3	7.65	5.75	7.90	40.35	23.49	2	.75	.73	3
DiRj-30-F17	601494.22	5465664.79	.	.	.		2	5.08	5.08	5.54	21.23	16.69	1	1.00	.92	2
DiRj-30-F18	601490.89	5465686.97	1900	2120	2010	Beta-210137	2	6.23	5.71	7.41	33.19	21.39	1	.92	.77	1
DiRj-30-F21	601514.74	5465737.01	.	.	.		2	6.13	5.00	6.34	26.82	18.94	1	.82	.79	3
DjRi-14-F10	615107.13	5490733.60	.	.	.		4	13.2	12.0	14.03	137.65	42.32	5	.91	.86	1
DjRi-14-F13	615120.07	5490721.71	150	430	290	Beta-210174	4	12.5	11.9	12.19	117.60	39.37	4	.95	.97	2
DjRi-14-F15	615134.43	5490726.39	.	.	.		4	14.8	12.9	14.64	153.51	44.86	6	.87	.88	3
DjRi-14-F16	615136.00	5490740.00	.	.	.		4	11.8	10.8	13.19	96.99	36.43	3	.91	.82	1
DjRi-14-F17	615151.40	5490716.48	.	.	.		4	9.79	8.10	10.18	68.26	29.95	3	.83	.80	3
DjRi-14-F19	615160.47	5490741.87	.	.	.		4	11.2	10.5	10.80	91.61	34.26	3	.94	.97	2
DjRi-14-F23	615175.74	5490769.50	150	430	290	Beta-210175	4	10.8	10.2	11.25	93.64	35.06	3	.95	.91	2
DjRi-14-F25	615183.84	5490761.07	.	.	.		4	13.2	12.2	13.97	141.75	43.10	5	.93	.88	1
DjRi-14-F26	615194.20	5490785.92	.	.	.		4	9.93	9.31	10.37	78.89	31.97	3	.94	.90	1

Feature	UTMeast	UTMnorth	D2	D1	Mid	Sample	P	Lth	Wth	Diag	Area	Circ	Sz	WL	WD	Shp
DjRi-14-F27	615190.86	5490797.74	.	.	.		4	10.4	9.60	11.35	86.00	33.43	3	.93	.85	1
DjRi-14-F28	615178.30	5490806.06	150	440	295	Beta-210176	4	11.5	7.58	11.00	76.05	32.49	3	.66	.69	3

__Column Name (Position) & Label__:

Feature (1) Feature Designation (i.e., Site number-feature number)
Measurement Level: Nominal

UTM east (2) UTM mE - Feature Center
Measurement Level: Scale

UTM north (3) UTM mN - Feature Center
Measurement Level: Scale

D2 (4) Min. Age - Cal BP
Measurement Level: Scale

D1 (5) Max. Age - Cal BP
Measurement Level: Scale

Mid (6) Age Midpoint - Cal BP
Measurement Level: Scale

Sample (7) C14 Sample No.
Measurement Level: Nominal

P (8) Periods Ia-b/II/IIIa-b
Measurement Level: Nominal

Value	Label
1	Period Ia (ca. 2550 cal B.P.)
2	Period Ib (2000-2250 cal B.P.)
3	Period II (950-1400 cal B.P.)
4	Period IIIa (150-550 cal B.P.)
5	Period IIIb (100-150 cal B.P.)

Lth (9) Max. Length (m)
Measurement Level: Scale

Wth (10) Max. Width (m)
Measurement Level: Scale

Diag (11) Diagonal Distance / Largest Measurement (m)
Measurement Level: Scale

Area (12) Area (m2)
Measurement Level: Scale

Circ (13) Circumference (m)
Measurement Level: Scale

Sz (14) Size (m2)
Measurement Level: Scale

Value	Label
1	Class I (21-34 m2)
2	Class II (35-67 m2)
3	Class III (68-99 m2)
4	Class IV (100-117 m2)
5	Class V (118-152 m2)
6	Class VI (153-180 m2)

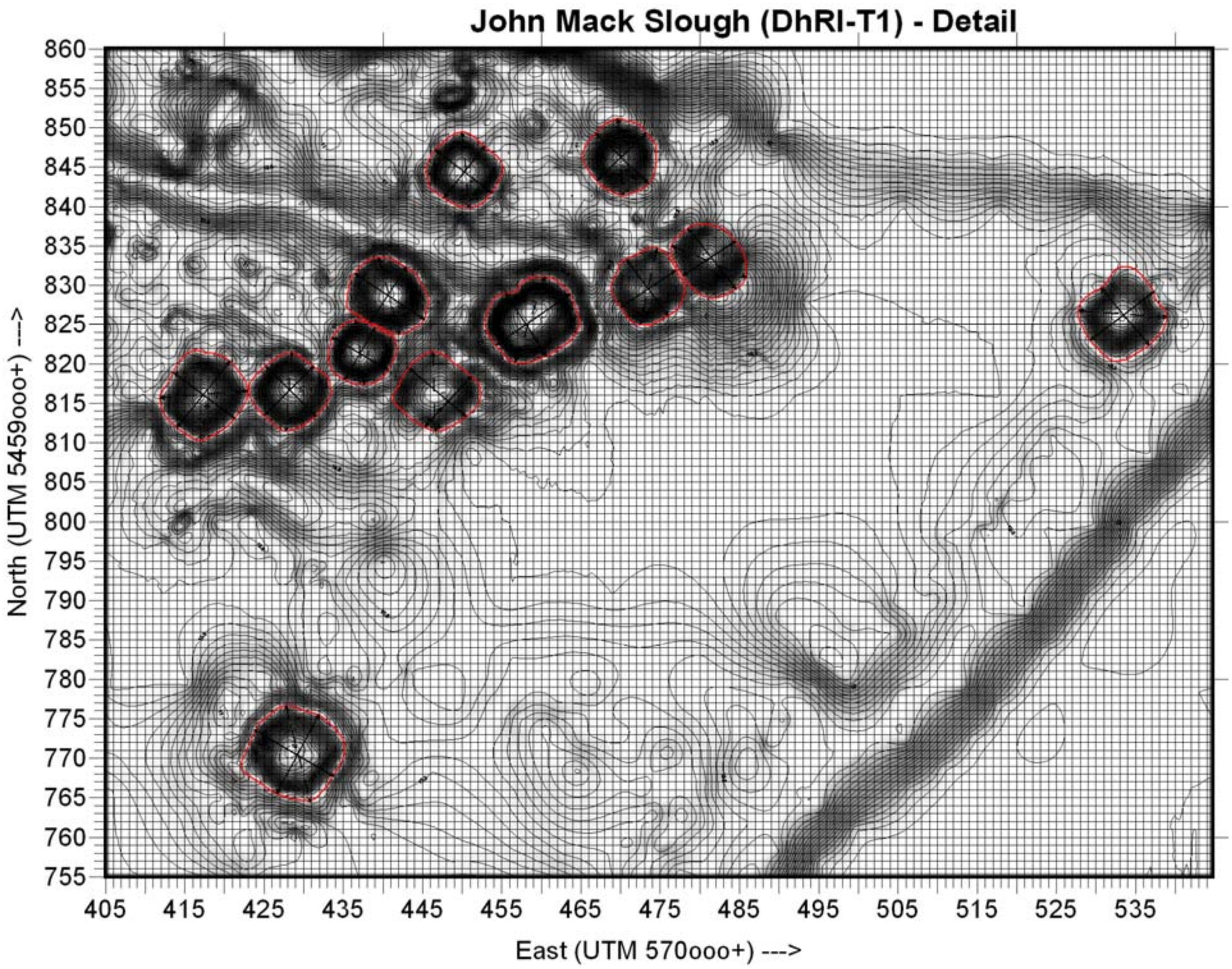
W/L (15) Width / Length Value
Measurement Level: Scale

W/D (16) Width / Diagonal Value
Measurement Level: Scale

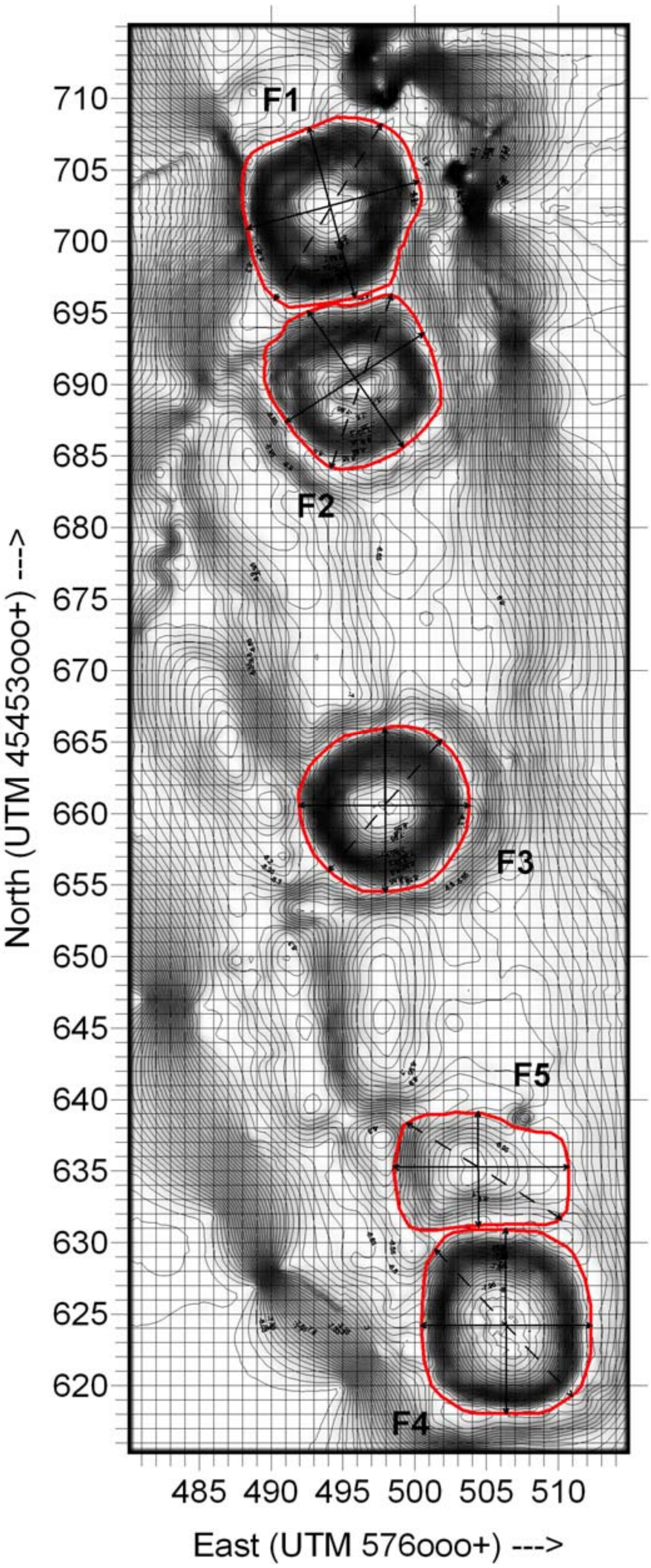
Shp (17) Feature Shape
Measurement Level: Scale

Value	Label
1	Square
2	Circular
3	Rectangular / Ovoid

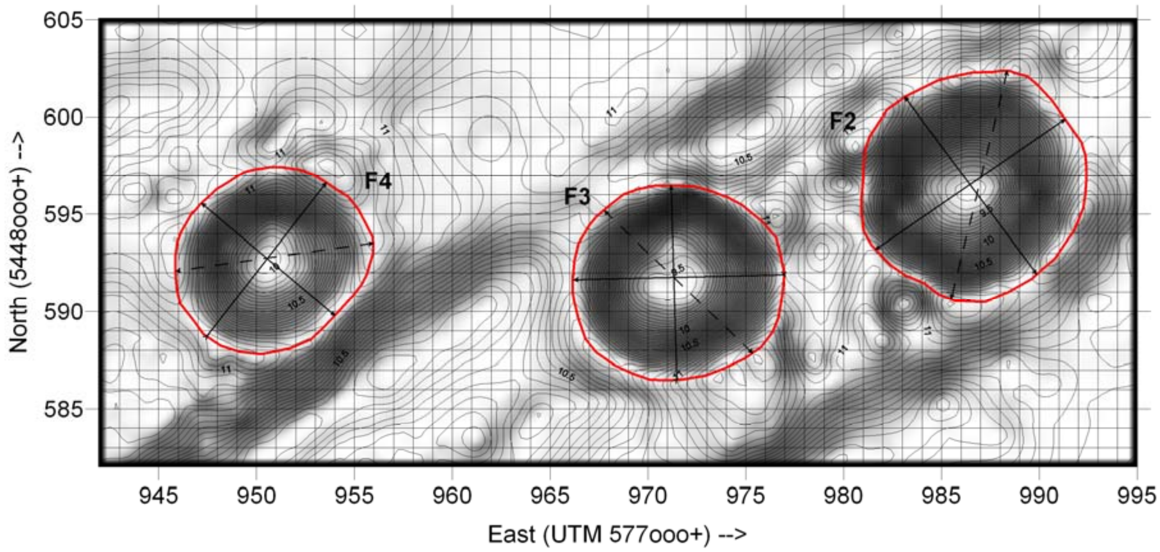
APPENDIX II - MAPS DEFINING HOUSEPIT POLYGONS AND LINE-WORK USED FOR TAKING AREA AND DIMENSION MEASUREMENTS.



