Archaeological Research in Southern Gitxaała Territory, Pitt and Banks Islands, August 2009

Report Prepared for
Dr. Charles Menzies

Submitted to
Gitxaała Environmental Monitoring Office
Gitxaała First Nation

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TABLE OF CONTENTS

THE VERY CONDENSED SUMMARY....4

ACKNOWLEDGEMENTS....5

CREDITS....6

LIST OF FIGURES....7

LIST OF TABLES....9

INTRODUCTION....10
Project Background....10
Fieldwork Context....10
Previous Archaeological Survey and Research in the Territory....10
Paleo Sea Levels and Archaeological Visibility on the Northern BC Coast....12
Sea levels in Gitxaala Territory....13

RESEARCH METHODOLOGY....14
Mapping Methods....15
Soil Probes....16
Percussion Coring....16
Bulk Sediment Samples....17

RESULTS....17
Kitsemenlagen and Tsimarlien Reserves, Curtis Inlet, Western Pitt Island....17
KL1 – Tsimlarien #15....19
CMT's in Curtis Inlet....22
KL2 Possible Paleo-beach, northern end of Curtis Inlet....24
Preliminary Diatom Analysis of Sediments from KL2....24
KL3 – Kitsemenlagen Reserve # 19a and 19b – near the outlet of Tsemhara Lake....27
KL4 - Fish Drying Strucutre....27
Kooryet Reserve #12, Kooryet Rivermouth, eastern Banks Island....28
Wil lu sgetk, Saycuritay Cove, southwestern Pitt Island....32
FhTj-6 Intertidal Trap....32
CMT's at Saycuritay Cove....35
FhTj-4 and FhTj-5 Site Revisits....36
Wil lu Sgetk....37
Citeyats Reserve 9, Southeast Pitt Island....40
Ethnographic Descriptions of Citeyats....40
Site Description....41
Total Station Mapping....43
Percussion Coring at Citeyats....43

Citeyats Site Boundaries 45
Sediment samples 47
Citeyats Summary 48

DISCUSSION AND CONCLUSION 49

REFERENCES CITED 50

APPENDIX 1: TRAVELOGUE 53

APPENDIX 2: STRUCTURAL FEATURES AT CITEYATS 55

APPENDIX 3: PRELIMINARY DIATOM DESCRIPTIVE ANALYSIS 55

THE VERY CONDENSED SUMMARY

This report describes the results of an archaeological survey conducted in southern Gitxaała territory in August 2009. The survey targeted select Gitxaała reserve lands with the aim to describe archaeological heritage sites. Both terrestrial and intertidal areas were surveyed resulting in the discovery of a variety of sites in each of the four localities examined.

The first inspected locality was Curtis Inlet. Here we observed:

- A small shell midden site associated with historic-era house platforms.
- Culturally modified trees in two locations.
- An intertidal shellfish assemblage and marine clay deposit potentially associated with a time of ancient sea level change.
- Historic-era structures associated with a fish harvesting camp.
- Evidence of recent and contemporary Gitxaała use of the inlet, including salmon drying rack, and crab-trapping fishing debris.

The second inspected locality was Kooryet River. Here we observed:

- Elaborate fish trap complex including boulder alignments and holding ponds along the lower reaches of the Kooreyet River.
- A canoe run and associated historic era structures near the northern mouth of the river.

The third inspected locality was *Wil lu sgetk*, Saycuritay Cove. Here we observed:

- A previously un-documented shell midden village site containing multiple house depressions and estimated to have a depth of 4 or more meters.
- Stone tools found on the surface of the intertidal shoreline.
- Multiple CMT's including one of which was illegally logged. This feature has a minimum date of AD 1829.

The final inspected locality was Citeyats Village. Here we observed:

- A major precontact village containing an estimated 29 houses and documented cultural depths of up to 4.41 meters.
- A highly weathered but still standing carved housepost or totem positioned at the back center of a defined house platform.
- Structural remains such as roof beams and house posts.

ACKNOWLEDGEMENTS

The author gratefully acknowledges the Gitxaała chiefs, council, and administrative staff for the privilege of conducting archaeological research in their traditional territory. Particular thanks to Dr. Charles Menzies for the inspiration to put this project together and his enthusiasm for archaeological methods and perspectives.

Thanks also to Vince Davis and Captain Teddy Gamble for providing luxurious and capable transportation onboard the *Katrena Leslie I*. Thanks also to Teddy and Charles for the many humorous and enriching late-evening discussions.

Tremendous thanks to Brendan Gray, Jarek Ignas-Menzies, and Ken Innis for their assistance in the field and fieldlab (aka, the galley table). Particular thanks to Brendan for taking a break from archaeology in the lower mainland to participate in this project.

Thanks also to Mike Blake, Andrew Martindale, and Patricia Ormerod and the UBC Laboratory of Archaeology for supporting this research through the use of a total station and percussion coring equipment and coordinating the subsequent laboratory analyses. Thanks also to Jean Pourcelot and Naomi Smethurst for their excellent work on ANTH 406 laboratory projects.

Additional thanks to Daryl Fedje, Quentin Mackie, Duncan McLaren, and Nicole Smith for insights into paleo-landforms, regional sea level histories, diatoms, and archaeology in general.

This report is dedicated to my Nicole and Flora.

The *Katrena Leslie I* anchored in Saycuritay Cove. Photos by Brendan Gray.

Captain Teddy Gamble and Vince Davis

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LIST OF FIGURES

Figure 1. Overview of the Northwest Coast showing the location of the study area. 11
Figure 2. Map of the study area showing the location of the four study sites 11
Figure 3. Diagram of the post-glacial crustal rebound affecting relative sea levels on the Northern BC Coast 13
Figure 4. Relative sea level histories for the northern BC coast, southern Gulf Islands and the global eustatic sea level change. 13
Figure 5. Chain and compass mapping of cultural terrace features at KL1, Curtis Inlet, western Pitt Island. 15
Figure 6. Iain McKechnie operating the Total station at the Kooryet River. 16
Figure 7. Charles Menzies holding the reflective prism on a partially submerged boulder alignment .. 16
Figure 8. Reserve maps showing the general locations of reserve locations on southern Pitt and Banks Islands 18
Figure 9. Marine chart of Curtis Inlet showing the shallow sills and sediment delta at the eastern end of the inlet 19
Figure 10. Entrance to Curtis Inlet facing east. 20
Figure 11. 1893 reserve map showing the boundaries of Tsimlarien #15 20
Figure 12. Surface map of KL1 showing the shoreline and associated shell midden deposit. 20
Figure 13. Ken Innis and Iain McKechnie collecting a bulk sample from the surface of the shell midden deposits at KL1 (ST1) 21
Figure 14. A fractured fire altered rock (broken boiling stone) recovered from the surface of the shell midden deposit at KL1 21
Figure 15. Replica canoe bailer made from cedar bark 22
Figure 16. Rectangular CMT on the trail to Tsemhara Lake 23
Figure 17. Rectangular CMT at the northern arm of the head of Curtis Inlet (122b) 23
Figure 18. Detail shot of distinctive 'chop marks' inside the characteristically 'kinked' healing lobe which forms after the bark chopped and removed 23
Figure 19. Estuarine delta at the head of the north arm of Curtis Inlet 25
Figure 20. Photo looking towards bedrock shoreline taken from beach looking northwards 25
Figure 21. Surface of intertidal exposure showing butter clam shell fragments and eroded paired valves in growth position. 25
Figure 22. A partially exposed example of a deceased butter clam in growth position. 26
Figure 23. Gravel and boulders near creek mouth sitting atop very fine marine clay exposure 26
Figure 24. Marine clay exposure beneath centimeters of alluvial gravel. 26
Figure 25. Contour map of the delta landform showing the outline of the shell exposure and shovel tests 27
Figure 26. Marine chart showing the general location of the shellfish surface exposure. 27
Figure 27. Remains of a collapsed wooden structure on the west side of the river draining Tsemhara Lake 28
Figure 28. Fish drying structure on Curtis Inlet 28
Figure 29. GoogleEarth image of the lower reaches of the Kooryet River draining into Principe Channel 29
Figure 30. Canoe run at the northern entrance to Kooryet Bay 29
Figure 31. Map of boulder alignments in lower Kooryet River 30
Figure 32. View upriver at mid-tide 30
Figure 33. View of the lowermost rock alignment feature that cross-cuts the river flow 31
Figure 34. Side channel rock alignment in the tidally influenced portion of Kooryet River 31
Figure 35. View of pools and side channels facing east and downriver 32

Figure 36. Marine chart of Southern Pitt Island including Saycuritay Cove and Citeyats....33
Figure 37. Map of Saycuritay Cove and three sites recorded in 1970....34
Figure 38. Flaked stone tool found on the intertidal cobble beach near site FhTj-6....34
Figure 39. The second flaked stone tools found on the surface of the intertidal at FhTj-6....34
Figure 40. Rectangular bark-stipped cedar CMT along the western bank of the stream draining into Saycuritay Cove....35
Figure 41. Recently felled cedar CMT in Saycuritay Cove....35
Figure 42. Eastern side of site FhTj-5 showing eroded midden in foreground at tideline and area without forest growth in area to left....36
Figure 43. Intertidal midden exposure at site FhTj-6....36
Figure 44. Stone tool found on beach in front of site FhTj-5. Photos by Brendan Gray....36
Figure 45. Panorama photo facing south showing boulder beach and the western entrance to Saycuritay Cove....37
Figure 46. Shell midden exposure at the base of a 4m terrace....38
Figure 47. Medium-grained flaked lithic debitage found on the surface of the beach at the base of the midden....38
Figure 48. Fine-grained flake present on the beach....38
Figure 49. Total Station surface map of Wil lu sgket showing landform features and house depression numbers....39
Figure 50. Remains of a highly deteriorated 18 cm diameter house-post, (feature 10)....42
Figure 51. Fallen house beam with nurse logs on flat terrace area....42
Figure 52. Front of the carved house-post....42
Figure 53. Side-view of the carved post looking north....42
Figure 54. Total station surface map of Citeyats....43
Figure 55. Total station surface map of Citeyats showing a north-facing perspective....44
Figure 56. North-South stratigraphic profile of Citeyats Village showing the distribution of cultural sediments....45
Figure 57. East-West cross-section stratigraphic profile of Citeyats showing the distribution of cultural sediments....46
Figure 58. Sedimentary profiles from house and non-house features at Citeyats in relation to depths below surface....46
Figure 59. Map of Citeyats obtained from the BC remote access to archaeological information....47
Figure 60. Wet-screened cultural sediments from C1-2....48
Figure 61. Map of Citeyats showing the relative location of the four sediment samples....48
Figure 62. Wet-screened cultural sediments from sample C1-4....48
Figure 63. Proportions of shellfish by weight recovered from Citeyats village....49

List of Tables

Table 1. Documented characteristics of the CMT's recorded in Curtis Inlet. 22
Table 2. House dimensions at Wilu lu skegt. 39
Table 3. Location and dimensions of structural remains at Citeyats 56

INTRODUCTION

This report describes the preliminary results of an archaeological survey conducted in select areas of Pitt Island and Banks Island in Gitxaała Traditional Territory on the north coast of British Columbia (Figure 1). This survey was conducted in August 2009 with the financial and logistical support of the Gitxaała Nation and aimed to document archaeological evidence of ancient Gitxaała traditional use in the vicinity of a provisionally proposed oil tanker route.

Project Background

This survey project was coordinated and supervised by Dr. Charles Menzies, the Traditional Ecological Knowledge Research Director for the Gitxaała Nation and Professor of Anthropology at the University of British Columbia. Charles identified areas of specific interest through consultation with Gitxaała elders, band councilors and administrators and consulted further with archaeologist and UBC PhD student Iain McKechnie about field logistics and research methods/strategies. Victoria-based archaeologist Brendan Gray (MA, University of Victoria) also took part in the field research along with Gitxaała archaeologist Ken Innes and Jarek Ignas-Menzies, an undergraduate engineering student at UBC.

The project aimed to identify and map specific areas of cultural and archaeological interest for Gitxaała research purposes (Figure 2). A particular aim of the study was to identify evidence of Gitxaała traditional ecological knowledge as represented in pre-contact archaeological heritage sites. Traditional ecological knowledge is physically embodied in archaeological contexts including ancient resource harvesting technologies and physical locations such as village sites.

This project was not designed as an "impact assessment" and the results should not be construed as a representative archaeological inventory of this large and complex region. Our survey coverage should be considered partial and incomplete. Rather, specific locations of interest were identified through consultations with Gitxaała elders, administrators, and community members based on their knowledge, experience, and interest in the history of the territory.

Fieldwork Context

The fieldwork was conducted between August 12 and 19, 2009, with the use of a 65-foot aluminum seine boat, the *Katrena Leslie I*, owned by the Gitxaała Nation and operated by Captain Marvin (Teddy) Gamble and Vince Davis. This large vessel served as a spacious mobile base camp and field laboratory, including amenities such as a galley kitchen, showers, and sleeping quarters. Two small aluminum skiffs, transported on the back deck, could be launched for shore excursions and provided versatile transport in shallow near-shore waters.

Archaeological investigations (i.e., sample collection, excavation, probing) were limited to federally defined Indian reserve lands. Observations were made of archaeological heritage sites located outside reserve lands but these were descriptive and non-intrusive.

Previous Archaeological Surveys and Research in the Territory

While a diverse array of archaeological research has been conducted in BC throughout the 20th century, very little archaeological investigation has been conducted in Gitxaała traditional territory. In contrast, other North Coast areas such as Prince Rupert Harbour and Haida Gwaii have been the focus of considerable archaeological study (e.g., MacDonald 1969; Coupland et al. 2006; Fladmark 1975, Martindale 1999, Fedje and Mathewes 2005).

The first documented archaeological research conducted in Gitxaała territory was a 1938 survey conducted by Philip Drucker, an anthropologist working for the Bureau of American Ethnology in

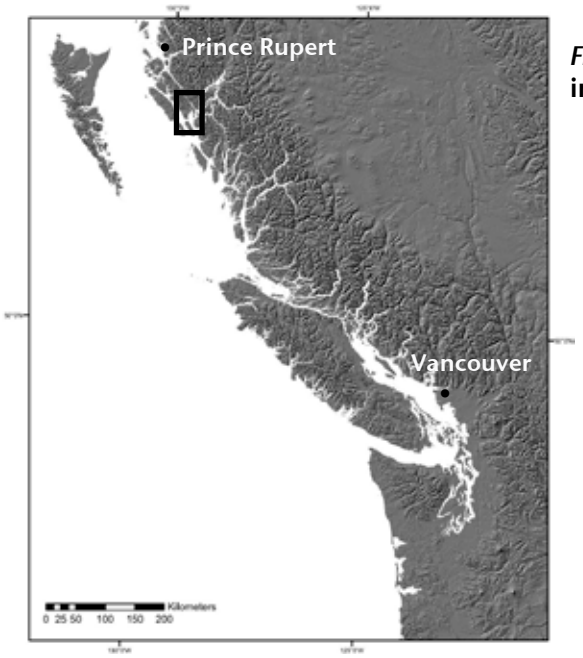


Figure 1. **Overview of the Northwest Coast showing the location of the study area.**

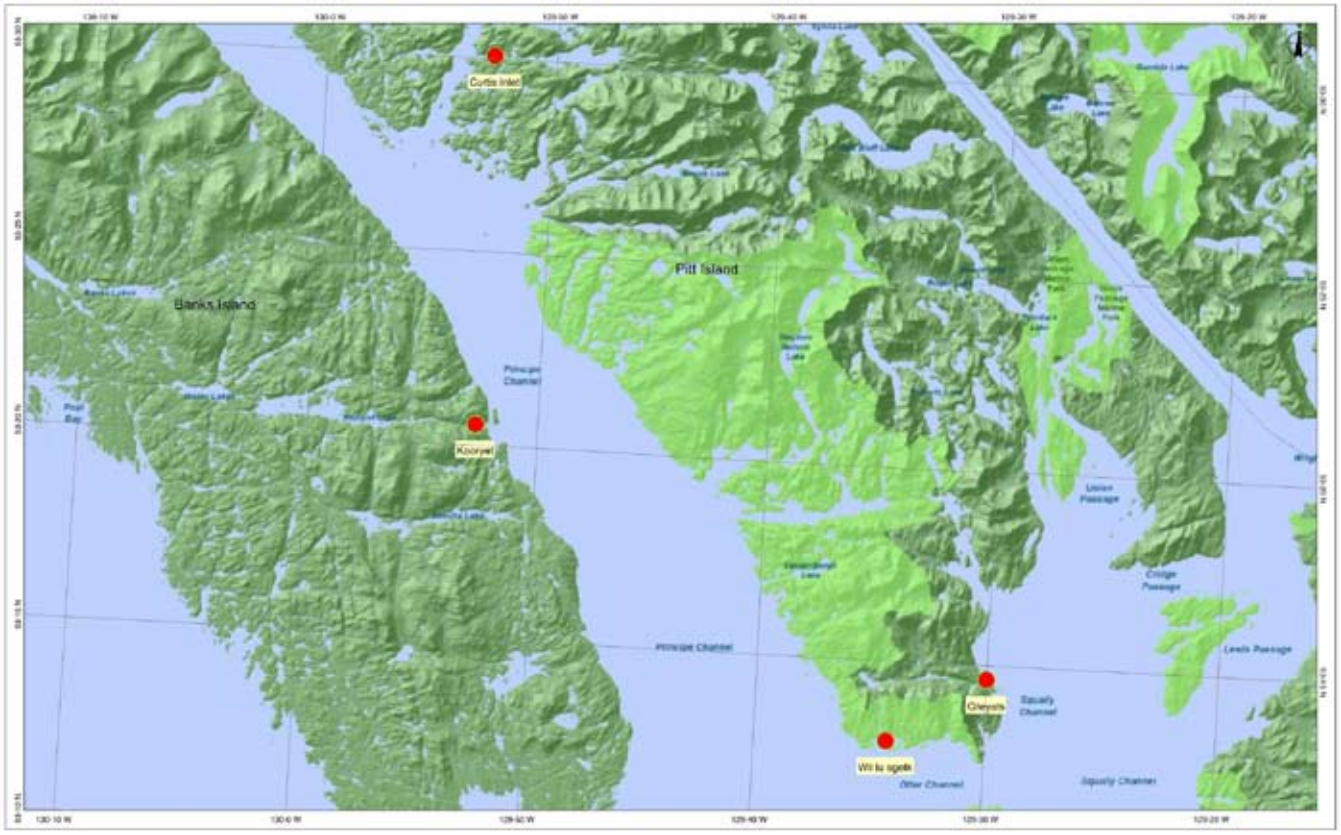


Figure 2. Map of the study area showing the location of the four study sites described in this report. Map created using an online tool.[1]

1. http://webmaps.gov.bc.ca/imfx/imf.jsp?site=imapbc

Washington DC (Drucker and Fisher 1943). Drucker obtained funds to collect material for the Smithsonian Museum by purchasing artifacts from coastal First Nation communities and hiring local people to participate in archaeological excavations at a limited number of sites. Drucker's survey region appears to have been constrained to areas near the coastal steamship route and relied on knowledgeable First Nation informants to identify locations of archaeological sites.

