

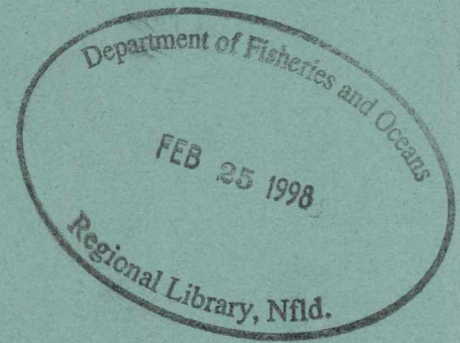


INTERTIDAL CLAM RESOURCES (Manila, Littleneck and Butter Clam)

Volume I: The West Coast of Vancouver Island

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ABSTRACT

Harbo, R., K. Marcus and T. Boxwell. 1997. Intertidal Clam Resources (Manila, littleneck and butter clam) Volume I: The West Coast of Vancouver Island. Can. Manuscr. Rep. Fish. Aquat. Sci. 2416: viii + 116 p.

This report documents 326 beaches and 1672 ha on the west coast of Vancouver Island (WCVI) Pacific Fishery Management Areas 21 and 23 to 27. This area supports populations of Manila, littleneck and butter clams. It is important to note this is not a complete inventory of all sites and only a portion of the identified beach area supports clam populations. The clam beach data are available in electronic formats.

Most of the beaches identified are small "pocket" beaches with 280 beaches being less than 10 ha in size. The largest identified beach is 57 ha.

Annual landings of intertidal clams, butter, littleneck, Manila and mixed (littleneck and Manila) are presented for the WCVI. Currently the most important commercial species are the Manila and littleneck clams and the WCVI may account for 20 to 25% of the annual British Columbia production. Peak landings for the WCVI were 862 t in 1988. Historically, in the 1960's and earlier, butter clams were also important commercially. Other clam species may be present but have not been commercially exploited.

Earlier assessments of clam populations indicate that recruitment is sporadic and annual rates of recruitment vary for beaches only a few kilometres apart.

There are a number of beaches closed to commercial harvest for allocations to Aboriginal and recreational harvest. Some beaches are also closed due to pollution. Historically, paralytic shellfish poisoning has been a problem and there are a number of mussel monitoring stations established along the west coast of Vancouver Island, 33 stations in 1995. There are also concerns for amnesiac shellfish poisoning on the west coast of Vancouver Island.

There are 12 commercial tenures approved (1995) to culture Manila clams on the WCVI, all in Area 23, Barkley Sound.

The shallow burrowing species of bivalves such as butter clams and littleneck clams may be impacted by the recent introduction of sea otters to the WCVI. Manila clams, found high on the tide in shallow waters, may not be as vulnerable to otter predation.

RÉSUMÉ

Harbo, R., K. Marcus and T. Boxwell. 1997. Intertidal Clam Resources (Manila, littleneck and butter clam) Volume I: The West Coast of Vancouver Island. Can. Manuscr. Rep. Fish. Aquat. Sci. 2416: viii + 116 p.

Ce rapport contient des données sur 326 plages et 1672 hectares, situés dans les zones de gestion des pêches du Pacifique 21 et 23 à 27, sur la côte ouest de l'île de Vancouver (COIV); on y retrouve des populations de palourdes japonaises, de palourdes du Pacifique et de palourdes jaunes. Il faut remarquer qu'il ne s'agit pas d'un inventaire complet de tous les sites et que l'on retrouve des populations de palourdes uniquement sur une partie des plages désignées. Les données sur les plages où vivent des palourdes sont également consignées sous forme électronique.

La plupart des plages désignées ne sont que des petites plages situées dans des anses : 280 d'entre elles couvrent moins de 10 ha de superficie, alors que la plus vaste mesure 57 ha.

Ce rapport fournit les données sur les débarquements annuels de bivalves intertidaux, soit les palourdes jaunes, les palourdes du Pacifique, les palourdes japonaises, et une combinaison de palourdes du Pacifique et japonaises pour la COIV. Actuellement, les espèces commerciales les plus importantes sont la palourde japonaise et la palourde du Pacifique, et la COIV peut compter pour 20 à 25 % de la production annuelle de la Colombie-Britannique. Les débarquements de la COIV ont atteint un pic de 862 t en 1988. Historiquement, au cours des années 1960 et avant, les palourdes jaunes occupaient également une place importante sur le plan commercial. Il est possible que d'autres espèces de bivalves vivent dans ces secteurs, mais elles ne font pas l'objet d'une exploitation commerciale.

Les évaluations précédentes des populations de bivalves fouisseurs indiquent que le recrutement est sporadique et que les taux annuels de recrutement varient pour différentes plages séparées uniquement de quelques kilomètres.

Un certain nombre de plages sont fermées à l'exploitation commerciale et sont réservées aux Autochtones et à la pêche sportive. D'autres plages sont également fermées en raison de la pollution. Au cours de l'histoire, la présence de la neurotoxine paralysante a posé un problème, et c'est pourquoi on retrouve un certain nombre de stations de surveillance des moules le long de la côte ouest de l'île de Vancouver. En 1995, on y comptait 33 stations. La présence de la toxine amnestique dans cette même région est également préoccupante.

En 1995, on comptait 12 exploitations commerciales approuvées pour la culture des palourdes japonaises sur la COIV, toutes étant situées dans la zone 23, soit celle de la baie Barkley.

Les espèces fouisseuses de bivalves vivant à faible profondeur comme les palourdes jaunes et les palourdes du Pacifique pourraient être touchées par l'introduction récente de loutres de mer le long de la côte ouest de l'île de Vancouver. Quant aux palourdes japonaises, qui vivent dans la partie supérieure de la zone intertidale en eau peu profonde, elles seraient peut-être moins exposées à la prédation par les loutres de mer.

1.0 INTRODUCTION

A series of three reports have been prepared to document clam beaches on the south coast of British Columbia. Two reports deal with the inside waters of Vancouver Island and the mainland (Harbo et al. 1997a, 1997b). This report was prepared to document beaches on the west coast of Vancouver Island that support populations of Manila, littleneck and butter clams, important to Aboriginal, commercial and recreational harvesters. Pacific Fishery Management Areas 21 to 27 are illustrated in Fig. 1. The report identifies different sizes of beaches from <1 to 57 ha.

This report is not to be treated as a complete inventory of clam beaches and it only covers a limited number of species. There are many other additional areas of "pocket beaches" that support clam populations that have a tradition of harvest for Aboriginal, commercial or recreational purposes. These beaches will be added to this database as they are identified. There may be sites not included in this inventory where DFO or resource users may object to a tenure or other development.

It is necessary to identify as many beaches as possible to assist in identifying sites of conflict with other uses such as aquaculture and to protect them from other potential development, such as log storage facilities that may impact on the shellfish resources. A policy was adopted by DFO in the 1980's to maintain beaches in the "wild", common property fishery for intertidal clams. DFO supported the development of clam culture on existing oyster tenures only and objected to new tenures where there was a history of Aboriginal, commercial or recreational harvest (Bourne and Dickson 1990). The identification of the beaches is also important for protection or clean-up activities in the event of environmental emergencies such as oil spills.

1.1 Intertidal Clam Biology

This report documents intertidal clam resources but is limited in scope to include Manila and littleneck clams and, to some extent, butter clams.

There are a number of clam and other bivalve species harvested for food and commercial purposes. Common and scientific names of harvested clam species are detailed in Table 1. Cockles (*Clinocardium nuttallii*), butter clams (*Saxidomus gigantea*), littlenecks (*Protothaca staminea*), horse clams (*Tresus capax* and *T. nuttallii*), razor clams (*Siliqua patula*) and more recently Manila clams (*Venerupis philippinarum*) have been harvested by Aboriginal and recreational harvesters on the west coast of Vancouver Island. The commercial fishery on the west coast of Vancouver Island targets on Manila and littleneck clams (the 'steamer' clams) and to a lesser degree butter clams. Others intertidal species of commercial interest include the soft-shell clam, *Mya arenaria*, introduced to the west coast sometime in the early 1900's. The giant geoduck clams, *Panopea abrupta*, are only found on the lowest tides and are exploited subtidally by divers (Harbo et al. 1986).

The biology of these species are discussed by Quayle and Bourne (1972), Quayle (1960), and Bourne (1986a; 1987a). Life cycles of the Manila clam, littleneck clam, butter clam, and razor clam are illustrated in Figs. 2 to 6.