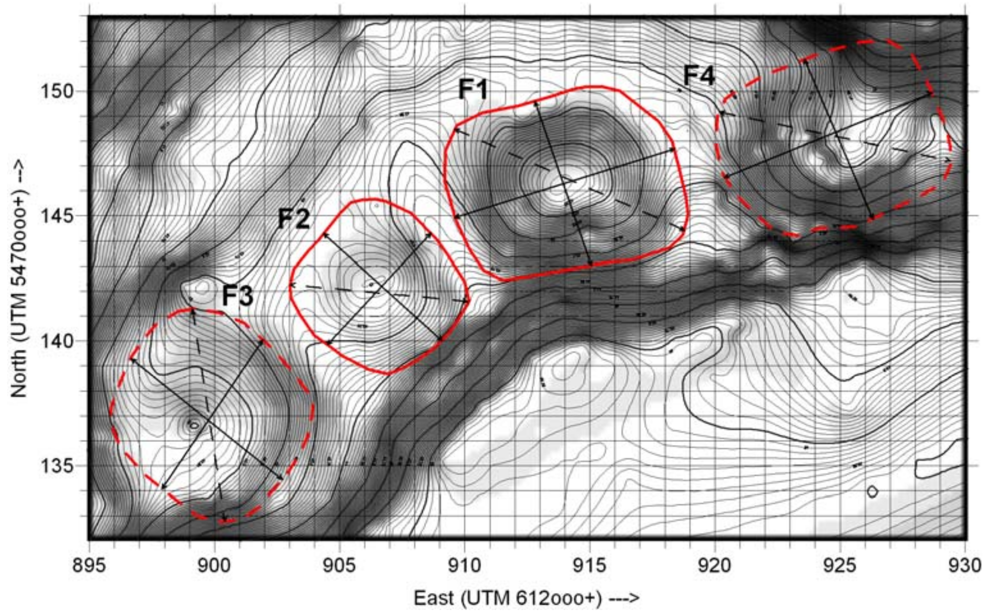
Qithyil Island (DhRl-15) - Detail



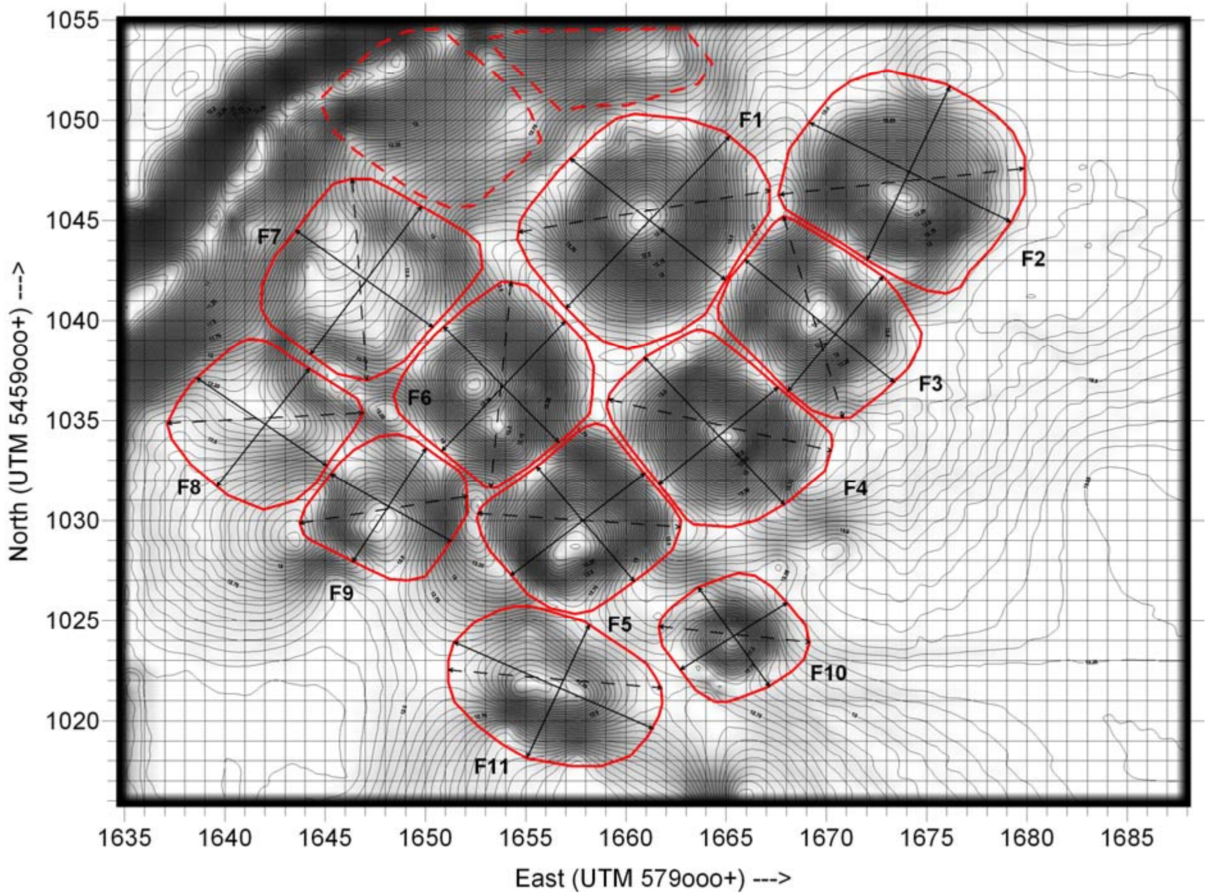
Sqwa:la (DhRl-6) - Detail



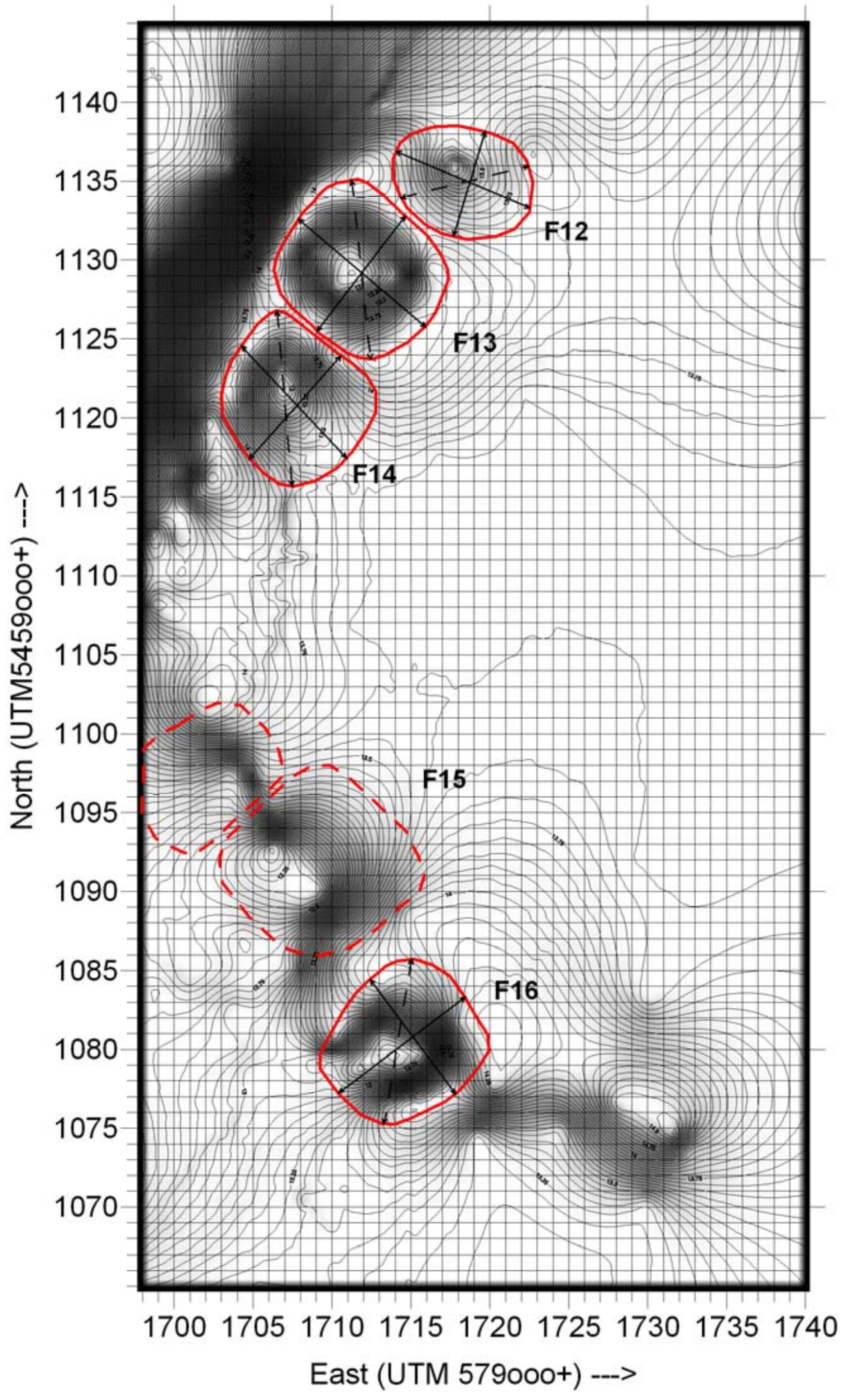
DiRi-48 (Eyxel) - Detail



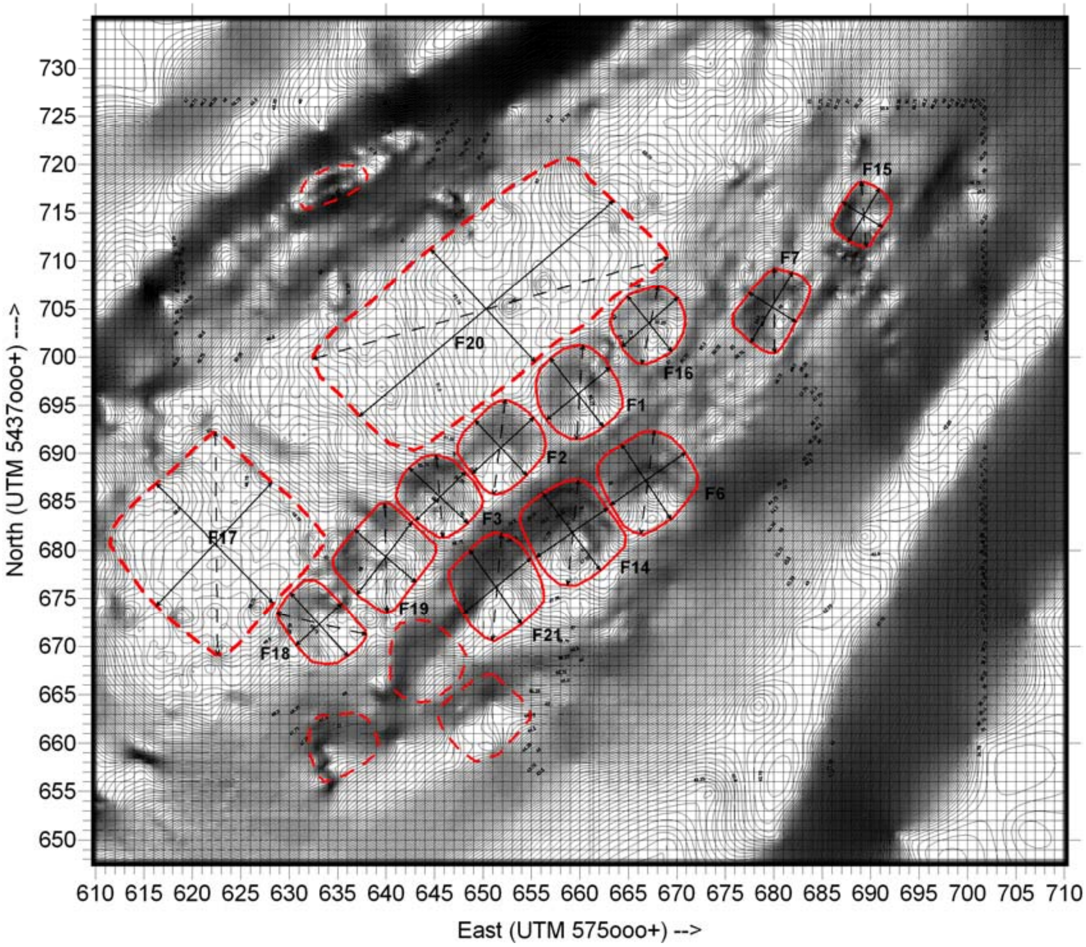
Hiqelem (DhRl-T2) - Southern Detail