Further archaeological research was conducted in 1969 and 1970 by a team from the University of Victoria funded by the Province which documented a variety of shell midden sites, rock art, and fish traps from Milbanke Sound to Southern Pitt Island (Simonsen 1970, 1973). Survey methods were "casual" and involved summer travel by pleasure craft to accessible areas. This project conducted excavations at the Grant's Anchorage site, located 80 km south of the study area on Price Island. This single site is the only site between Namu and Prince Rupert, a linear distance of about 300 km, which has been excavated and radiocarbon dated.

In the past few decades, a number of archaeological resource management projects relating to forestry operations have resulted in a growing inventory of culturally modified tree sites. These provincially protected heritage sites have been recorded in the process of forestry operations (cf. Wilson 1994). Recent studies by Hall and colleagues have documented a large number of CMT sites along both sides of Grenville Channel (Hall and Johansen 2007; Hall and Bonner 2008; Wilson 1994 a, b). To my knowledge, despite the hundreds of CMT features recorded in Gitxaała territory, none of these have been directly dated using stem-rounds or increment bores.

A 1985 archaeological survey for rock art (petroglyphs and pictographs) was conducted in the region by independent researcher Daniel Leen (Leen 1985; Leen and Mackie 1985). In addition, Barbara and Gerald Radke, an American couple travelling the coast by kayak, have recorded numerous boulder alignments and fish trap features and submitted this information to the Provincial Archaeology Branch (Provincial Archaeological Site forms).

In summary, to the author's knowledge, only very limited archaeological research has occurred in the region and only one site in southern Gitxaała traditional territory (Grant's Anchorage) has been investigated beyond descriptive observations (i.e., location and size).

Paleo Sea levels and Archaeological Visibility on the Northern BC Coast

Sea levels on the northern British Columbia coast have fluctuated *significantly* since the last glacial maximum, 18,000 years ago (Josenhans et al. 1997; Warner et al. 1982). The rapid changes in ice volume and glacial loading that occurred at the end of the last ice age (ca. 12,000 years ago) caused a great deal of sea level change both globally due to glacial meltwater (eustatic change) and on a regional level through crustal rebound and/or submergence (isostatic change).

Sea level changes since the Pleistocene period have dramatically altered the shape and location of the BC coastline but this change is highly variable and specific to different portions of the coast and critically affects the identification of archaeological sites. Figures 3 and 4 depict the dramatic change in relative sea level over the past 12,000 years on the North Coast. In Haida Gwaii, situated on the outer continental shelf, archaeological sites have been found 53m below present day sea level (Fedje and Josenhans 2000), in the modern intertidal area (Fedje et al. 2001; 2005), and on inland terraces 15m higher above modern sea level dating to between 12,500 and 9,300 years ago (Fedje and Christensen 1999; Fedje et al. 2005).

This contrasts sharply with sea level histories for Prince Rupert, where sea level was approximately 50 meters higher at 13,500-14,000 years BP (12,000 ^{14}C years BP) rapidly lowering to modern levels by about 8,000 years BP and dropping to less than 3.5 meters below modern during the mid Holocene (Archer 1998; Fedje et al 2005; Eldridge and Parker 2007).

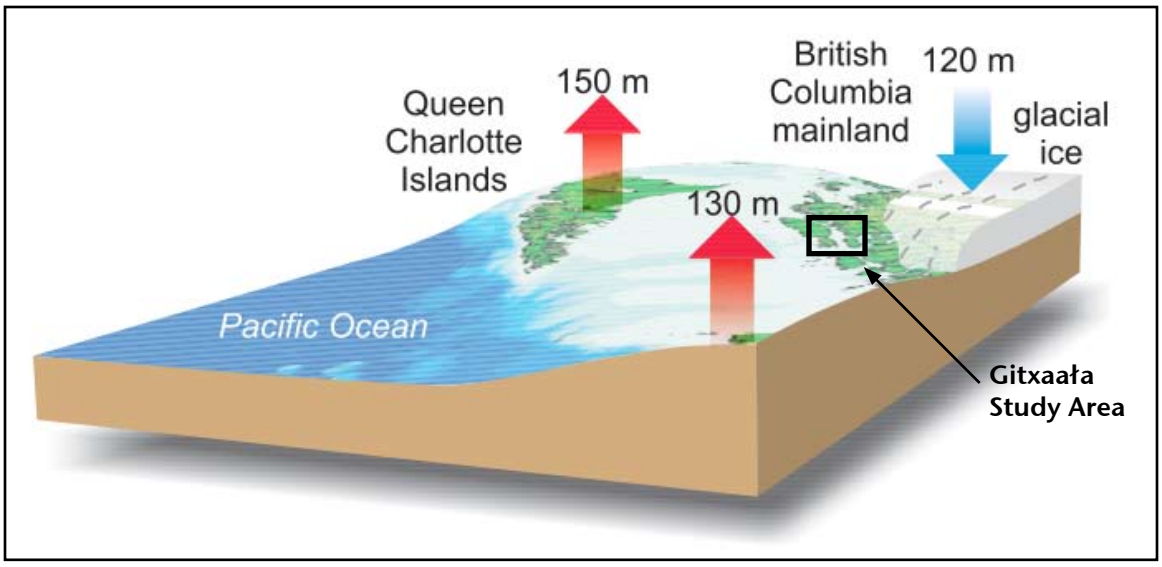


Figure 3. **Diagram of the post-glacial crustal rebound affecting relative sea levels on the Northern BC Coast. Figure obtained from Heatherington et al. (2004:1757). Vertical scale is highly exaggerated.**

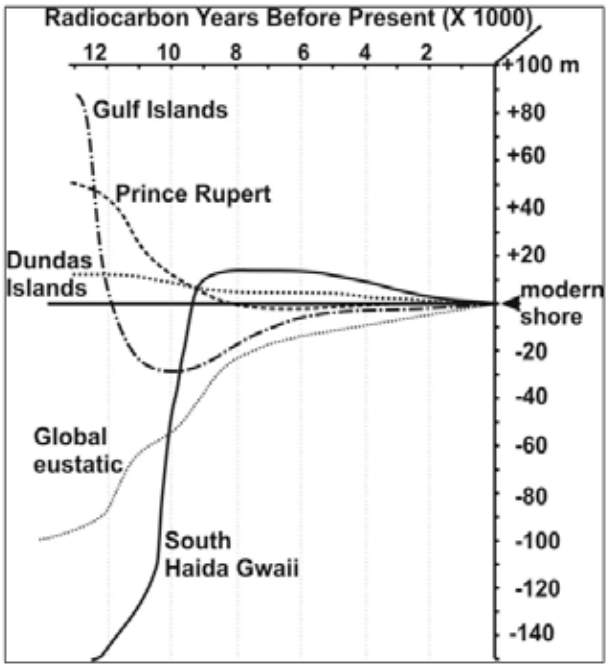


Figure 4. **Relative sea level histories for the northern BC coast, southern Gulf Islands and the global eustatic sea level change. Figure obtained from Mackie et al. (n.d.).**

Sea levels in Gitxaała Territory

Very little information has been collected on sea level history in Gitxaała territory but the contrasting sea level histories discussed above suggests that the study area may be situated in a region that may have had comparatively little relative sea level change and stable shorelines over the past 12,000 years.

A preliminary investigation of paleo-sea level on western Porcher Island was conducted by Daryl Fedje and Duncan McLaren and colleagues in 2001 (Fedje, McLaren, and Wigen 2004). The work involved examining sediment cores obtained from ponds and lakes between 2 and 7 meters above modern high tide near Welcome Harbour and Oval Bay. A sediment core obtained from a lake (CP Lake) at 6.59 meters above high tide did not contain evidence for marine inundation and yet dated to 13,200-13,700 years BP (11,640 ± 120 ^{14}C yr BP) suggesting that the post glacial sea level was somewhere below this point throughout the past 13,000 years (Fedje, McLaren, and Wigen 2004:10).

A more intensive investigation of relative sea levels was undertaken by Duncan McLaren

for his PhD research but this research occurred in the Dundas Islands (McLaren 2008). He demonstrated that relative sea levels were higher than at present (~5-15m) throughout the Late Pleistocene and Early Holocene periods meaning that shorelines experienced minimal change compared to other areas of the coast such as Haida Gwaii and Kitimat. In the context of a large scale survey of the Dundas region led by Andrew Martindale, this information enabled the identification of archaeological sites dating to the early Holocene and doubled the length of the known archaeological culture history for this region (Martindale et al. 2009).

While the study area is approximately 100km south of the closest sea level data point, it is situated at generous distance from the mainland coast. The single core obtained from Porcher Island suggests sea levels may have been significantly lower or may have fluctuated less than 6 meters over the past 13,000 years. If the latter is true, then this area may represent a location with potential for early evidence for human habitation (cf. Fedje, et al. 2004).

RESEARCH METHODOLOGY

The survey methodology used in this project targeted Gitxaała Reserve lands on southern Pitt and Banks Islands. These reserve lands were accessed by boat from Prince Rupert. Archaeological survey methods were limited to visual inspection of the shorelines and pedestrian inspection of surface features and landforms. Locations deemed suitable for potential archaeological deposits were examined to the best of our ability given the time, tide and weather contraints.

Archaeological site types we specifically sought to identify included:

Habitation sites

- shell midden habitation sites and processing sites
- house platforms and depressions
- standing house remains (e.g., beams, posts)

Aboriginal forest utilization sites

- Culturally modified trees
- Bark stripped trees
- Aboriginally logged stumps
- Canoe manufacturing

Pictographs and Petroglyphs

Intertidal Boulder alignments

- fish trap rock alignments
- wooden weir stakes
- excavated pools and channels
- potential clam garden rock alignments visible at low tide

Caves and Rockshelters

Intertidal lithic sites (which may represent former habitation sites dating to periods of higher sea

level)
In addition to archaeological sites, we sought to identify geological features and contexts which would give contextual evidence of past landscapes and sea levels:

Evidence of paleoshorelines

- exposures of paleo-marine sediments
- wave cut-notches
- sea level terraces

In areas deemed to have the potential for habitation areas, we conducted limited subsurface probing using 2 cm diameter soil probes which can penetrate sediments up to 1.5 meters thick. In areas where archaeological deposits were observed, we used percussion cores to document the depth and stratigraphic record of sediment. These methods are described in more detail below.

Mapping Methods

Mapping of archaeological features was conducted using GPS devices (*Garmin* 76CSx or 60CSx) and by using a compass (declination set to zero), a clinometer (for measuring angles), and a 'hip-chain' (for documenting distances; see Figure 5). GPS coordinates were referenced to the 1983 North American Datum and all observations were in UTM Zone 9.

In areas with complex archaeological deposits warranting more detailed documentation, we used a *Leica Total Station* to map artifact and sample locations as well as the surface topography of archaeological sites and natural landforms (Figure 6 and Figure 7). This professional survey device (owned by the UBC Laboratory of Archaeology) is capable of highly accurate (± millimeters) measurements at distances of hundreds of meters. The total station can be used to efficiently obtain hundreds of elevation points and therefore create highly accurate and detailed three-dimensional surface contour maps. This required traversing the site surface holding a reflective prism while the operator 'shot' points from a known benchmark location.

Elevation was established in reference to the barnacle line (mean high tide) as well as in relation to the water level recorded at a particular time and date. Orientation was established by sighting to a distinct portion of a landmark or feature recognizable on a 1:50,000 scale map with a GPS.

Total station mapping data was downloaded into a spreadsheet format each evening using a laptop and *Leica* '*Survey Office*' software. All total station mapping points are assigned a sequential

Figure 5. **Chain and compass mapping of cultural terrace features at KL1, Curtis Inlet, western Pitt Island.**

Figure 6. **Iain McKechnie operating the Total station at the Kooryet River. Photo by Brendan Gray.**

Figure 7. **Charles Menzies holding the reflective prism on a partially submerged boulder alignment ~250 meters away from photo on left. Photo by Brendan Gray.**

number ('Point ID') and different types of data points are assigned a "code" (e.g., at= auger test) and are associated with x, y, and z coordinates. These data were then imported into a mapping program *Surfer*[2] and/or ARCGIS 9.3[3] which enabled the creation of a detailed surface contour map.

The accuracy of the surface contours are only as good as the spatial coverage in the field—the more points taken for a given area, the higher the degree of accuracy. In reviewing the mapping data each day, we were able to assess our gaps coverage and target our coverage the following days. Elevation data highlight the surface features in great detail and reveal landforms and dimensions of household features. Coordinate data was compiled into worksheets in Excel and then imported into Surfer and ArcMap to create contour maps and images of the surface features and will be submitted to the Gitxaała Environmental Monitoring Office in the Spring of 2010

Soil Probes

In an effort to locate buried archaeological sediments, the survey team variously used *Oakfield* Soil probes to determine the sediment types encountered during terrestrial survey. This handheld probing method involved pushing a 2 cm diameter core into the ground by hand. Two probe lengths were used (90 cm and 1.5 m) and offered a way to expediently visualize the sediments in a variety of locations. This method is generally effective for discovering the presence or absence of shell midden deposits (e.g., abundant shell fragments and greasy black, charcoal-rich silt). However, this method is not suitable for locating deeply buried or non-shell bearing sediments. Probing was used regularly but individual probe locations were not recorded. Rather, probing was used to supplement and confirm surface observations, particularly at the KL1 site in Curtis Inlet.

Percussion Coring

In order to determine and document the depth and stratigraphy of the cultural sediments, we conducted percussion coring[4] at two habitation sites (Curtis Inlet and the Citeyats village). This method has been successfully used at a number of archaeological research projects on the BC coast (cf. Cannon 2000; Martindale et al 2009).

2 From Golden Software.

3 ESRI, Redlands, California.

4 Using an Environmentalist Soil Probe (ESP) manufactured by Clements Associates Inc., Newton Iowa.

This coring device is capable of driving a 2.5 cm diameter steel core tube into unconsolidated soils and sediments. As the percussion core is driven downwards, sediments are collected in a clear 90 cm plastic tube that recovers a stratigraphic profile. Depending on the substrate, stratigraphically intact cores can be recovered from depths of up to 10 m. Coring also provides a way to obtain samples for radiocarbon dating. Collectively, this method provides a way to document deeply buried cultural deposits that would otherwise be prohibitively deep for conventional excavation.

Naomi Smethurst, a student enrolled in the Anthropolgy 406 laboratory class has compiled site-wide profile transects of the stratigraphy at the Citeyats village site using these coring results. These are briefly summarized in this report.

Bulk Sediment Samples

While no conventional excavation was conducted during this project, small samples of cultural sediments were collected from two sites (Citeyats and Curtis Inlet). These sediment samples were collected for preliminary analysis of the shellfish and fish remains. Samples were collected by exposing an approximately 20 x 20 cm area of humic forest soils using a trowel until cultural shell midden matrix was exposed. Approximately 1-2 litres of cultural sediment were collected from these exposures and the humic layer was then replaced. The volume of each sample was measured using water displacement. The sediments were then "wet-screened" through ~1 mm mesh (a pasta colander) and ~6 mm mesh (a deep frying colander).

Jean Pourcelot, a student enrolled in the Anthropology 406 laboratory class has compiled a list of shellfish and vertebrate species with the input of Charles Menzies, Andrew Martindale, and Iain McKechnie. His results are briefly summarized in this report.

RESULTS

The survey took place over nine days. Four locations were the focus for examination; Curtis Inlet, Kooryet River, Saycuritay Cove, and Citeyats (Figure 1). Localities in Curtis Inlet were examined over two days. Kooryet was examined over the course of an afternoon. A full day was spent in Saycuritay Cove and five full days spent at Citeyats. The following pages describe the archaeological survey observations at each of the four examined locations including brief and preliminary discussions of their environmental setting and historic contexts.

Kitsemenlagen and Tsimarlien Reserves, Curtis Inlet, Western Pitt Island

Curtis inlet is a small (<3km) and narrow (10-250 m) protected coastal inlet on western Pitt Island which flows out towards Alpha Passage and Principe Channel. Curtis Inlet is mentioned in Gitxaała oral tradition as a location where the powerful Gitxaała chief Ts'bassa established a village in ancient times (Personal communication from C. Menzies, August 2009). This location is also where one of the first commercial fishing industry contracts was signed between First Nations and colonists in BC, a contract between Gitxaała chief Paul Sebassah and colonial businessman C.S. Windsor in the 19th century (Harris 2008:68-70). This agreement illustrates the historic recognition of aboriginal rites and title by colonists who were granted the "exclusive privilege to fish for salmon" by Gitxaała chiefs (Harris 2008:69-70).

There are currently two primary Gitxaała reserve parcels in Curtis Inlet. Tsimarlien #15, located along the south end of the entrance to Curtis Inlet, and Kitsemenlagen #19 situated at either side of the Kitsumalarn River that drains Tsemhara Lake, a productive sockeye lake also containing chum, pink, coho salmon (Rolston and Proctor 2003:20). Several other small streams drain into the inlet.