1.2 Marine Toxins - Paralytic Shellfish Poisoning (PSP) and Amnesiac Shellfish Poisoning (ASP)

Bivalve shellfish and in some instances crabs may be affected by blooms of toxic algae. In British Columbia, toxic shellfish are known to occur along the entire coastline but outbreaks are localized. A discussion of PSP can be found in Quayle (1969), Quayle and Bourne (1972), Bond (1975), Medcof (1985) and Anderson (1989).

PSP toxins have been found in intertidal clams (littlenecks, Manilas, butter clams, razor clams), mussels, oysters, cockles and subtidal species of scallops (rock, pink and spiny, weathervane), geoducks and horse clams. PSP toxins have also been found occasionally in Dungeness crabs.

ASP toxin (domoic acid), have been found in razor clams, mussels, oysters, and geoducks. Dungeness crabs have also been found to accumulate ASP and some fishery closures have been effected (R. Chiang, DFO, Fish Inspection, pers. comm.).

1.2.1 History of marine toxins on the WCVI

PSP monitoring has been in effect in BC since 1942 (Bond 1975). Regular monitoring of PSP on the WCVI has been in effect since 1963.

Following the deaths of three persons in Barkley Sound in May, 1942, the west coast of Vancouver Island was closed to the harvest of butter clams and mussels until 1953 (Quayle and Bourne 1972).

A year round closure to the harvest of all bivalves was in effect on the WCVI, 1971 to 1983. Harvesting was only allowed through a controlled permit system to federally registered shellfish plants that allowed sampling of clams prior to them entering the market.

Since 1983, areas were closed to harvest under the Pacific Fishery Management Area Regulations until they were judged to be safe and opened. Areas were opened to the commercial and recreational fisheries when monitoring programs were established to ensure public health safety. A series of mussel monitoring stations, 33 on the WCVI in 1995, have been set up by DFO to determine the presence of toxin blooms (Fig. 7).

The harvest seasons for intertidal clams was set from November to April, generally considered to be a low risk time for PSP. Recent data provided by DFO Inspection Branch suggests that August, September and October had the greatest number of blooms from 1988 through 1994. (Figs. 8 and 9).

1.2.2 Management program for marine toxins

Samples from mussel stations are regularly provided by contractors, Fishery Officers and patrol vessel crews. In addition, commercial landings of clams are periodically sampled to determine levels of PSP. Outbreaks of PSP have been recorded in all areas and in most months of the year and may affect intertidal clam species and subtidal species of clams such as geoducks and horse clams (DFO 1993).

Closures in areas may be species specific according to a number of criteria including the level of toxins recorded, the species specific nature of uptake and retention of toxin, the pattern of blooms in surrounding areas, the numbers of samples tested, and others.

1.2.3 Contaminated areas on the west coast of Vancouver Island

There are number of closures on the west coast of Vancouver Island due to fecal contamination, often from wildlife. The closures for 1997 are described in Appendix 3. To date, there have not been harvests of clams from contaminated areas on the west coast of Vancouver Island for depuration or relay. Ucluelet Harbour, where a number of clam beaches are located, is highly contaminated and is a prohibited harvest area (see Appendix Figure 1.3.4).

2.0 INTERTIDAL CLAM FISHERIES ON THE WEST COAST OF VANCOUVER ISLAND

Clams of commercial interest on the WCVI include butter clams, littlenecks and Manila clams. Intertidal razor clam populations have not been large enough to support any commercial fisheries. Although there may be populations of soft-shell clams, there has been no commercial interest to date.

There are no estimates of landings of clams in recreational or Aboriginal food fisheries.

2.1 Early Commercial Clam Fisheries

Early landings of butter clams were reported to be sold to the cannery at Sidney, which operated from 1905 to 1939, and to canneries at Nanaimo and Vancouver (BC Packers; see Quayle 1939). Clams (littlenecks, butter clams) and cockles were also sold fresh in Victoria and Vancouver.

The landings from the WCVI prior to 1951 are not well documented. Quayle (1939) reports that except for one or two seasons, the north coast and the west coast had been "untouched". In the peak year of 1938, the west coast of Vancouver Island added a "substantial quantity" of butter clams, when the annual production was 2919 tonnes (6,435,200 lb).

Manila clams were introduced with oyster seed to the WCVI, and were abundant in Barkley Sound in the early 1950's (Bourne 1982). By the late 1950's Manila clams were established in Esperanza Inlet and in 1966 Manila clams were reported from Quatsino Sound.

2.2 Clam Fisheries From 1951 to 1995

The commercial clam fishery began just before the turn of the century, however landings were not reliably recorded until 1951. The commercial clam fisheries and fishery management have been described in Quayle and Bourne 1972, Bourne 1986(b), Bourne 1987(a) and 1987(b), Dickson and Hobbs 1990, Dickson 1992, and Webb and Hobbs 1996. Since 1971, strong markets and higher prices for littleneck and Manila clams have focused the intertidal fishery on these two species. Landings in the fishery increased dramatically between 1984 and 1988. The landings of butter clams, which enter the market as a canned product, had been declining because of the high cost of processing and a shift in demand toward fresh steamer clams. However, recent efforts have been made to reactivate the butter clam fishery.

The commercial clam fishery has been managed as a common property fishery with licence holders competing each season for a share of the harvest. A variety of regulatory controls have been put in place to support conservation and management objectives and are intended to restrain the commercial harvesting efforts to sustainable levels.

The main conservation tool utilised in the clam fishery are minimum size limits of 63 mm shell length for butter clams, 90 mm for razor clams and 38 mm for littleneck and Manila clams.

Since 1990, in-season catch monitoring which tracks digger catch per tide and relative numbers of legal sized clams, has played a key role in active management of the fishery. Fishery openings are short and staggered to maintain market supply where possible. During the fishing season meetings are held with industry representatives in each area to determine the sequence of fishery openings and closures.

An individual commercial clam licence was first introduced in 1989, along with area licensing restrictions. The South Coast was divided into 6 "clam licence areas" and fishers had to choose to fish one of these six licence areas (Fig. 10). Coastwide in 1995, 2448 clam licences were issued, including 538 licences for Area F, the west coast of Vancouver Island.

Significant problems in the management of the clam fishery are the result of too many harvesters. Openings are reduced to a few days annually, income levels are low for most harvesters and illegal harvest is a significant problem.

A Clam Reform strategy has been initiated through extensive consultations which began in 1992 with clam fishery stakeholders, DFO, First Nations and the Province of BC. A pilot project was initiated in Licence Area C on the Sunshine Coast which consisted of licence limitation and community based management. As a result, individual diggers in Area C have earned on average three times more than harvesters from other licence areas and enforcement efforts have improved due to information received for the local community regarding illegal clam harvest activity.

As part of the proposed Clam Reform strategy, a system of licence limitation, establishment of community based management boards and improved First Nations access has been recommended for the entire commercial clam fishery, effective in January, 1998.

2.2.1. Commercial clam landings by species and area

Landings for BC and landings for the WCVI are given in Tables 2 and 3 and shown in Figs. 11 and 12. Landings presented represent commercial clam fishery harvest only, and do not include landings from clam tenures. Landings for each of the Areas 23 to 27, over the period 1951 to 1995, are given in Tables 5 to 9 and Figs. 13 to 15. There are very small commercial landings of clams recorded from Area 21 (Table 4). Any landings from Area 123 would be recorded in the catch statistics for Area 23.

The landings of clams from the WCVI have fluctuated greatly since the collection of clam statistics, beginning in 1951. They have ranged from approximately 1% to 25% of the total BC intertidal clam landings. Overall, the WCVI has only accounted for 9% of the total intertidal clam production 1951 to 1995 (Tables 2 and 3; Fig. 12). The shift to fresh market steamer clams from processed canned product has increased the importance and value of the clams from the WCVI.

Landings of butter clams were greatest in 1963, 115 tonnes (Table 3). The market shifted to steamer clams in the early 1980's and peak landings of Manilas were 836 t in 1988; 87 t of littlenecks in 1980 and 73 t of mixed clams in 1984 (Table 3). At most times, landings reported as mixed clams were predominantly Manilas but included littlenecks.

For the total production of intertidal clams from the west coast of Vancouver Island, Area 24 has accounted for 34%, Area 25 - 28%, Area 23 - 24%, Area 26 - 12% and Area 27 only 2%. The total production from historic data includes landings of 8 tonnes recorded in error from Area 22 (Nitnat Lake), but likely from some other WCVI area. The largest accumulated landings of Manila clams have come from Area 24 - 34%, then Area 25 - 30%, Area 23 - 22%, Area 26 - 12%, and Area 27 - 2%.

