Chapter II

THE CRESCENT BEACH SITE; LOCATION AND PREVIOUS INVESTIGATIONS

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INTRODUCTION

The Crescent Beach site is situated on the eastern shore of Mud and Boundary Bays, approximately 6.5 kilometres north of the Canada- United States border (Figure II-1). It is within the traditional territory of the Semiahmoo Band of the Straits Salish. The mouth of the Nicomekl River forms the northeastern boundary of the Crescent Beach site, while a high bluff provides an approximate limit to the southeastern extent of the prehistoric deposits. This bluff rises sixty to ninety meters and is composed of unconsolidated Pleistocene deposits (Conaty and Curtain 1984:7). The site itself is spread out from the toe of the bluff out on to the present low-lying spit on which the present community of Crescent Beach lies (Figure II-2). Ham (1982) provides a detailed and precise description of the physiographic, geological, and biological environment of the Crescent Beach Locality, on which the account below is partially based.

PALEOGEOGRAPHY

Crescent Beach is at the eastern edge of Boundary Bay, at the edge of the White Rock uplands, which consist of Pleistocene deposits laid down by glaciers during the Wisconsin glaciation, which is locally referred as the Fraser Glaciation (Armstrong 1981). Other highland areas such as Point Grey and Point Roberts are of similar composition, being made up of a variety of unconsolidated Pleistocene materials. In the early Fraser Glaciation the Quadra deposits blanketed the Strait of Georgia with as much as 75 metres of deposit, but a lot of these were removed when the glaciers advanced to cover the area. The ice began to waste by approximately 14000 years ago and seems to have be gone from this area by 12000 RCYBP.

As the ice left the land rebounded from its depressed position, as the world-wide sea level rose because of ice melting, resulting in a very dynamic situation, which is still poorly understood. It is clear that initially the sea level was relatively much higher, but by 9000 RCYBP the sea level was around 12 metres below today (Williams 1988:187) according to a study based on analyzing a series of drill cores from the delta. The gross pattern since that time for the lower mainland is that of a steadily rising sea level. The basin north of the White Rock uplands now occupied by the Serpentine and Nicomekl Rivers (Figure II-1) must have been filled in early in the post-glacial period.

Initially the Fraser River filled in a series of basins in the lower Fraser valley, but by 8000 RCYBP began to fill in the current Fraser Delta, as shown by the Glenrose Cannery Site (Matson 1976). The Fraser River probably had a much heavier sediment load prior to 7000 RCYBP than it does today, and rapidly developed the present delta. Williams (1988) presents convincing evidence (buried peat deposits) of a still stand at about 6000 RCYBP. Boundary Bay was probably at least one of the exits of the Fraser River at this time.

By 4400-4100 RCYBP Hebda (1977:170) argues that the delta front had reached the Point Roberts Uplands, beginning blocking the flow of the Fraser River from Boundary Bay. Williams (1988:198) has the delta's tidal flats within a few km of Point Roberts by 4500 RCYBP. Since the oldest dates from the Crescent Beach site are of this period, it appears that the first occupation took place at about the time the Fraser River no longer entered into Boundary Bay. Williams (1988:198) states that the sea-level rise slowed markedly at about 4500 RCYBP at which point it was about 2 metres below the current level. The sea