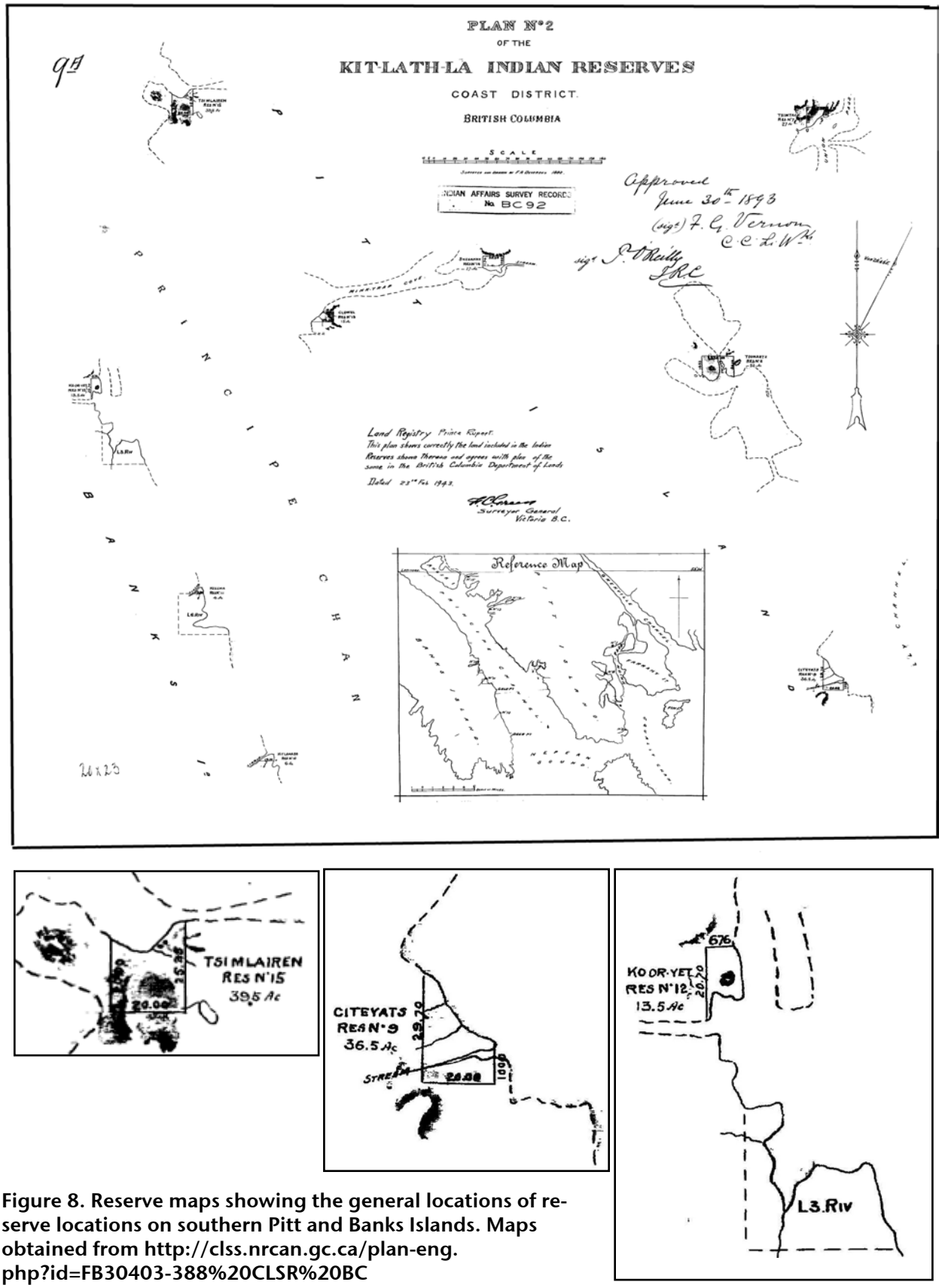


Figure 8. Reserve maps showing the general locations of reserve locations on southern Pitt and Banks Islands. Maps obtained from http://clss.nrcan.gc.ca/plan-eng.php?id=FB30403-388%20CLSR%20BC

Two narrow and shallow sills are present in the inlet that constricts water flow (Figure 9). One particularly narrow passage is located appears to dry out at low-low tides.

The *Katrena Leslie I* anchored in Curtis Inlet on the afternoon of August 9, 2009. The crew launched the aluminum skiffs and began to explore the inlet by boat, landing at a variety of locations of potential archaeological interest. Four locations were examined and each contained archaeological sites that were numbered sequentially KL-1 through KL-4.

KL1 - Tsimlarien IR 15

This reserve is situated on the north and westward facing shoreline of a protected cove near the mouth of Curtis Inlet. Anger Island is visible to the north and west but the area is sheltered from view of vessels approaching from Principe Channel.

The reserve shoreline consists of a small cove dominated by bedrock (Figure 10). A small stream drains the eastern portion of the cove and contains a small intertidal gravel delta. Inspection of the eastern side of this gravel exposure revealed a small amount of eroded clamshell on the eastern surface of the creek mouth indicating the possible presence of a nearby habitation sites. Further exploration of the area within the forest revealed the presence of at least four rectangular terrace/platform features indicative of leveling, clearing, and human habitation. Second-growth hemlock and balsam were located along the periphery of the rectangular platforms while younger trees tended to be present in the platforms. The terraces parallelled the modern shoreline at approximately 3-5 m above the current high tide line (barnacle line). A partially-exposed bedrock ridge was present behind the two easternmost terraces, furthest from the creek. A vertical cut in this bedrock ridge appears to be the result of human clearing to create level space.

Historic and modern debris was present on the surface of the two western-most terraced platforms, located closest to the small stream. A partially-buried large iron leg-hold trap was located in one of these platforms and appeared to have been potentially capable of trapping bear-sized animals. A small 50 x 80 cm rectangular depression was present nearby the leg-hold trap. Metal pipe fittings and a large number of recently manufactured plastic 'bait' containers were also present, many of which had been scattered and chewed by wolves or other carnivorous mammals.

Extensive probing with the Oakfield soil probes in these terraces revealed that the underlying sediments consisted of a black charcoal-rich coarse sandy matrix to a depth of at least 1.5m. No shell midden deposit was observed within the terraces but the presence of very black sandy silt and charcoal suggests a substantial human occupation history for these terraces. Additional probing

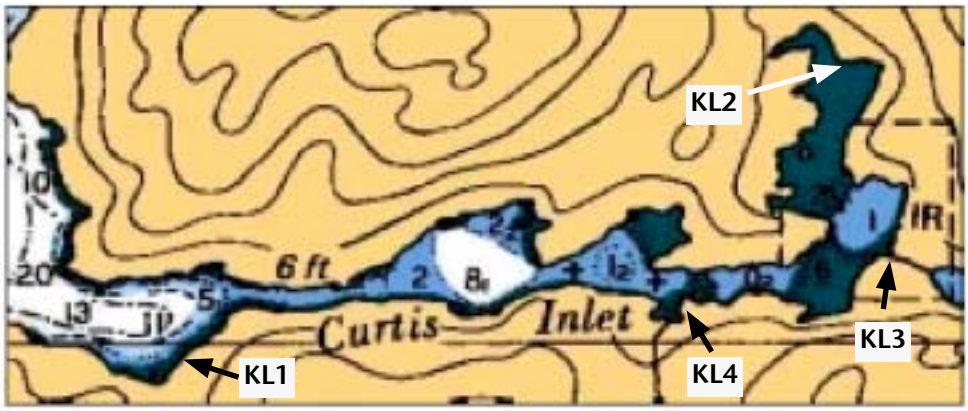


Figure 9. **Scanned marine chart image of Curtis Inlet showing the shallow sills and sediment delta at the eastern end of the inlet. Approximate locations of sites KL1 - KL4 are shown with arrows.**

above and behind the western platforms revealed a narrow band of shell midden deposit present along a small ridge that paralleled a bend in the stream.

A series of percussion cores were obtained from the house terraces and the associated shell midden deposits. Two percussion cores in the shell midden deposit demonstrated that the deposits extended to depths of between 130 and 169 cm below the surface respectively. A third demonstrated that the shell midden deposits abruptly truncated at the top of the ridge.

Percussion cores from the terraces were dominated by black charcoal-rich sandy sediments that suggest that shell deposition was not a significant contributing factor to the accumulation of sediments in this part of the site. While these deposits appear to be cultural, this observation has yet to be confirmed by examining the core sediments with a microscope.

A single ~1 litre sediment sample was recovered from the upper portion of the shell midden deposits and contained a variety of shellfish and fire-cracked rock (Figures 13 and 14). Jean Pourcelot, an anthropology undergraduate student at UBC with the assistance of Charles Menzies and Iain McKechnie has examined and quantified the shellfish and fishbone assemblage and the results will be incorporated into a future draft of this report.

The presence of shell midden deposits in a small and discrete area relative to the larger house platforms (and at slightly different elevation and orientation) suggests that the shell midden deposits may not have accumulated during the period the terraced platforms were occupied but during an earlier period of occupation. Alternatively, it is also possible that shell midden deposition may have

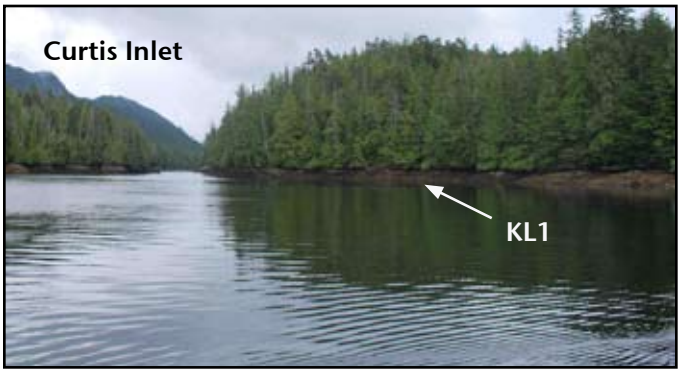


Figure 10. **Entrance of Curtis Inlet, facing east.**

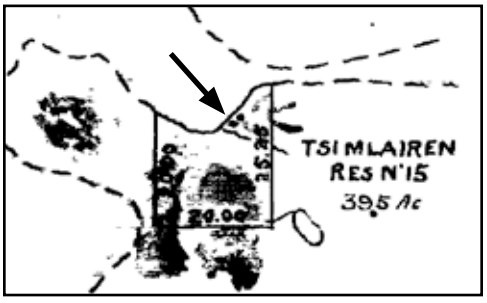


Figure 11. **1893 reserve map showing the boundaries of Tsimlarien, IR 15. Large arrow points to the two rectangles on the north side of the stream likely representing Gitkaała houses present at the time the reserve was established. These structures appear to correspond with the western-most levelled terraces and platforms, and associated shell midden deposits observed in the field.**

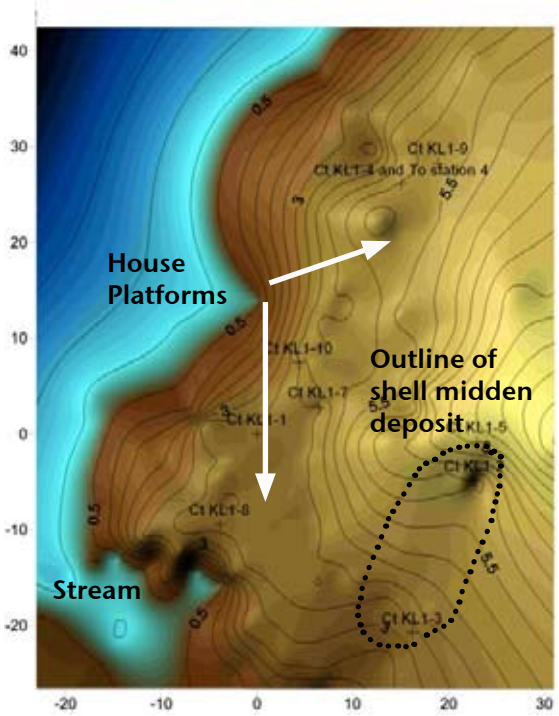


Figure 12. Surface map of KL1 showing the shoreline and associated shell midden deposit.

Figure 13. Ken Innis and Iain McKechnie collecting a bulk sample from the surface of the shell midden deposits at KL1 (ST1). Photo by Charles Menzies.

Figure 14. A fractured fire altered rock (broken boiling stone) recovered from the surface of the shell midden deposit at KL1. Note the discouloration of the outer portion of the stone. Photo by Charles Menzies.

occurred during the time the terrace platforms were occupied and that shellfish deposition was very specific to this particular area. In comparison with other occupation sites on the northwest coast where shell midden deposits typically dominate the site deposits, this small shell midden deposit may reflect less intensive use of shellfish and specialized occupation which focussed on fish harvesting and processing. The lack of extensive shell deposits and the widespread presence of black charcoal rich sands is consistent with historic era descriptions of the commercial salmon fishery being located in the inlet. Charcoal samples obtained from the base of the cores which will be submitted for radiocarbon dating will provide a way to address these uncertainties. In addition, further investigation of the ethnographic accounts of the occupation of this village and region should provide additional insight into these preliminary archaeological findings.

Subsequent to the fieldwork, the author obtained copies of the original 1893 reserve map which clearly shows the location of two rectangular structures in this area west of the creek (Figure 10). This appears to confirm the presence of structures at these terrace locations. Further research into the Gitxaała occupation of this reserve may provide additional insight into who, how and when these structures were occupied.

CMTs in Curtis Inlet

A brief exploration of the forest at the head of the north arm of the inlet resulted in the discovery of two culturally modified cedar trees (CMTs), approximately 2.4 km from the inlet mouth. Two

additional CMTs were recorded near the eastern mouth of river draining Tsemhara Lake.

One tree had been subject to two separate stripping events where the bark had been removed in a rectangular cut. This included characteristic "chop-marks" (approximately 3 cm wide) on the upper portion of the rectangular scar indicating how the bark had been cut prior to removal (WP122). The second, slightly larger rectangular bark strip (WP123) is located approximately 20 away and contained a single rectangular scar measuring 60 cm in length (See Table 1).

Brief exploration of the slope above the eastern side of the river draining Tsemhara Lake revealed the presence of a single CMT with two rectangular bark strips one on either side. On one the scar facing downslope had additionally been marked with paint to designate a trail used by DFO fisheries monitors (WP126, Table 1).

Although a sample of three CMT's can in no way be considered representative, the presence of three rectangular bark strips and the absence of taper bark strips is notable. Rectangular bark strips have been used as roofing material. Swanton (1905) mentions that thick large rectangular sheets were used as roofing material and were traded between Haida Gwaii and the Nass river. Other researchers have suggested that smaller rectangular bark strips were used for more specialized purposes such as canoe bailers (Stewart 1984:119–120), a replica of which is pictured in Figure 15.

KL2 Possible paleo-beach, northern end of Curtis Inlet

Inspection of the exposed intertidal surface sediments along the delta on the north arm of the Curtis Inlet (E442626, N5928856) revealed the presence of dead clams in growth position as well as numerous small shell fragments concentrated in a surface exposure in the upper intertidal (Figures

Table 1. **Documented characteristics of the CMT's recorded in Curtis Inlet.**

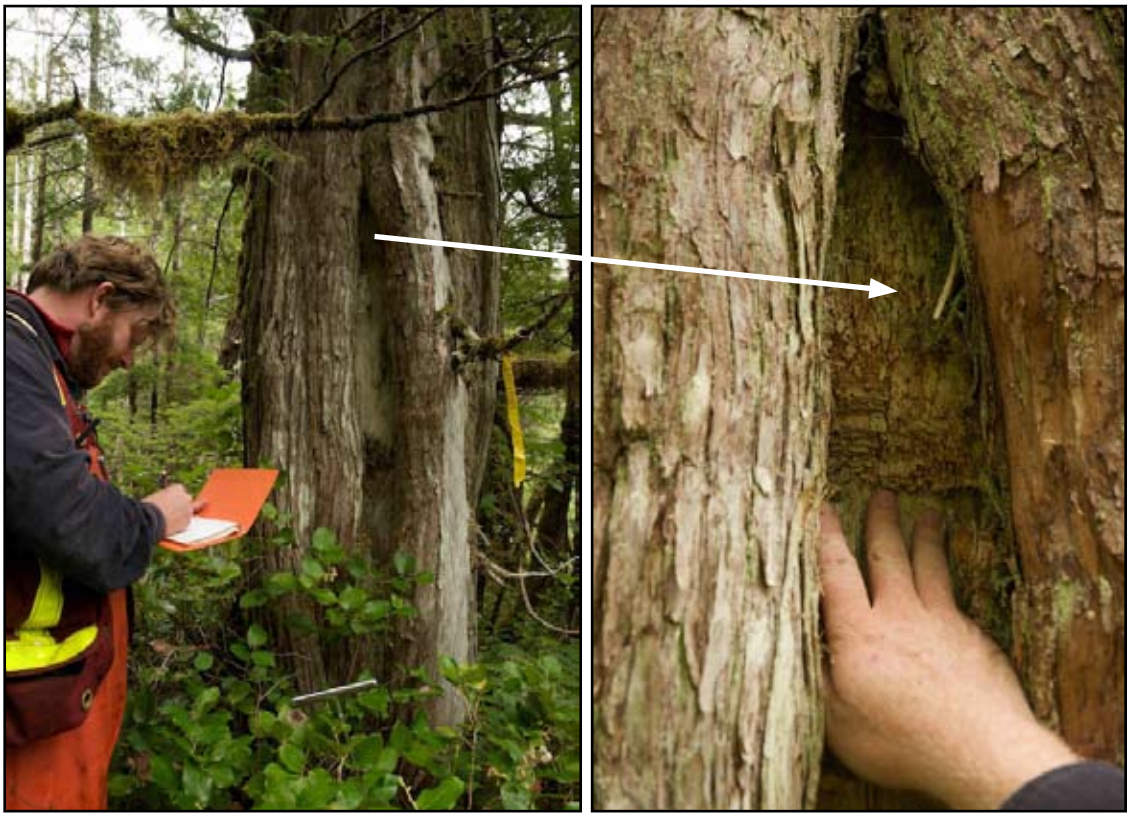
CMT Number and UTM coordinate	Class	Diameter at Breast Height (cm)	Alive tree?	Scar Width (cm)	Healing lobe thick-ness (cm) L	R	Tool Marks/ Chop Marks	Height of scar above ground (cm)	Scar Crust?	Length (cm)	% Slope	Scar facing (bearing)
WP122a N5928929 E442463	Rectangular bark-strip	56	Yes	10	12	18	No	60	Yes on right side	350	15	156
WP122b UTM Same as above	Rectangular bark-strip	56	Yes	8	16	17	Yes	75	Yes on left side	400	15	70
WP123 N5928934 E442491	Rectangular bark-strip	86	Yes	12	9	17	Yes	92	No	60	10	234
WP126a N5928433 E442825	Rectangular bark-strip	75	Yes	33	17	15	Yes	70	No	205	5	254

Figure 15. Replica canoe bailer made from cedar bark. Photo obtained from: http://saltspringarchives.com/akermanmuseum/pages/2004022003.htm

Figure 16. (top) **Rectangular CMT on the trail to Tsemhara Lake (WP 126 Table 1). Another older rectangular scar (with much thicker healing lobes) is present on the opposite side of this same tree and additionally marked with orange spray paint.**

Figure 17 (bottom left). **Rectangular CMT at the northern arm of the head of Curtis Inlet (122b). Another similar feature was present on the other side of the same tree.**

Figure 18 (bottom right). **Detail shot of distinctive "chop marks" inside the characteristically "kinked" healing lobe which forms after the bark chopped and removed.**



9 through 11). At least four small actively-flowing streams drained into this sheltered location where a broad, shallow and gently sloping delta has formed and is exposed at low tide (Figure 19). Close inspection of this exposure did not reveal the presence of artifacts, fire cracked rock, or other cultural materials that might be expected for an archaeological deposit.

