CHAPTER 23

Wet Site Components of St. Mungo (DgRr-2) and Glenrose (DgRr-6) Canneries

Morley Eldridge
Millennia Research Limited

Introduction and Wet Site Discovery

In 1989, preserved basketry was recovered from the beach in front of the Glenrose Cannery site on the south bank of the Fraser River (Figure 1). A 4000 BP radiocarbon age estimate triggered further interest in the beach which, despite its proximity to one of the largest archaeological excavations in BC coastal archaeology, had never been closely examined. Glenrose Cannery and St. Mungo Cannery are two of the best-known archaeological sites on the Northwest Coast, and both figured prominently in the development of archaeological culture-history frameworks and theoretical issues in the mid-late 20th century (e.g., Boehm 1973; Calvert 1970; Eldridge 1984; Ham, Yip, *et al.* 1984; Matson 1974; Matson 1976, 1981, 1988, 1992; Matson and Coupland 1995). Wet site components at both locations remained undiscovered despite years of excavation in dry parts of the sites, a pattern found throughout the Lower Fraser, where wet deposits are actually present at a significant portion of dryland sites (Bernick 1991).

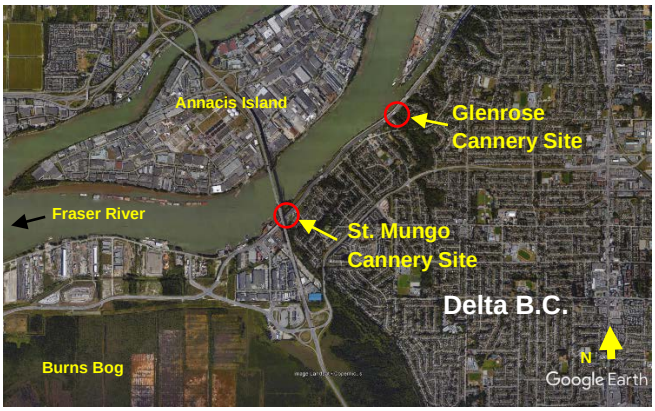

Figure 1. Location of the Glenrose and St. Mungo sites on the east bank of the Fraser River, Delta, B.C. Google Earth 2016.

The gently sloping beaches (or intertidal zones, henceforth 'ITZ') fronting Glenrose and St. Mungo sites were always known to contain a high density of artifacts and collectors have combed these beaches at low water for many decades. Archaeologists working on the dryland sites always had assumed that these artifacts were in a secondary disturbed context, washed out of retreating bank midden. After the basketry was dated, Millennia Research was contracted by the Province to conduct a brief archaeological examination where the basketry was found, uncovering an amazing and unexpected amount of new information about the site.

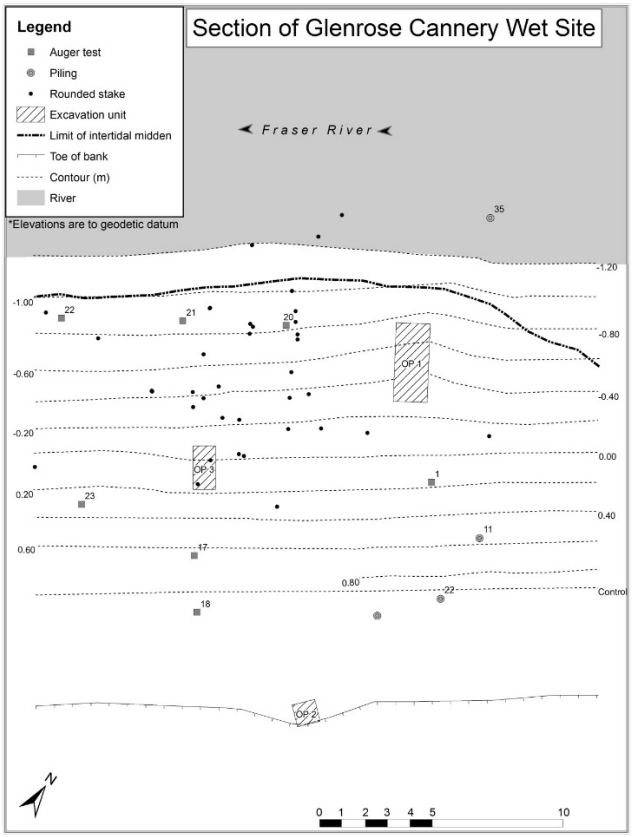

Figure 2. Detailed map of a small part of the Glenrose Cannery wet site DgRr-6 deposits in the ITZ, showing excavation unit placement. The dryland midden begins at the bank at the bottom.

Knowledge of a wet component at St. Mungo was even slower to surface. A wooden wedge with a proximal-end grommet had been found in 1982 while excavating a sediment settling pond with a backhoe at the upper ITZ/immediate backshore, but at the time this was attributed to, "…a random find of a water-saturated wooden artefact and not the presence of a waterlogged deposit" (Ham *et al.* 1984 II:55). Several years later wet site materials were

Archaeology of the Lower Fraser River Region
Edited by Mike K. Rousseau, pp. 193-200
Archaeology Press, Simon Fraser University, 2017

discovered eroding within the ITZ at the upriver end of the site, which by then was the last remnant of intact ITZ at St. Mungo. Millennia was again privileged to undertake testing of the wet site (Eldridge and Fisher 1997).