Landings of littleneck clams have been significantly less than Manilas (Tables 2 and 3). The total accumulated landings of littlenecks on the WCVI is approximately 12% of the Manila landings. On the WCVI, Area 23 accounted for 37% of the littleneck landings, Area 24 - 33%, Area 25 - 23%, Area 26 - 3% and Area 27 - 4%.

2.3 Aboriginal Fisheries

First Nations peoples have a long history of harvesting clams on the west coast, both for food purposes and in the commercial fishery. First Nations participation in clam fisheries has been taken into consideration through extensive consultations in the ongoing Clam Reform process.

A number of areas have been closed to the commercial fishery in recent years, in order to assure First Nations access to clams for food, social and ceremonial purposes. Generally, recreational harvesting has also been permitted within the Aboriginal Harvest closure areas.

Some reports of WCVI Aboriginal use of clam resources include Jewitt (1815), Frederick (1980), Ellis and Swan (1981), Kenyon (1981), Arima (1983), and Arima et al. (1991). The presence of middens on west coast beaches generally indicate the presence of clam stocks and historical Aboriginal harvest.

3.0 INTERTIDAL CLAM ASSESSMENTS

A number of surveys of clam resources have been carried out on the west coast of Vancouver Island. An assessment of a hydraulic clam harvested was undertaken in Mary Basin, Area 25 in 1982 (Adkins et al. 1983).

Surveys of intertidal clams on the WCVI have been published by Bourne and Farlinger (1982) and for the period 1981-1987 by Adkins and Harbo (1991). There are reports in preparation for surveys on the WCVI, Areas 23 to 27, 1989 to 1992 (Heizer 1993), and for Areas 25 and 26, surveyed in 1993 (S. Heizer, pers. comm.).

3.1 Predation by Sea Otters

Sea otters were reintroduced to the west coast of Vancouver Island through transplants during the years 1969 to 1972, in the areas of Kyuquot (Area 26) and Bajo Reefs (Area 25). and have grown to a population of several hundred animals. The population growth rates approach 19% annually (Watson 1996).

Sea otters in BC are known to forage for many of the intertidal and shallow subtidal clam species, including butter clams, littleneck clams, horse clams and even geoducks (Watson 1996).

4.0 CLAM BEACHES SORTED BY AREA FOR THE WEST COAST OF VANCOUVER ISLAND

4.1 Clam Species

The beaches of interest at the time of the preparation of information were beaches that had quantities of butter clams, littleneck clams and Manila clams. Not included are exposed sandy beaches that have populations of razor clams and sheltered muddy beaches with populations of soft-shell clams. Beaches that support significant populations of butter clams were not identified separately from the other hard shell steamers, littlenecks and Manilas.

4.2 Clam Beach Inventory Methodology

The information on the clam beaches was obtained initially in 1986, from personal interviews with local Fishery Officers. Additional beaches have been added through consultation with Fishery Officers, Aboriginal harvesters, commercial harvesters and others. As identified earlier, not all sites of clam populations are identified.

The type of harvesting at a beach location was originally designated by the local fishery officers in 1986 as commercial, Aboriginal or recreational use, with an associated "intensity code". These designations were arbitrary and have likely changed significantly according to markets and harvesting trends. For example, a beach with significant butter clams may not be a commercial beach under current market conditions. However, if there was a market demand for butter clams the status of many beaches may change and some additional areas be identified. For the purposes of this report, use and intensity data have been excluded pending revisions.

4.2.1 Charts of beach locations and measuring area (ha)

The beaches were first marked out by hand on a series of nautical charts which were used to create an electronic GIS (Geographic Information System). The beaches were then digitized and Savemap files created in QUIKMap version 4.0. *The beach maps are sorted by Pacific Fishery Management Area and presented in Appendix 1.*

The digital basemaps used are based on Canadian Hydrographic Service (CHS) paper charts and range in scales from 1:37,500 to 1:80,000. These basemaps were compiled by AXYS Software Ltd., in QUICKMap format. Beach areas were estimated from the polygons, first established in 1989 and the database has been continually updated since then under funding from both DFO and Environment Canada Shellfish Program. Each clam beach is defined as a geographical area in the GIS with associated attribute information. Clam beaches were defined on the GIS by "snapping" their boundaries to features in the digital map set.

Please note that beach areas were measured that encompassed the whole intertidal area and that only portions of the beach may bear clam populations. We have found that clam areas of commercial interest are often small relative to the overall size of the beach. Table 10 presents a summary of beaches by digitized size (ha), while Table 11 shows a comparison of digitized area to estimated harvestable area on sites where surveys have occurred.

Hard copy charts were produced from QUIKMap savemaps which were customized to show all the areas with clam beaches reported. Clam beach data were imported from the associated dBase GIS files to a Microsoft Access database. Hard copy tables were produced from MS Access queries and reports using MS Excel 5.0 and MS Word 6.0.

All of the data in this report are available from DFO in QUICKMap and MS Access formats.

4.2.2 Beach closures for Aboriginal and recreational harvest

Appendix 2 provides a list, descriptions and figures for 17 beaches (109 ha) closed to commercial fishing and allocated for harvest for food, social and ceremonial purposes by First Nations. In addition, there are 27 park areas (62 ha) closed on the WCVI; in Area 23, the Broken Group Islands section of Pacific Rim National Park, and at a provincial Ecological Reserve in Area 26, at the Tahsish River Estuary (Subarea 26-4).

4.2.3 Beach listings

The beaches have been initially sorted by Pacific Fishery Management Areas 21 to 27, on the west coast of Vancouver Island (Fig. 1). *Tables and maps for each Management Area are presented in Appendix 1.*

Summary tables of beaches sorted alphabetically by location name and sorted by beach number are given in Appendices 4 and 5, respectively, along with the estimates of beach area.

4.3 Summary of Beach Data

4.3.1 Area 21

Three beaches (67 ha) were identified in Area 21, shown in Appendix Fig. 1.1. The beaches range from 6 to 44 ha (Appendix Table 1.1).

4.3.2 Area 123

Three beaches (49 ha) were identified in Area 123; two beaches in Pachena Bay and one in Keeha Bay. The beaches range from 4 to 27 ha (Appendix Table 1.2).

4.3.3 Area 23 - Barkley Sound

There are 103 beach locations identified in Area 23 for 372 ha (Appendix Table 1.3). Five figures are presented (Appendix Figs. 1.3.1 to 1.3.5). Beach areas range from <1 ha to 57 ha. Most of the beaches (98) are small, "pocket" beaches less than 10 ha in area (Appendix Table 1.3).

4.3.4 Area 24 - Clayoquot Sound

There are 46 beaches identified in Area 24 for 176 ha. Five figures are presented (Appendix Figs. 1.4.1 to 1.4.5). The beaches are all relatively small with areas ranging from <1 to 14 ha. It is important to note that Area 24 has supported 34% of the total WCVI intertidal clam production, 49% of butter clam production, 33% of littlenecks, 34% of Manilas and 22% of mixed for WCVI (Table 6).

4.3.5 Area 25 - Nootka, Esperanza

There are 77 beaches identified in Area 25 for 247 ha (Appendix Table 1.5). The beaches are shown on five figures (Appendix Figs. 1.5.1 to 1.5.5). They range in size from <1 to 22 ha. Area 25 has supported 27% of the total WCVI intertidal clam production, 8% of butter clam production, 22% of littlenecks, 30 % of Manilas and 34 % of mixed for WCVI (Table 7).

4.3.6 Area 26 - Kyuquot

There are 40 beaches identified in Area 26 for 231 ha (Appendix Table 1.6). Six figures show the clam beaches (Appendix Figs. 1.6.1 to 1.6.6). Most are relatively small beaches, with areas ranging from <1 to 37 ha. Area 26 has supported only 12% of the total WCVI intertidal clam production, 16% of butter clam production, 3% of littlenecks, 12 % of Manilas and 8 % of mixed for WCVI (Table 8).

4.3.7 Area 27 - Quatsino

There are 54 beaches identified in Area 27 for 540 ha (Appendix Table 1.7). Five figures are presented for clam beaches in this area (Appendix Figs. 1.7.1 to 1.7.5). The beaches are relatively small, with areas ranging from <1 to 39 ha. In spite of the large total area, 35% of the WCVI beach area, Area 27 has supported less than 2% of the total WCVI intertidal clam production, 0.2% of butter clam production, 4% of littlenecks, 2 % of Manilas and 1 % of mixed for WCVI (Table 9).