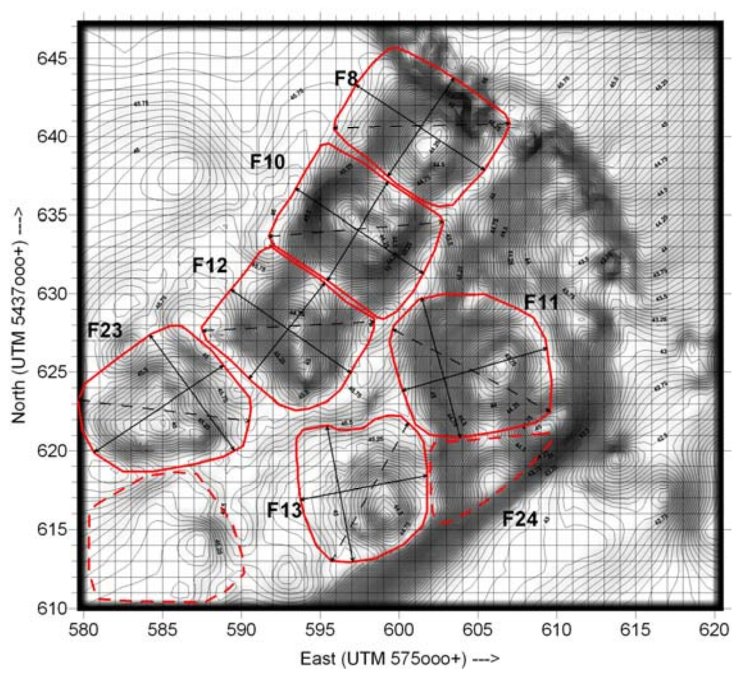
Hiqelem (DhRl-T2) - Northern Detail



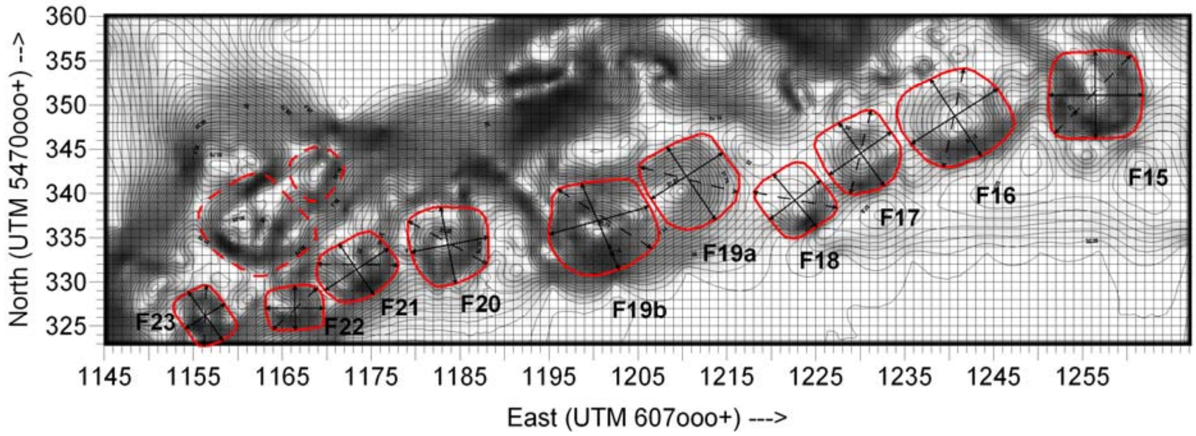
Th'ewali (DgRl-17) - Eastern Detail



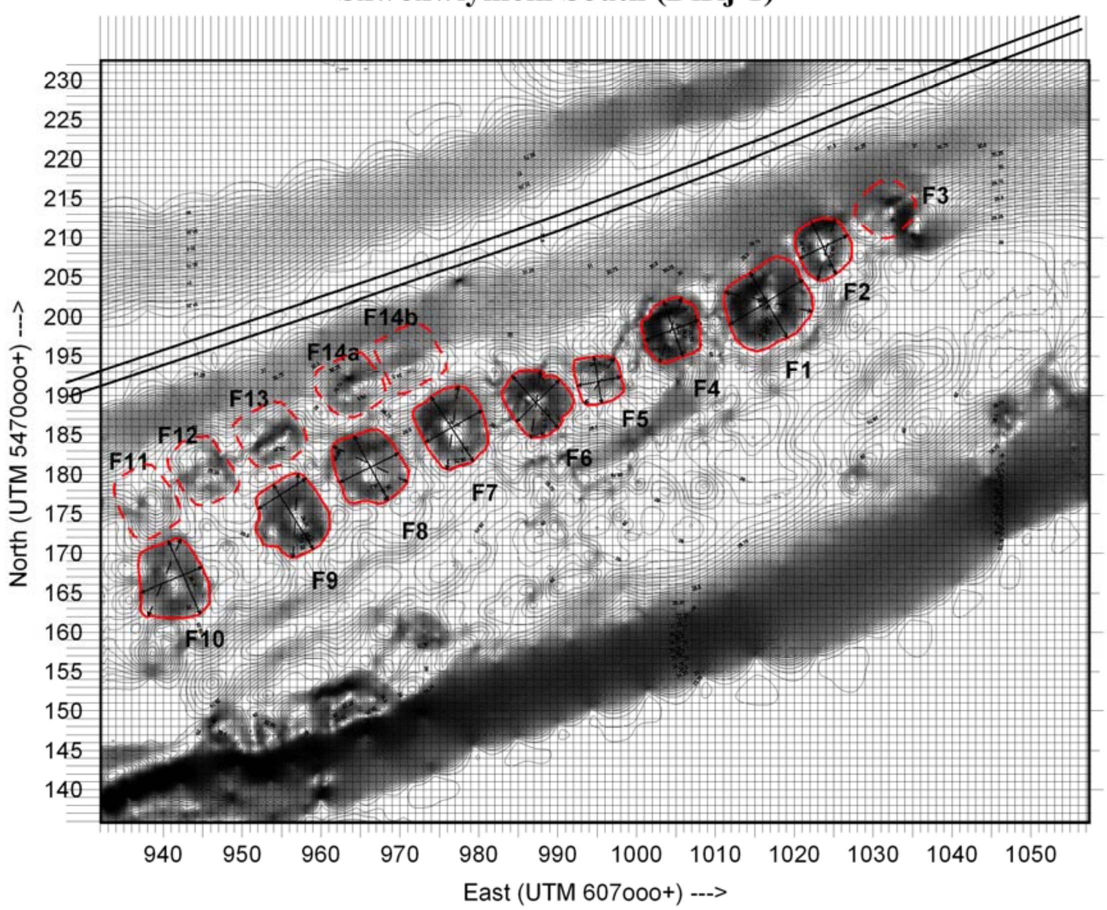
Th'ewali (DgRl-17) - Western Detail



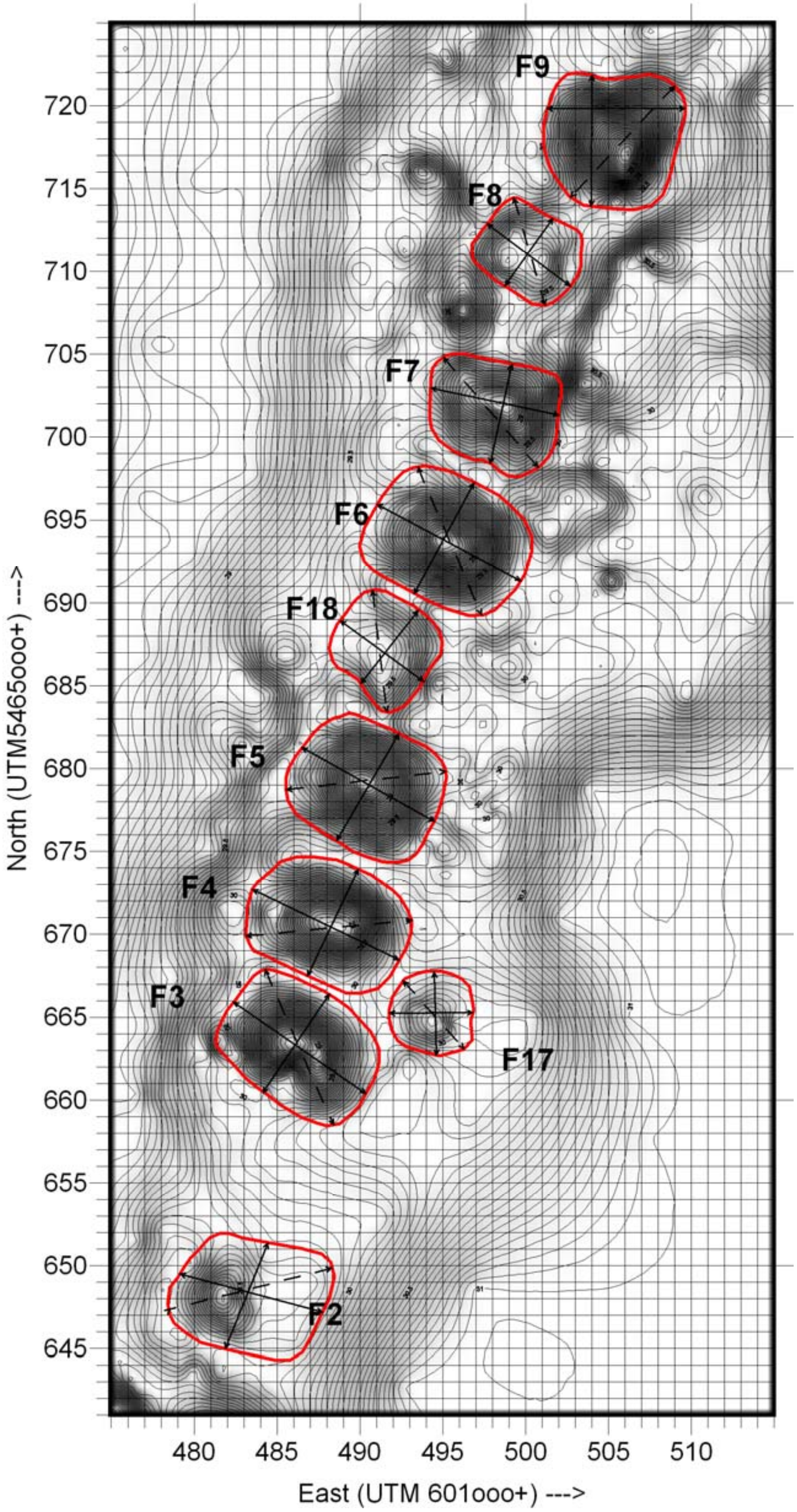