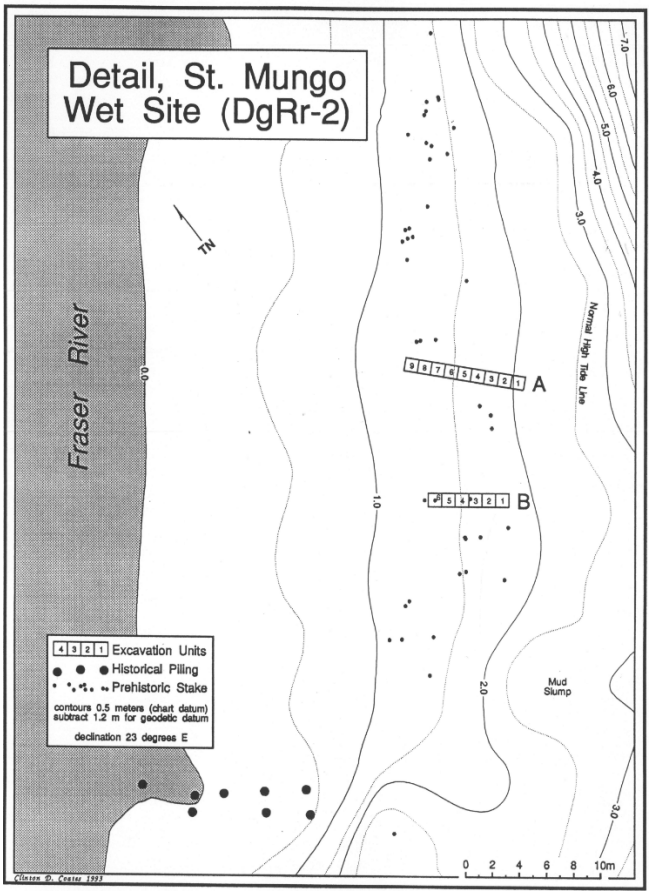

Figure 3. St.Mungo Cannery Wet site Component showing location of excavation trenches. The ITZ lies between the "high tide" and river.

St. Mungo may originally have had wet site for much of the ITZ fronting the shell midden. It is unlikely that substantive organic cultural materials continued much downstream from the shell midden, since the site is at the western toe of the Surrey Uplands, and only marshy deltaic deposits continue downstream. There were no downstream backshore 'raised' areas where people could live for extended periods.

At Glenrose, intertidal midden and waterlogged artifacts were found to almost perfectly match the distribution of dryland cultural deposits. The dryland shell midden is well constrained by near-vertical unconformities in the eroding riverbank at both ends of the site, and the distance between these measured 260 m. Waterlogged materials in addition to stakes occur in a band at least 15 m wide for a minimum of 200 m at Glenrose. Culturally sterile layers that underlay the wet site were exposed at the beach surface upstream of the unconformity. For a short distance upstream, the bases of wooden fish trap stakes were found driven into glacial clays, but there was no intertidal shell midden or wet materials in this area.

The downstream end of the wet site was not clearly defined at Glenrose, and neither was the upstream end of the St. Mungo site. A survey between the two sites of the ITZ found occasional scattered wooden stakes (Eldridge and Fisher 1997).

Wet Site Excavations

At Glenrose, three short trenches labeled "operations" were excavated: Operation 1 measured 1.5 x 3.2 m; Operation 2 was a 1x1 m operation placed at the top of the ITZ, and Operation 3 was 2 x 1 m in size (Figure 2). Operations 1 and 3 were excavated using shovel shaving (for the mobile surface gravels), trowelling, and hydraulic (garden hose) excavation (for the cultural layers). Operation 2 was excavated by shovel and trowel to waterlogged depth, and probed and shovel tested below that. Screening was found to be virtually impossible when excavating hydraulically. Tests with a powered auger using 6 inch flights were made over the entire ITZ on a 5 x 10 m grid to help establish the nature and limits of the site. In addition to excavations, the hundreds of wooden stakes, posts, and piles were identified through survey then mapped with a theodolite, with attribute data on their sizes collected.

At St. Mungo two trenches were excavated: Trench A measured 6 x 1 m and Trench B measured 9 x 1 m. These were excavated as a series of connected 1 m^2 units (Figure 3). The St. Mungo excavation and survey work was conducted at night, using a generator and portable lights. This was necessary because low tides combined with a low river outflow occurred only at night. Temperatures to -7°C made field conditions challenging.

Stratigraphy

Both sites have very similar stratigraphy. At Glenrose, the lower and mid beach showed multiple relatively thin shell-hash (essentially a shell midden but containing very little sediment) containing preserved organics interbedded with laminated clays or sandy-clays. The shell-hash was composed of bay mussel, littleneck, butter and horse clams, chipped and ground stone artifacts, unmodified pebbles, and unmodified wood, bark, moss, conifer cones and hazelnut shells. Shell-hash layers dip at a gentle angle towards the river and overlay a culturally sterile clay containing massive wood debris, including whole tree trunks, branches, shattered fragments, etc. (Figure 4, top). The modern active beach truncates these layers as an unconformity, and is represented as a pebble surface lag layer with occasional boulders, periodically overlain by a mobile silt drape. A considerable portion of the lag consists of fire-cracked rocks, cobble and pebble cores, and other artifacts.