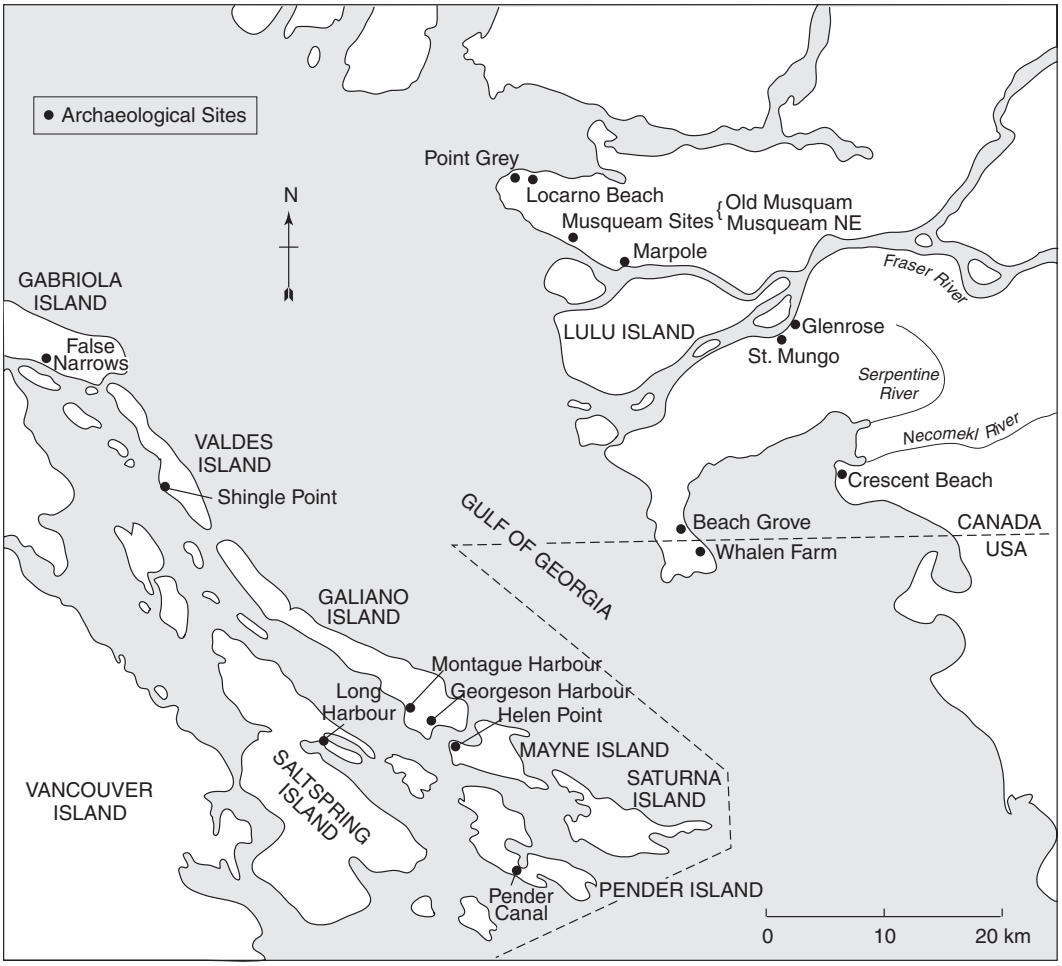

Figure II-1, Crescent Beach Location

level essentially reached the modern relationship about 2250 RCYBP according to Williams (1988:189), although the delta continued to expand north of Point Roberts.

In summary, at the time of first occupation at Crescent Beach, the Serpentine and Nicomekl Rivers were probably present in something like their present situation, and the Fraser River emptied in the Gulf of Georgia, north of Point Roberts. Although the current shoreline was probably different, the current structure of Boundary Bay was probably very similar to that today. It was probably only after the Fraser River no longer entered Boundary Bay that the Crescent Beach could begin to develop. It is of interest to note that the earliest archaeological deposits are immediately adjacent to the Pleistocene highlands, indicating that the spit did not exist at that time.

PLANT COMMUNITIES

Evidence from pollen records (Hebda 1977, Mathewes 1973) indicates that the plant community had evolved to something very similar to that observed by the first European visitors by 4000 years ago. On the highland areas, a coniferous forest was present, with Red Cedar (*Thuja plicata*), Hemlock (*Tsuga heterophylla*), Douglas Fir (*Pseudotsuga menziesii*) and Sitka Spruce (*Picea sitchensis*) being the most important large trees. Minor tree species include Vine Maple (*Acer circirnatum*), Maple (*Acer macrophyllym*), lodgepole pine (*Pinus contorta*), several species of cottonwood, Alder (*Alnus rubra*) and yew (*Taxis brevifolia*). The

understory of shrubs, including Oregon grape, Salal, blue berries, huckleberries included a number of useful economic species.

Much of the delta to the north of Boundary Bay was covered by Peat Bogs, as well as parts of the Serpentine-Nicomekl river valleys. These are elevated up to 3 m above sea level. As well as sedge-sphagnum peat, economic shrubs such as hawthorn, crabapple, cranberry, Sasakatoon berry *(Amerlanchier alnifolia*) are found in the bogs. Bog resistent tree species, such as *Pinus contorta*, and Hemlock, were found around the fringes.