Sxwoxwiyemelh North - DiRj-1



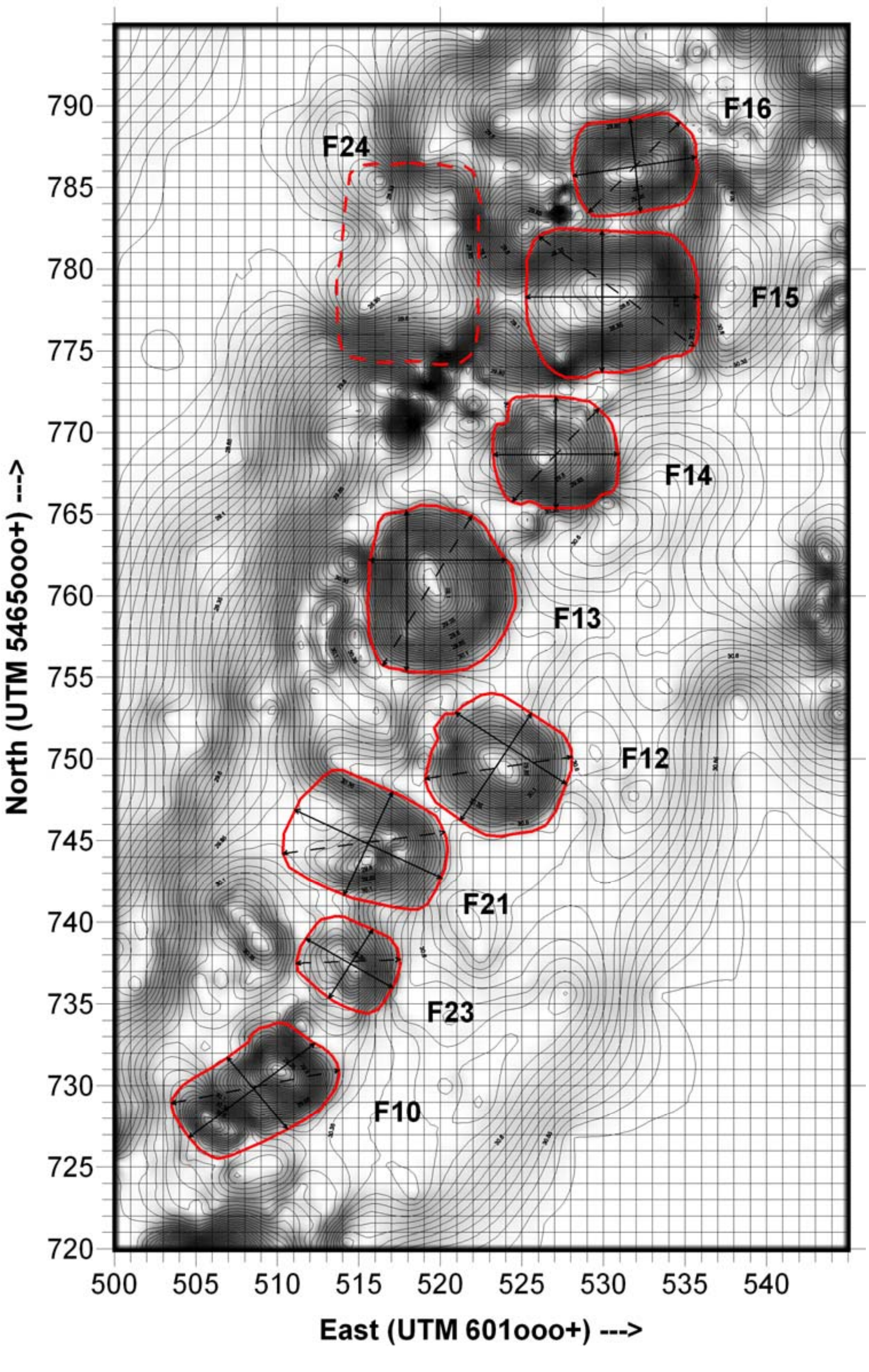
Sxwóxwiymelh South (DiRj-1)



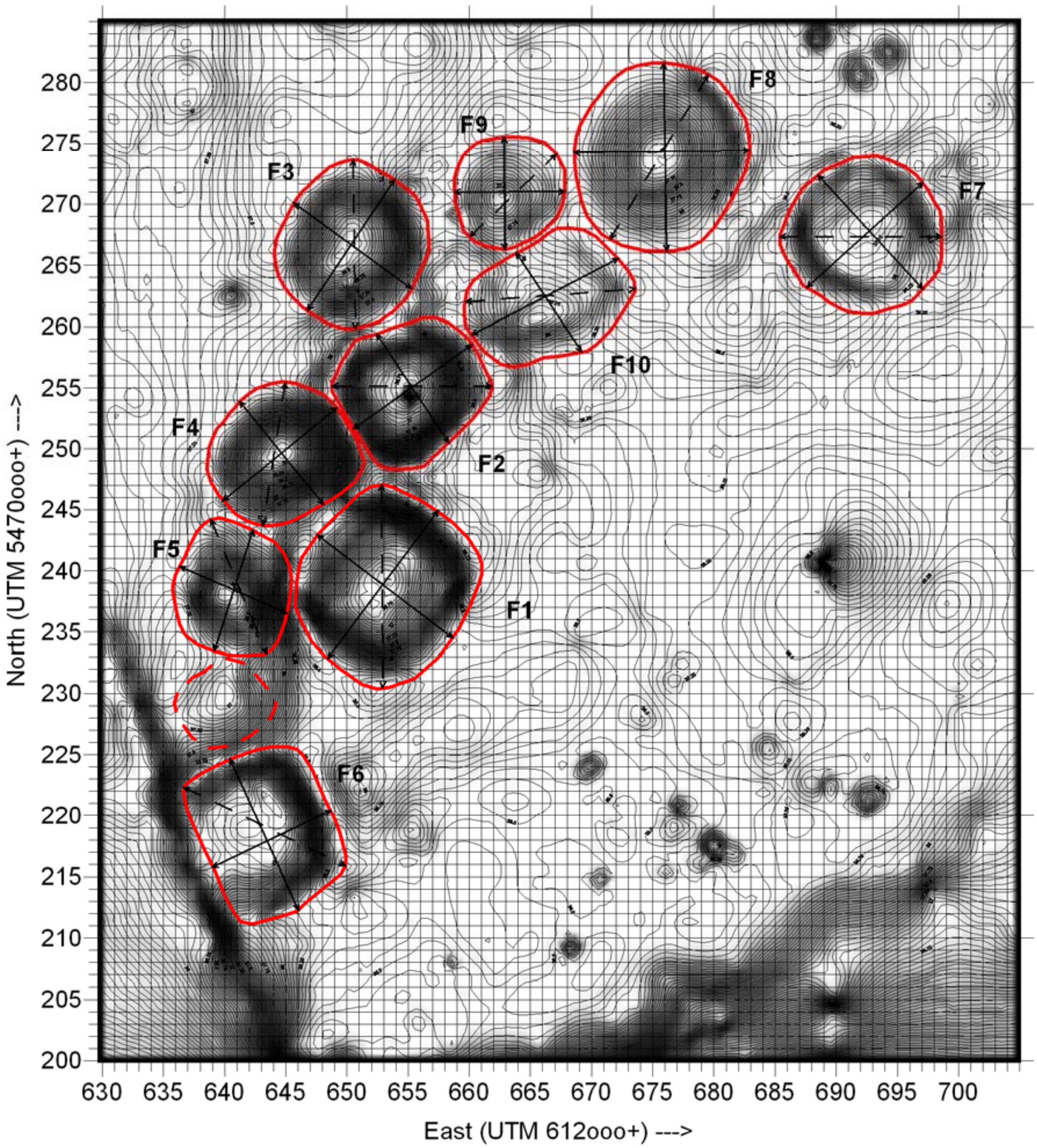
Shxw'ow'hamel (DiRj-30) - Detail 'A'



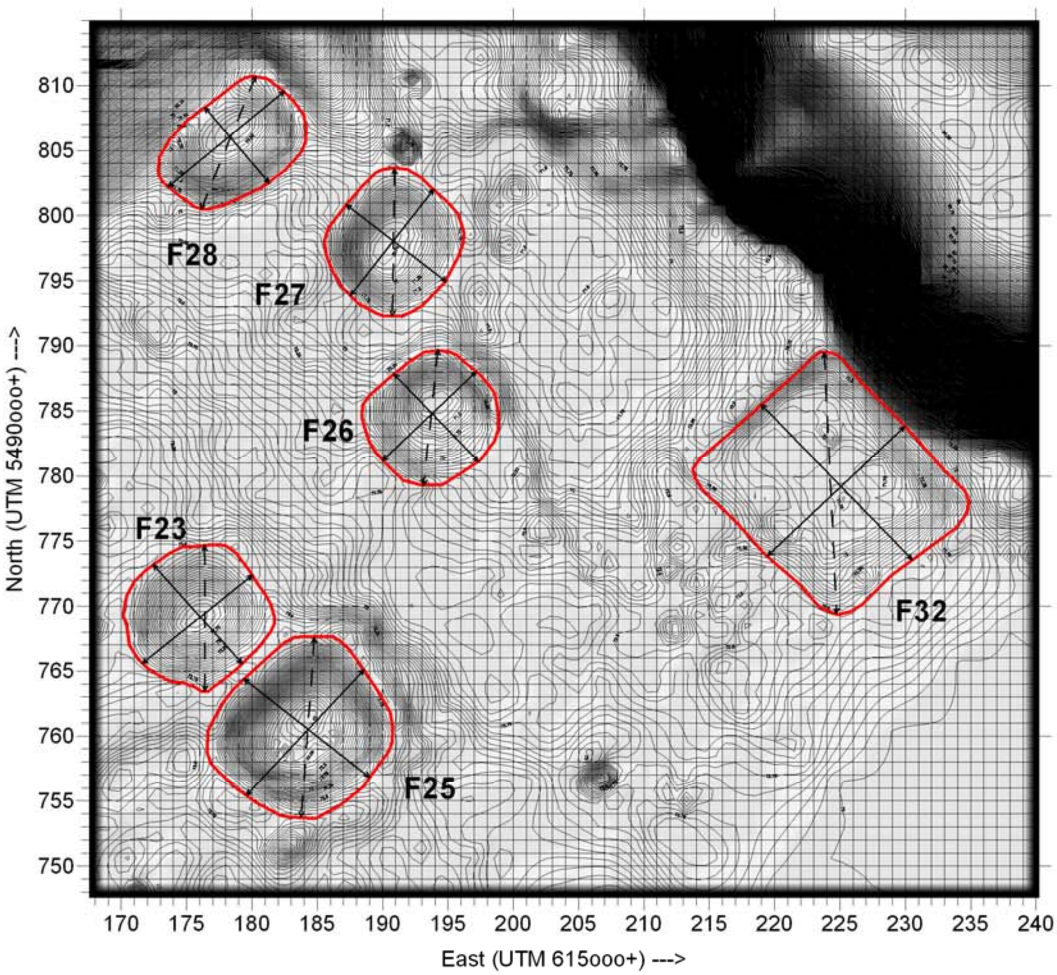
Shxw'ow'hamel (DiRj-30) - Detail 'B'