Considering the protected nature of this portion of the inlet and the high freshwater input from multiple creeks and the Kitsemenlaren River, it was unusual to see such a concentration of clam shells in the upper intertidal, just meters away from the current high tide line and at the same elevation (barnacle line).

Further inspection the following day at low tide revealed the presence of very fine marine clay beneath a shallow layer of gravel near the mouth of one of the creeks and close to the shell concentration (E442664, N5928849, 65 cm below barnacle line). This unique sediment is commonly related to glacial and post-glacial environmental changes where trapped glacial ice melts. To determine the relative abundance of shellfish in this delta, Ken Innis conducted a series of shovel tests running in a line from the low to high intertidal area (Figure 25). He found four live horse clams in the lower intertidal area but these were located more than 50 meters away from the shell exposure. No other similar concentration of shells was noted in the large delta area.

A 2003 study on salmon habitat on western Pitt Island noted that surface salinities in Curtis Inlet were low (4.5%) relative to other protected inlets in the region where surface salinities were around 21-37% (Roslton and Proctor 2003:11). This implies high abundance of freshwater relative to other inlet settings. Thus, the freshwater input from the river, creeks and shallow sill may impact saline circulation. However, under different climatic or sea level conditions, shellfish may have thrived in this delta plain.

Similar exposures of shellfish are found in Haida Gwaii and date to 9,500 radiocarbon years ago when sea levels rose rapidly immediately following the last ice age (Fedje and Christensen 1999). If similar paleo-shellfish beds could be found on western Pitt Island, this would provide an anchor point for the sea level history for this portion of the coast. Given that relatively little sea level change has occurred in the Dundas Islands and Porcher Island, the relative difference in sea level could be slight which could potentially explain the presence of these shellfish in growth position. Alternatively, the shellfish beds could be recent and simply anomalous. Daryl Fedje has offered to date a sample of macrobotanical wood and shell from inside one of the paired clamshells and this will demonstrate if this shellfish death assemblage is indeed ancient.

A total station map of the surface of the delta including the shovel tests, sediment samples and shell exposures was made showing the small creek draining and the extent of the shellfish exposure (Figure 19).

Preliminary Diatom Analysis of Sediments from KL2

To further investigate the geological origin of the sediments associated with the shellfish in growth position, sediment samples were taken for microscopic analysis and potential radiocarbon dating. Daryl Fedje, an archaeologist with Parks Canada, kindly volunteered to examine five samples and make preliminary observations about their contents. His observations are briefly transcribed in Appendix 3.

KL3 Kitsemenlagen IR 19a and 19b (near the outlet of Tsemhara Lake)

Further archaeological observations were made of the area surrounding the river draining Tsemhara Lake, a moderately sized sockeye salmon lake. This reserve location contains undulating terrain with a relatively steep and rocky shoreline. The river outlet has a turbulent flow over large cobbles

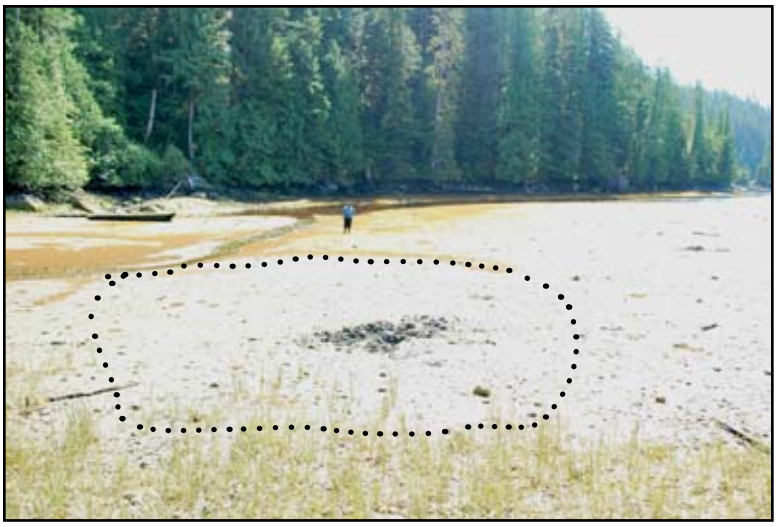


Figure 19. **Estuarine delta at the head of the north arm of Curtis Inlet. Ken Innes is standing by the drainage channel. Dotted line shows the approximate extent of the shell exposure.**

Figure 20. **Photo looking towards bedrock shoreline taken from beach looking northwards towards photo shown on left.**

Figure 21. **Surface of intertidal exposure showing butter clam shell fragments and eroded paired valves in growth position.**

Figure 22. **A partially exposed example of a deceased butter Clam in growth position.**

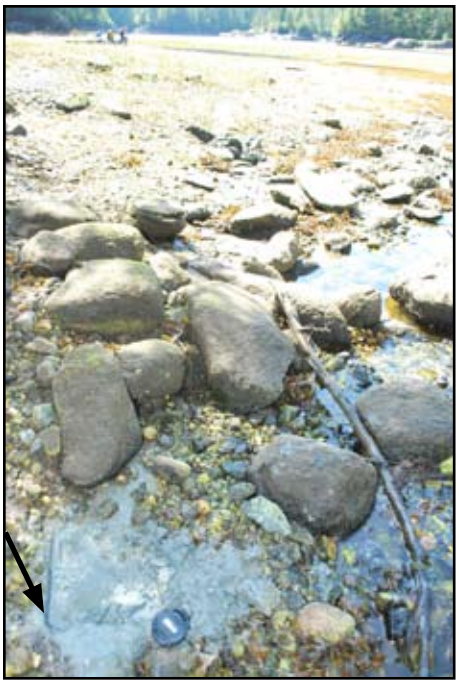


Figure 23. **Gravel and boulders near creek mouth sitting atop very fine marine clay exposure (note lens cap for scale). UTM Location: E442664, N5928849.**

Figure 24. **Marine clay exposure beneath centimeters of alluvial gravel.**

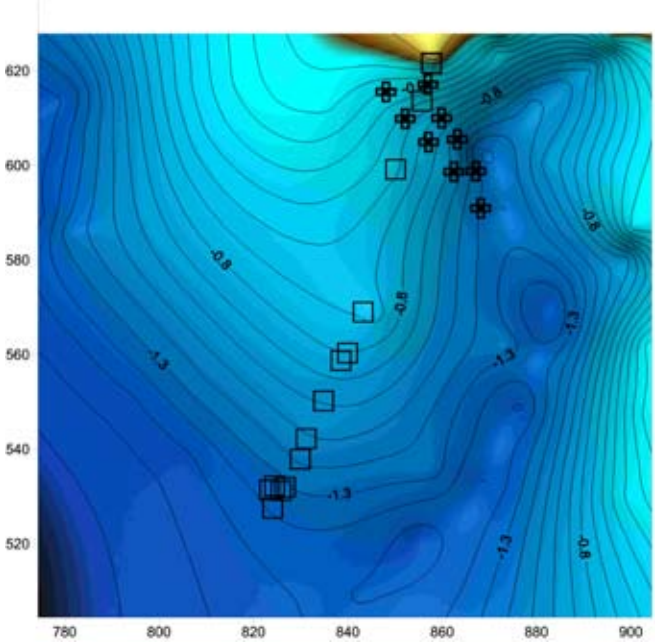


Figure 25. **Contour map of the delta landform showing the outline of the shell exposure (crosses) and shovel tests (squares). Elevations are in relation to the present barnacle line. Contours are 10 cm.**

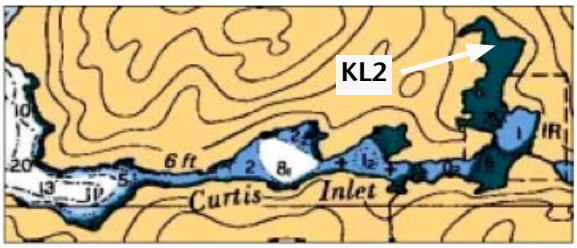


Figure 26. **Marine chart showing the general location of the shellfish surface exposure.**

and does not appear to be navigable by canoe or boat. An old trail follows the east side of the river up to Tsemhara Lake and was most recently used by the Department of Fisheries and Oceans staff to estimate salmon escapement during 20th century.

An artificially-levelled platform, measuring approximately 7 x 10 m was noted on the eastern portion of the shoreline and appears to have been the location of an historic-era cabin (E442714, N5928406). Probing in this terrace location revealed the presence of black charcoal-rich sand and silt to depths of up to 1 m. This deposit was similar to that observed at KL1 and suggests that these are cultural deposits, but further investigation is likely necessary to assign definitive cultural origin for these deposits.

On the western side of the river draining Tsemhara Lake, several historic wooden structures were encountered along with crockery, lead battery cores, and glass fragments (E442633, N5928350). These structures are situated in dense undergrowth and immature spruce and cedar and ripe salmonberry bushes. Based on forest growth, these structures appear to have been abandoned more recently than at KL1. One structure in particular appears to be the shape and size of a small cabin or traditional smokehouse (2 x 3 m). Other structures appear to have been small cabins under 4 meters in length. Evidence of historic-era hand logging is ubiquitous in this area with numerous stumps and a few stumps with springboard notches. Time constraints prevented further documentation of these structures.

KL4 - Fish Drying Structure

The standing structural remains of a fish drying rack were observed in a tiny south-facing cove off the main channel of Curtis Inlet (E442210, N592870). The drying rack is made from locally obtained immature tree trunks and split cedar planks, strung together with rope. This sheltered location contains a narrow semi-level vegetated platform just above the high tide line. While the potential exists for this structure to be quite old, it likely dates to within the past 30 years, but it may indicate a good location for such activities for a long period. Brief inspection of the landforms near this structure did not encounter any cultural deposits. This structure embodies the continuity of traditional use.

Figure 27. **Remains of a collapsed wooden structure on the west side of the river draining Tsemhara Lake. The small white objects are lead battery cores. Photo by Brendan Gray.**

Figure 28. **Fish drying structure on Curtis Inlet. Photo taken at high tide by Brendan Gray.**

Kooryet IR 12, Kooryet rivermouth, eastern Banks Island

Kooryet River is a productive sockeye salmon river located along the eastern portion of Banks Island (E441950, N5910680). This small river drains two large lakes respectively ~2.5 and 12.5 km from the rivermouth. The river channel drains along a natural fault that slopes along a particularly gentle gradient. The lower reaches of the river forms a narrow channel approximately 800 m long and between 20-40 meters wide that is subject to considerable tidal fluctuation. The river empties into the ocean within a semi-protected bay, partially enclosed by a small island to the northeast (Kooryet Island) and a cluster of rocky islets to the southeast (Figure 29). In addition to sockeye, chum, coho and pink salmon spawn in several channels of this river.[5]

Dr. Charles Menzies had previously visited this site and photographed the prominent boulder alignments along the lower reaches of the river, some of which stretched across its path. Sometime in the 1950s, Captain Lorne A. Peck had reported the existence of a fish trap at this site to a provincial museum employee, but no other archaeological information has been submitted to the Gitxaała or the Province since this time. Our goal in re-visiting this site was to inspect and map the boulder alignments in order to show their relative location and estimate their approximate size and number.

We arrived in Kooryet Bay on the afternoon of August 14 2009 during a moderate low tide (2.1 m) flooding to a high of 4.6 m that evening. Sockeye and pink salmon were present throughout the bay, regularly leaping out of the water. We observed a canoe run at the entrance to the bay (Figure 30). Examining the riverbanks from the vessel with binoculars, we noted that a pack of at least six wolves were foraging or waiting to forage on salmon a considerable distance upstream. Noting the absence of bears, we launched the skiffs and ascended the narrow channel, immediately noticing the presence of multiple rock alignments both paralleling the riverbank and running across the path of the river. The boulder alignments were constructed from readily available riverbed cobbles. Some of the rock alignments altered the stream channels while side channels and pools were present alongside these features. No preserved wooden stakes or wooden weir fragments were observed in association with the rock alignments, despite efforts to identify them. Based on the lack of fine sediment, such features may not have been preserved if indeed they were once present. Bedrock

5 GeoBC: https://apps.gov.bc.ca/pub/geometadata/metadataDetail.do?recordUID=43471&recordSet=ISO19115

predominated on the southern riverbank, which is also where the river channel is deepest. In comparison, the northern riverbank has a gentler slope until the river channel becomes fully tidal.

The crew proceeded to set up the total station on the barnacle line on the north side of the river (E 441485, N 5910704) and map as many features as possible within the constraints of time and a rising tide. Two people operated the total station prisms to efficiently document the size and orientation of the rock alignment features. Cross-sections of individual rock alignments were mapped at 5-10 m intervals. A total of 453 data points were collected. The edges of individuals alignments were mapped as well as the centerline of the alignment at the greatest height. Side channel retaining "pools" were also mapped by taking a variety of points along the periphery of the ponds.

Figure 29. GoogleEarth image of the lower reaches of the Kooryet River draining into Principe Channel.

A minimum of eight individual rock alignment features and three 'retaining pool' features were recorded along both sides of the river extending over an area approximately 430 m in length (Figure 31) and range in elevation from a low of -2.45 m below the current barnacle line to +0.51 m above barnacle line. The longest boulder alignment is 81 m in length and is located in the centre of the stream in a v-shaped formation that substantially alters the stream flow (Figure 32).

Four shorter linear features were present along the lower reaches of the southern riverbank running nearly perpendicular to the river (Figure 33). These features run parallel to each other but do not match up with similar features on the northern riverbank. A distinct 50 m long arc-shaped boulder alignment follows the river flow in contrast to the four linear features on the southern shoreline (Figure 34). The alignment located closest to the river outlet extends all the way across the river channel but this particular feature is only visible at low-low tides and was submerged at the time of the fieldwork. A photo of this feature taken by Dr. Menzies at low-low tide is shown in Figure 33.

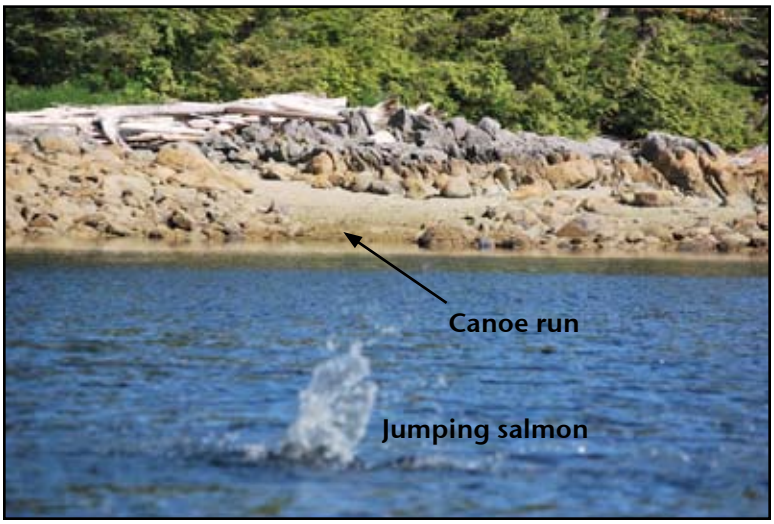


***Figure 30*. Canoe run at the northern entrance to Kooryet Bay (flowing from left to right). Photo by Brendan Gray.**

Steven Langdon, an archaeologist who has recorded numerous similar intertidal boulder alignment sites in Tlingit territory in southeast Alaska, distinguishes fish weirs from fish traps. Weirs are structures which direct the

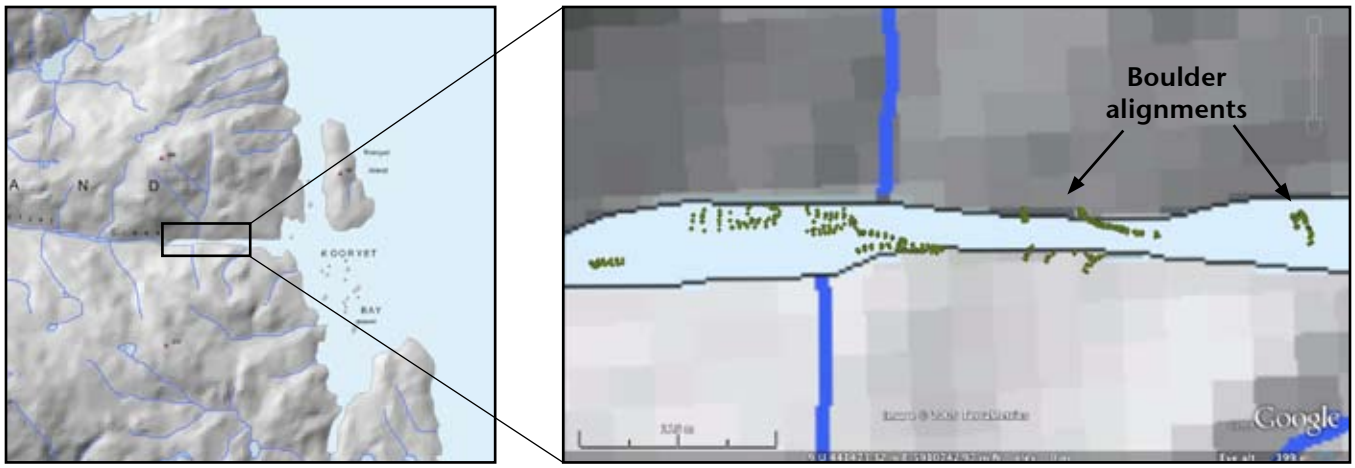


Figure 31. **Map of boulder alignments in lower Kooryet River overlayed on BC TRIM data obtained from the provincial website http://geobc.gov.bc.ca.**

Figure 32. **View up-river at mid-tide. White arrows point to two parallel rock alignments altering and narrowing the river channel. Ken Innis shown in background. Photo by Charles Menzies.**

movement of fish to places where people can harvest fish (e.g., with leisters or nets) whereas traps are features which captures fish "by drawing them into a structure from which they are unlikely to escape" (Langdon 2006). Traps are often used in combination with a tunnel-shaped or box-shaped basket trap which can be temporarily placed in or at an outlet of a boulder alignment (Drucker 1955:14; Emmons 1991:106). Using this working definition, the features at Kooryet can be characterized as containing both traps and weirs. The only currently recognizable trap feature is located in the lower intertidal and stretches across the stream mouth. Fish weirs are represented by the numerous boulder alignments and linear channels further upstream which continue to direct fish to places where they could be readily harvested. Additional features of this trap complex are the retaining pools along the side channels which could provide temporary holding pond where harvested salmon could be kept prior to processing and transport (Figure 35).