Large grasslands and grassland and shrub communities were also present, although, as Ham (1982) points out, they are not what we expect to exist on the coast. On the North et al. (1979) map, these are found surrounding Burns bog and other low-lying areas. Ham (1982:37) indicates these communities include two forms, a dry and wet variants, with the dry community dominated by *Agrostis stolonifera*. The shrubby parts include willow, crabapple (*Pyrus fusca*) and rose (*Rosa* sp.). These open communities are home to a wide variety of animals, including elk, deer, otters, beavers, and a wide variety of birds.

Between the open areas and the coniferous forests, along the streams, and colonizing old burns were forested areas, not dominated by conifers. Trees important here, include maples (*Acer macrophyllum* and *A. circirnatum*), alder (*Alnus rubra*), cottonwood (*Populus spp.*), Willow, (*Salix spp*.), Birch (*Betula spp*.) as well as smaller numbers of the conifers found in the coniferous forests. Ferns, horsetails, skunk cabbage, and a wide variety of shrubby plants are also present.

Between the grassland communities and the normal high tide line a salt-marsh community was present in many areas along the delta front and along Nicomekl-Serpentine valley. Sedge and bulrushes are found at the shore-side of this community, while arrowgrass, sandspurry, and salwort, the sea-side.

This review of plant communities around Boundary Bay indicates something of the diversity present; a more thorough treatment with the communities further subdivided in present in Ham 1982. As well as a diversity of plant communities on land, diversity in shoreline communities are also present around Crescent Beach today, and there is every evidence that they have been present for the last 4000 years.

INTERTIDAL COMMUNITIES

The intertidal zones around Crescent Beach fit into Part II, bays and estuaries of the classic work *Between Pacific Tides* (Ricketts et al. 1985). Although they differ in some ways vary from these classic descriptions, the Crescent Beach locality intertidal zones general have most of the important features and animals present in Ricketts et al. (1985).

The first community described by Ricketts et al. (1985:269-316) is that of Rocky Shores, and this is also one of the most important in terms of resources found at the Crescent Beach site. Today the rocky intertidal zone begins circa 400 meters south and east of the site and extends towards White Rock (Figure II-2). Zones 1 and 2 include the uppermost horizon and high intertidal in Between Pacific Tides format. Acorn barnacles are the animal present highest in the zone, with the small *Balanus glandula* present near Crescent Beach. Whether they were actually used as food is unclear. Also present are limpets (esp. *Collisella pelta*) and periwinkle (*Littorina sitkana*) likely of no economic value as are hermit and shore crabs.

Also present in the high intertidal is the bay mussel (formerly *Mytilus edulis,* now *Mytilus trossulus*) which can occur in great numbers. This is a very important economic resource with many early northwest coast middens having *Mytilus* as the most abundant shellfish. Ricketts et al. report that this mussel usually does not exceed 5 cm long, although the occasional individual twice that size is found. This shellfish sometimes blankets the rocky foreshore in bands southeast of Crescent Beach.

A variety of small worms and pill bugs are often found in these zones as well. None of these, however, are of economic value, which is also true of the more abundant sponges.

Figure II-2. Air Photograph of Crescent Beach in 1940(BC 2071) with Rocky Foreshore indicated.

The next zone, 3, is the middle intertidal. A picturesque animal often seen here is the purple starfish (*Pisaster ochraceus*), a predator on mussels. Whelks, mainly *Nucella lamellosa*, are also found . These congregate together in small groups to breed, when mature in winter or spring (Ricketts et al. 1985:276). The hardy shells of whelks are frequently found in archaeological sites, usually broken in such a way that their tasty muscle can be obtained. It may be that significant numbers are only obtained when the whelks congregate to breed.

Abandoned whelk shells are used by the hairy hermit crab (*Pagurus hirsutiusculus*). Also present are sea anemones, particularly *Anthopleura elegantissima*. The purple shore crab, *Hemigrapus nudus*, is often abundant. Chitons, usually *Tonicella linenta*, are commonly present, as well as limpets, although usually in modest numbers. Small crustaceans, pillbugs, and worms occur "in such variety and abundance to distract the specialist" (Ricketts et al. 1985: 280).