Near the upper ITZ beach, adjacent to the high-water cut-bank of eroding shell midden, Operation 2 revealed a very different profile (Figure 4, bottom). Although below high tide, Operation 2 showed traditional midden layers of shell and ash lacking preserved vegetal matter. These layers dip upriver and, contrary to the shell hash layers lower on the

beach, inland. Beneath this is a one metre thick deep clay layer with sparse cultural items and small midden lenses, with marbling typical of slide deposits. A shovel test placed at the basal limit of this excavation revealed that a water-saturated compact mussel shell midden layer underlies the clay, to an unknown depth.

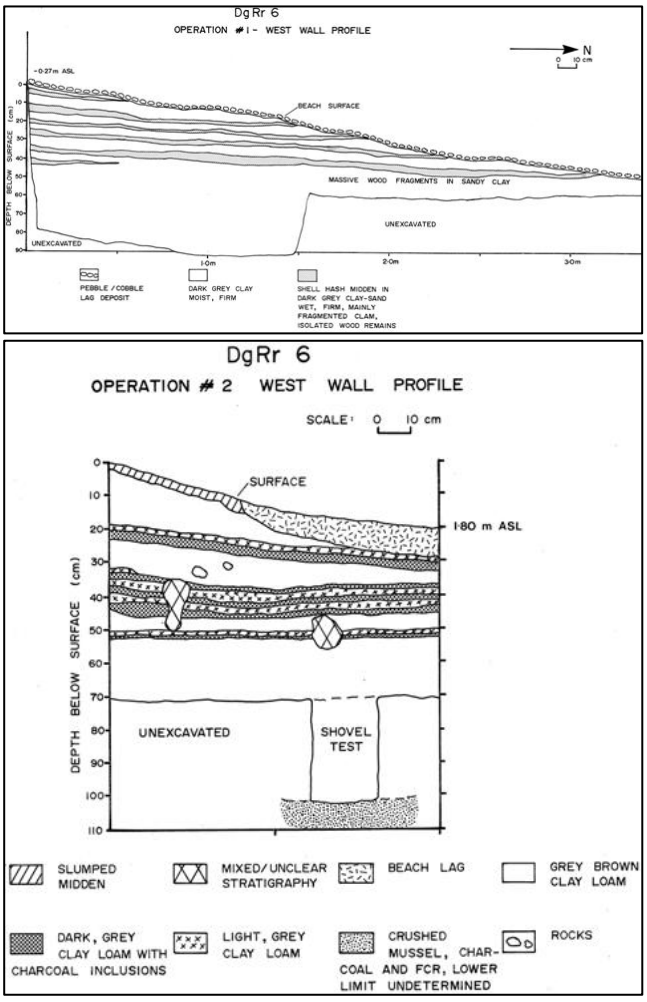

Figure 4. Stratigraphic profiles of Glenrose Operations 1 and 2 west walls.

Geomorphologist John Harper (1990) concluded that the non-cultural basal massive wood layer at Glenrose represents a flood or slough deposit that trapped woody debris. The overlaying cultural layers represent seasonal occupations on a low energy intertidal beach alternating with low energy seasonal flood deposits. He also concluded that the boulders and much of the pebbles on the beach surface are lag derived from landslides that flowed down the Surrey Uplands scarp.

At St. Mungo, a basal stratum of firm blue-grey clay lacking organics underlies two non-cultural layers with vegetal preservation. A single cultural layer with preserved botanicals conformably overlays the two non-cultural layers. The cultural layer consists of silty sands, dense pebbles, fire-cracked rocks, wood fragments, other plant material, animal bones and scattered logs. The cultural layer unconformably underlies a pebble/cobble beach lag that generally forms the modern surface. In some places, the cultural layer was overlain by a thick terrestrial mudflow unit and lacked the surface lag.

The basal clay seemed similar to the basal layer of glacio-marine clay found throughout the dryland site (Ham, Yip, *et al.* 1984). Coastal geologist Doug Reimer visited during wet site excavations and his interpretation is generally consistent with Harper's Glenrose sequence: woody layers under the cultural layer were slough or overbank flood deposits of the Fraser River, separated from each other by an unconformity representing a period of erosion, perhaps when the river channel shifted. The archaeological layer put down after this Reimer considered a mixture of terrestrial, fluvial/ marine, and cultural deposits. Mudflows or landslides, or a run-off stream reworking uplands materials then capped the cultural material. The modern beach surface layer is lag from reworking and intermixing of the cultural and non-cultural layers, including the overlaying mudflow unit. The mudflow and supra-tidal shell midden layers were rapidly eroding from wave action.

Dating

Eight radiocarbon date estimates have been obtained from the wet site materials at both sites. All are on wood, and they provide a consistent age range from ca. 4150 to 5450 cal BP (Figure 5; Table 1). Table 1 provides calibrated age ranges; many fluctuations in the calibration curve through this period result in multiple range intercepts, and the overall calibrated ranges tend to be considerably larger that the plus/minus one sigma radiocarbon age that the uncalibrated date would suggest.

Table 1. Calibrated ages for St. Mungo and Glenrose wet site material radiocarbon dates.