Area 27 should be assessed for its potential clam stocks. It may be an area to be considered for clam culture. The natural dispersal of Manila clams has been restricted by natural physical and oceanographic effects (Bourne 1982).

5.0 DISCUSSION

There are a large number (326) of small beaches identified and probably a number of small locations missed in this inventory. Approximately 1672 ha of beach was identified, but the clam bearing portions of the beaches are much less. There has been a long traditional use of the beaches by First Nations and 16 beaches (102 ha) have been closed to commercial fishing for harvest for food, social and ceremonial purposes.

The testing for PSP and ASP is essential on the WCVI by the testing of mussels from stations along the coast. There are few fecal contaminated closures on the WCVI, relative to inside waters of the Strait of Georgia. There is a prohibited harvest area in Ucluelet Harbour.

Some intertidal clam stocks may be threatened by the increase in sea otters on the WCVI.

5.1 Recommendations

1. Additional resource inventories are required to identify butter clam beaches specifically. It may be important to document the distribution of razor clams and other species such as soft-shell clams.
2. A further analysis of the potential of beaches in Area 27 for clam culture is recommended.
3. Additional studies on the impacts of sea otters should be carried out.
4. Further studies are required on the growth and recruitment of intertidal clams on the WCVI.

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Table 1. Common and scientific names of intertidal bivalve species exploited in British Columbia.¹

Class	Order	Family	Common Names	Scientific Names
Bivalvia	Heterodonta	Cardiidae	Cockle <i>Also known as:</i> Nuttall cockle heart cockle	<i>Clinocardium nuttallii</i> (Conrad, 1837)
"	"	Pharidae	Razor clam	<i>Siliqua patula</i> (Dixon, 1789)
"	"	Veneridae	Manila clam <i>Also known as:</i> Japanese littleneck	<i>Tapes philippinarum</i> (A. Adams & Reeve, 1850) <i>Also known as:</i> <i>Venerupis</i> and <i>Ruditapes</i>
"	"	Veneridae	Pacific littleneck <i>Also known as:</i> native littleneck rock cockle	<i>Protothaca staminea</i> (Conrad, 1837)
"	"	Veneridae	Butter clam	<i>Saxidomus giganteus</i> (Deshayes, 1839) <i>Also known as:</i> <i>Saxidomus gigantea</i>

¹Coan and Scott, 1997

Table 2. Annual commercial clam fishery landings (t) and landed values (\$000), 1951 to 1995, for British Columbia.

Year	LANDINGS (t)					LANDED VALUE (\$000)	TOTAL BC LANDINGS (t)
	Butter	Littleneck	Manila	Mixed	Razor		
1951	1,597	237	81	65	61	149	2,041
1952	2,490	224	184	65	57	222	3,020
1953	1,674	140	176	20	70	127	2,081
1954	1,314	66	204	5	123	104	1,712
1955	2,170	36	207	3	99	159	2,515
1956	1,454	14	99	*	108	102	1,676
1957	1,606	10	29	11	84	102	1,739
1958	987	18	15	6	75	65	1,101
1959	1,094	22	25	13	90	75	1,244
1960	1,800	41	6	23	101	133	1,971
1961	857	46	48	34	104	76	1,089
1962	1,533	92	69	43	77	139	1,813
1963	1,144	59	59	*	67	103	1,329
1964	570	69	26	1	48	59	714
1965	704	82	97	0	68	106	951
1966	831	105	149	1	35	125	1,121
1967	975	139	92	*	46	163	1,252
1968	399	91	164	15	12	98	681
1969	378	107	81	7	8	85	581
1970	792	144	79	15	18	184	1,049
1971	568	361	153	11	62	235	1,156
1972	645	631	265	1	17	382	1,559
1973	298	207	134	0	76	196	715
1974	531	328	182	0	69	383	1,110
1975	746	236	158	6	27	333	1,173
1976	655	173	199	70	82	340	1,179
1977	649	209	394	59	78	545	1,389
1978	383	159	753	245	47	834	1,587
1979	613	273	251	374	101	916	1,612
1980	760	358	288	151	75	1,001	1,632
1981	119	179	318	161	30	737	806
1982	102	242	598	155	68	1,135	1,165
1983	77	324	1,048	279	31	1,723	1,759
1984	130	294	1,677	410	100	2,757	2,610
1985	251	191	1,913	477	90	3,288	2,922
1986	158	284	1,893	371	142	3,801	2,848
1987	68	373	3,607	87	142	6,775	4,277
1988	134	290	3,909	27	155	7,770	4,515
1989	92	433	2,764	159	117	6,955	3,565
1990	109	465	1,456	339	114	5,279	2,483
1991	42	201	982	137	117	3,302	1,479
1992	132	116	914	124	55	2,861	1,341
1993	102	131	1,059	133	44	3,371	1,469
1994	174	94	1,376	88	105	4,410	1,838
1995**	101	140	1,292	3	140	4,724	1,677
Total:	32,010	8,433	29,472	4,193	3,434	66,429	77,516
% of BC Total:	41%	11%	38%	5%	4%		

* Less than 500 kg.

** 1995 values are preliminary.

Years 1957-69 from Quayle and Bourne (1972).

Years 1970-95 from sales slip records. 1992 to 1995 include depuration (Areas 14, 17 18, 19, 20) and Aboriginal licenced harvest (Area 7) from industry catch reports.

Table 3. Annual landings (tonnes) of intertidal clams from the west coast of Vancouver Island (Areas 21 to 27) as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total WCVI Landings
1951					
1952					
1953	2	0.2			3
1954		0.4			0.4
1955	113				113
1956	17				17
1957	53				53
1958					
1959	19				19
1960	3				3
1961	4			8	12
1962	43			11	54
1963	115	0.5			115
1964 ¹	26	14	3		44
1965	11	38	56		104
1966	12	56	128	1	196
1967	0.9	49	23		73
1968	0.5	11	31		43
1969	10	2	8		19
1970	15	8	0.1		23
1971	6	7	9		22
1972	3	43	9		55
1973		11	4		15
1974		5	19		24
1975	3	21	84	3	112
1976		20	25	12	58
1977		4	49	5	58
1978	1	5	32	1	39
1979		8	23		31
1980	10	87	36		133
1981		10	16	3	30
1982		17	130	2	148
1983	1	16	240	17	274
1984	3	35	378	73	489
1985		12	548	59	619
1986*	4	21	378	27	430
1987	13	25	728	11	776
1988	3	21	836	2	862
1989		43	651	1	695
1990		13	294	55	362
1991		4	135	0.4	139
1992	2	1	178	1	182
1993		1	144		145
1994	1	1	249	0.2	252
¹ 1995	2	5	351	0.8	359
Total:	496	614	5,795	292	7,198
% of WCVI Total:	7%	9%	81%	4%	

* Area 23 was closed in 1986 due to conservation concerns.

¹Totals include 8 t of landings recorded in error from Area 22, but likely from some other WCVI area.

Table 4. Annual landings (tonnes) of intertidal clams from Area 21¹, as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total Landings
1951					
1952					
1953					
1954					
1955					
1956					
1957					
1958					
1959					
1960					
1961					
1962					
1963					
1964					
1965					
1966					
1967		0.1			0.1
1968					
1969					
1970					
1971					
1972					
1973					
1974					
1975					
1976					
1977					
1978					
1979				*	
1980					
1981				0.1	0.1
1982				*	
1983					
1984			*	*	
1985					
1986				*	
1987		0.1	0.1	*	0.2
1988			0.3		0.3
1989	*	0.2	*		0.2
1990					
1991					
1992					
1993					
1994					
1995					
Total:	0.0	0.4	0.4	0.1	0.9
% of Total:	0%	46%	43%	11%	

* Less than 500 kg.

¹These landings may be from errors on the fish slips and may be from another area.