The most important economic species in zone 3 is *Protothaca staminea*, usually called the littleneck clam in B.C. It is found in packed mud, gravel and sand in clayey gravel and usually lies within 8 cm of the surface. According to Ricketts et al (1985:281) it seldom exceeds 7 cm in size but often occurs in very dense quantities. It can be obtained in large numbers with a rake today. The shell of this clam is frequently found

in archaeological sites, where its distinctive cross-hatching on the outside of the valves makes it easily identified.

Given the large number of important economic species in the higher intertidal zones, it is curious that zone 4, the low intertidal zone has few of note. A variety of starfish are present as well as worms, snails, and tunicates. Also present is the native oyster, *Ostrea lurida*. Although Ham (1982) found there present in later deposits at Crescent Beach, they occurred in small numbers and were not identified in our work.

Also of possible economic importance is the green sea urchin, *Stongylocentrotus droebachiensis*. This species occurs today in large numbers in the Gulf Islands but is present today in the Crescent Beach locality in very low numbers, if present at all. Ham (1982:248) reports a single presence (0.01g) of sea urchin in his work. The rock oyster or jingle, *Pododesmus cepio*, is also present, and its orange flesh is said to have an excellent flavor (Ricketts et al. 1985:290).

A variety of crabs and tubeworms are also found in this zone as well as sea cucumbers. Sponges and chitons are also present. Further out in deeper waters, scallops are present, but these are not seen in numbers in archaeological sites. Although not really a full-time resident of this zone, the Dungeness crab, *Cancer magister*, is often found here. Really a resident of deeper water this large crab comes inshore to molt and thus gets stranded in the low intertidal zone. The only part of this animal found in archaeological deposits are the very tip ends of the pinchers (Ham 1982:248).

Also present in this zone is the plainfin midshipman (*Porichthys notatus*). These fish make nests under rocks where they guard their eggs. This occurs in the spring where they can be gathered during low tides. They "grunt" when poked and so are known as grunt fish. Remains of these fish are found in archaeological sites, although not in large numbers. Although fish, these animals are 'gathered' rather than obtained by the usual fishing techniques.

Although the present day rocky shores environment is very limited today in the Boundary Bay area, the remains of animals living there are very abundant in the archaeological record, demonstrating its importance to the people living here in the past. There are grounds to expect the rocky foreshore environment was larger in the past. As reviewed above, the relative sea level was rising until about 2250 RCYBP. In a rising sea level situation rocky foreshores are continually being created as new sea cliffs are being created. In a stable sea level situation, the slopes lessen, and the sand beaches expand at the expense of the rocky shores. This sort of situation is thought to have created dramatic changes in the southern California coast, for instance (Warren et al. 1961). One would expect something of the same process to have occurred in the Boundary Bay area, where the beaches, including Crescent Beach, have expanded at the expense of the rocky shores, although probably not to a great amount.

Sand Flats are the next community to be discussed within Part III of the Between Pacific Tides. Extensive areas around Boundary Bay belong to this environment, although few resources of economic value are present. Unlike most other intertidal environments, these are not well zoned by tidal position. One abundant animal, familiar to most is the sand dollar *(Dendraster ss*p.) which can occur in great numbers around Boundary Bay. These are actually sea urchins, but with small spines and a flattened body. Numerous crabs, snails, starfish, and shrimp are found, but of little economic value. Segmented worms are another class of animals that are abundant in sand flats but of little or no economic value. One medium sized clam, *Macoma secta*, is present, but in low numbers, and only occasionally seen in archaeological deposits (Ham 1982: 251). In summary, the broad sand flats produce little of economic value in terms of resident animals, although they may be important feeding areas for birds (when exposed) and fish (when inundated).