In sum, our field observations suggest that the lower reaches of the river (extending over 430 m in length) has been variously modified and engineered to facilitate access to the salmon fishery. The complexity and extent of the features likely represents intergenerational communal investment in securing access and managing the use of salmon at this location. The additional presence of a canoe run along the north side of the stream mouth (E441950, N5910680) further demonstrates the

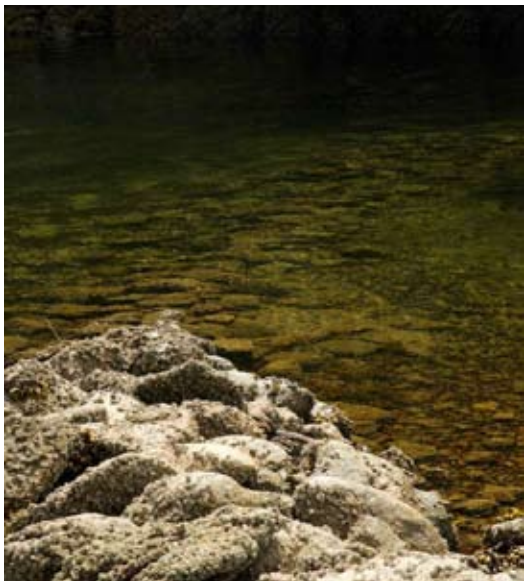


Figure 33. **View of the lowermost rock alignment feature that cross-cuts the river flow at low-low tides. Photo by Charles Menzies.**

Figure 34. **Side channel rock alignment in the tidally influenced portion of Kooryet River (view to west facing up river). Note the abundance of barnacles and the size of the cobbles. Photo by Charles Menzies.**

extent of human use of the area.

Subsequent to the field research, the author noted this fish trap complex was visited by the crew of Captain James Colnett in October of 1787. Colnett's crew caught salmon in the river and 'destroyed' a portion of this trap complex after a dispute with a chief in the area (Galois 2004:156–160, 359). This represents one of the earliest European accounts of the indigenous use of fish traps in British Columbia. The curious discontinuity of linear boulder alignments along the lower portion of the river may possibly be the result of Colnett's crew attempting to dismantle portions of this elaborate fishing structure but future archival research is needed to help clarify the historical context of this feature and how it was dismantled. Additional fieldwork at low-low tides is necessary to fully document the features present at the site.

Wil lu sgetk, Saycuritay Cove, southwestern Pitt Island

The crew departed Kooryet and headed across Principe Channel towards a protected cove on the southwestern corner of Pitt Island (currently named Saycuritay Cove). This 30-hectare cove is protected from the high-energy waters in Principe and Otter Channels by a small, currently unnamed island and several rocky islets. The cove is accessible from a shallow narrow approach to

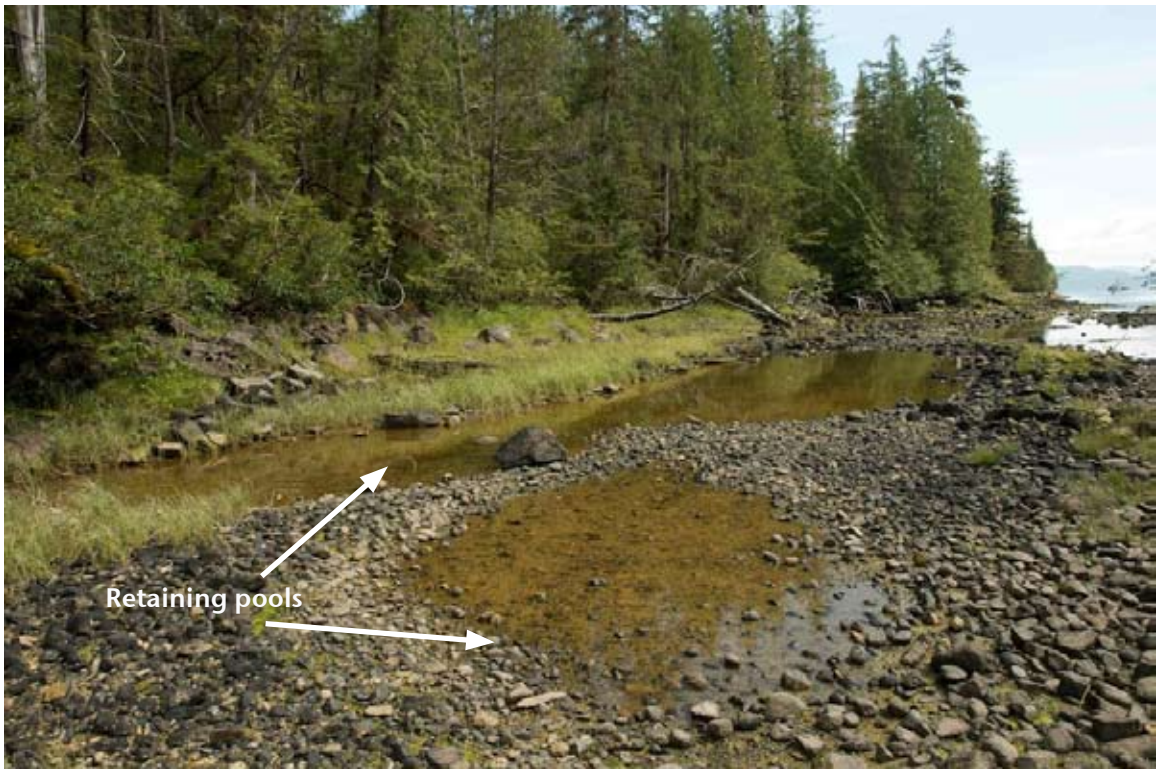


Figure 35. **View of pools and side channels facing east and downriver. This portion of the river is above barnacle line but is still influenced by tidal surges. Photo by Charles Menzies.**

the west and two deeper wider channels to the south and east. (See Figure 36.)

Unlike the other localities examined during this project, this area was not declared a Gitxaała reserve in the late 1800s. However, this location has been subject to previous archaeological survey which documented two shell midden habitation sites as well as a fish trap at the outlet of a small creek (Figure 37). These sites were recorded in 1970 by Bjorn Simonsen and colleagues from the University of Victoria as part of a provincially sponsored archaeological survey project (Simonsen 1970, 1973). Aside from the site boundaries depicted on the original site map and a brief description of the location, no additional information about these sites was obtained. Moreover, as a testament to the lack of archaeological research conducted on this part of the coast over the past 40 years, these three sites still represent 75% of the recorded archaeological sites on southern Pitt Island.

Our purpose in re-visiting this locale was to relocate these previously identified sites, evaluate potential impacts, and potentially make additional observations about site potential and significance in this area.

FhTj-6 Intertidal Trap

Preliminary inspection of the shoreline during a 4.7 m high tide in the vicinity of the previously recorded fish trap (FhTj-6) did not identify any recognizable trap features at this location. Cobbles and boulders were abundant along the shoreline and a semi-circular area of deep water was present at the outlet of the stream which would be suitable for trap. This landform could be readily modified to create arc-shaped boulder alignments shown in the original site map (Figure 37). We additionally inspected the creek mouth early the following morning during a lower tide (3.0 m) but still did not see any evidence of a trap. The absence of such features is puzzling but is likely a result of either a lack of low tides during the time of our fieldwork or that small-scale log salvagers may have dredged

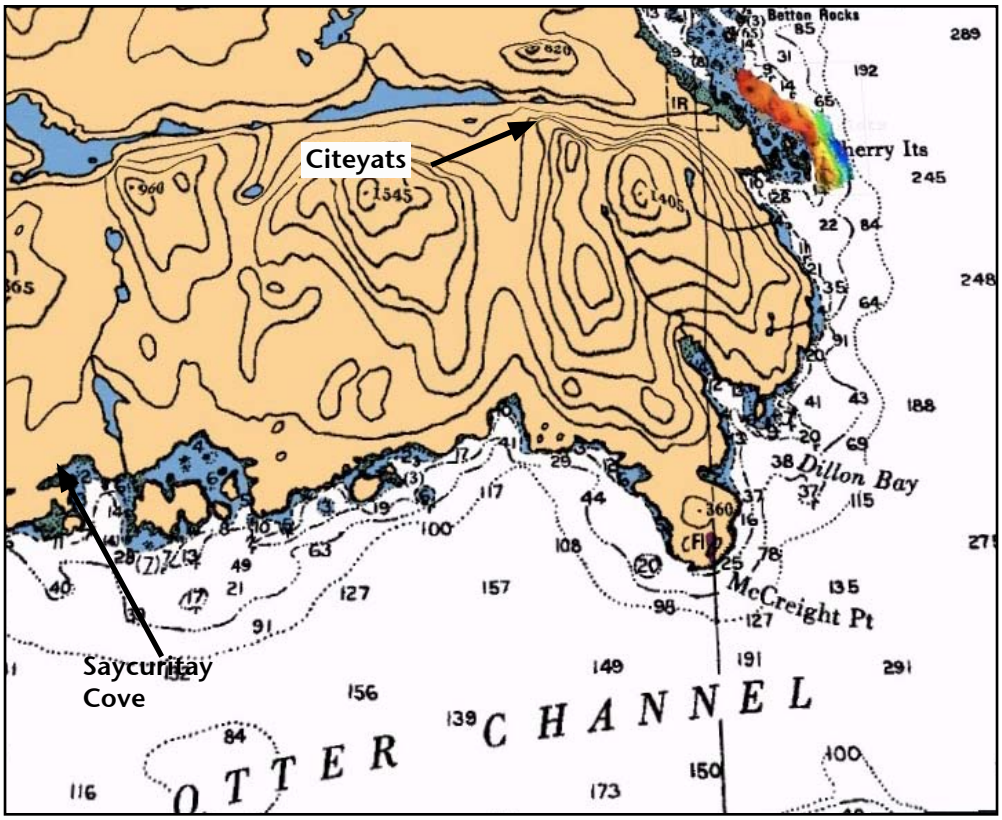


Figure 36. **Image from a marine chart of Southern Pitt Island including Saycuritay Cove and Citeyats. Multicoloured 'rainbow' on right is a high resolution image of the sea floor obtained from the Canadian Hydrographic Service.**

the stream mouth to access timber from the shoreline. This is suggested by the presence of multiple recent stumps and felled trees on the hillside above the creek mouth and modifications to the stream itself (discussed in more detail below). An additional possibility is that federal or provincial fisheries officials may have dismantled this fishing feature to "enhance" habitat sometime during the past 40 years.

Regardless of whether the fish trap site remains intact or not, archaeological materials were found in the intertidal area at site FhTj-6. Two stone tools were present on the upper intertidal of the shoreline just west of the creek mouth (Figure 38 and Figure 39). These tools were not collected but examined and photographed in the field. The tools have numerous flake scars removed in two directions and can be characterized as "multi directional cores." Broadly similar stone tools have been found at a variety of intertidal sites elsewhere on the northern and central coasts (Apland 1977; Mackie and Sumpter 2005). In southern Haida Gwaii, intertidal lithic sites are common and are hypothesized to date to the period when post glacial sea levels rose above modern (transgressed) approximately 10,500 years ago (Fedje et al 2001, 2005). That said, intertidal lithics have also been found at sites elsewhere on the coast that date to a wide variety of time periods.

CMT's at Saycuritay Cove

A small recently logged area is present on the south-facing hillside above the outlet of the creek draining into site FhTj-6. At least one of the remaining felled trees was a CMT (discussed further below). The small actively-flowing stream drains a steep rocky gradient which does not appear to be deep enough for salmon to ascend. A curious makeshift dam has been installed across the creek approximately 30 m from its mouth. The dam was approximately 2 m high and 3 m across and

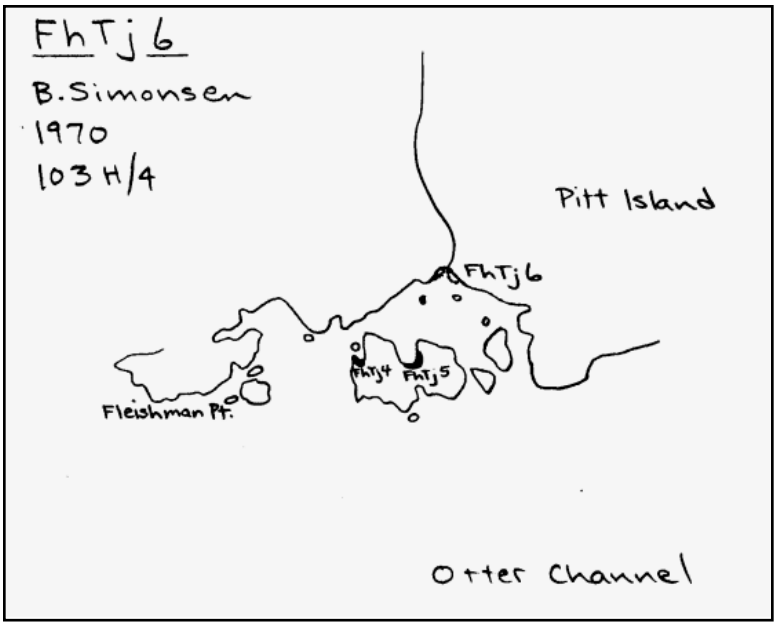


Figure 37. **Original site map showing the outline of Saycuritay Cove and the location of the three sites recorded in 1970 (map obtained from the BC Archaeology Branch). FhTj-6 is the fishtrap site and sites FhTj-4 and FhTj-5 are shell midden habitation sites.**

Figure 38. **(a) One of two flaked stone tools found on the intertidal cobble beach near site FhTj-6. (b) Opposite side of the tool pictured above. Photos by Iain McKechnie.**

Figure 39. **The second of two flaked stone tools found on the surface of the intertidal at FhTj-6 (UTM coordinates: N5896732, E462332).**

appears to be related in age and purpose to the recently logged area immediately to the east.

A distinctive rectangular bark stripped CMT is present along the western bank of the stream approximately 40 m from shore (Figure 40) and several other taper bark stripped CMTs are present in the area immediately above the clear-cut. Due to time constraints and the high number of CMTs observed, dimensions for each archaeological feature were not recorded.

The discovery of a felled CMT provided an opportunity to directly date Indigenous forest utilization in this region. This particular taper stripped CMT has distinctively large healing lobes and the scar-crust is visible in the chain-sawed cross-section (Figure 41). A detailed count of the tree-rings by Jarek Ignas-Menzies revealed that the tree is a minimum of 230 yr old (ca. AD 1779) and the bark-stripping event occurred a minimum of 180 yrs ago (ca. AD 1829). The relatively young age of this cedar at the time the bark was removed (50 years) is within the ethnographically preferred size-range (Turner 2004:83-84) and is commonly observed for archaeologically-recorded taper bark stripped trees (Stafford and Maxwell 2006).

Since this bark-stripping event predates AD 1856, this designates the site as protected under the Provincial Heritage Conservation Act. The fact that this archaeological site has been logged without an archaeological permit represents a direct violation of the Heritage Conservation Act.

FhTj-4 and FhTj-5 Site Revisits

Brief inspection of sites FhTj-4 and FhTj-5 revealed the presence of shell midden exposures of moderate depths (1-3 m) and had landform topography consistent with other coastal shell midden sites. According to the provincial site database, site FhTj-5 measures approximately 100 m in length and 20 m in width and Site FhTj-4 is considerably smaller, measuring approximately 25 x 8 m. In addition to shell deposits, site FhTj-5 contained a number of mid-to-late 20th century structures,

Figure 40. **Rectangular bark-stipped cedar CMT along the western bank of the stream draining into Saycuritay Cove. Photo by Brendan Gray.**

Figure 41. **Recently felled cedar CMT in Saycuritay Cove. Top finger points to the initial scar that formed at the base of the healing lobe. Detailed tree-ring counts by Jarek Ignas-Menzies documented 190 years of growth from the date this scar was made (ca. AD 1819) and 230 years of tree growth in total (ca. 1774). Photo by Jarek Ignas-Menzies.**

including cabins and outhouses situated at the southern head of this small u-shaped bay. These structures appear to be the deteriorated remains of a temporary fishing camp or homestead and are not mentioned in the original site report.