^{14}C Lab Number	Description	^{14}C Radio-carbon Age in yrs BP	One Sigma Range (cal BP)*
Beta-38809	Wood stake just below Op 3 DgRr-2: 7022	**3950±60**	4296-4515
Beta-38810	Wood stake in Op 3 DgRr-2: 7024	**4260±70**	4646-4958
Beta-38811	Wood stake 5 m downstream Op 1 DgRr-2:7025	**4370±60**	4857-5036
Beta-38807	Wood splint basketry Op 1 DgRr-2:7000 (lowest cultural layer)	**4440±80**	4889-5277
Riddle-1229	Wood splint or bark basketry strap, surface DgRr-6:7018	**3970±90**	4250-4567
Beta-49001	Wood Stake Trench B unit 3 DgRr-2	**4120±60**	4531-4810
Beta-49002	Wood stake trench B unit 4 DgRr-2	**4490±60**	5046-5286

***** For brevity, multiple ranges are not individually presented, but only the outer limits of the overall range at one sigma.

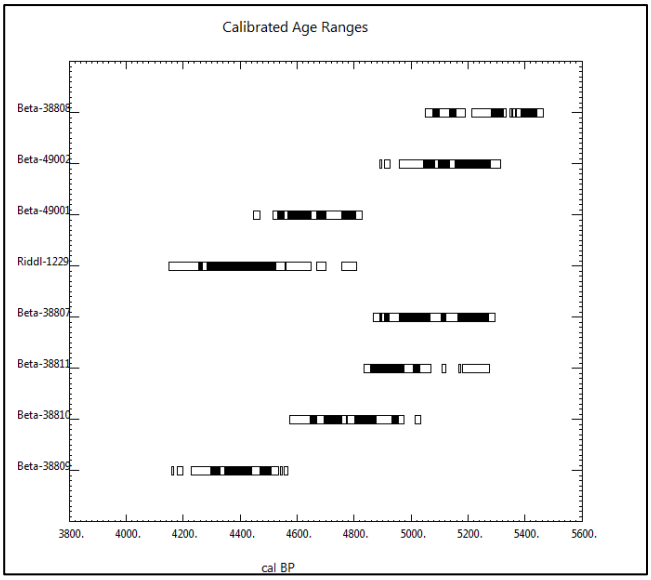

Figure 5. Radiocarbon dates in calibrated years BP for St. Mungo and Glenrose wet sites. Dark bar portions indicate one sigma, hollow bars indicate two sigma ranges. Y axis labels are lab numbers.

Vegetal Artifacts

Excluding wooden stakes, only 22 artifacts are in this category from Glenrose and six from St. Mungo, but the information they reveal is far out of proportion to their number. This is consistent with many wet site assemblages. For researchers wanting attributes on material objects that are time and potentially ethnically or socially diagnostic, basketry is considered superior to even pottery in the archaeological record (Adovasio 1977; Bernick 1998a). This is because basketry and other organic wet-site artifacts are additive, as opposed to reductive, in nature. They are fashioned by adding and combining materials to make a larger object rather than by reducing a blank to a finished object, as is the case for pecked, ground, and flaked stone and bone materials. This results in a myriad of potential permutations of source materials, construction techniques, and ornamental details, but which tend to occur in a limited number of combinations that are unique to time, place, and even families or individuals.

Basketry

Even a small fragment of basketry may reveal a narrow time range and sometimes reflect ethnicity (Bernick 1998b). Six basketry pieces are known from Glenrose and none from St. Mungo. The Glenrose assemblage is dominated by wrapping techniques, which is considered unusual by world standards (Adovasio 1977; Mason 1902). Wrapping is particularly suitable for carrying heavy loads because both vertical and horizontal elements can be rigid but joined together by pliable wrapping elements creating a very strong but light container.

A unique form of wrapping is evident on a medium-sized conical basket at Glenrose which Eldridge (1991) termed "dual-warp wrapping" (Figure 6). Rigid warps were folded in half and the two parts joined to a rigid weft with a fourth element, a spiraling active weft. One part of the folded warp is on the outside of basket (outside the rigid weft) and the other inside this weft, resulting so that three principal layers comprise a single basket wall (Figure 6). This basic basketry construction technique appeared to be unreported anywhere else in the world to 1991; but since then a second basket with similar construction was found by a collector at Glenrose. It appears that this technique is likely confined to the Charles period of the Fraser Delta.

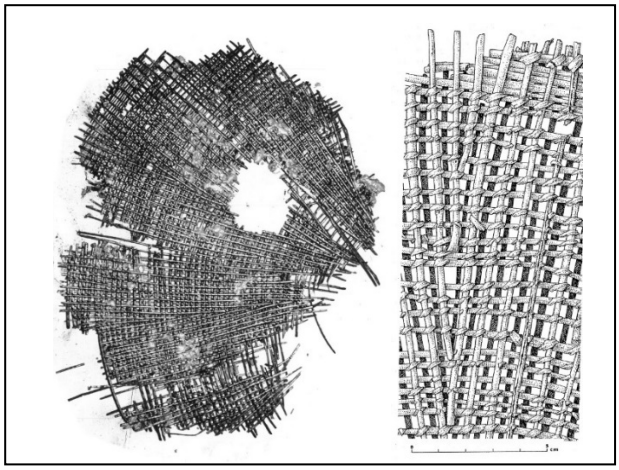

Figure 6. Dual-wrap wrapped conical basket Art.#7002 (field photo left, long axis 46 cm). Right shows detail of double warp layer and corner expansion.