Mud Flats is the last natural community to be discussed in Part III of *Between Pacific Tides*. However, the situation around Boundary Bay does not correspond very closely that described for the upper intertidal zones. Mud Flats in this area are often found below sand flats or adjacent to eelgrass beds in this area. Like

sand flats, few animals of economic values are found in mud flats that are distance from eelgrass beds. Most animals of economic value located in mud flats in Ricketts et al. appear to be associated with eel grass beds in the Boundary Bay area and so will be discussed under that community. One clam, though, is clearly present there, the bent-nosed clam (*Macoma nasuta*). This small clam, usually no larger than 6 cm is found fairly deep in muddy sediments. Ricketts et al. (1985:379-380) report than it can be found in very stale water, and that it was an important species for Californian Indians. That does not appear to be the case in the Boundary Bay area, although Ham (1982:251) does report a few identified remains in his excavations at Crescent Beach.

Eelgrass Flats (Ricketts et al. 1985:341-353) are found in the lower intertidal zones, and consist of eelgrass (*Zostera sp*.) and associated animals. One of the most visible is the cockle (*Clinocardium nutallii*). This good eating shellfish has very short siphons and so lives very close to, and even on top of, the surface. It occurs in some numbers, but never very concentrated in eelgrass beds in the Gulf of Georgia area. Ricketts et al. place it in sand flats, where it is very rare. As will be reported later, it can be obtained in larger numbers in the spring time, than at other times. Another very important shellfish is found in and at the lower edges of eelgrass beds, the horse clam (*Tresus capex* and *T. nutallii)*. This very large clam lives up to 0.5 metres below the surface, with a long siphon extending up to the surface. The shells 'gaps' not enclosing the body totally, thus leading to another common name 'gaper'. These are important economically, with dried animals being an important trade item (Suttles 1951:69). In some places horse clam beds were "owned" (Suttle 1951:68,69) and inherited. Horse clams can be easily spotted at low tide by their siphons; these have sizes according to the body size of the clam, and have a tough, leathery top, making them easy to spot and identify. These features make clusters of horse clams easy to spot, and even their sizes to be estimated before digging.

In addition to these two important shellfish, the starry flounder (*Platichthys stellatus*) is also a resident and can be sometimes collected in very shallow water. Lots of uneconomic animals are also present in the eelgrass flats. Varieties of snails, nudibranchs, sponges, and shrimp abound, along with many types of worms.

Another important clam, *Saxidomus giganteus*, locally called the butter clam is also present near eelgrass beds. Ricketts et al. (1985:378) have this clam being present in mud flats, but experience in the Gulf of Georgia (Matson 2003) and at Crescent Beach places this clam more in gravelly/sandy areas, often at the foot of steep gravelly beaches where sandy flats begin. This clam, then can be found at the up-beach edge of eelgrass beds, and at the foot of rocky foreshores, at lower intertidal zones than *Protothaca*, although much deeper in the sand. This large clam is important today economically, and is common in archaeological sites.

Although the eelgrass and rocky foreshore zones are treated by Rickett et al. (1985) as being usually located in different areas, today they can be found adjacent to each other, just southeast of the Crescent Beach site. Here, erosion of the headlands of the White Rock uplands has resulted in rocky foreshores from above hightide line to low tide. But further out are eelgrass beds, in a sandy-muddy situation, with *Clinocardium* and *Tresus* present. Eelgrass flats are also present due south of the Crescent Beach site. No other concentration of different productive zones is present around Boundary Bay, until one gets to the Point Roberts uplands.

It is likely that this general distribution of intertidal communities has been present for about 4000 years. Since that time the shores between the highland ends of Boundary Bay have been along the edge of delta sediments, precluding the presence there of the important rocky foreshore zone. Today most of this intervening shoreline is the relatively unproductive (in terms of aboriginally important economic invertebrates) sand flats. Remembering that the important clams, *Saxidomus* and *Tresus*, although suggested by Ricketts et al. (1985) to be found in in mud flats and sand flats, today are not found inareas accessible at

most low tides around Boundary Bay, these zones are more barren than one might think.

Thompson (1913) offers an interesting perspective on the shellfish beds of Boundary Beds in his "Report of the Clam-Beds of British Columbia." In addition to the rich area to the south of Crescent Beach, he shows abundant *Clinocardium* and *Tresus* in the lower intertidal area of the mudflats surrounding Boundary Bay. Thompson's sketch map corresponds in a general way with our current understanding of eelgrass flats. These areas are accessible only in the lowest tides.