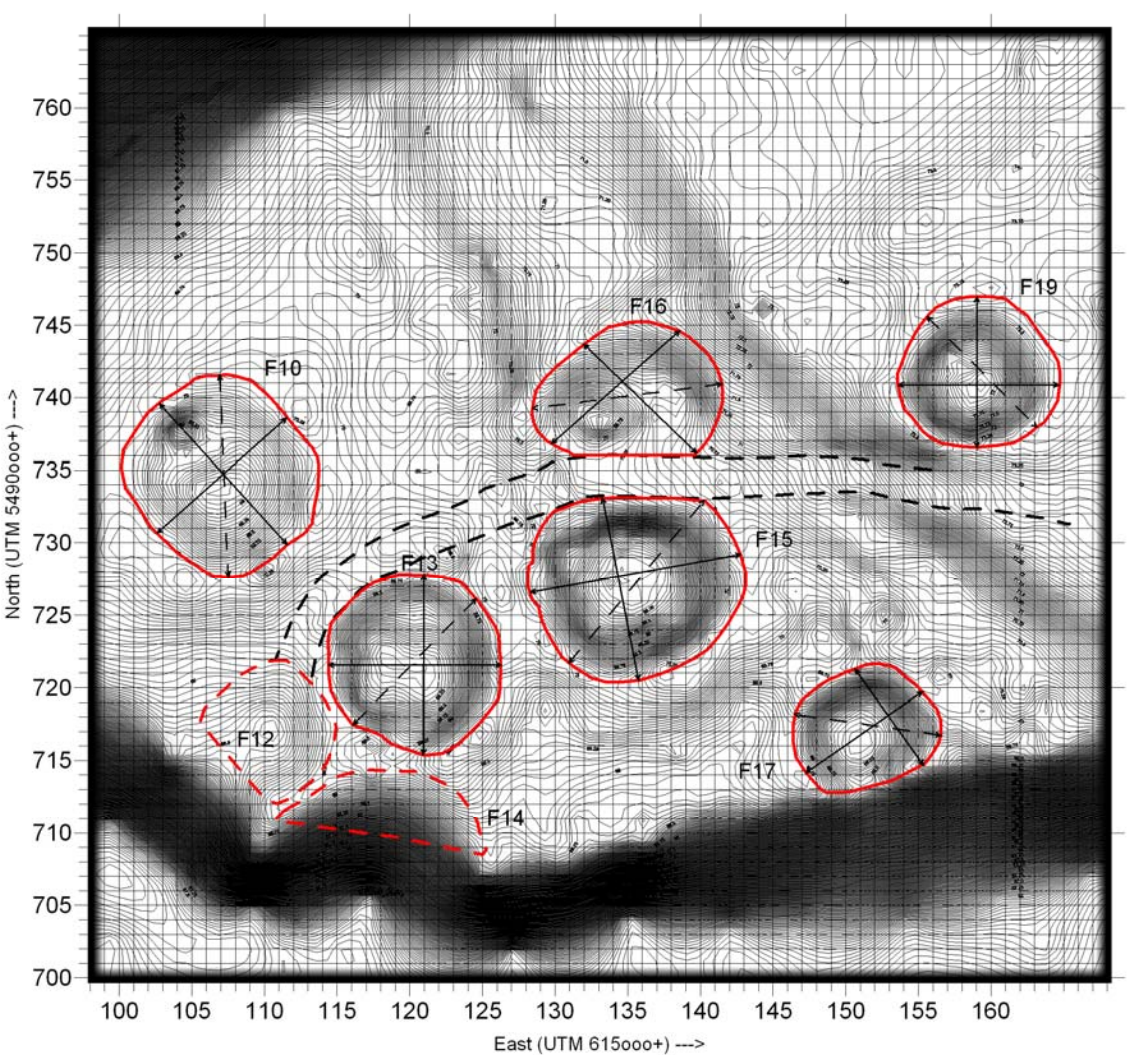
DiRi-15 - Welqamex - Detail



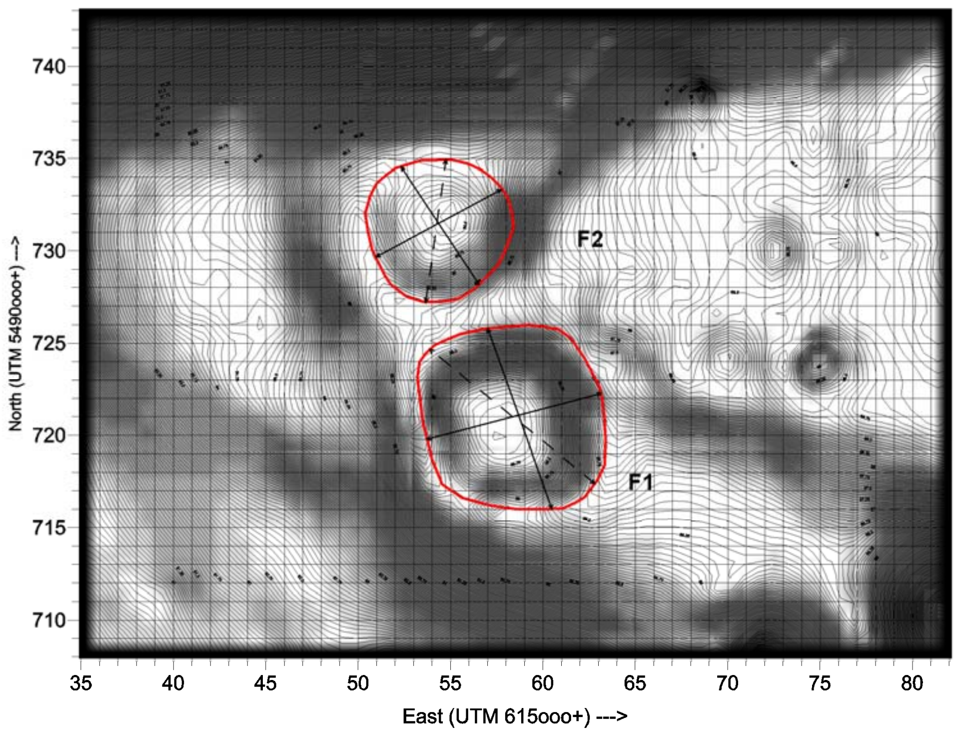
Xelhalh (DjRi-14) 2005 - Main Settlement Area - Eastern Detail



Xelhalh (DjRi-14) 2005 - Main Settlement Area - Central Detail



Xelhalh (DjRi-14) 2005 - Main Settlement Area - Western Detail



APPENDIX III - RADIOCARBON DATA SET OF DATED 'UPRIVER GROUP' HOUSE FEATURES (n=46).

Site #	Site Name	Sample #	Feat. #	Association	Material Dated	14C Age B.P.	Calibrated Ages B.P.[52]	Reference
DgRl-17	Th'ewá:lí	Beta-210179	2	Charcoal from base of internal house midden; initial occupation	Charred material	1160 ± 40	1180 - 970	Schaepe et al. 2006
DgRl-17	Th'ewá:lí	Beta-210180	8	Charcoal from base of internal house midden; initial occupation	Charred material	1060 ± 40	1060 - 930	Schaepe et al. 2006
DhRl-15	Qithyil Island	Beta-217440	4	Charcoal from floor / occupation surface	Charred material	450 ± 40	540 - 470	Schaepe et al. 2006
DhRl-15	Qithyil Island	Beta-217441	6	Charcoal from basal floor layer (of apparent plankhouse)	Charred material	720 ± 40	700 - 640	Schaepe et al. 2006
DhRl-16	Scowlitz	CAMS-61998	3	Charcoal from last use of hearth	Charred wood	2250 ± 70	2360 (2310, 2220, 2210) 2070	Lepofsky et al. 2000:400
DhRl-16	Scowlitz	Beta-91911	3	Charcoal from post hole, possibly charred post	Charred wood	2270 ± 60	2360 (2330) 2120	Lepofsky et al. 2000:400

[52] Calibrated ages were calculated using the dataset in Stuiver et al. (1998), based on radiocarbon curve intercepts. This table presents the maximum and minimum calibrated ranges, with any associated calibrated ranges in parentheses (calculated at 2 sigmas; 95 % probability). Previously unpublished radiocarbon calibrations were established using INTC AL 98.

Site #	Site Name	Sample #	Feat. #	Association	Material Dated	14C Age B.P.	Calibrated Ages B.P.[52]	Reference
DhRl-16	Scowlitz	WSU-4542	3	Charcoal associated with floor	Charred wood	2460 ± 90	2750 (2700, 2670, 2660, 2650, 2490, 2480, 2470) 2330	Lepofsky et al. 2000:400
DhRl-16	Scowlitz	Beta-91910	3	Charred beam on floor	Charred western red cedar	2450 ± 60	2740 (2490, 2580, 2470) 2350	Lepofsky et al. 2000:400
DhRl-16	Scowlitz	WSU-5051	4	Charcoal layer laying on sterile	Charcoal	2940 ± 180	3550 (3150, 3140, 3130, 3100, 3090, 3080) 2740	Lepofsky et al. 2000:400
DhRl-16	Scowlitz	WSU-5052	5	Hearth on structure floor	Charcoal	1850 ± 50	1920 (1820) 310	Lepofsky et al. 2000:400
DhRl-16	Scowlitz	WSU-5054	7	Fill within feature	Charcoal	2740 ± 470	4060 (2850, 2820, 2810, 2800, 2790) 1710	Lepofsky et al. 2000:400
DhRl-16	Scowlitz	CAMS-61997	8	Charcoal from slab-lined hearth	Charred wood	2410 ± 50	2710 (2360) 2340	Lepofsky et al. 2000:400
DhRl-T1	John Mack Slough	Beta-210181	5	Charcoal from floor / occupation surface	Charred material	290 ± 40	470 - 290	Schaepe et al. 2006
DhRl-T2	Hiqelem	Beta-208884	1	Charcoal from floor / occupation surface	Charred material	1090 ±	1070 - 940	Lepofsky et al. 2005:4
DhRl-T2	Hiqelem	Beta-208883	4	Charcoal from internal house midden	Charred material	550 ± 40	540 - 460	Lepofsky et al. 2005:5
DiRi-1*	Ts’qo:ls	--	1	--	--	--	--	Arnold & Schaepe 2003

Site #	Site Name	Sample #	Feat. #	Association	Material Dated	14C Age B.P.	Calibrated Ages B.P.[52]	Reference
DiRi-1*	Ts'qo:ls	--	2	--	--	--	--	Arnold 2006
DiRi-15	Welqámex	Beta-213529	1	Lowest floor, hearth	Charred material	320 ± 40	490 - 290	Graesch 2006:66
DiRi-15	Welqámex	Beta-213530	5	Floor, hearth smear	Charred material	70 ± 40	270 (210, 140) 20	Graesch 2006:66
DiRi-15	Welqámex	Beta-213531	6	Floor	Charred material	140 ± 40	290 - 0	Graesch 2006:66
DiRi-15	Welqámex	Beta-213532	7	Upper roof	Charred material	300 ± 40	470 - 290	Graesch 2006:66
DiRi-15	Welqámex	Beta-196134	7	Lowest floor, hearth	Charred material	220 ± 60	430 (360, 330, 240, 230) 70	Graesch 2006:66
DiRi-15	Welqámex	Beta-213533	9	Floor	Charred material	70 ± 40	270 (210, 140) 20	Graesch 2006:66
DiRi-15	Welqámex	Beta-213534	11	Subfloor, hearth (plankhouse)	Charred material	640 ± 40	670 - 540	Graesch 2006:66
DiRi-48	Eyxel	Beta-210177	1	Charcoal from hearth / occupation zone	Charred material	150 ± 40	280 (170, 150) 0	Schaepe et al. 2006
DiRi-48	Eyxel	Beta-210178	2	Charcoal from hearth / occupation zone	Charred material	510 ± 40	550 - 500	Schaepe et al. 2006
DiRj-1	Sx̲wóxw̲iymelh	I-6191	1	Floor / occupation zone	Charcoal	2430 ± 90	2741 - 2334	Hanson 1973:267 / Calib 5.0.2
DiRj-1	Sx̲wóxw̲iymelh	Beta-208885	6	Occupation zone	Charred material	2380 ± 40	2690 (2660, 2480) 2340	Lepofsky & Lenert 2005

Site #	Site Name	Sample #	Feat. #	Association	Material Dated	14C Age B.P.	Calibrated Ages B.P.[52]	Reference
DiRj-1	Sxwóxwiymelh	Beta-208882	9	Occupation zone	Charred material	2130 ± 40	2320 - 2050	Lepofsky & Lenert 2005
DiRj-1	Sxwóxwiymelh	Beta-208881	10	Occupation zone	Charred material	2300 ± 40	2350 (2290, 2270) 2160	Lepofsky & Lenert 2005
DiRj-14	Pipeline	Gak-5432	1	Occupation zone	Charcoal	370 ± 80	535 (285, 165) 156	von Krogh 1976:210-211 / Calib 5.0.2
DiRj-1a	Sxwóxwiymelh	Beta-208879	15	Occupation zone	Charred material	2470 ± 40	2730 - 2360	Lepofsky & Lenert 2005
DiRj-1a	Sxwóxwiymelh	Beta-208880	20	Occupation zone	Charred material	320 ± 40	490 - 290	Lepofsky & Lenert 2005
DiRj-30	Shxw'ow'hamel	Beta-210170	4	Charcoal from hearth / occupation surface	Charred material	1980 ± 40	2060 - 1880	Schaepe et al. 2006
DiRj-30	Shxw'ow'hamel	Beta-201169	9	Charcoal from hearth / occupation surface	Charred material	2160 ± 40	2330 - 2120	Schaepe et al. 2006
DiRj-30	Shxw'ow'hamel	Beta-217438	12	Charcoal from hearth / occupation surface (terminal)	Charred material	2050 ± 40	2120 - 1900	Schaepe et al. 2006
DiRj-30	Shxw'ow'hamel	Beta-217439	12	Charcoal from hearth / occupation surface (initial)	Charred material	2110 ± 40	2290 (2270, 2160) 1990	Schaepe et al. 2006

Site #	Site Name	Sample #	Feat. #	Association	Material Dated	14C Age B.P.	Calibrated Ages B.P.[52]	Reference
DiRj-30	Shxw'ow'hamel	Beta-210171	13	Charcoal from hearth / occupation surface	Charred material	1520 ± 40	1480 (1470, 1430) 1300	Schaepe et al. 2006
DiRj-30	Shxw'ow'hamel	Beta-210173	18	Charcoal from hearth / occupation surface	Charred material	2050 ± 40	2120 - 1900	Schaepe et al. 2006
DiRj-38	Flood	Gak-5429	2	Occupation zone	Charcoal	650 ± 100	768 - 504	von Krogh 1976:210-211 / Calib 5.0.2
DjRi-14*	Xelhálh	--	1	--	--	--	--	Schaepe et al. 2006
DjRi-14*	Xelhálh	--	2	--	--	--	--	Schaepe et al. 2006
DjRi-14	Xelhálh	Beta-210174	13	Charcoal from hearth / floor	Charred material	270 ± 40	430 (360, 330, 280, 180, 150, 10) 0	Schaepe et al. 2006
DjRi-14	Xelhálh	Beta-210175	23	Charcoal from floor / occupation surface	Charred material	250 ± 40	430 (380, 320, 270, 180, 150, 10) 0	Schaepe et al. 2006
DjRi-14	Xelhálh	Beta-210176	28	Charcoal from hearth / occupation surface	Charred material	270 ± 40	440 (350, 330, 280, 170) 150	Schaepe et al. 2006
DjRi-5**	Esilao	--	1	--	--	--	--	Mitchell 1963:133

APPENDIX IV - RADIOCARBON DATA SUB-SET (extracted from Schaepe, Blake, Formosa, and Lepofsky 2006).