All construction materials are fine gauge (27 warps per 10 cm) and produce a close but breathable mesh. The splints used for the rigid elements are *Abies* (true fir) withes and the wrapping is maple bark. A decorative band is present near the top of the basket that has eight rows of continuous rigid wefts that are held from slipping loose by wrapped rows above and below this band. The basket was sufficiently complete to allow a reconstruction with the aid of a photocopy onto clear film, and physical 3D manipulation of the image. It appears to have been a rather narrow cone with a sub rectangular cross-section, about 25 cm across at the top and 50 cm high. This shape could not left standing on its base without tipping over.

A fragment from a large basket (Artifact #7000) measuring 17 x 15 cm (Figure 7) has several attributes similar to historical Salish and Wakashan carrying baskets. The straight parallel weft rows and reinforcing band suggest the basket may have had flat sides, and possibly cubic or pyramidal shape, although the fragment is too small to be confident of this. True fir warps and wefts are combined with maple or cherry bark wrapping. The alternating lean of the wrapping creates an attractive look and the original basket was probably very beautiful. A prominent feature is the very sturdy split salmonberry stick reinforcing attached by cross stitching to the inside the basket. Horizontal reinforcing bands are present on 1500 to 2500-year-old prehistoric baskets from Puget Sound and Gulf of Georgia

region (Bernick 1989:72-74, 95-96; Croes 1977:80-82) and cross stitching is also an attribute of that time period, linking this basket style with middle pre-contact and post contact periods of the region.

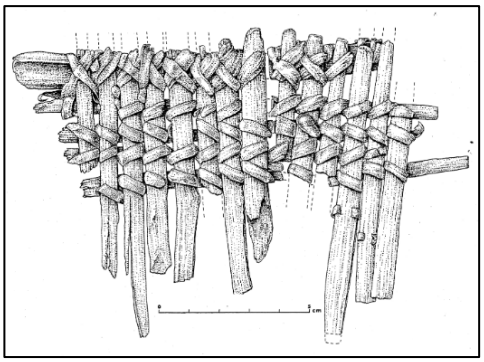

Figure 7. Open wrapped basketry fragment Art.#7000. Note reinforcing band attached by cross-stitch. It is directly dated to 4867-5295 cal BP.

Another basketry fragment (Art. #7001) measuring 20 x 15 cm was found in contact with a cobble core (Figure 8). It is made from a mix of inner and outer first splints and cedar wefts with the wrapping probably made maple bark. The lean of the wrapping rows is alternating left and right. This object was clearly *not* a basket as there is a flat edge formed by the wefts where they have been folded back on themselves to form a new row. This is likely a piece of flat latticework that may have been part of a fish trap.

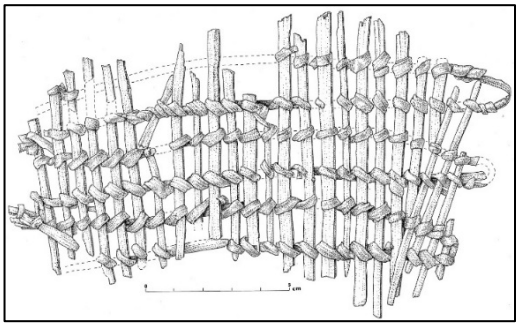

Figure 8. Open wrapped basketry fragment of weir latticework panel or fish-trap (?) Art.#7001. Note wefts bent back on themselves to form new rows.

Figure 9. Section of open-wrapped basketry fragment, Art.#7003. 15x8 cm.

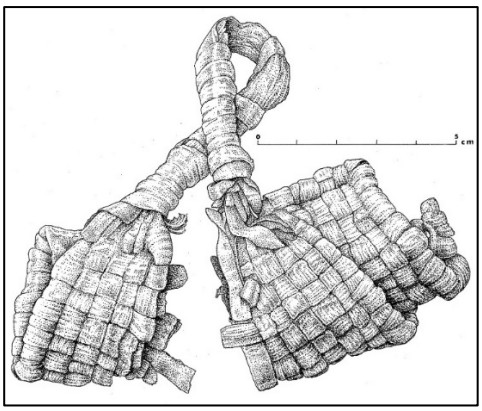

Figure 10. Plaited strap and cord Art.#7018 directly AMS dated to 4150-4800 cal BP.

Artifact #7003 is a small fragment of open-wrapped basketry that has five partial rows of weft remaining. Light "shadows' on the warps showed where additional wefts have come loose, indicating it was made with even rows, and had been used long enough to become discoloured (Figure 9). Likely this is a fragment of a larger basket. Historically, Wakashan and some Central Salish people used baskets made with similar principal weaves to collect shellfish, where their sturdy construction permitted heavy loads and the open weave allowed drainage.