In summary, to the south of Crescent Beach today is a very rich shellfish area, with rocky shores and eelgrass flats closely adjacent. Nowhere else around Boundary Bay does a similar concentration of resources exist today. Further, there is no evidence that other similar areas have existed in the last 4000 years. There are, though, eelgrass beds around Boundary Bay where *Clinocardium* and *Tresus* are available.

FISH RESOURCES

The two most important resources recovered at Crescent Beach were shellfish and fish. The location of shellfish procurement is more certain than that of fish since shellfish are relatively sessile animals but some statements can be said about the more mobile fish. The greatest fish resource is the late summer availability of Sockeye salmon as they swirl through Boundary Bay on their way to the Fraser River. It is not clear that these fish were exploited by inhabitants of Crescent Beach while they were in Boundary Bay. Sockeye salmon (*Oncorhynchus nerka*) is today the most important commercial salmon, weighing about 2.5 kg. Fraser river Sockeye typically spend a year in fresh water and three in salt water, resulting in the well-known four year cycle (Burgner 1991:95-6; Hart 1973:118-123) with the Fraser River being by far the most important run in B.C. Although sockeye are long distant spawners in B.C. and the most important fish along interior rivers, it is not clear that they were important aboriginally on the coast prior to the invention of the reef-nets (Suttles 1951). This possibility exists because the sockeye do not spawn in small coastal streams and are hard to obtain in the lower Fraser river in the absence of drag nets or gill nets, which have uncertain antiquities. The reef net technology is very specialized (Suttles 1951) and is usually thought to be a relatively recent invention.

Coho salmon (*Oncorhynchus kisutch*) and Steelhead (*Oncorhynchus gairdneri*) today spawn on all three regional streams, the Nicomekl, Sperpentine, and Campbell Rivers, and Chum salmon *Oncorhynchus keta*) only in the Campbell River. Coho are larger than Sockeye (average around 3 to 4 kg) and typically spawn between November and January (Groot and Margolis 1991:409). Chum are slightly larger than Coho, averaging about 5 kg in southern B.C. (Groot and Margolis 1991:275) and can spawn even later, even well into the new year (Hart 1973:112-114). They have a lower fat content than the Coho and Sockeye, thus preserve well, and were a favorite salmon of coastal aborigines (Hart 1973:114). It is likely that the two local salmon were more abundant than the Steelhead, but the numbers of fish produced by all three local streams were probably modest.

As described later, in addition to salmon, the other really important fish recovered from our excavations were the Starry Flounder (*Platichthys stellatus*). This fish, known for its tough, scaly skin, is also called "Grindstone", "Grinder", and "Emeryboard" It is a right-eyed flounder, usually weighing from 2 to 4 kg at maturity (Hart 1973:631-633). This flounder is known for its tolerance of of low salinities, thus its abundance around the Fraser Delta and other estuaries.. It comes into shallow waters in February and April to spawn but lives in deeper waters most of its life. It is commonly seen in eelgrass beds, as mentioned above, among other places and can be speared. It is relatively abundant around Boundary Bay.

The final important fish is the Pacific Herring (*Clupea harengus pallasi*). This is not now seen as being a different species from the Atlantic herring, and in B.C., usually does not exceed 25 cm in length. This fish is important in aboriginal fishing mainly because of its spawning behavior, as it begins to school in very dense