The most readily visible pre-contact archaeological deposits are located along the eastern shore of the bay where shell midden deposits are visible on the beach surface (Figure 42). A couple from New Zealand kayaking the coast from Prince Rupert to Vancouver were temporarily camped at this location but were unaware they were camped on an archaeological site. The moderately eroded shell exposure next to their camp contained barnacle, littleneck, cockle and mussel shell. Historic debris was also present including copper, a square nail, and purple/blue glass. On the other side of this U-shaped bay and outside the currently defined site boundary, a stone tool was found on the surface (Figure 44). This core tool has several flake scars and is slightly water-worn. The tool material appears to be a fine-grained chert.

Wil lu sgetk

Additional reconnaissance of the shoreline along the western extent of the cove resulted in the discovery of a boulder-strewn beach with a canoe run at its easternmost extent (Figure 45). Inspection of this beach revealed shell midden deposits eroding from beneath a mature hemlock tree (Figure 46). Two small stone tools were found on the surface of the beach (Figure 47 and Figure 48) along with a wide variety of shellfish.

Figure 42. **Eastern side of site FhTj-5 showing eroded midden in foreground at tideline and area without forest growth in area to left.**

Figure 43. Intertidal midden exposure at site FhTj-6.

Figure 44. (a) Stone tool found on beach in front of site FhTj-5. (b) Top of the tool. Photos by Brendan Gray.

This eroding midden deposit is situated at the base of a steeply-sloped banking which rises approximately four meters and promptly levels off on a broad terrace paralleling the shoreline. Another exposure of shell midden is present on the top of this terrace in the root ball of a partially fallen tree indicating that the entire banking consists of midden deposits. These two exposures are situated in front of five house-sized cultural depressions paralleling the shoreline. The five rectangular-shaped depressions measured between 11.6 and 5 meters in length and 10.6 and 4 meters in width (Table 2). A small stream drains the western portion of the site and a nearly vertical granitic bedrock bluff abuts the back of the cultural depressions. A bedrock promontory that is contiguous with the midden landform faces southwest and would serve effectively as a "lookout" location. This distinctive cultural topography strongly suggests that this large landform is likely entirely archaeological.

Compared to the moderate size of the two previously documented shell midden sites (FhTj-4 and -5), this particular site appears to have a substantially greater volume of cultural deposits and contains evidence for a minimum of five houses. In addition, there is a direct line-of-sight between this site and the two smaller sites but the two shell midden sites are not inter-visible. The elevated terrace location has a commanding view to the south and west, particularly the pass between Banks Island and the Estevan Group which is one of the most direct routes to southern Haida Gwaii. While it is impossible to definitively conclude without sub-surface investigation, this site can be preliminarily classified as a village measuring approximately 80 x 30 meters. Surface contour mapping was conducted with a total station collecting a total of 565 topographic data-points. The resulting map shows the five structural depressions and the steep beach-front banking as well as the bedrock bluffs behind the site (Figure 49). In interviews with knowledgeable community members, Charles Menzies suggests that this village may be the village of "Wil lu sgekt."

The fact that this extensive archaeological site was not documented during the previous survey of this small cove is surprising but reveals the extent to which "previously surveyed areas" may dramatically under-represent the archaeological record. In this case, the previous researchers were the first to work in this region and had a different set of goals, survey methodology and were working on a very broad scale (Simonsen 1973). While the omission of this site may have also been due to any number of logistical factors (e.g., inclement weather, scheduling constraints, etc), it also

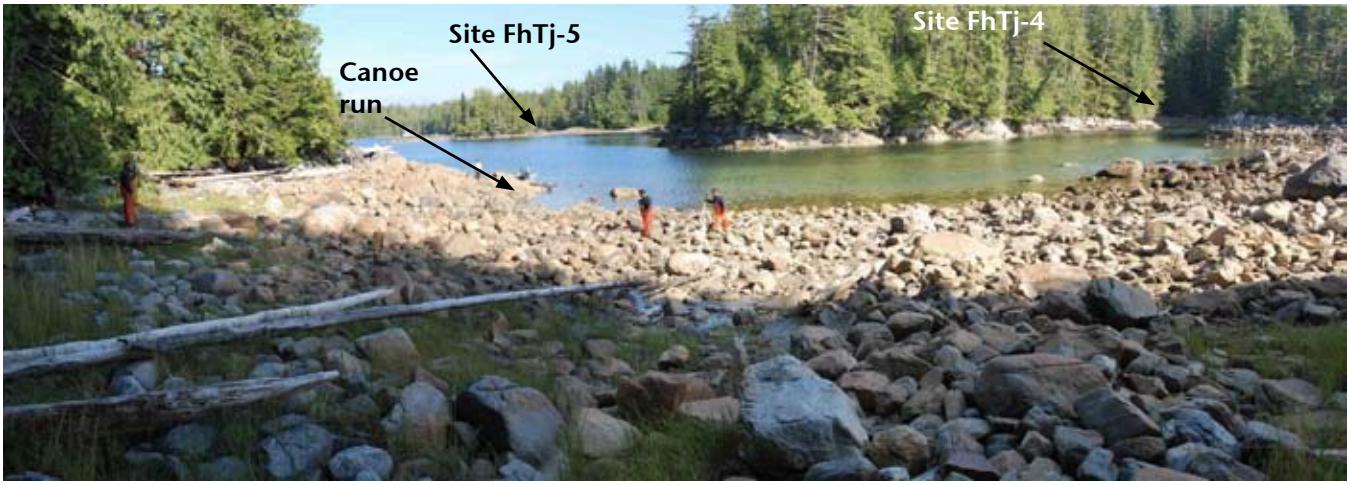


Figure 45. **Panorama photo facing south showing boulder beach and the western entrance to Saycuritay Cove. Four meter deep shell midden deposits are located in forested area to left of the image. Locations of Sites FhTj-4 and 5 are also shown. Photos by Brendan Gray.**

reflects the fact that archaeological survey has only begun in this region.

Citeyats Reserve 9, Southeast Pitt Island

Citeyats is a ~16-hectare Gitxaała reserve on the southeastern end of Pitt Island, just west of the Cherry Islets. The reserve is situated along the banks of the lower reaches of the Citeyats River, which drains a moderately sized lake approximately 5 km upstream (Figure 2). The river empties into a small, protected cove that faces north and is partially protected from large waves generated

Figure 46. **Shell midden exposure at the base of a 4 m terrace. Another exposure was present at the top of this slope in a tree throw.**

Figure 47. **Medium-grained flaked lithic debitage found on the surface of the beach at the base of the midden exposure shown in the adjacent figure.**

Figure 48. **Fine-grained flake present on the beach in front of the banking pictured on left.**

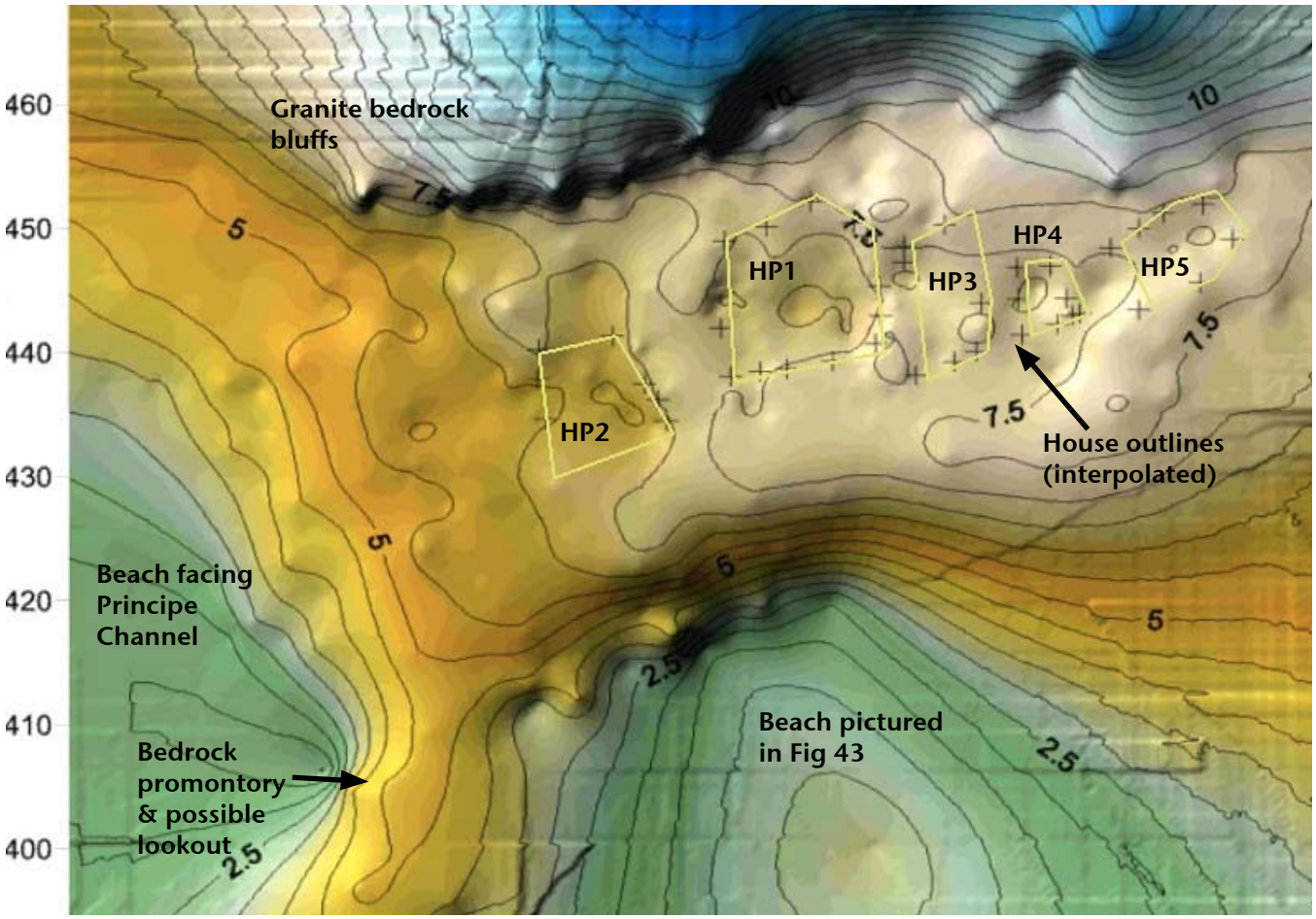


Figure 49. **Total Station surface map of Wil lu sgket showing landform features and house depression numbers. Scale-bar on left is in meters. Elevation contours are in 50 cm increments. Angular distortion on the top left and lower right of map is due to a lack of data-points obtained for this portion of the map.**

Table 2. House dimensions at Wilu lu skegt.

House num.	Width (m)	Length (m)	Total Area (m^2)
HP1	10.6	11.6	126
HP2	8.4	9.0	67
HP3	5.0	10.0	55
HP4	4.5	5.0	18
HP5	4.0	9.0	41

in Squally Channel during southeasterly gales and winter storms. Coho, chum and pink salmon are known to spawn in the river[6] and pink salmon were repeatedly seen schooling in this cove throughout the time of our fieldwork.

Dr. Menzies and the project team selected to investigate this location because of the detailed accounts of Gitxaała occupation and interaction with European explorers during the early colonial fur trade (ca. AD 1787-1793). Moreover, no archaeological fieldwork had been conducted at this significant cultural site. The only previous archaeological documentation is a brief description submitted to the provincial museum by Capitan Lorne A. Peck in the 1950s who mentions "this is a promising site with apparently quite a depth of deposit" and notes that "foundations of houses and two house totems" were present at the site in 1934 (FhTj-1 site form). The site was revisited in 1970 by Bjorn Simonsen but no additional descriptive information was provided in the documents available to us.

We anchored in the cove, launched the skiffs and approached the broad, sandy beach fronting the shoreline north of the Citeyats rivermouth. Ascending a steep banking on the northern portion of the beach, we immediately noted distinctive terracing and cultural topography. This area contained several small (5-8 m) rectangular and square platforms on a landform sloping towards a small, trickling stream draining onto the beach. Probing revealed extensive shell midden deposits immediately beneath a thin humic forest soil layer.

Additional exploration revealed a long, arcing midden ridge that defines the "back" of the site and runs perpendicular towards the river for a distance of over 100 meters. This ridge is consistently higher than all other points in the village and is fronted by numerous "house-sized" cultural depressions as well as highly-undulating cultural topography. To the south, a variety of cultural depressions are present along an elevated terrace-edge that overlooks the lower reaches of the Citeyats River. Several seemingly natural trails provide direct access to the river and several structural depressions appear to be oriented towards this direction.

The area closest to shore contains four large, rectangular platforms along a broad and flat terrace that drops sharply 4-5 m towards the beach (Figure 54). These large platforms contain small but discrete linear ridges abutting the 'back' of the platforms and also feature highly defined 90-degree corners, most likely representing midden that built up around a house corner. Three of the large platforms contain standing structural remains including three highly deteriorated posts, one recognizable post-hole as well as nine house beams lying on the surface of the site (Figure 51). The structural features are coherently located in relation to the surface topography, that is, the fallen beams run perpendicular to the shoreline and ridge described above and the posts are located near the terrace edge and ridge. Individual features and their UTM locations are given in Appendix 2.

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Ethnographic Descriptions of Citeyats

Citeyats is one of the first Tsimshian villages to have sustained contact with European traders in the late 18th century. James Colnett was the first European trader to visited the territory but did not make primary observations of this particular village. In contrast, Jacinto Caamaño, captain of the Spanish trading vessel, the *Aranzazu*, sought to chart the waters around southern Pitt Island throughout August of 1792 during which time his vessel was repeatedly visited by villagers and chiefs from Citeyats (Galois 2004:47). After an incident when a group of Caamaño's men went ashore to wash their laundry and managed to have both their clothes and boat removed from their possession, Caamaño was unnerved and sought retribution by holding captives and plotting to fire on the village. This desire for revenge was quelled by "*Jammsit"* (also known as Hammsit) a Citeyats

6 GeoBC: https://apps.gov.bc.ca/pub/geometadata/metadataDetail.do?recordUID=43471&recordSet=ISO19115

chief who in response, repeatedly invited Caamaño to visit the village to attend a feast in his honour (Caamaño 1938:274–293). Caamaño accepted and after several attempts to sail to Citeyats were rebuffed by recurring southeasterly gales, Caamaño anchored in the lee of the Cherry Islets where he finally managed to come ashore at the village on the 28th of August 1792.

To honour his high rank, Caamaño was carried ashore up a "pretty steep slope leading … to the village" and carried through a "narrow doorway of the chief's house, over which was painted a huge mask" to a "prepared seat which was to the right of the entrance" (Caamaño 1938:289). Here he was subject to the ritual purification of eagle down and witnessed dancing and ceremonial performances by *Jammsit* and *Giteyon*, a rival chief, elder, and shaman. After leaving the house, Caamaño provides the following detailed description of the village:

> I noticed four more houses similar to the one in which we had been entertained. This was about fifty to fifty-five feet in length, and thirty to thirty-five in breadth, with walls and roofs of well fitted planking. In the middle of the roof was a louver or skylight, placed to as to admit plenty of light, and serving also for the exit of smoke from the hearth (on which a fire is kept constantly burning), but at the same time keeping out the rain. It was cleaner than I had expected to find, and at some time must have been much larger, as around and above it stood heavy forked posts with cross timbers. [293]

This account provides excellent context for understanding the archaeological deposits we observed at the site. Caamaño notes five large houses approximately 17 m long and 11 m wide, which are remarkably consistent with our observations of the site topography shown in Figure 54. The "pretty steep banking" is present and the large rectangular platforms contain evidence for standing structural remains including house posts and beams.

Site Description

At the back-centre of one of the house platforms in the centre front of the site, stands a broad and thick carved house-post measuring 2.9 m long, 90 cm wide and 25 cm thick (Figure 52). The post is heavily weathered and tilting away from shore and to the north at a 10-degree angle. The remains of deeply carved larger figures are visible along the less weathered edges of the post (Figure 53). Four areas with carved notches are present on the north side of the post at 52-62, 74-92, 106-154, and 200-213 cm from the ground surface and one carved area is present on the south side of the post at 146-167 cm. The post stands in a small circular depression approximately 1.4 x 1 m in diameter and is located in front of the ridge running along the back of the terraced platform.

On the southern periphery of the site lies a series of three- or four-levelled platforms that appear to be locations of house features. These features are considerably lower in elevation and are also shallower than those in the middle of the site and may suggest an expansion of the village or a separate form of use such as canoe storage or fish processing areas. The overall site stratigraphy is discussed further below.

The overall site area is vegetated with a mature and relatively open forest understory consisting of numerous wild huckleberry (*Vaccinum parviflorum*), blueberry (*Vaccinium alaskaense*) as well as large devilsclub (*Oplopanax horridus*). The berries were abundant at this time and several of the berry patches near the shoreline appeared to have been recently harvested by people as there were subtle trails through the undergrowth towards particularly dense patches. Behind the site is a broad area of open forest rising along a gentle hillslope. An elevated promontory overlooking the mouth of the river is present to the southeast of the main village but was not explored.

Figure 50. **Remains of a highly deteriorated 18 cm diameter house-post, (feature 10). Photo by Brendan Gray.**

Figure 51. **Fallen house beam with nurse logs on flat terrace area. Photos by Brendan Gray.**

Figure 52. **Front of the carved house-post showing the highly weathered moss covered face and carved sections . Photo by Charles Menzies.**

Figure 53. **Side-view of the carved post looking north. Note the depression at the base of the post and the remains of the carved sections. Photo by Brendan Gray.**

Total Station Mapping

Mapping this large and complex village site with the total station required the use of multiple datums and significant brush clearing in order to be able to take total station shots of the surface topography. Over 2900 total station data points were obtained over five days and provide high-resolution perspective of the site topography (Figure 54). House features (e.g. depressions, back-ridges, terraces) appear on the surface map but additional observations were made of the dimensions and orientation of the house features with a compass and meter tape. These estimations are shown in Figure 54.