An unusual piece of woven strap (#7018) was the only piece of plaited weave found (Figure 10). While most straps are woven plaited on a diagonal with all elements being bent at 90 degrees and running at 45 degrees to the long axis, this one is woven with the wefts at right angles and warps parallel to the long axis, with the wefts encircling the outermost warp before returning to form "around and back" selvage. The strap has three components: a central round-cord section consists of warps wrapped with a spiral strand to form a cord with a diameter of less than 1 cm. This cord expands into a 4 cm wide plaited short strap at both ends, and was rolled up from the two ends. These ends may have been cut but this could not be observed and the item was damaged during conservation. The artifact is made of maple or cherry bark. The function of the strap is unknown. Tumplines had a central plaited section that then have cord 'tails' which attach to a basket or load. This object reverses that, and has the central part as cord.

The oldest currently known shredded cedar bark object in the Northwest Coast was found in Operation 1 at Glenrose. Although not directly dated, it is assumed to be contemporaneous with the other objects in the shell hash layers at ca. 4800 to 5300 cal BP. It is an unusual piece that may be part of a garment (Figure 11). Folded strands of soft shredded redcedar bark are joined by a single wrapped strand of maple or cherry bark. Most garments formed in this manner have a "header line" which is missing in this object, but which may have been pulled out and lost around the time of discard; and most are twined rather than wrapped (Chechik and Hutchcroft 1986). Gathered bark strip bundles of unknown function were found at the Musqueam Northeast

and Water Hazard sites, but these are made with different construction techniques and the bundles have a very different appearance (Archer and Bernick 1986:23-26; Bernick 1989:43-46) and they probably had a different function to this Glenrose object.

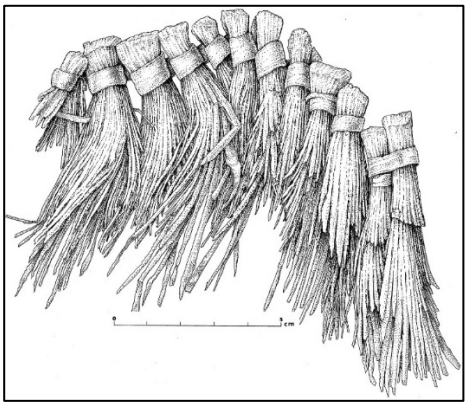

Figure 11. The oldest currently known shredded cedar bark object from the Northwest Coast.

Cordage

Cordage is very rare at Glenrose and St. Mungo compared to most other wet site components on the Northwest Coast. At Glenrose, three unlaid twisted red cedar withes were found, including a knotted one that passed between two wood stakes. At St. Mungo, cordage was limited to a split withe that had been purposefully sharpened.

Shaped Cut Cedar Bark

An unusual find from St. Mungo is a rectangular cut piece of cedar bark. The outer bark texture is smooth suggesting that it was harvested from a young cedar tree. It measures 15 x 11 cm. Multiple scored cuts were made across the grain at each end with a very sharp tool, possibly an unmodified lithic flake. One end in particular is ragged, and it appears that the square was trimmed by bending and breaking the fibers after scoring. It is not known if the bark was used as-is or whether it is merely production waste.

Wooden Fish Trap Stakes

Some 226 wooden stakes were measured and mapped at Glenrose, and a further 40 at St. Mungo. The majority of these ITZ stakes were about 5 cm in diameter, with smaller clusters of larger stakes around 9 or 10 cm diameter, and a few larger posts up to 17 cm diameter. Some small stakes were found touching each other in double or triple groups; likely it was much easier to drive several small stakes rather than one large one when a stronger post was needed. Post replacement is also a possible explanation for the clustering. The function of these stakes is discussed more fully below.

Four stakes at Glenrose and three at St. Mungo were collected. They are made from a variety of coniferous and deciduous trees: true fir, Sitka spruce, and poplar. One had been driven into the clays that had a blunt, squared-off tip. Most of the others were sharpened using a similar technique; a series of small facets were cut with a rough chopping tool, and the distal wood was then bent and splintered away. The stake was gradually reduced to a point by splitting around the circumference and towards the end. In some cases, the cuts are so rough that no shaping facets can be seen. The tips were slightly battered from hitting rocks as they were driven.

Other Wooden Artifacts

The eared corner of what appears to be an elegant wooden cedar dish artifact #7008 or tray and tip of a wooden wedge made from Sitka spruce compression wood were found at Glenrose by private collectors. The cedar tray was apparently finished by sanding (Figure 12). A third artifact, a 4 cm long wooden point sharpened on both edges and made from a hard wood, may be the tip of a projectile point. None of these artifacts has been directly dated, but they are assumed to be from the Charles Period.

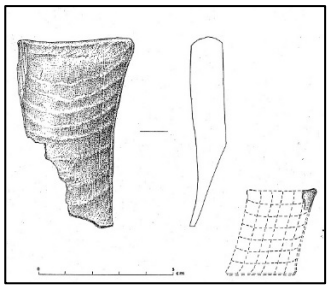

Figure 12. Wooden dish/tray fragment #7008. Inset shows hypothetical original form.

Wood Detritus

Wood waste chips were ubiquitous, and ranged from the most common which were small curved chips with rough faces, to large smooth chips with multiple clean-cut multiple facets, to long splinters with one rough-cut end. Split withes, some with burnt or whittled ends, were probably detritus from basket making. These are plentiful at both sites. Partly burnt sticks and larger wood fragments are probably unburnt portions of firewood.