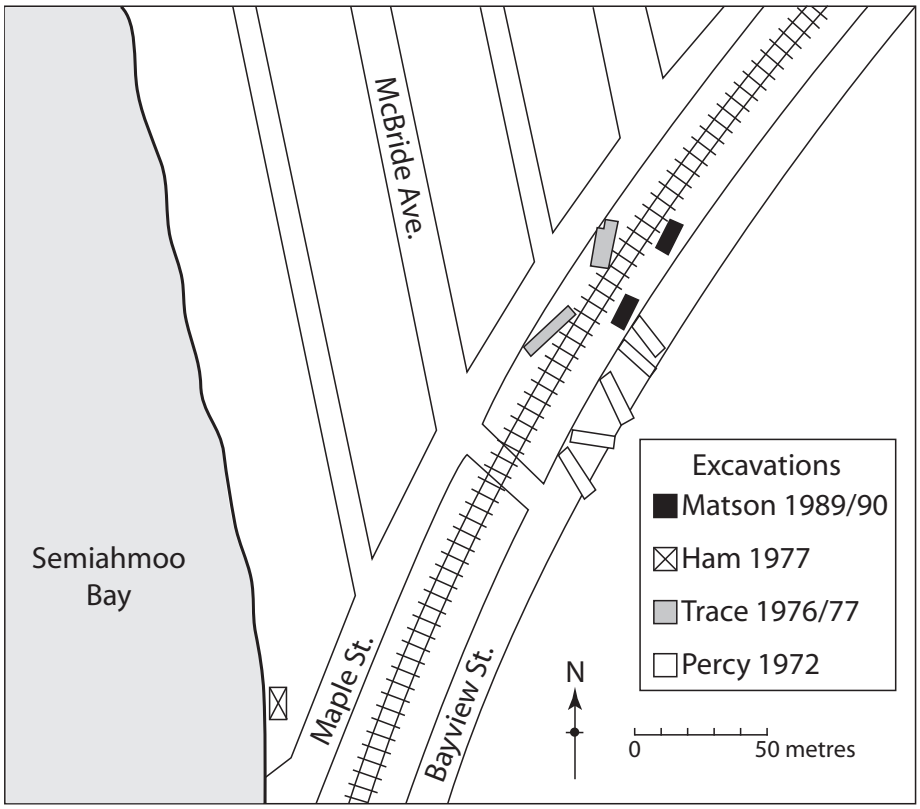

Figure II-3. Location of Excavations at the Crescent Beach site.

groups adjacent to shore during this time. This occurs mainly in March in B.C. with lesser amounts in February and April (Hart 1975:97), making herring a very good seasonality indicator. Actual spawning occurs at depths between high tide and 11m where eelgrass is one of the main substrates. During spawning large numbers can be obtained by "herring rakes" and spawn can be collected from branches and eelgrass. Although relatively few herring are seen today in Boundary Bay, it is likely substantial numbers were present in the past. Certainly substantial numbers were found in our and in Ham's (1982) investigations

Numerous other fish are also present in the Boundary Bay area, but large numbers of remains of any other single species is absence in archaeological contexts. In total, though, these less common fish to come to a substantial total. In addition to the fish discussed in this section, it needs to be remembered that the plain fin midshipman is also present, although likely obtained during shellfish procurement rather than by standard 'fishing' techniques. All in all, the fish resources are one of the most important sources of food found in Crescent Beach deposits.

PREVIOUS INVESTIGATIONS

The Crescent Beach site has been the focus of several archaeological investigations throughout the past decades because of its large size and the constant threat of development. Of the previous excavation reports available for this site, the three most important are two Master's theses (Percy 1974, Trace 1981) and one Ph.D. dissertation (Ham 1982). All three excavations took place in different parts of the site as shown in Figure II-3. Percy and Trace's excavations were carried out under salvage conditions, Percy's of sewer connections along Bayview Street, and Trace's, drainage ditches on the other side of the railroad track. The data obtained from their excavations focuses on obtaining information about the artifacts present and from this information, delineating cultural components which at that time were not well known for the study

area, as discussed below. Ham's 1977 excavations (under Matson's distant direction and supported by funding from S.S.H.R.C.) focussed on what subsistence information could be obtained from the shells and other faunal remains present within the natural layers within a typical recent Northwest Coast shell midden. As reviewed below, an important part of this endeavor involved experimenting how to excavate natural layers via wide area excavations of shell middens.

The cultural history conclusion drawn from these three major excavations was that there were at least four 'culturally ' distinct components present at Crescent Beach. These are, starting from the bottom, St. Mungo/Mayne, Locarno Beach, Marpole, and Late. In all, these four components represent at least four thousand years of occupation and most importantly, almost continuous occupation throughout the time period represented. Furthermore, analysis (Matson et al. 1980; Matson 1989; Matson and Coupland 1995:211-218) had shown that the Marpole component found by Percy, belonged to the Old Musqueam subphase of the Marpole culture, which immediately follows the Locarno Beach phase. It was this evidence of continuous occupation before and after the Locarno Beach phase that led us to excavate the Crescent Beach site further. If we were to begin to try and answer questions about the Locarno Beach culture and its relationship to contingent cultures, being able to investigate these questions at a single geographical location means that factors that are the result of environmental differences can be eliminated (except for environmental changes through time, which have not been thought to be too important in this period). Crescent Beach is the only known intact mainland deposit with both pre-Locarno Beach deposits, Locarno Beach material, and Old Musqueam subphase Marpole material.