Sample No.	Field Collection Sample No.	Site Name	DBS (cm)	Feature Type	Sample Context	Association	Conv. Age B.P.	Meas. Radio-carb. Age (B.P.)	Cal A.D. (2 sigma 95% prob.)	Cal B.P. (2 sigma 95% prob.)	Notes
Beta-210181	DhRl-T1-F5-SP1-CS-1	John Mack Slough	14	Housepit	Hearth / House Living Surface	House Floor Zone	300+/-40	290+/-40	1480-1660 AD	470-290 BP	Single occupation; shallow housepit floor - well defined stratum; high water table
Beta-217440	DhRl-15-F4-SP2-CS-1	Qithyil Island	27-28	Housepit	House Living Surface	House Floor Zone	460+/-40	450+/-40	1410-1480 AD	540-470 BP	Single occupation; thin housepit floor - well defined stratum; high water table
Beta-217441	DhRl-15-F6-CS-3	Qithyil Island	78	Plank-house	House Living Surface	House Floor Zone I (initial)	720+/-40	720+/-40	1250-1300 AD	700-640 BP	Erosional exposure; stratified deposit; upper house floor layer - thin & well-defined stratum
Beta-210180	DgRl-17-F8-AT2-CS-4	Th'ewa:li	48	Housepit	Midden	House Occupation Midden; Internal; Basal	1070+/-40	1060+/-40	890-1020 AD	1060-930 BP	Column sample; unstratified midden matrix; base of cultural deposits
Beta-210179	DgRl-17-F2-AT4-CS-4	Th'ewa:li	60	Housepit	Midden	House Occupation Midden; Internal	1170+/-40	1160+/-40	770-980 AD	1180-970 BP	Column sample; unstratified midden matrix ; associated with basal cultural deposits

Sample No.	Field Collection Sample No.	Site Name	DBS (cm)	Feature Type	Sample Context	Association	Conv. Age B.P.	Meas. Radio-carb. Age (B.P.)	Cal A.D. (2 sigma 95% prob.)	Cal B.P. (2 sigma 95% prob.)	Notes
Beta-210178	DiRi-48-F2-SP1-CS-5	Eyxel	52	Housepit	Hearth / House Living Surface	House Floor Zone I (initial)	510+/-40	510+/-40	1400-1450 AD	550-500 BP	NOTE: DiRi-48 carbon samples numbered per site v. per Test / Feature (6 samples taken from site)
Beta-210177	DiRi-48-F1-AT2-CS-6	Eyxel	21.5	Housepit	Hearth / House Living Surface	House Floor Zone	110+/-40	150+/-40	1670-1780 / 1800-1950 AD	280-170 / 150-0 BP	NOTE: DiRi-48 carbon samples numbered per site v. per Test / Feature (6 samples taken from site)
Beta-210176	DjRi-14-F28-ST2-CS-2	Xelhalh	30-31.5	Housepit	House Living Surface	House Floor Zone I (initial)	270+/-40	270+/-40	1510-1600 / 1620-1670 / 1780-1800 AD	440-350 / 330-280 / 170-150 BP	
Beta-210175	DjRi-14-F23-AT2-CS-2	Xelhalh	38	Housepit	Hearth / House Living Surface	House Floor Zone I (initial)	250+/-40	250+/-40	1520-1580 / 1630-1680 / 1770-1800 / 1940-1950 AD	430-380 / 320-270 / 180-150 / 10-0 BP	
Beta-210174	DjRi-14-F13-ST6-CS-3	Xelhalh	23-24	Housepit	Hearth / House Living Surface	House Floor Zone I (initial)	260+/-40	270+/-40	1520-1590 / 1620-1670 / 1770-1800 / 1940-1950 AD	430-360 / 330-280 / 180-150 / 10-0 BP	

Sample No.	Field Collection Sample No.	Site Name	DBS (cm)	Feature Type	Sample Context	Association	Conv. Age B.P.	Meas. Radio-carb. Age (B.P.)	Cal A.D. (2 sigma 95% prob.)	Cal B.P. (2 sigma 95% prob.)	Notes
Beta-210169	DiRj-30-F9-AT2-CS-3	Shxw'ow'hamel	59.1	Housepit	Hearth / House Living Surface	House Floor Zone I (initial)	2200+/-40	2160+/-40	380-160 BC	2330-2120 BP	
Beta-210172	DiRj-30-F18-ST4-CS-5	Shxw'ow'hamel	17-18	Housepit	Disturbed modern sediments	Disturbed sediments capping house deposits	modern	modern	modern	modern	Possible roof - terminal floor transition (floor capped by roof) = disturbed material per C14 results (!!)
Beta-210173	DiRj-30-F18-ST4-CS-4	Shxw'ow'hamel	38-40	Housepit	Hearth / House Living Surface	House Floor Zone I (initial - lower)	2040+/-40	2050+/-40	160-50 AD	2120-1900 BP	Lower portion of initial floor zone / hearth - same layer as CS-3
Beta-210170	DiRj-30-F4-ST3-CS-1	Shxw'ow'hamel	33-34	Housepit	Hearth / House Living Surface	House Floor Zone II (terminal)	2020+/-40	1980+/-40	110 BC - 70 AD	2060-1880 BP	
Beta-210171	DiRj-30-F13-ST1-CS-5	Shxw'ow'hamel	57-58	Housepit	Hearth / House Living Surface	House Floor Zone I (initial)	1490+/-40	1520+/-40	460-480 / 520-650 AD	1480-1470 / 1430-1300 BP	
Beta-217438	DiRj-30-F12-ST2-CS-4	Shxw'ow'hamel	44-45	Housepit	Hearth / House Living Surface	House Floor Zone III (terminal)	2050+/-40	2050+/-40	170 BC - 40 AD	2120-1900 BP	

Sample No.	Field Collection Sample No.	Site Name	DBS (cm)	Feature Type	Sample Context	Association	Conv. Age B.P.	Meas. Radio-carb. Age (B.P.)	Cal A.D. (2 sigma 95% prob.)	Cal B.P. (2 sigma 95% prob.)	Notes
Beta-217439	DiRj-30-F12-ST2-CS-6	Shxw'ow'hamel	53-54	Housepit	Hearth / House Living Surface	House Floor Zone I (initial)	2110+/-40	2110+/-40	340-320 BC / 210-40 BC	2290-2270 BP/ 2160-1990 BP	

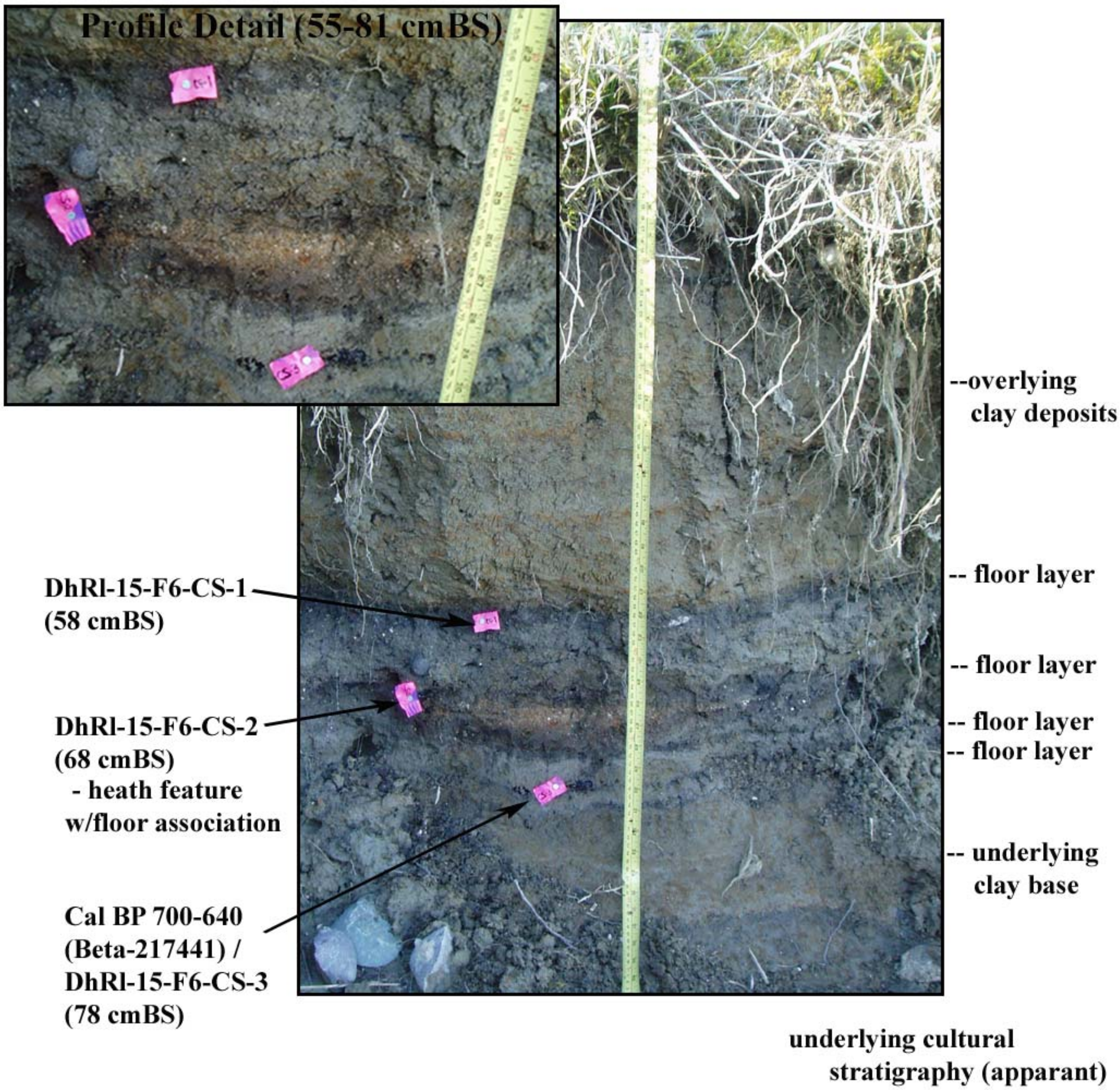
APPENDIX V - EXAMPLES OF TEST UNIT STRATIGRAPHIC PROFILES

Qithyil Island (DhRl-15) - Test Unit Profiles

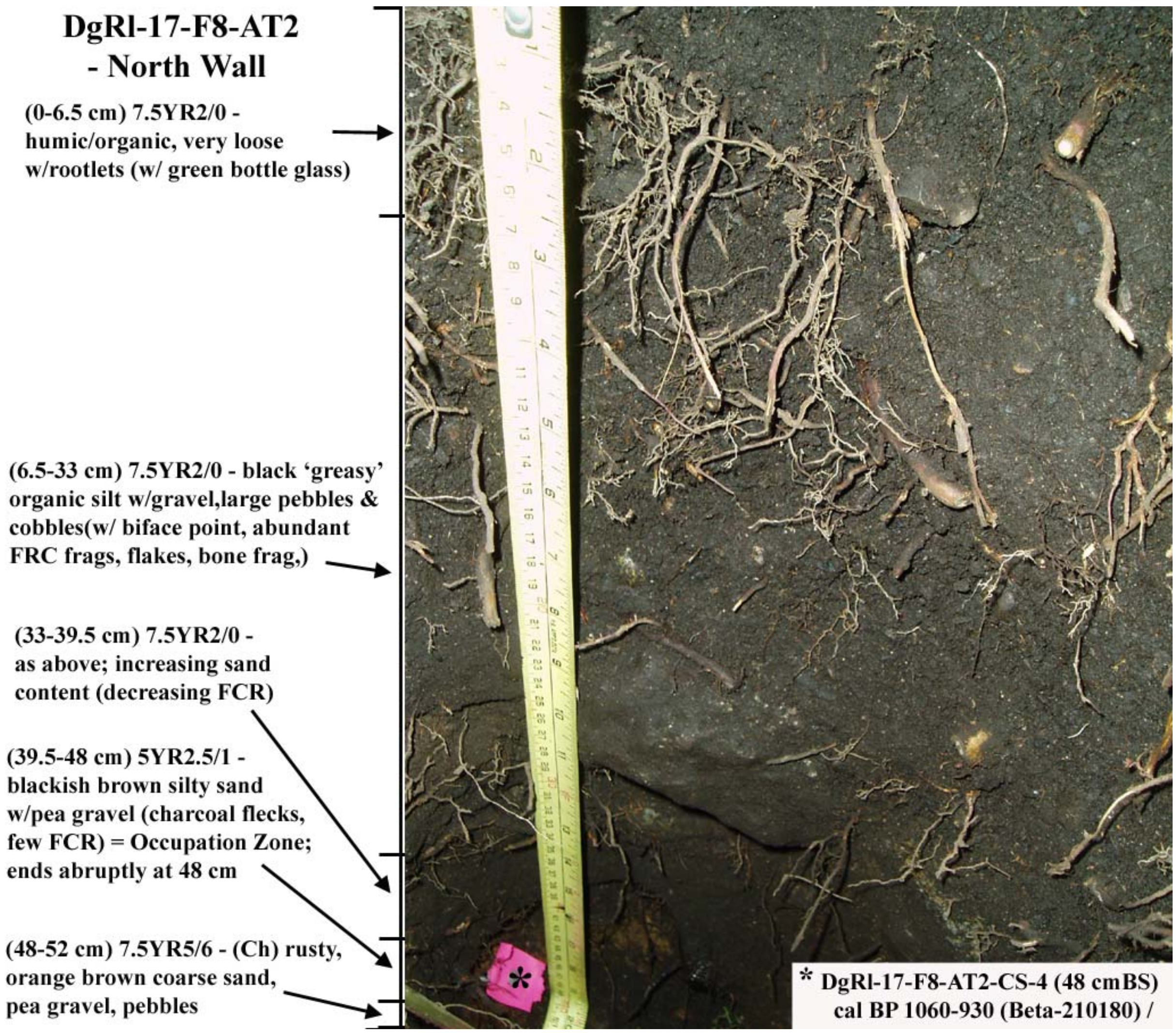
DhRl-15-F4-SP2

DhRl-15-F6 - Plankhouse feature riverbank exposure - profile

DhRl-15-F6 - Plankhouse feature profile exposure (riverbank)