Other Artifact Types

In addition to the vegetal artifacts, those of "conventional" materials were also found in the wet site layers. Similarities and differences of these artifacts provide a way of comparing activities occurring in the ITZ compared to dryland parts of the sites. The excellent quality of preservation of the wet sites extends to stone artifacts. When found these often have white powder still adhering to battered areas and sharp edges are unrounded. In one case, paint was found for the first time on an artifact diagnostic to the time period.

An incised stone "plaque" was found at Glenrose within a shell-hash layer wedged between a stake and a knotted withe. It is made from micaceous schist with one surface ground smooth that has incised lines parallel the edge with double ticks between the encircling line and the edge (Figure 13). The incised lines are filled with paint residues.

Figure 13. Siltstone plaque #7021. Note red pigment visible in incisions. A bluish-grey or black pigment is also present.

An underlying black residue has shrinkage cracks suggesting it was applied as a moist paste and is clearly overlain by a layer of presumably red ochre. This plaque fragment belongs to a class of incised schist artifacts recovered from dryland Charles components at Glenrose (Matson 1976:127, 154, 158), St. Mungo (Calvert 1970; Ham 1984; Ham, Yip, *et al.* 1984), Crescent Beach (Matson, Pratt, *et al.* 1991; Pratt 1992), the Fraser Canyon (Borden 1975) and southeast Vancouver Island sites (e.g., Lindberg and Eldridge 1996). To my knowledge, all have been found as fragments; but they were clearly large originally, in the order of several 10s of centimetres across. None had been previously found with pigment although they have been interpreted as "not strictly utilitarian in nature, but served some aesthetic function" (Pratt 1992: 373). They could have been paint palettes for body paint, or the paint could simply have been applied to emphasise the incised designs.

The chipped stone tools from both sites are mainly pebble or cobble choppers or cores. One each scraper, graver, and spoke-shave were found at St. Mungo wet component.

Several hundred lithic debitage flakes were found at both sites. A study of the reduction sequence revealed that almost all were early stage reduction flakes. Expedient lithic technology is dominant within the ITZ at both sites but this was not the case in the dryland parts, where biface reduction or resharpening flakes comprise nearly a quarter of the lithic detritus (Matson 1973; Ham *et al.* 1984). None of these types of flakes occurred in the wet components and few are found in the inland rear of the site (Eldridge 1984). Knapping bifacial knives and projectile points was an activity confined to the core. Another significant difference is scarcity of bipolar reduction in the ITZ compared to the dryland components of these sites.

Two land mammal bone chisels and an antler wedge were found at Glenrose. Likely, woodworking tasks were undertaken on the upper beach, which would have provided a convenient clear, flat, and often well-lit work surface. This interpretation is corroborated by the abundant wood chips. A sawn, drilled and ground human tooth likely came from the wet site layers. It was almost certainly suspended as a pendant.

At St. Mungo, bone artifacts were absent, but an antler wedge, an antler chisel, and a heavily adzed antler detrital piece were found. A shell disc bead and a California mussel celt (chisel or adze blade) were found at Glenrose, one of the latter was also found at St. Mungo.

Wood stake alignments: Function and Implications for Storage

The stakes in the ITZ have been described above. Some are isolated, some in tight clusters, and many are clearly aligned. The Glenrose excavations revealed double the number of stakes capped by silts as were visible at the surface, suggesting that hundreds more are present but remain to be exposed and mapped. The clear alignments are up to about 10 m long, mostly at right or 45° angles to the river (see Figures 10 and 11 in Eldridge [1991]).

There has been considerable discussion regarding wooden stakes at the Glenrose and St. Mungo sites due to the importance of large-scale storage in the development of complex societies on the Northwest Coast. Originally, I considered that primarily salmon were being caught and the stakes represent fish weirs used possibly also for sturgeon (Eldridge 1991). A debate ensued as to whether fish weirs and intensive salmon harvesting originated on the north or south coasts (Eldridge and Acheson 1992; Moss *et al.* 1990; Moss and Erlandson 1998). The Glenrose stake alignments were considerably earlier than any found to that date in Alaska. Stevenson (1998) is careful to differentiate between large weirs that imply major amounts of organized labor, and smaller converging fence and latticework fence-type traps that could be built by small groups and yield a modest harvest. She emphasizes the Glenrose examples are more similar to a fence trap than a large weir. Part of her argument is that no latticework is found at Glenrose, whereas basketry object (Art.#7001) is likely a flat latticework panel.

Associated faunal remains clarify the function of these stake alignments. Fish bones, especially small species are under-represented at Glenrose due to excavation techniques. To rectify this bias, at St. Mungo column samples were also taken. Faunal analysis for both sites (Crockford and Wigen 1991; Crockford 1990) revealed that at Glenrose, very large numbers of friable and fragile salmon vertebrae were present in the shell-hash layers of the wet site. It was unclear whether rarity of salmon head bones at Glenrose was the result of taponomic, functional, or anthropogenic causes. Head bones are generally more fragile and may have simply disappeared; the heads may have been discarded at a different location than the vertebral columns when they were processed (Bernick 1983). Flatfish bones were very rare compared to salmon. Sturgeon dermal bones and scutes were relatively plentiful. The sturgeon bones were from large to very large individuals, possibly weighing hundreds of kilos.