The three previous major excavations each contributed important information to our research, and these contributions are summarized next. It is important to note that because changing research questions and field methods, we could not simply re-analyze or amalgamate the information gathered from the three major excavations previously done at Crescent Beach in order to answer our research questions. Our research required us to return to the site with a very specific excavation strategy that would allow us to obtain subsistence information not available for the earlier components.

Percy's excavations (in the spring of 1972) took place on Bayview street because a large section of intact midden was going to be destroyed by the creation of a large sewer trench built to accommodate new houses soon to be built in the area and the laterals from it to existing homes (Figure II-3). He had the unenviable task of working directly under the heavy machinery of the Surrey Municipal department and having a very limited time period. Several times while he was working, he had to abandon his trenches and rescue burials uncovered by the city work crews. In his thesis (Percy 1974) ties in these burials with his major trenches, and he also incorporated a description of an extensive artifact collection privately held by a Crescent Beach resident. His excavations uncovered the earliest component present at Crescent Beach, dated to more than 4000 years ago. Based on the artifact assemblage, burial types, and features present, Percy defined this early assemblage as Mayne phase (Carlson 1970) in part because at the time, there was little other information available for this early time period within the Gulf of Georgia region. Two more recent cultural phases were also well represented in his data and these were defined as Locarno Beach and Marpole. Using the standard salvage procedures of his time, Percy excavated in arbitrary 10 cm levels which may have led to some mixing of distinct cultural phases and to a blurring of archaeological cultural boundaries. As typical of salvage excavations of that time, little subsistence information was sought or recovered.

Trace's excavations took place in the summers of 1976 and 1977 (Trace 1981). This was a combined salvage and field school situation, where a University of British Columbia field in 1977 contributed to the material reported by Trace. The excavations took place because the Municipality of Surrey wanted to excavate a series of drainage ditches on the west site the Burlington Northern railway right of way (Figure II-3). Trace's work at Crescent Beach is important because it proved that there were extensive Locarno

Beach deposits present there, and that the pre-Locarno deposits did not appear to extend to the west side of the railroad tracks. The Locarno Beach deposits from Percy's work were not as large as those from the pre-Locarno deposits, so the size and extent of the Locarno deposits was uncertain. Trace worked as much as possible with natural layers and interpreted the basal cultural layers as being interlaced with natural beach deposits (Trace 1981:16). As was not uncommon at the time, he did not attempt a faunal analysis for this project, but instead, focussed on the artifact assemblage. The area in which he worked appeared to have been disturbed by previous land modification, making his analytical task more difficult.

Ham's work, carried out in the summer of 1977, dealt with the youngest deposits present at Crescent Beach, which are dated to the Marpole and Late phases (Ham 1982). From the three excavations it becomes clear that the oldest material are adjacent to the bluffs which run to the east of Bayview Street, and that this is the only place where pre-Locarno material exists. Close to the west side of the railroad tracks, Locarno Beach is the deepest cultural stratum, but it does not exist much beyond that. Further away from the Bluffs, Marpole is the basal stratum, and later material is widely spread. This pattern agrees with the idea of the occupation being near the coast at the edge of the bluff, before the spit existed, and moving north and west as the Crescent Beach spit developed out from the bluff over the last 4500 years or so.

Ham's techniques for and experience in excavating a shell midden and his analysis of the faunal materials and shellfish remains are important to our study because we could adapt his excavation and analytical strategies where the older are deposits present, which are the focus of our work. While Ham's excavation strategy was useful to our work, we required information concerning an older section of the site than that excavated by him. Therefore, while we have borrowed from his methodology, we could not use the information he obtained to answer the questions posed for this work.