DgRl-17-F8-AT2



<u>**Eyxel (DiRi-48) - Test Unit Profiles**</u>

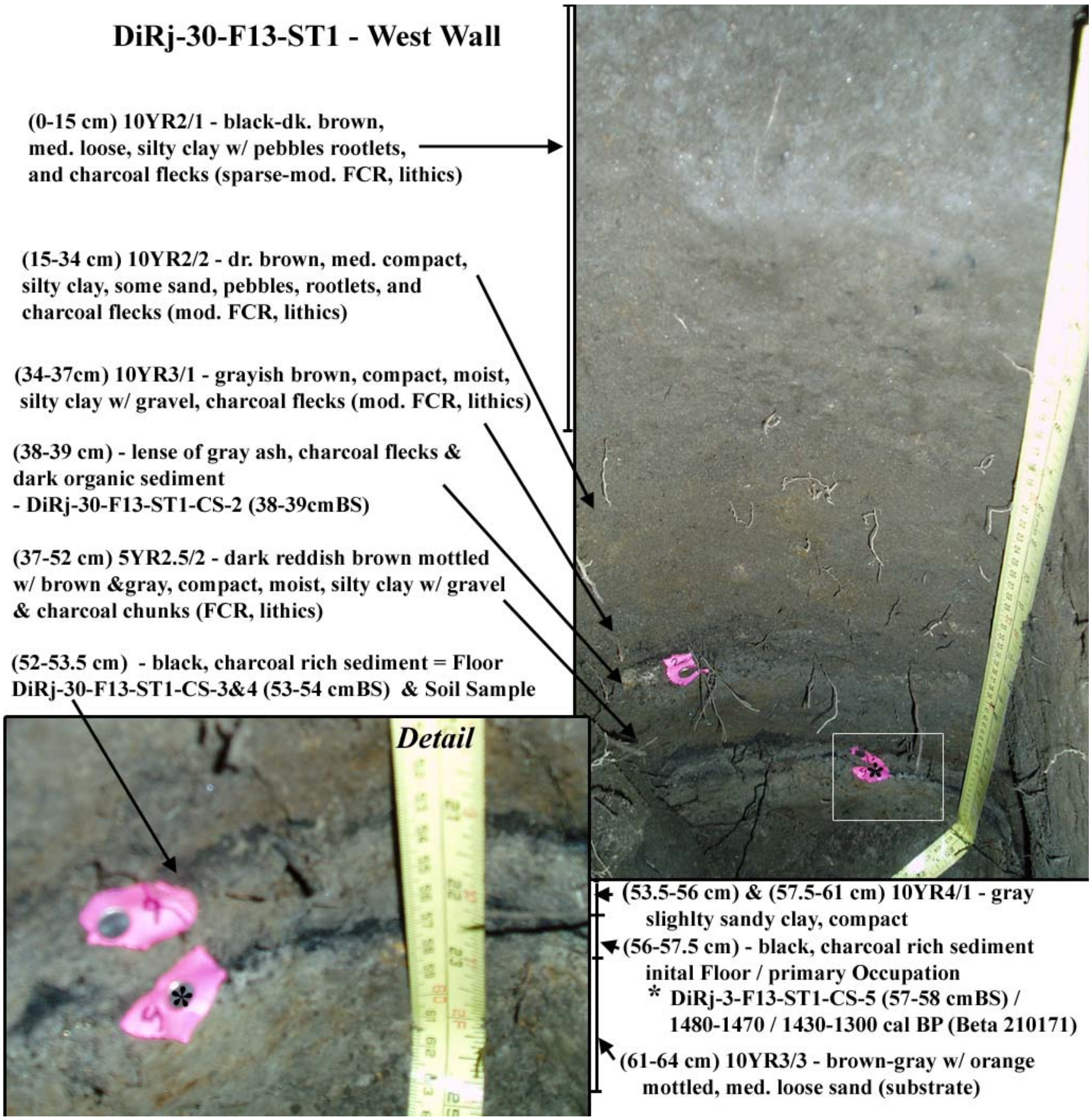
DiRi-48-F1-AT2

DiRi-48-F1-AT2 - Western Portion

* DiRi-48-AT2-CS-6 (21-22 cmBS) 280-170 / 150-0 cal BP (Beta 210177

Shxw’ow’hamel (DiRj-30) - Test Unit Profiles

DiRj-30-F13-ST1



DiRj-30-F18-ST4

DiRj-30-F18-ST4 - NE Corner

(0-10 cm) 10YR2/1 - (Oh/Ah) black, organic, loose silt w/charcoal chunks & rootlets

(10-15 cm) 10YR2/2 - dark brown, oraganic, loose silt w/pebbles & rootlets (sparse FCR)

(15-19/20 cm) 5YR3/1-2.5/1 - gray-brown mottled slighltly clayey silt, some charcoal staining (flakes, debitage)
- DiRj-30-F18-ST4-SC-5 = disturbed deposit (per Beta 210172 - 'modern soil')

(19/20-21 cm) 10YR3/6 - gray/brown/ orange mottled, compact, slightly clayey silt

(21-24) 5YR2.5/1 - black, charcoal-rich silt]= Floor(flakes. microdebitage)
- DiRj-30-F18-ST4-CS-1

(24-27 cm) 10YR4/3 - tan, compact silt w/oxidized fire-reddening & charcoal flecks & calcined bone (flakes/microdebitage)

(27-30 cm) 5YR2.5/1 - black, charcoal-rich silt, w/calcined bone = Floor
- DiRj-30-F18-ST4-CS-2

(30-34 cm) 10YR3/4 - highly fire-reddened/ oxidized, compact silt w/calcined bone (poss. hearth)

(34-40/41 cm) 10YR2/2 - black, charcoal-rich fine silt (FCR, microdebitage)
= Intial Floor / Primary Occupation
- DiRj-30-F18-ST4-CS-3 //

*** DiRj-30-F18-ST4-CS-4**
2120-1990 Cal BP (Beta 210173)

(40/41-86 cm) 10YR4/3 - (Ch) yellow-brown, compact clayey sand becoming sandier at 50 cm (sparse FCR, flake - sterile beyond @ 50 cm)

DjRi-14-F28-ST2

DjRi-14-F28-ST2 - North Wall (partial West Wall)

(0-13 cm) 10YR2/2-2/1 - (Oh/Ah) brown-black mottled sandy silt, w/organics (sparse FCR)

(13-18 cm) 10YR2/2 - blackish brown slightly sandy silt, med. compact, w/ dense charcoal & ash deposit, underlain by reddish-brown, oxidized/burned earth (poss. hearth) (FCR) = Upper Floor (?) / terminal house occupation
DjRi-14-F28-ST2-CS-1 (16-17 cmBS)

(18-30 cm) 10YR3/4 - dk. yellowish-brown slightly sandy silt, dense charcoal flecks (moderate FCR)

(30-32 cm) 10YR2/2 - black, charcoal-rich, compact slightly sandy silt w/ash (FCR) = Inital House Floor / primary occupation

*** DjRi-14-F28-CS-2 / (Beta 210176) 440-350/330-280/170-150 Cal BP (30-31.5 cmBS)**

(32-45 cm) 10YR3/4 - orange-brown, compact, sandy silt w/dense pebbles (moderate FCR)

(45-55 cm) 10YR3/4 - orange-brown grading to reddish-brown compact clayey silt w/abundant rounded pebbles (decreasing FCR)

DjRi-14-F13-ST6

DjRi-14-F13-ST6 - North Wall (partial West Wall)

(0-7 cm) - (Oh) oraganic, loose, loamy sand & rootlets

(7-13 cm) 10YR2/1 - black-dk. brown, loose, sandy silt, w/ charcoal chunks (dense FCR; lithic)

(13-23 cm) 10YR2/2-3/6 - dk. brown-blk. yellow-brown/orange mottled sandy silt- irregular surface, charcoal flecks/ chunks (dense FCR; core, lithics)
= terminal house occupation
DjRi-14-F13-ST6-CS-1 (13.5 cm) //
DhRi-14-F13-ST6-CS-2 (16 cmBS)
- see 'SouthWall detail' - charcoal concentration

(23-27 cm) 10YR2/2 - very dk. brown/gray-black silty sand w/dense charcoal,ash & oxidized soil & rocks/pebbles (mod. FCR)
= Floor / rock-lined hearth/pit

*** DjRi-14-F13-ST6-SC-3 (23-24 cmBS) 430-360/330-280/180-150 Cal BP (Beta 210174) /**

[Note: hearth feature and floor lenses slope downward, from S to N, toward the feature center; excavation stopped at the hearth/pit feature, minimizing unnecessary disturbance.]

APPENDIX VI - HOUSEPIT SETTLEMENT TRAVEL DISTANCE DATA

(arranged alphabetically by Bordern Grid, and sequentially by Site Number, and Dist1 value)