Table 5. Annual landings (tonnes) of intertidal clams from Area 23, as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total Landings
1951					
1952					
1953					
1954					
1955	104				104
1956					
1957					
1958					
1959					
1960					
1961					0
1962					0
1963	3				3
1964	2	14	3		19
1965	5	38	56		98
1966	7	55	128		189
1967	1	49	23		73
1968	0.4	12	31		43
1969		0.3	8		8
1970					
1971		2			2
1972		4			4
1973		0.5			1
1974			19		19
1975		6	73	3	82
1976		3	23	12	38
1977		1	19	4	24
1978		2	20		22
1979		0.5	5		6
1980					
1981					
1982					
1983		8	83	5	96
1984		27	27	68	122
1985	0.1	1	30	9	41
1986			3	0.2	3
1987	10	0.7	115		125
1988		0.2	92		92
1989		2	182	0.1	184
1990		1	104	1	106
1991		0.1	12		13
1992		0.4	80		80
1993			3		3
1994		0.1	100		100
1995		0.7	64		65
Total:	132	228	1301	102	1763
% of Total:	7%	13%	74%	6%	

Table 6. Annual landings (tonnes) of intertidal clams from Area 24, as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total Landings
1951					
1952					
1953	2	0.2			3
1954					
1955	10				10
1956	17				17
1957	32				32
1958					
1959	19				19
1960	3				3
1961	4			8	12
1962	26			11	37
1963	59				59
1964	25				25
1965					
1966	5	1		1	7
1967					
1968					
1969	10	1			11
1970	14	3	0.1		17
1971					
1972		0.3			0.3
1973					
1974					
1975		1	2		3
1976			1		1
1977		1	29	1	31
1978	1	2	6		9
1979		8	18		26
1980	9	79	28		116
1981	0.4	7	9	3	20
1982		15	105	0.1	121
1983		2	112	10	124
1984		7	195	0.1	202
1985		10	248	16	273
1986		4	147	7	158
1987	0.3	8	210	0.6	219
1988		15	305	0.5	320
1989		21	129	0.4	151
1990		8	96	4	108
1991		3	40	0.1	43
1992	2	0.4	30	0.2	33
1993		0.5	56	*	57
1994	1	1	86	0.2	89
1995	0.4	2	100	0.8	103
Total:	241	201	1952	64	2458
% of Total:	10%	8%	79%	3%	

* Less than 500 kg.

Table 7. Annual landings (tonnes) of intertidal clams from Area 25, as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total Landings
1951					
1952					
1953					
1954					
1955					
1956					
1957	9				9
1958					
1959					
1960					
1961					
1962					
1963	10				10
1964					
1965	6				6
1966					
1967					
1968					
1969					
1970					
1971	5	4	9		18
1972	3	37	10		49
1973		8	3		11
1974		4			4
1975	3	14	9		26
1976		18	2		20
1977			1	1	2
1978			6	1	7
1979					
1980		2	4		6
1981		3	7	0.1	10
1982		1	17	2	21
1983	1	2	46	0.1	49
1984	0.4	1	81	5	87
1985		2	144	12	157
1986	4	12	198	17	231
1987		14	256	8	278
1988		2	255	1	258
1989		10	224	0.3	234
1990		2	89	50	140
1991		1	83	0.4	84
1992		0.4	68	0.4	69
1993		0.1	85		85
1994			64		64
1995		1	84		85
Total:	41	136	1743	99	2020
% of Total:	2%	7%	86%	5%	

Table 8. Annual landings (tonnes) of intertidal clams from Area 26, as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total Landings
1951					
1952					
1953					
1954					
1955					
1956					
1957	12				12
1958					
1959					
1960					
1961					
1962	17				17
1963	42	1			43
1964					
1965					
1966					
1967					
1968					
1969					
1970					
1971					
1972		1			1
1973					
1974		1			1
1975		1			1
1976					
1977		1			1
1978		1			1
1979					
1980		2	4		6
1981					
1982			2		2
1983					
1984	3	1	75		79
1985			99	21	120
1986		3	23	1	27
1987	3	2	123	2	129
1988	3	4	183	0.3	190
1989		1	95		95
1990			1		1
1991					
1992					
1993					
1994					
1995	2	2	103		107
Total:	82	19	705	24	830
% of Total:	10%	2%	85%	3%	

Table 9. Annual landings (tonnes) of intertidal clams from Area 27, as reported on sales slips, 1951 to 1995.

Year	Butter	Littleneck	Manila	Mixed	Total Landings
1951					
1952					
1953					
1954					
1955					
1956					
1957					
1958					
1959					
1960					
1961					
1962					
1963					
1964					
1965					
1966					
1967					
1968					
1969					
1970					
1971					
1972					
1973		3	1		4
1974					
1975					
1976					
1977					
1978					
1979					
1980	1	4			5
1981		0.3	0.3		1
1982			6		6
1983		4		2	6
1984				0.1	0.1
1985			28		28
1986		2	9	2	13
1987		1	24		24
1988			1		1
1989		10	22		31
1990		2	5		7
1991					
1992					
1993					
1994					
1995					
Total:	1	25	95	4	125
% of Total:	1%	20%	76%	3%	

Table 10. Summary of the number of clam beaches and beach areas (ha) for the west coast of Vancouver Island (WCVI).

Management Area	No. of Beaches	Area of Beaches	Range of Areas	No. of beaches by size ranges (ha)					
				< 10	10 to < 20	20 to < 30	30 to < 40	40 to < 50	50 to < 60
21	3	67.4	6.2 to 43.5	1	1	0	0	1	0
23	103	371.8	0.1 to 56.7	98	1	2	0	1	1
123	3	49.3	4.1 to 26.7	1	1	1	0	0	0
24	46	176.0	0.01 to 13.8	43	3	0	0	0	0
25	77	246.9	0.3 to 21.9	72	4	1	0	0	0
26	40	231.3	0.3 to 36.8	34	3	2	1	0	0
27	54	529.2	0.5 to 38.2	31	16	4	3	0	0
Total WCVI:	326	1671.9	< 1 to 57	280	29	10	4	2	1
% Total No. of Beaches:				85.9%	8.9%	3.1%	1.2%	0.6%	0.3%

Table 11. Measured beach area compared to harvestable clam area (ha) estimated from surveys 1981 to 1987 (Adkins and Harbo 1991; S. Heizer, pers com.).

Pacific Fishery Management			Clam.	No. Sites	Measured Beach	Est. Clam
Area	Subarea	Location Name	Beach No	Surveyed	Area (ha)	Harvestable Area (ha)
23	6	Vernon Bay	215,216	3	5.71	1.00
23	6	Usless Inlet	225,226,227,228	1	10.02	1.20
23	8	Pinkerton Islands	231 to 241	3	13.81	1.40
23	10	Hillier Island	549,727	4	27.98	2.40
23	10	Bazett Island	193	1	1.00	0.10
23	10	Stopper Islands	195	1	2.83	0.02
23	10	Cataract Creek	552	1	2.10	0.20
23	10	Lucky Creek	550	1	2.24	0.50
24	5	Whitepine Cove	260	1	8.24	3.00
24	10	Warn Bay	272	1	8.40	1.20
24	10	Mosquito Harbour	ptn. 258	1	<13.85	0.60
24	13	Sulphur Passage	276	1	3.01	1.60
24	3	Whiskey Jenny	275	1	5.97	4.30
24	14	Atleo River	675	1	6.02	3.00
25	14	Mary Basin	315	1	14.37	5.00
25	14	Mary Basin	316	1	17.15	8.00
25	14	Inner Basin (Head)	346	1	11.79	5.00
25	11	Nuchatlitz Creek	301	1	4.88	1.50