The types of fish directly associated with the wood stake weirs is clarified by the column sample results from St. Mungo. Column samples reveal a high density of fishbone

(Crockford and Wigen 1991). Salmon is by far the most numerous (83%) followed by flatfish including starry flounder (5%) and sturgeon (4%). Combined, the salmon, flatfish and sturgeon account for 92% of all vertebrate specimens. Other fish identified were smelt (possibly eulachon) (3%), suckers/chub (3%), herring (1%), and stickleback (1%). Of significance is that fragile salmon ribs and gillplates are present in relatively large numbers in the column samples. These are not expected to enter the archaeological record from imported preserved fish. Head bones are still absent, however, suggesting that although the salmon was probably caught locally (presumably in the weirs) the heads were treated differently from the rest of the fish. The column sample data clearly support the interpretation that the wood stake alignments are the remains of fish traps used to catch a variety of fish including salmon. "Truly large quantities" of salmon in the dryland faunal material from this period imply mass capture and storage (Matson 1976:96, 300). A large portion of this salmon was captured directly in front of the sites using convergent fencing weir technology.

Conclusions and Future Research Directions

Faunal analysis and close scrutiny of the trap features cannot conclusively settle the questions about the beginning of mass fish storage and associated social hierarchy and complexity. They combine with other evidence to suggest that the Charles culture was much more complex than early authorities such as Borden (1975) and Matson (1976) and Matson and Coupland (1995) believe.

Glenrose and St. Mungo wet sites provide evidence that 4500 year-old Charles period basketry has strong links to technologies of the contact-period peoples of the Salish Sea, and intermediate periods about 2000 years ago. Open wrapping with alternate leans of wrapping elements are characteristic of burden baskets of both Coast Salish and Wakashan groups. A decorative band of a different structural weave type positioned just below the rim is characteristic of Salish baskets from 2400 to 1500 BP (the Marpole period) (Bernick 1998b:149), although the method used in the Glenrose example (Art.#7002) with unwrapped 'packed together' horizontal elements is unique.

Preference for non-cedar materials is also shared with later times, although the Glenrose examples stand out for the scarcity of this material (Bernick 1998b:145). Charles period basketry has a suite of diagnostic characteristics, including dual-warp wrapping and an emphasis on wrapping techniques. Croes (1987:114-115) notes that use of reinforcing rows is diagnostic of early (Locarno and Marpole Phase) baskets from the Puget Sound/Gulf of Georgia (Salish Sea) region, and the Glenrose finds extend this to the Charles period. I believe basketry attributes support an *in situ* development of Coast Salish culture, but a very different conclusion is drawn by Bernick (1998b), who sees major discontinuities in non-functional attributes of basketry that correspond to changes in the established archaeological cultural-historical periods, and ethnic diversity or cultural dislocation could be evident. I believe that continuity of some attributes is more important than changes in others; although an apparent complete lack of wrapped weaves during the Marpole period, when they are present both before and after, is a powerful argument for discontinuity. However, differences between late Marpole and early Gulf of Georgia non-basketry assemblages are difficult to define as more data becomes available for the transition, which is evidence for continuity at the end of Marpole (Eldridge *et al.* 2007).

One salient long-standing aspect of the regional culture-history is fluorescence of art during the Marpole period (Burley 1980). Bernick (1998b: 153) sees this reflected in basketry too, with sophisticated selvages and standardized techno-stylistic attributes. The Glenrose basketry, despite being mostly small fragments and lacking in some elaboration compared to the Marpole baskets, show that the original complete baskets and straps were beautifully crafted with considerable design sophistication, some 2000 years before Marpole. Peeled split withes were oriented so their shiny, smooth outer surfaces were most visible, and glossy cherry and maple bark was used for wrapping. This, combined with twining, would have been visually stunning. Indeed, historical equivalents of such baskets are now highly sought after by collectors.

The cedar wood tray fragment, too, shows hints of a refined, subtle styling in its 'eared' corner. This, along with contemporary burials of youths accompanied by hundreds of thousands of beads (Curtin 1999; Mackie 2012), suggest that cultural elaboration was much further developed during the Charles Period than has been acknowledged by most Northwest Coast scholars. This may challenge the current models of the development of cultural complexity on the Northwest Coast (Ames and Maschner 1999; Matson and Coupland 1995.

Further research directions can benefit the most from a larger sample. At present, each new basket or wood artifact can help establish cultural and historical patterns. None of these artifacts have been recovered in the last two decades despite a great deal of archaeological investigation in the region. There is a huge volume of unexcavated wet site sediments remaining at the Glenrose wet site in particular. A modest project could recover a reliable sample of basketry and other vegetal artifacts. A larger excavation might also be able to reveal what function the various basketry had, and what activities were undertaken on the beach that resulted in the deposit of the shell hash layers. Were the baskets involved in fishing, or shellfish harvesting, or something entirely different? Were they simply refuse disposed of in the intertidal? A larger sample would also allow for seriation of attributes to assist with determining what is diagnostic, and the degree of continuity or disruption between time periods. At some point discoveries of contemporary basketry will be made at multiple places in the region. Basketry, with its ability to supply data to conduct fine-grained attribute research, will help to determine the degree of interaction between communities.