Percussion Coring at Citeyats

To obtain a stratigraphic record of the cultural deposits at Citeyats, a series of 23 percussion cores were collected from throughout the cultural deposits in a rough grid pattern (Figure 54). These individually-numbered cores were collected by Charles Menzies and Ken Innis over five days. The average depth of cultural deposits for the 23 cores is 2.37 vertical meters. The greatest depth recorded, 4.41 m, is located at the height of the backridge (ct11). Shallower depths are present along the periphery of the site (core tests 2-3, 5, and 18-23). Detailed stratigraphic analyses of the cultural and non-cultural sediments was recently conducted by Naomi Smethurst as part of a

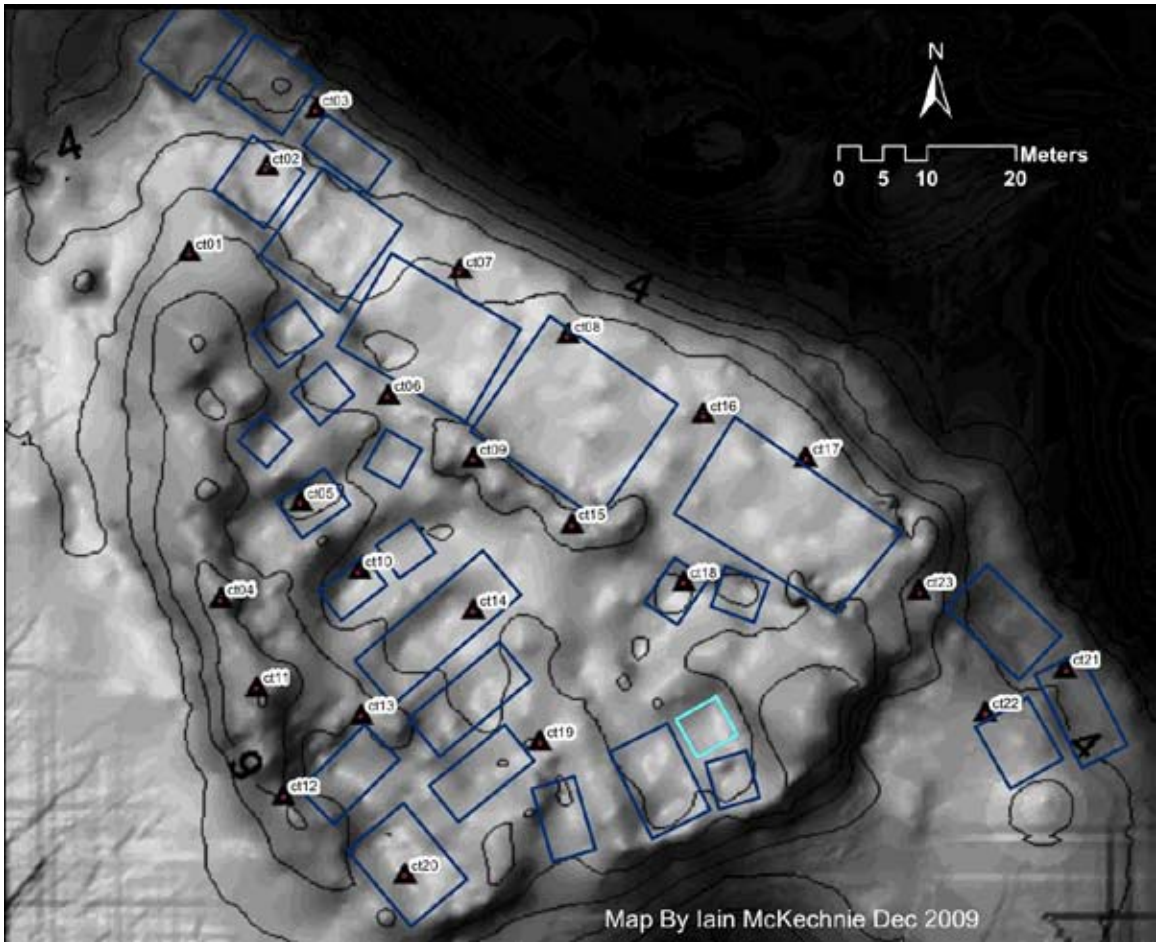

Figure 54. **Total station surface map of Citeyats showing the distribution of core tests (numbered triangles) and the interpolated boundaries of structural depressions and house platforms (Blue rectangles).**

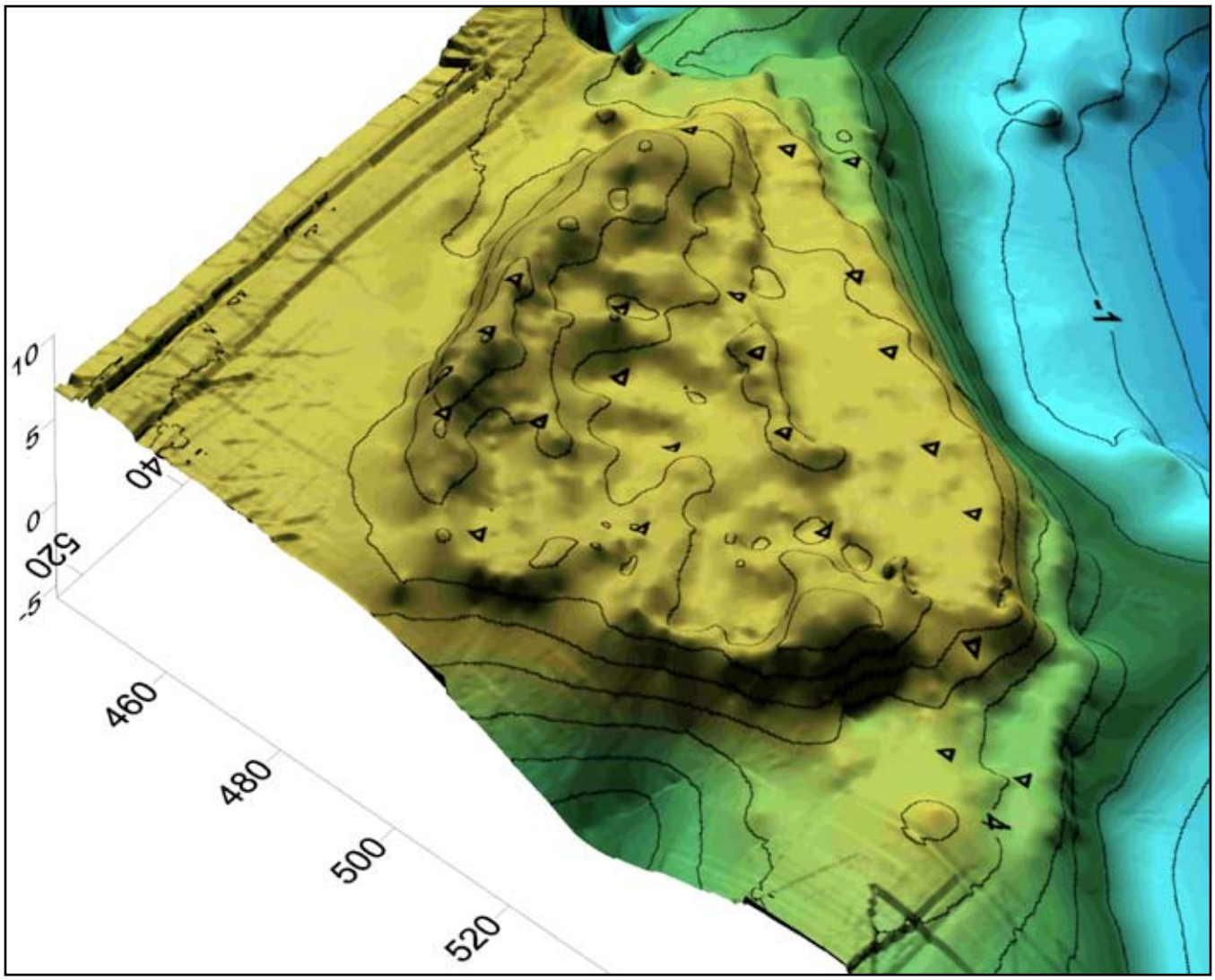

Figure 55. **Total station surface map of Citeyats showing a north-facing perspective view of the site topography in relation to the shoreline depicted in blue on the right of the image. Triangles are core test locations and the contour lines represent 1-meter intervals. Map by author.**

student laboratory project. A selection of her site-wide stratgraphic profiles are shown in Figure 56 and Figure 57. These images provide context for linking stratigraphic sequences across a very broad site area. The fact that multiple contiguous cores show similar depths and stratigraphic constituents indicates that the occupation of Citeyats was extensive, long-term, and occurred in a coherent sequence. One of the striking differences between areas of the site was the extensive deposits of shell in the ridges and the high silt content in the deposits with house-platforms and depressions. This difference is shown in Figure 58.

Citeyats Site Boundaries

Currently, the provincial archaeological site database identifies three separate sites at Citeyats, one on a small island opposite the stream mouth recorded by Bjorn Simonsen in 1970 (Site FhTi-4), and the latter two on the south and north sides of the river mouth respectively FhTj-1 and FhTi-1, Figure 59). These latter two sites are in separate 'Borden Grids' meaning that the prefix to the site numbers

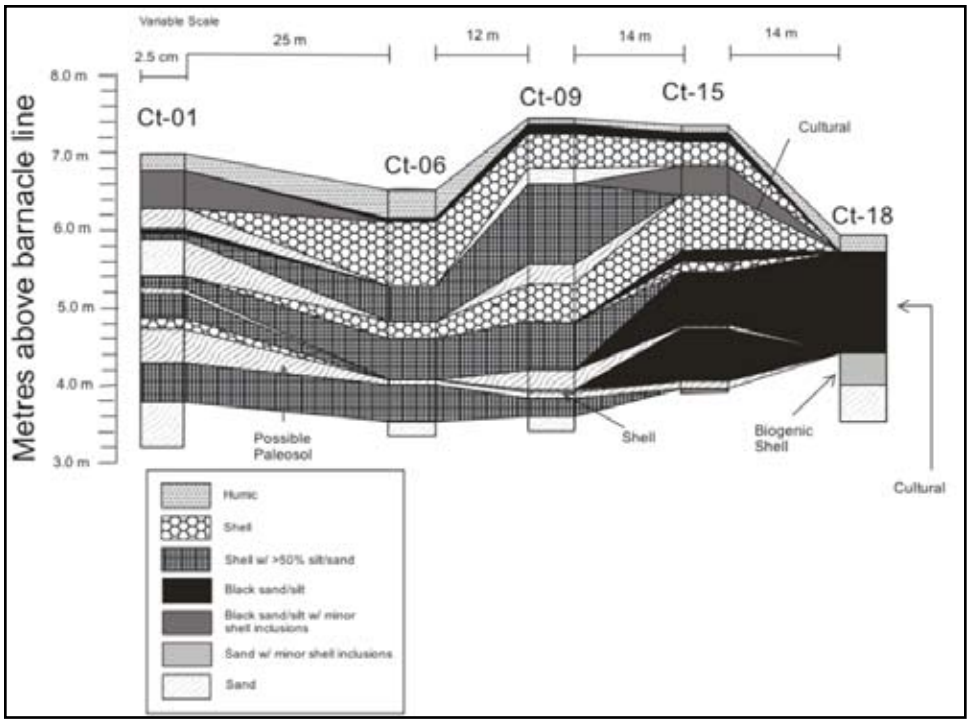

***Figure 56*. North-South stratigraphic profile of Citeyats Village showing the distribution of cultural sediments as viewed from the 'front' of the site. See Figure 54 for core locations. Profile created by Naomi Smethurst.**

is different (FhTj instead of FhTi). A note on the FhTi-1 site form stating that "this site could possibly be the same as FhTi-001" suggests that the sites are one in the same. This can be supported by field observations in which reconnaissance of the shoreline south of the river mouth did not result in the discovery of definitively cultural deposits as depicted on the provincial site form.

An additional confusing factor is that the Citeyats Reserve boundaries appear to be inaccurately located, as the shoreline depicted in the reserve boundaries is approximately 80 m south and 60 m west of the shoreline it depicts (Figure 59). This apparent inaccuracy is also present in the Indian Reserve Boundaries information available on a Federal Government website[7] but the boundaries appear to be correct in a recently conducted "Biodiversity, Mining and Tourism Area Official Plan" for the Citeyats reserve.[8]

Sediment samples

Four small sediment samples were obtained from separate areas of the Citeyats village deposits. Two samples were recovered from the northern and southern portions of the village close to the modern shoreline and another two were recovered from the top of the prominent ridge at the back of the site which was situated at a comparatively higher elevation and located far from the modern

7 Geobase.ca http://www.geobase.ca/geobase/en/search.do?produit=alta&language=en

8 http://www.ilmb.gov.bc.ca/slrp/lrmp/nanaimo/central_north_coast/maps/bmta_citeyats.pdf

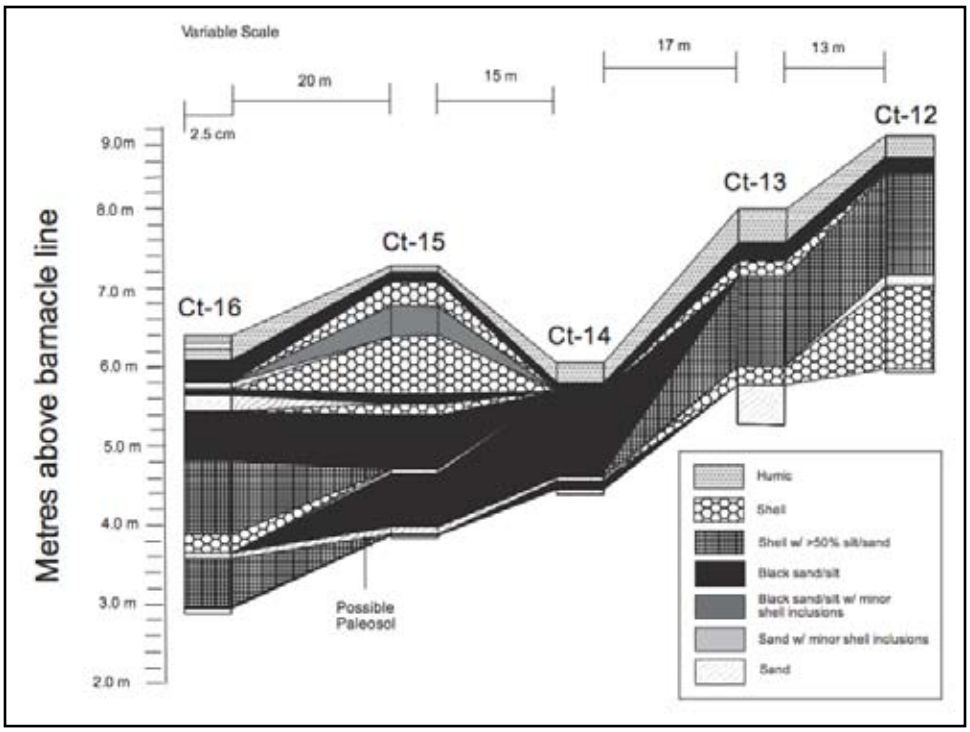

Figure 57. **East-West cross-section stratigraphic profile of Citeyats showing the distribution of cultural sediments as viewed from the 'side' of the site. See Figure 54 for core locations. Profile created by Naomi Smethurst.**

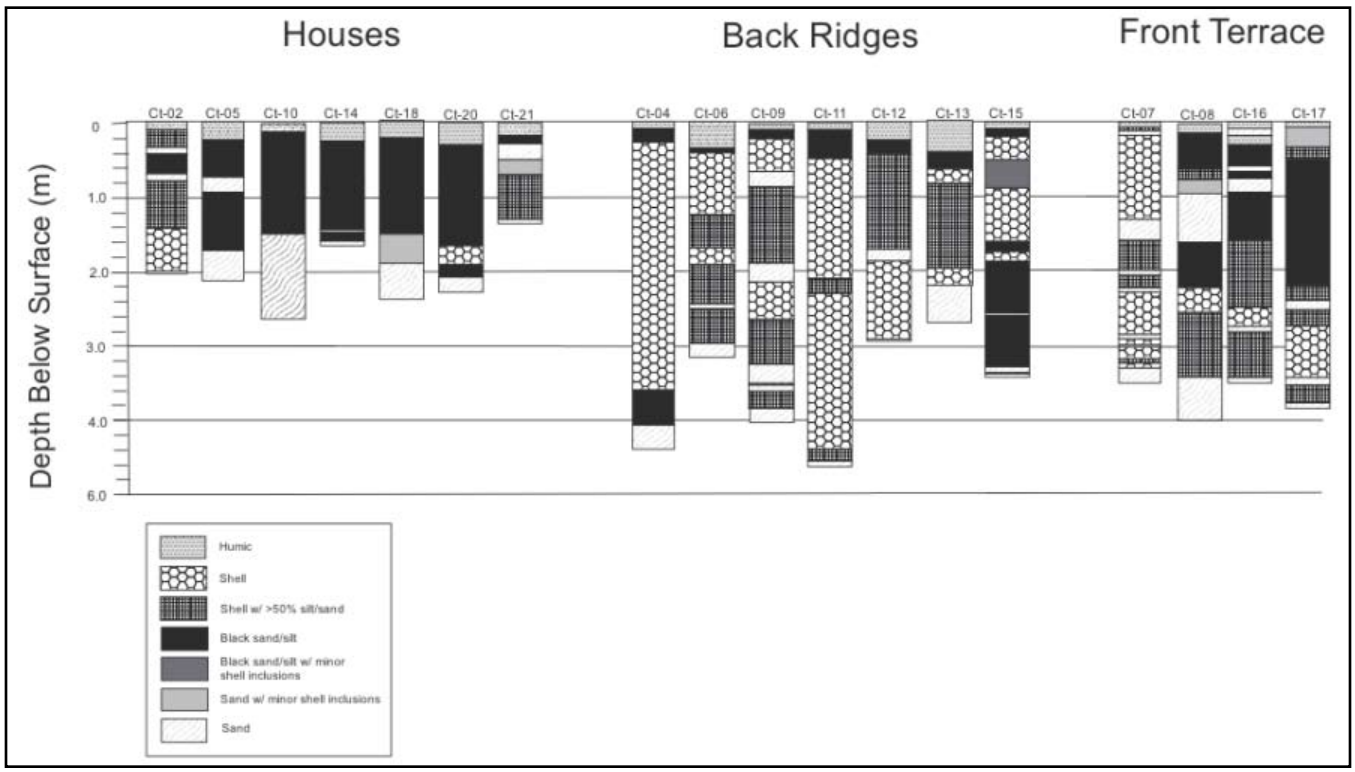

Figure 58. **Sedimentary profiles from house and non-house features at Citeyats in relation to depths below surface. Data compilation and image created by Naomi Smethurst.**