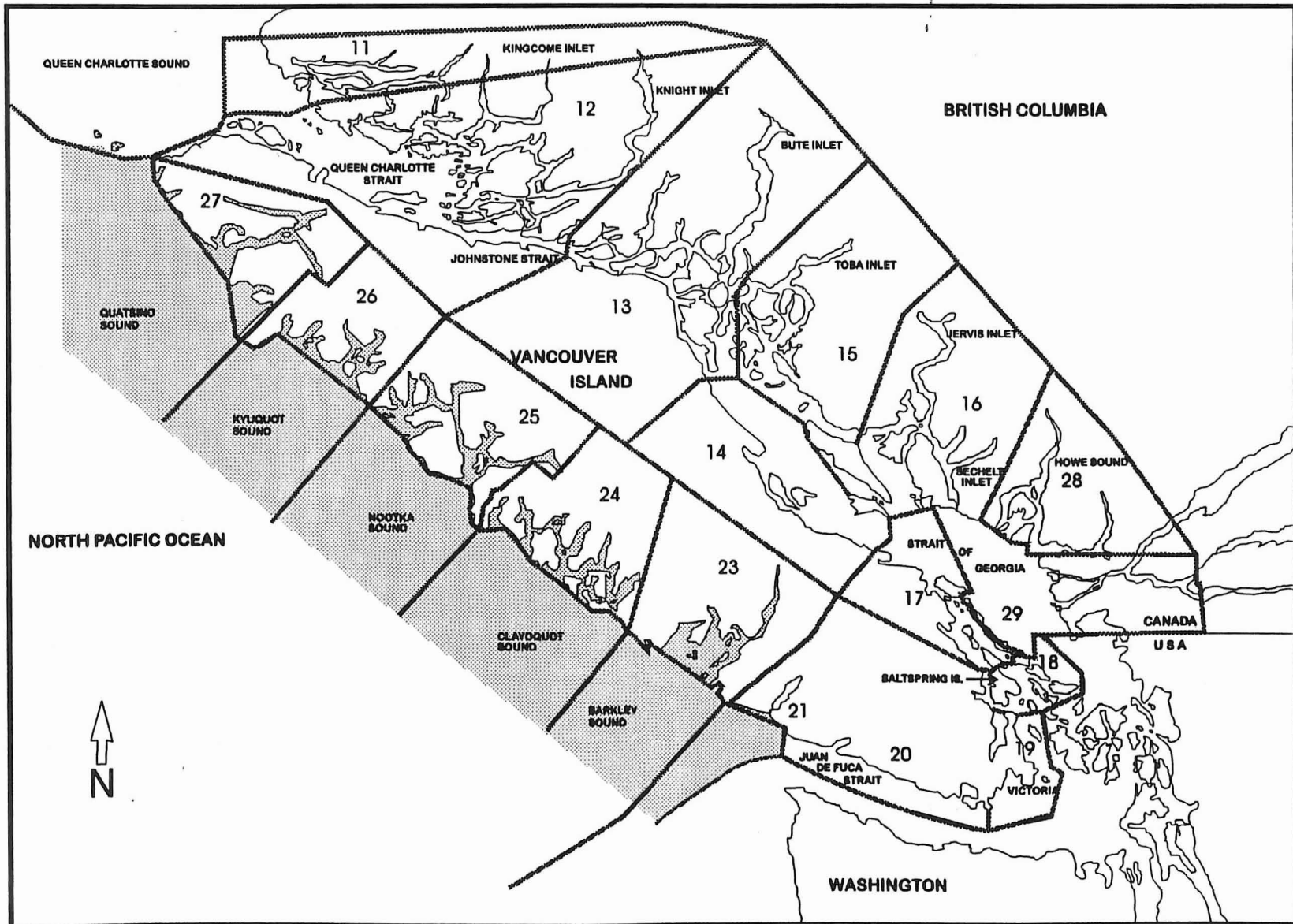


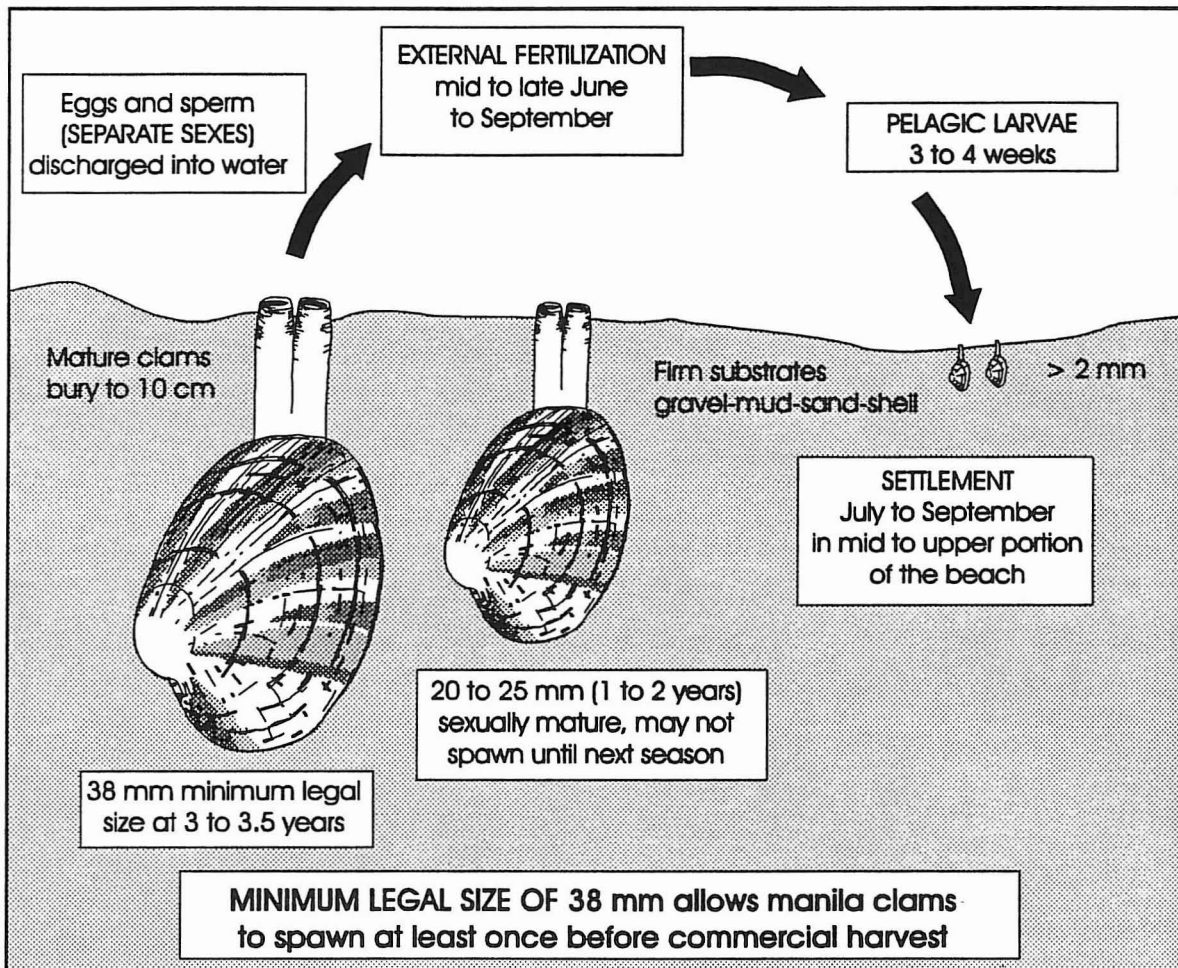
Figure 1. Pacific Fishery Management Areas 21 to 27, west coast of Vancouver Island.

MANILA CLAM

Manila clams, *Venerupis philippinarum* (A. Adams and Reeve, 1850), also called *Tapes philippinarum*, were accidentally introduced to BC with Pacific Oyster seed from Japan in the 1930's. This clam spread quickly in the Strait of Georgia and, in the 1950's, along the west coast of Vancouver Island. In the 1960's manila clams spread to the Queen Charlotte Strait area and, in the 1970's, to the central coast area as far north as Bella Bella.

Manila clam shells are longer than they are high and the clam has a distinct oblong shape. The shells are heavy with radiating ridges crossing the concentric growth rings. The external colour varies from a greyish-white, through yellowish-buff to brown, often with geometric patterns of black and white in the young. The internal surface is smooth and yellowish-white with deep purple at the siphon (posterior) end. The inside edge of the shell is smooth and distinct from that of the native littleneck, which has regular shallow notches along the edges of the shell. The tip of the siphon is split, unlike the native littleneck. Manila clams measure up to 7.5 cm in length at 14 years.