Grid	site#	dist1	dist2	dist3	dist4	anchor	utmeast	utmnorth
DgRi	1	98.40	16.40	42.00	156.80	2	613,670	5,438,709
DgRj	T1	98.40	16.40	30.30	145.10	2	603,079	5,438,183
DgRk	8	98.40	16.40	21.80	136.60	2	597,198	5,439,226
DgRk	10	98.40	16.40	11.20	126.00	2	588,216	5,436,888
DgRk	16	98.40	16.40	13.80	128.60	2	590,566	5,436,988
DgRl	2	98.40	3.20	0.00	101.60	2	574,135	5,445,967
DgRl	4	98.40	1.80	0.00	100.20	2	573,197	5,445,867
DgRl	5	98.40	11.10	0.00	109.50	2	577,481	5,442,539
DgRl	7	98.40	10.10	0.00	108.50	2	576,574	5,443,213
DgRl	9	98.40	13.70	1.10	113.20	2	577,395	5,438,428
DgRl	10	98.40	13.50	0.90	112.80	2	576,686	5,438,951
DgRl	17	98.40	1.20	0.00	99.60	2	575,763	5,437,530
DgRl	18	98.40	14.40	0.00	112.80	2	577,197	5,437,764
DgRl	23	98.40	12.70	0.00	111.10	2	576,579	5,438,704
DgRl	26	98.40	16.40	6.20	121.00	2	584,607	5,435,947
DgRm	3	94.60	1.70	0.00	96.30	2	570,046	5,443,759
DgRm	5	89.00	4.00	0.00	93.00	2	565,728	5,442,216
DgRm	6	89.00	5.00	0.00	94.00	2	565,154	5,441,526
DgRm	10	86.30	0.00	0.00	86.30	2	561,260	5,443,016
DgRn	12	79.90	4.50	0.00	84.40	2	554,501	5,445,902
DgRn	21	83.30	0.00	0.00	83.30	2	558,686	5,442,044
DgRn	23	78.80	0.00	0.03	78.83	2	554,493	5,444,591
DgRn	29	89.00	13.40	0.00	102.40	2	560,355	5,435,009
DgRs	1	6.40	0.00	0.90	7.30	3	495,054	5,431,001
DgRs	14	2.30	0.00	0.00	2.30	3	497,208	5,427,899
DhRk	2	114.50	5.90	0.00	120.40	2	586,499	5,457,023
DhRk	5	121.50	0.00	0.00	121.50	2	592,770	5,451,070
DhRk	8	118.40	0.00	0.00	118.40	2	587,256	5,452,673
DhRk	14	120.10	0.00	0.00	120.10	2	589,931	5,450,920
DhRk	17	100.40	16.50	0.00	116.90	2	584,983	5,447,481
DhRk	20	124.60	1.70	0.00	126.30	2	592,472	5,455,713
DhRk	29	100.40	19.00	0.00	119.40	2	586,904	5,448,486
DhRk	42	100.40	16.90	0.00	117.30	2	585,009	5,447,053
DhRk	43	100.40	16.80	0.00	117.20	2	585,332	5,447,360
DhRk	45	124.60	1.10	0.00	125.70	2	592,770	5,455,214
DhRk	46	124.60	1.20	0.00	125.80	2	592,565	5,455,306
DhRk	49	126.10	1.40	0.00	127.50	2	593,575	5,456,249
DhRk	52	127.80	4.80	0.00	132.60	2	595,197	5,461,461
DhRk	53	124.60	9.50	0.00	134.10	2	593,844	5,461,810
DhRk	56	124.60	7.50	2.40	134.50	2	594,067	5,462,938
DhRk	T1	134.30	0.00	0.00	134.30	2	596,767	5,463,038
DhRl	6	100.40	5.20	0.00	105.60	2	577,976	5,448,604
DhRl	8	100.40	5.30	0.00	105.70	2	578,070	5,448,251
DhRl	12	100.40	9.90	0.00	110.30	2	579,973	5,448,109
DhRl	13	100.40	11.30	0.00	111.70	2	581,511	5,448,313
DhRl	14	100.40	9.60	0.00	110.00	2	580,129	5,448,347
DhRl	15	107.10	1.20	0.00	108.30	2	576,441	5,453,727
DhRl	16	107.10	0.40	0.00	107.50	2	576,611	5,453,055

Grid	site#	dist1	dist2	dist3	dist4	anchor	utmeast	utmnorth
DhRl	17	104.40	0.00	0.00	104.40	2	574,847	5,451,312
DhRl	48	107.10	15.40	0.00	122.50	2	579,277	5,462,065
DhRl	49	107.10	15.50	0.00	122.60	2	579,355	5,462,263
DhRl	50	107.10	15.30	0.00	122.40	2	579,486	5,462,268
DhRl	T1	107.70	7.70	0.00	115.40	2	576,913	5,458,766
DhRl	T2	114.50	2.00	0.00	117.00	2	590,567	5,462,939
DhRm	4	84.80	12.70	0.00	97.50	2	566,472	5,447,280
DhRo	25	63.10	8.10	0.00	71.20	2	546,974	5,452,335
DhRs	2	9.90	0.00	0.00	9.90	1	490,311	5,461,464
DhRs	275	10.80	0.00	0.00	10.80	1	489,814	5,462,219
DhRt	T1	2.30	0.00	0.00	2.30	2	485,348	5,453,090
DiRi	1	154.00	0.00	0.00	154.00	2	612,579	5,471,397
DiRi	2	157.10	0.00	0.00	157.10	2	614,433	5,473,195
DiRi	3	158.10	0.00	0.00	158.10	2	614,869	5,474,224
DiRi	4	161.10	0.00	0.00	161.10	2	613,344	5,477,168
DiRi	5	164.20	0.00	0.00	164.20	2	614,635	5,479,765
DiRi	7	155.60	2.70	0.50	158.80	2	614,698	5,469,869
DiRi	9	155.60	1.80	1.20	158.60	2	615,313	5,471,703
DiRi	13	153.00	0.00	0.00	153.00	2	613,021	5,470,141
DiRi	15	152.60	0.00	0.00	152.60	2	612,671	5,470,356
DiRi	16	155.60	1.80	0.00	157.40	2	614,534	5,471,198
DiRi	17	151.10	0.00	0.00	151.10	2	610,369	5,469,912
DiRi	19	151.80	0.00	0.00	151.80	2	611,047	5,470,007
DiRi	21	154.80	0.00	0.30	155.10	2	611,898	5,472,264
DiRi	32	152.30	0.00	0.00	152.30	2	611,505	5,470,276
DiRi	35	155.40	0.00	0.00	155.40	2	612,540	5,472,698
DiRi	38	150.20	0.00	0.00	150.20	2	609,598	5,470,170
DiRi	51	164.10	0.00	0.00	164.10	2	614,469	5,479,662
DiRi	71	155.60	3.60	0.00	159.20	2	615,437	5,470,451
DiRi	74	157.00	0.00	0.20	157.20	2	614,423	5,472,975
DiRi	92	164.60	0.00	0.00	164.60	2	614,966	5,478,456
DiRi	94	156.50	0.00	0.00	156.50	2	614,031	5,472,700
DiRi	98	165.60	0.00	0.00	165.60	2	614,502	5,481,313
DiRj	1	149.00	0.00	0.00	149.00	2	608,200	5,470,360
DiRj	2	147.20	0.00	0.00	147.20	2	606,620	5,469,595
DiRj	4	140.10	0.00	0.00	140.10	2	600,371	5,466,794
DiRj	7	146.30	0.00	0.00	146.30	2	605,955	5,469,442
DiRj	8	143.90	0.00	0.00	143.90	2	603,545	5,468,790
DiRj	9	143.70	0.00	0.00	143.70	2	603,355	5,468,683
DiRj	10	145.40	0.00	0.00	145.40	2	604,945	5,469,411
DiRj	29	137.30	4.30	0.00	141.60	2	602,306	5,466,243
DiRj	30	137.30	3.30	0.00	140.60	2	601,673	5,465,737
DjRi	1	175.60	0.00	0.00	175.60	2	614,693	5,496,752
DjRi	2	178.50	2.90	0.00	178.50	2	615,437	5,493,399
DjRi	5	178.60	3.00	0.00	178.60	2	615,820	5,493,280
DjRi	7	173.60	0.00	0.00	173.60	2	613,341	5,490,761
DjRi	9	172.10	0.00	0.00	172.10	2	612,807	5,489,557
DjRi	10	167.60	0.00	0.30	167.60	2	614,335	5,485,486
DjRi	11	166.80	0.00	0.00	166.80	2	614,893	5,484,789
DjRi	13	177.10	1.50	0.00	177.10	2	615,618	5,492,195
DjRi	14	175.60	0.00	0.10	175.60	2	614,939	5,490,686

Grid	site#	dist1	dist2	dist3	dist4	anchor	utmeast	utmnorth
DjRi	20	176.60	1.00	0.00	176.60	2	616,024	5,491,495
DjRi	21	176.70	1.10	0.00	176.70	2	615,843	5,491,736
DjRi	34	172.70	0.00	0.00	172.70	2	612,708	5,489,927
DjRi	36	175.00	0.00	0.70	175.00	2	613,510	5,491,451
DjRi	44	181.70	6.10	0.00	181.70	2	614,599	5,496,546
DjRi	46	180.90	5.30	0.00	180.90	2	614,528	5,496,008
DjRi	50	171.50	0.00	0.00	171.50	2	613,540	5,489,060
DjRi	52	176.50	0.90	0.00	176.50	2	615,985	5,491,298
DjRi	58	176.20	0.60	0.00	176.20	2	615,620	5,491,059
DjRi	59	174.30	0.00	0.00	174.30	2	614,007	5,490,682
DjRi	73	177.30	1.70	0.00	177.30	2	615,637	5,492,346
DjRl	3	107.10	45.40	0.00	152.50	2	581,650	5,487,300
DkRn	5	107.10	84.40	0.00	191.50	2	556,031	5,514,139

List of variables (Travel Distance Dataset):
Name (Position) Label

grid (1) Borden Grid
Measurement Level: Nominal

site# (2) Site Number
Measurement Level: Nominal

dist1 (3) Primary Water Travel Route (km)
Measurement Level: Scale

dist2 (4) Secondary Water Travel Route (km)
Measurement Level: Scale

dist3 (5) Tertiary Land Travel Route (km)
Measurement Level: Scale

dist4 (6) Total Travel Dist. to Gulf (km)
Measurement Level: Scale

anchor (7) Gulf Outlet Point
Measurement Level: Nominal

Value	Label
1	Burrard Inlet
2	Fraser River Arm 1
3	Fraser River Arm 2
4	Fraser River Arm 3
5	Fraser River Arm 4
6	Boundary Bay

utmeast (8) UTM mE
Measurement Level: Ordinal

utmnorth (9) UTM mN
Measurement Level: Ordinal

APPENDIX VII - SPECIFIC UPRIVER GROUP HOUSEPIT SETTLEMENT DATA.

Age	Age (cal B.P)	Sttlmnt. Name / Occupation	Site No. / Occupat.	No. of HsPits	HsPit Size (m^2) med // mean	HsPit Size (m^2) *Min-Max.*	Range (m^2)	Std. Dev. (S)	CV	Max. Roofed Area (m2)	Pop.†† Min-Max.
Period I	1500-2750	Sx̱wóx̱wiymelh Ii	DiRj-1Ai (max)*	**16†**	59.98 // 61.70	29.81-105.14	75.33	23.22	37.63	987.26	247-316
Period I	1500-2750	Sx̱wóx̱wiymelh Iii	DiRj-1Aii (min)*	**13†**	55.09 // 58.87	29.81-95.21	65.40	22.35	37.97	765.27	191-245
Period I	1500-2750	Shxw'ow'hamel I	DiRj-30 I	14	57.66 // 49.69	21.23-66.35	45.12	15.45	31.09	695.64	174-223
Period IIa	850-1500	Shxw'ow'hamel II	DiRj-30 II	4	61.65 // 61.81	40.35-84.18	43.83	22.20	35.92	247.23	62-79
Period IIa	850-1500	Hiqelem (total)	DhRl-T2 (max)**	15†	67.00-67.62	33.65-101.80	68.15	18.67	27.61	1014.26	254-325
Period IIa	850-1500	Hiqelem I	DhRl-T2 I**	11†	63.79 // 65.91	33.65-101.80	68.15	20.16	30.59	724.99	181-232
Period IIa	850-1500	Th'ewá:lí	DgRl-17	17	68.03 // 63.73	27.27-81.88	54.61	14.48	22.72	1083.36	271-347
Period IIb	150-850	Hiqelem II	DhRl-T2 II**	4†	79.91 // 72.32	58.78-86.68	35.90	15.28	21.13	289.27	72-93
Period IIb	150-850	Qithyil Island	DhRl-15	5	113.79 // 116.71	87.80-137.21	49.41	19.73	16.91	583.55	146-187
Period IIb	150-850	John Mack Slough	DhRl-T1	12	73.72 // 78.26	54.39-113.09	58.70	16.43	20.99	939.13	235-301
Period IIb	150-850	Sqwa:la	DhRl-6	3	88.93 // 90.91	75.18-108.63	33.45	16.81	18.49	272.74	68-87

Age	Age (cal B.P)	Sttlmnt. Name / Occupation	Site No. / Occupat.	No. of HsPits	HsPit Size (m^2) med // mean	HsPit Size (m^2) ***Min-Max.***	Range (m^2)	Std. Dev. (S)	CV	Max. Roofed Area (m2)	Pop.†† Min-Max.
Period IIb	150-850	Welqámex I	DiRi-15 I	5	128.38 // 131.41	109.62-178.78	69.16	28.21	21.47	657.06	164-210
Period IIb	150-850	Eyxel	DiRi-48	4	51.96 // 49.29	34.32-58.94	24.62	10.79	21.89	197.17	49-63
Period IIb	150-850	Sxwóxwiymelh IIi	DiRj-1 IIi (max)***	6	76.30 // 80.22	51.99-106.70	54.71	22.56	28.12	481.29	120-154
Period IIb	150-850	Sxwóxwiymelh IIii	DiRj-1 IIii (min)***	3	85.24 // 86.43	67.36-106.70	39.34	19.70	22.79	259.30	65-83
Period IIb	150-850	Xelhálh	DjRi-14	11	93.64 // 103.81	68.26-153.51	85.25	29.18	28.11	1141.95	285-365
Period III	100-150	Welqámex II	DiRi-15 II	9	112.52 // 122.16	67.37-178.78	111.41	36.91	30.21	1099.47	275-352

* denotes settlement / occupation option.
† denotes incomplete count (i.e., minimum values).
†† population calculations for *minimum* = 75% roofed area x 3 m^2/person; *maximum* = 80% roofed area x 2.5 m^2/person.