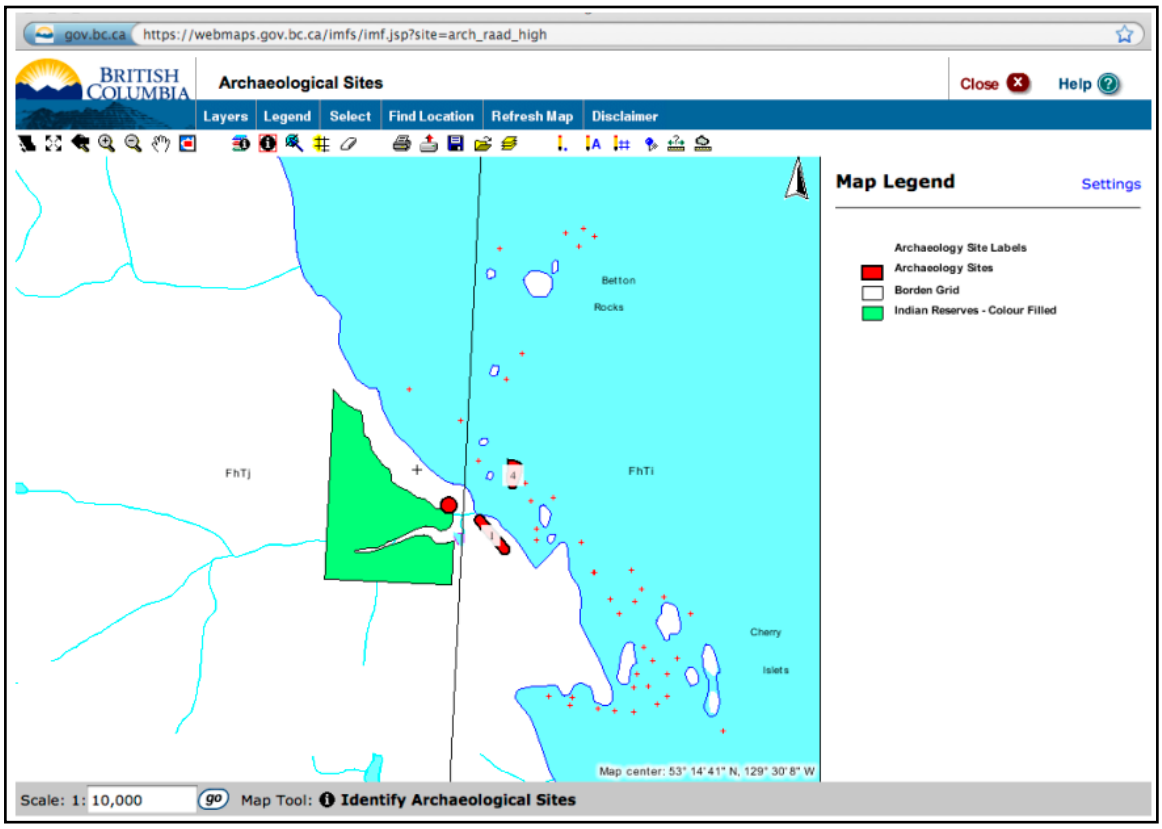

Figure 59. **Map of Citeyats obtained from the BC remote access to archaeological information (RAAD) website showing the currently documented archaeological site boundaries for sites (FhTj-1 [unnumbered], FhTi-1 and FhTi-4). Green area is meant to depict the Citeyats Reserve boundaries but appears to be offset.**

shoreline.

Sediments were obtained by removing an approximately 20x20 cm area of forest humic soils using a trowel until cultural shell midden matrix was exposed. Approximately 1-2 litres of cultural sediment were collected from these exposures after which time the humic layer was replaced. The volume of each sample was measured for each sample using water displacement and the sediments were "wet-screened" using the approximately 1 mm mesh of a pasta colander and the approximately 6 mm mesh of a deep frying colander. Samples were then placed on trays to dry. Numerous shell specimens and abundant fish remains were observed to be present in these small samples and provide some indication of the consistently practiced activities such as fishing and shellfish gathering which occurred here. In addition, fire cracked rocks were found.

These sediment samples were obtained in order to provide a preliminary documentation of the most common midden constituents (shells and bones). Briefly, it is intriguing that most unique of the four examined samples is sample C1-2 that comes from the top of the ridge at the back of the site. Of the four examined samples, this sample contains the lowest frequency of faunal remains, the most highly fragmented mussel shells, considerably higher proportions of barnacle and clam, and the highest frequency of unidentified shell. These observations seems to fit with expectations of an older more degraded assemblage in this part of the site.

It is also intriguing and suggestive that there are strong similarities in the relative frequency between samples C1-3 and C1-4 (each from the "periphery" of the village site) and lastly there is a

Figure 60. **Wet-screened cultural sediments from C1-2.**

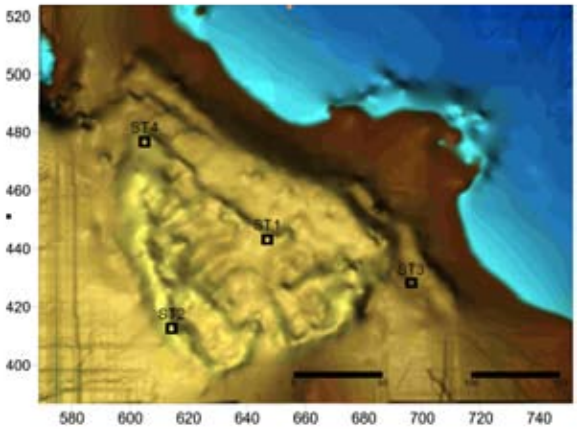

Figure 61. **Map of Citeyats showing the relative location of the four sediment samples.**

Figure 62. **Wet-screened cultural sediments from sample C1-4.**

high abundance of fish remains recovered from the sample in the centre of the village.

Citeyats Summary

In sum, this large complex site contains the remains of over twenty-nine structural depressions or platforms, features that are consistent with house occupations representing a very large village community. Our observations closely correspond to Caamaño's descriptions of the village he visited in 1792. However, the numerous other house and midden features and the substantial depth of the deposits suggest a much greater time depth and settlement complexity. It is notable that the large terrace house platforms associated with structural posts and beams appear to be orientated towards the modern shoreline but the numerous smaller house depressions are situated behind these terrace platforms and are oriented differently. These differences may indicate that the house depressions represent an older incarnation of the village. A preliminary examination of cultural sediments and shellfish remains recovered from the site supports this interpretation (Figure 63). Alternatively, these relatively smaller house depressions may also have been used to process or cure large numbers of salmon obtained from the river nearby. Whichever is the case, the depth, extent, and complexity of the archaeological deposits at this village provides a very strong basis for beginning to understand the cultural and historical significance of this ancient community.

A major component of future analysis of the project will be to radiocarbon date organic remains recovered from the percussion cores and sediment samples from both Citeyats and Curtis Inlet. While this will incur a considerable expense, dating these samples will likely expand the known human history of the region by thousands of years or more.

DISCUSSION AND CONCLUSION

The objectives of this project, to investigate archaeological evidence of traditional use in the southern portion of Gitxaała territory, revealed a wide range of archaeological sites and features, demonstrating a diverse and long-term record of human use. In each of the four examined locations, we observed archaeological evidence of human use showing continuity from pre-colonial times

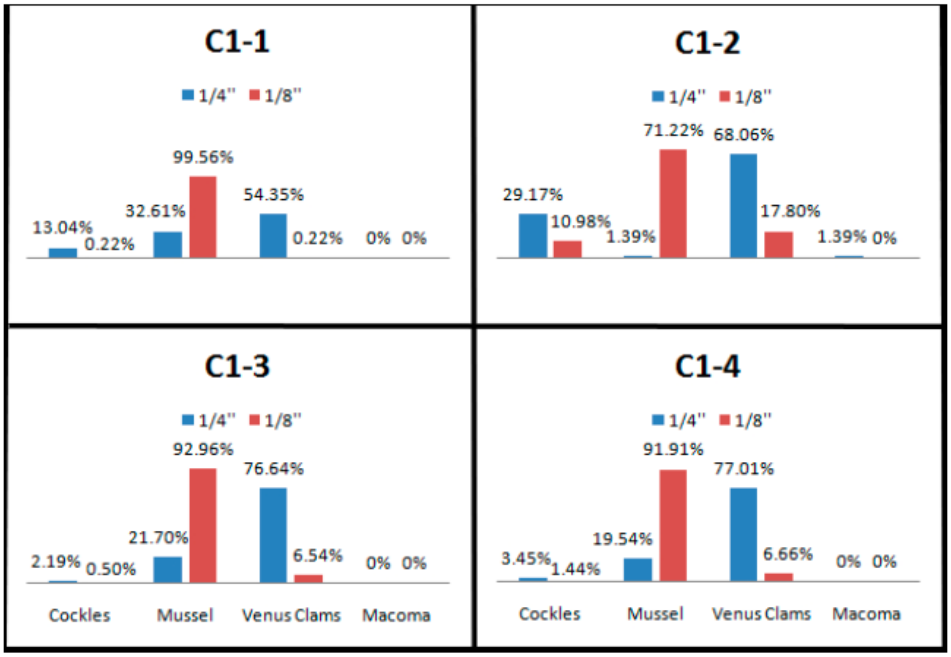

***Figure 63*. Proportions of shellfish by weight recovered from the multiple areas of the Citeyats village. Note the similar proportions of shellfish between C1-3 and C1-4 and the relative ratio of ¼" to 1/8" shellfish. Data compilation and image created by Jean Pourcelot.**

up to the recent past. This stands in contrast to the modern perception of this area as a sparsely populated and 'remote' portion of the BC coastline.

The fact that the archaeological history of this region is so poorly known is a reflection of the lack of work but it in no way indicates a lack of archaeological 'potential.' It is significant that excavation and radiocarbon dating has NOT been conducted in the territory other than Simonsen's 1968 excavation in Grants Anchorage, 80 km to the south of the study area. In fact, the stretch of coastline between Prince Rupert and Namu, a distance of 300 linear kilometers, may represent one of the largest segments of the BC Coast, if not the western North America coast, which has been subject to such little archaeological investigation.

This lack of knowledge may lead some to a misleading impression that the area has a lack of historical and cultural time-depth. In contrast, the diversity of physical evidence for human history observed during our brief and limited survey demonstrates this is certainly not the case. That said, this project likely represents only a small insight into a much larger and complex human past. Future efforts are greatly needed in order to rediscover and expand our contemporary knowledge of the ancient human history represented in this incredible territory.

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Appendix 1: Travelogue

Aug 11, 2009
Arrive in Rupert

Aug 12, 2009
Warm and Calm in AM breezy and cloudy in PM
Travel to Curtis Inlet from Prince Rupert leaving at 5 am
Arrive at Curtis Inlet in mid afternoon. Launch skiffs and explore
Find and record CMT's at N end of Curtis Inlet, locate shell exposure at KL2
Examine terrace at sockeye crk, historic era cabins on west side of creek at KL3
Observe fish drying racks at KL4
Go ashore at KL1 and examine exposures and note house platforms

Aug 13, 2009
Beautiful weather
Curtis Inlet
Begin to probe, core and map at KL1 in am
Mid day lowtide mapping at KL2
Conduct hip chain and compass mapping at KL1
Explore vicinity and Ire inlet by skiff in pm

Aug 14, 2009
Curtis Inlet – Korreyet- Saycuritay Cove
Cloudy in am Beautiful weather in pm
Finish mapping and recording KL1 in am
Depart mid-morning for Kooryet
Map at Kooreyet in midday on rising tide
Arrive at Fleishman Point/Saycuritay Cove in pm
Inspect shoreline CMTs and Simonsen recorded midden sites

Aug 15, 2009
Beautiful weather
Look at trap on intertidal lithic beach am
Locate *Wil lu sgetk* village behind corner from *Kwil doyks* (Wolf Point)
Map and map and map till 6pm
Depart for Citeyats in pm after dinner
Explore Citeyats village in pm

Aug 16, 2009
Citeyats, Beautiful weather
Explore islands in nearshore in AM, begin to map w totl stn at Citeyats
Mapping from STN 1 and 2

Aug 17, 2009
Citeyats
Beautiful weather
Mapping from STN 2 and 3
Coring grid begins

Aug 18, 2009
Citeyats
beautiful in am
Mapping and coring
SE gale in pm with sudden waves, requiring a move to Swartz Inlet

Aug 19, 2009
Citeyats Map and core all day from STN's 4 and 5
Explore Swartz Inlet fishtrap in PM

Aug 20, 2009 (Nicole's B-Day)
Citeyats – Lowe Inlet
Finish at Citeyats by lunch, head to Lowe Inlet in pm
Try to map at Lowe in pm to no avail

Aug 21st, 2009
Lowe Inlet – Prince Rupert
Wake up to find black bears, a grizzly and wolves at fish trap site, cannot go ashore so head for Prince Rupert

Appendix 2: Structural Features at Citeyats

Table 3. Location and dimensions of structural remains at Citeyats.

Description	Easting UTM	Northing UTM	Elevation above Barnacle Line (m)
house post 1 – 46 cm diameter	5899647.09	466447.73	6.51
house post 2 – 215 cm tall, 51 cm diameter	5899656.25	466459.94	6.21
house post 3 – 18 cm diam, but very deteriorated	5899683.44	466443.56	6.45
post hole – 55 cm diameter	5899668.56	466452.39	6.25
Carved housepost S side	5899625.72	466461.72	5.74
Carved housepost N side	5899625.12	466462.16	5.95
house beam 3 – end, 65 cm diam	5899653.43	466460.69	6.96
house beam 3 – 65 cm diam	5899649.32	466453.46	6.66
house beam 4 – end, 34 cm diam	5899651.00	466459.06	6.59
house beam 4 – end, 34 cm diam	5899645.54	466452.73	6.31
house beam 5 – end, 42 cm diam	5899643.60	466465.17	7.01
house beam 5 – end, 42 cm diam	5899640.50	466457.73	6.32
house beam 7 – end, 42 cm diam	5899635.68	466459.52	6.27
house beam 7 – end, 42 cm diam	5899638.60	466466.01	6.28
house beam 8 – end, 53 cm diam	5899663.53	466457.44	6.75
house beam 8 – end, 53 cm diam	5899657.83	466450.59	6.82
house beam 9 – end, 42 cm diam	5899661.40	466445.99	6.59
house beam 9 – end, 42 cm diam	5899667.71	466450.46	6.68
house beam 1 - end	5899626.70	466465.60	6.51
house beam 1 - midsection	5899627.64	466468.93	6.36
house beam 1- midsection	5899628.74	466472.55	6.47
house beam 1- end	5899629.51	466474.97	6.32
house beam 2- end	5899632.38	466459.18	6.31
house beam 2- end	5899633.98	466463.64	6.39
house beam 2	5899635.96	466469.69	6.34

Appendix 3: Preliminary Diatom Descriptive Analysis

Samples were prepared for analysis by wetting a very small amount of sediment (less than 1 cubic centimeter) and placing the slurry on a microscope slide. Slides were then examined using a backlit Nikon microscope at 400x magnification. This magnification provided a way to observe small microfossils such as diatoms and foraminifera. Several diatom photographic reference keys were consulted (Fallu et al. 2000; Pientiz et al. 2003). As this was a preliminary examination, no attempt was made to systematically quantify a sample of 100 individual diatoms as per normal peer-reviewed analyses.

The results of the preliminary analyses indicate that a variety of marine and freshwater diatoms were preserved in the sediments examined. Some samples had a curiously homogenous distribution of diatom taxa while others contained hardly any preserved specimens but rather an abundance of fragmented diatoms and sponge spicules indicating high energy deposition.

Sample: MC 1 (Pt Id 80, 20 cm below the surface, 65 cm below barnacle line)

Very few complete marine diatoms

Approximately 50% *Cyclotella bodanica* which are freshwater diatoms
and a mix of others:
1 *Cyclotella* are benthic (not in water column)
1 *Nitzschia* pinnate-shaped marine diatom
1 *Fragilaria* pennate -shaped diatom
1 *Thalassiosira*
1 *Cocconeis costata*
Unusual mix of high and low energy diatoms

Sample: MC2 (Pt Id 81, 53 cm below barnacle line)

Coarse silt
No identifiable pollen
~100-150 *Thalassiosira eccentrica* spherical marine diatoms
Fairly homogenous distribution of taxa
Interesting that no other species noted suggesting a rather inhospitable marine environment.
Might expect a diversity of species if sample was recent/modern.
Numerous silica shards of lots of sponge spicules indicating poor preservation conditions

Sample: MC 3 (Pt ID 83, 30 cm below surface, 29 cm below barnacle line)

Fine clay with a very small proportion of silt
Sterile for diatoms and pollen although the sample could be reduced and examined again
1 possible sponge spicule
generally sponge spicules preserve better than diatoms as they are made of slightly more silica

Sample: 3 (Pt ID 83, 15 cm below surface, 14 cm below barnacle line)

Sandy sediment with numerous tiny shell fragments
Fair number of sponge spicules
Fern pollen
Broken shell fragments - mussel shell?
Reminiscent of a sample from Lax K'walaams which contained late pliestocene aged sediments.

Sample MC3 (Pt ID 83, 5 cm below surface, 4 cm below barnacle line)

Sediment within paired shell.
Sample taken from deep within the paired valves of a deceased butter clam (near inner hinge)
Lots of sponge spicules and possible mussel shell (*mytilus*) fibers
Fern and herb pollen
No conifer pollen or diatoms