LIFE CYCLE OF THE MANILA CLAM (*Venerupis philippinarum*)



Clams of British Columbia

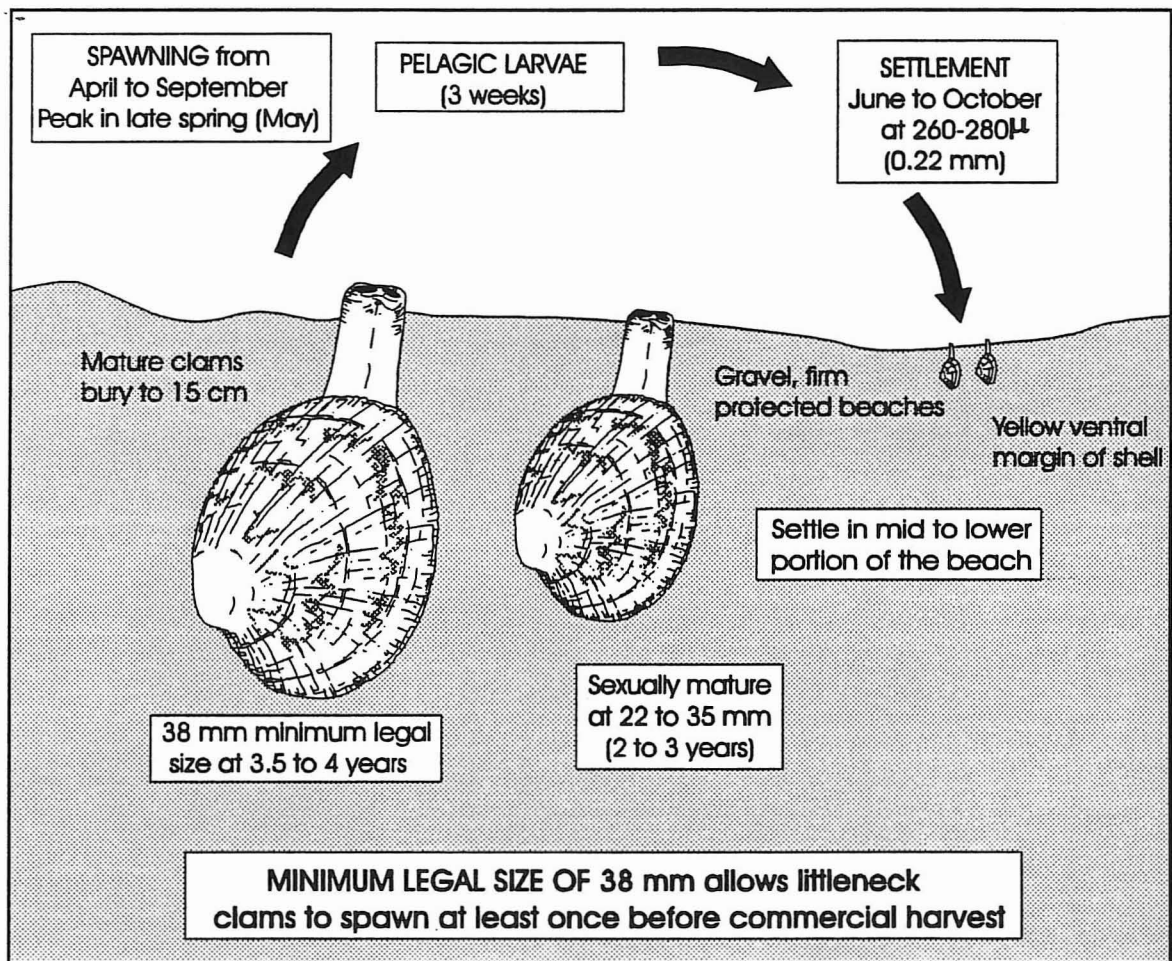
Figure 2. Life cycle of the Manila clam.

LITTLENECK CLAM

Littleneck clams, *Protothaca staminea* (Conrad, 1837), are medium size intertidal clams that may attain a shell length of 75 mm and ages to 14 years.

Littleneck shells are thick, oval to round with strong radiating ribs and less prominent concentric ridges. The external colour may vary from white to chocolate brown, often with angular patterns. The internal surface is smooth and white with fine notches on the margin. Unlike the manila clam, the siphon tips are fused.

LIFE CYCLE OF THE LITTLENECK CLAM (*Protothaca staminea*)



Clams of British Columbia

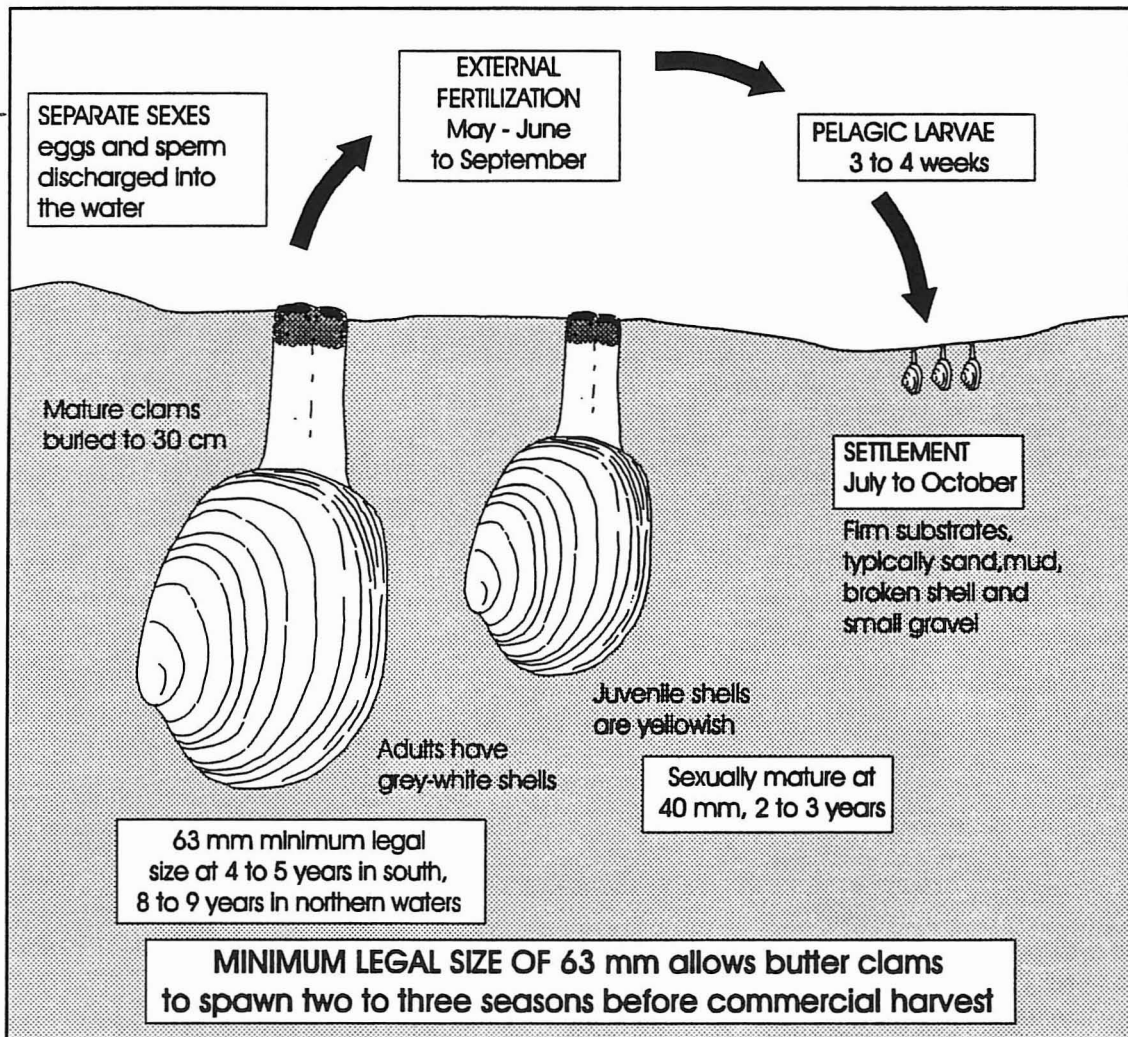
Figure 3. Life cycle of the littleneck clam.

BUTTER CLAM

Butter clams, *Saxidomus gigantea* (Deshayes, 1839), are large intertidal clams that may attain a shell length of 130 mm and ages to 20 years. They form the greatest biomass of intertidal clams in British Columbia.

The shells are heavy and square to oval in shape. There is a strong prominent external hinge ligament. The exterior is gray-white (yellow in juveniles) with prominent concentric striations and deep winter checks. The internal surface is a dull white and smooth with large indented muscle scars. The siphon tips are black.

LIFE CYCLE OF THE BUTTER CLAM (*Saxidomus gigantea*)



Clams of British Columbia

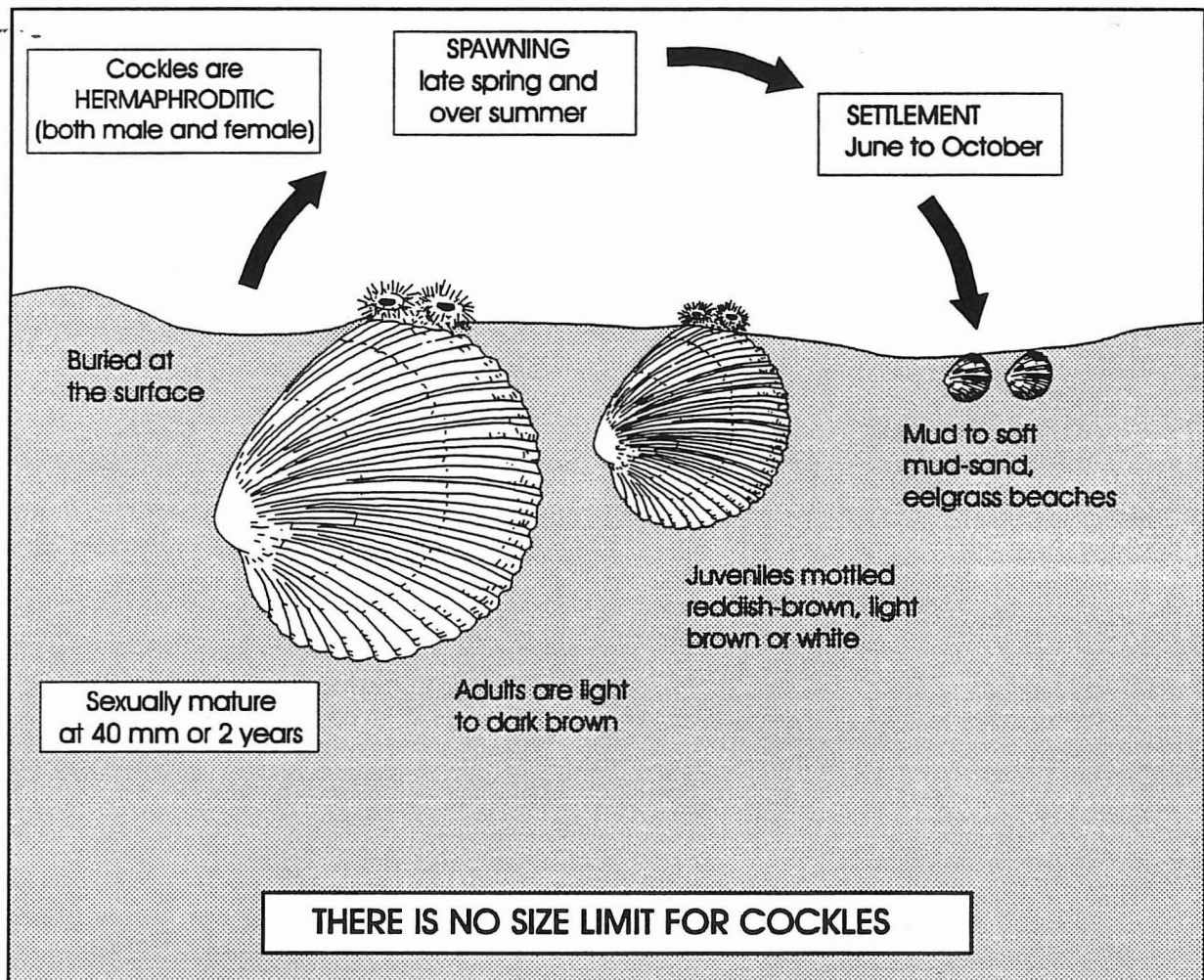
Figure 4. Life cycle of the butter clam.

COCKLE

Cockles, *Clinocardium nuttallii* (Conrad, 1837), are medium size with shell lengths to 140 mm and ages generally to 7 years, but some grow as old as 16 years. They are generally found in soft substrates in the lower intertidal zone and subtidally to 30 m.

The shells are thick with 34 to 38 prominent radial ribs and less prominent concentric growth rings. The exterior of adult shells are light to dark brown and juveniles have a mottled reddish brown, light brown or white colour. The internal surface of the shell is chalky white.

LIFE CYCLE OF THE COCKLE (*Clinocardium nuttallii*)



Clams of British Columbia

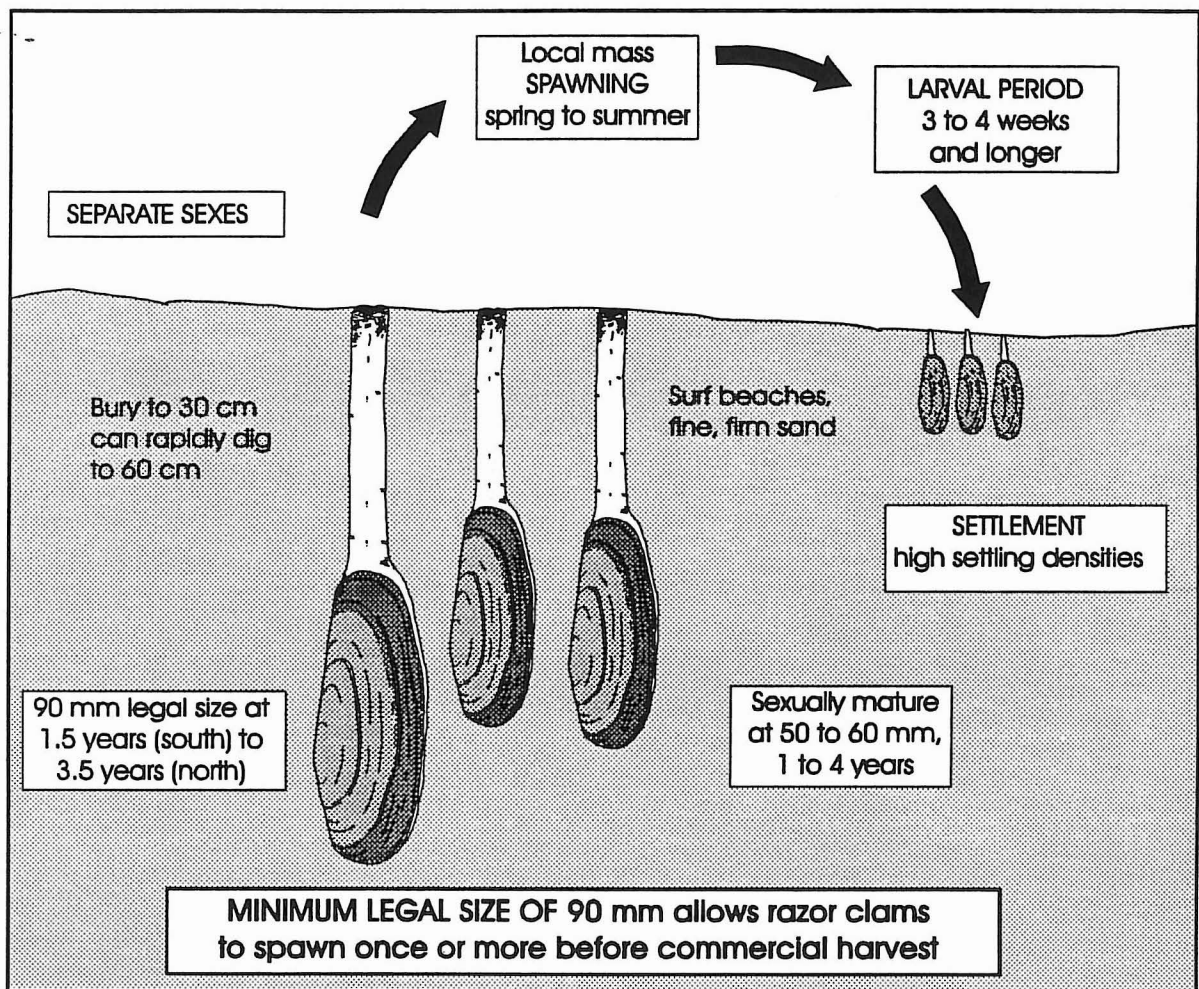
Figure 5. Life cycle of the cockle.

PACIFIC RAZOR CLAM

Razor clams, *Siliqua patula* (Dixon, 1789), are medium size intertidal clams that may attain a shell length of 180 mm and ages to 19 years.

Razor clam shells are thin, flat, long and narrow in shape. The exterior is covered with a glossy periostracum, olive green to dark brown. The interior of the shell is glossy white, often with a tinge of purple along the margin, with a prominent rib extending from the hinge area to the lower margin. The siphons create unique "shows" on the surface of the sand.

LIFE CYCLE OF THE PACIFIC RAZOR CLAM (*Siliqua patula*)



Clams of British Columbia

Figure 6. Life cycle of the razor clam.

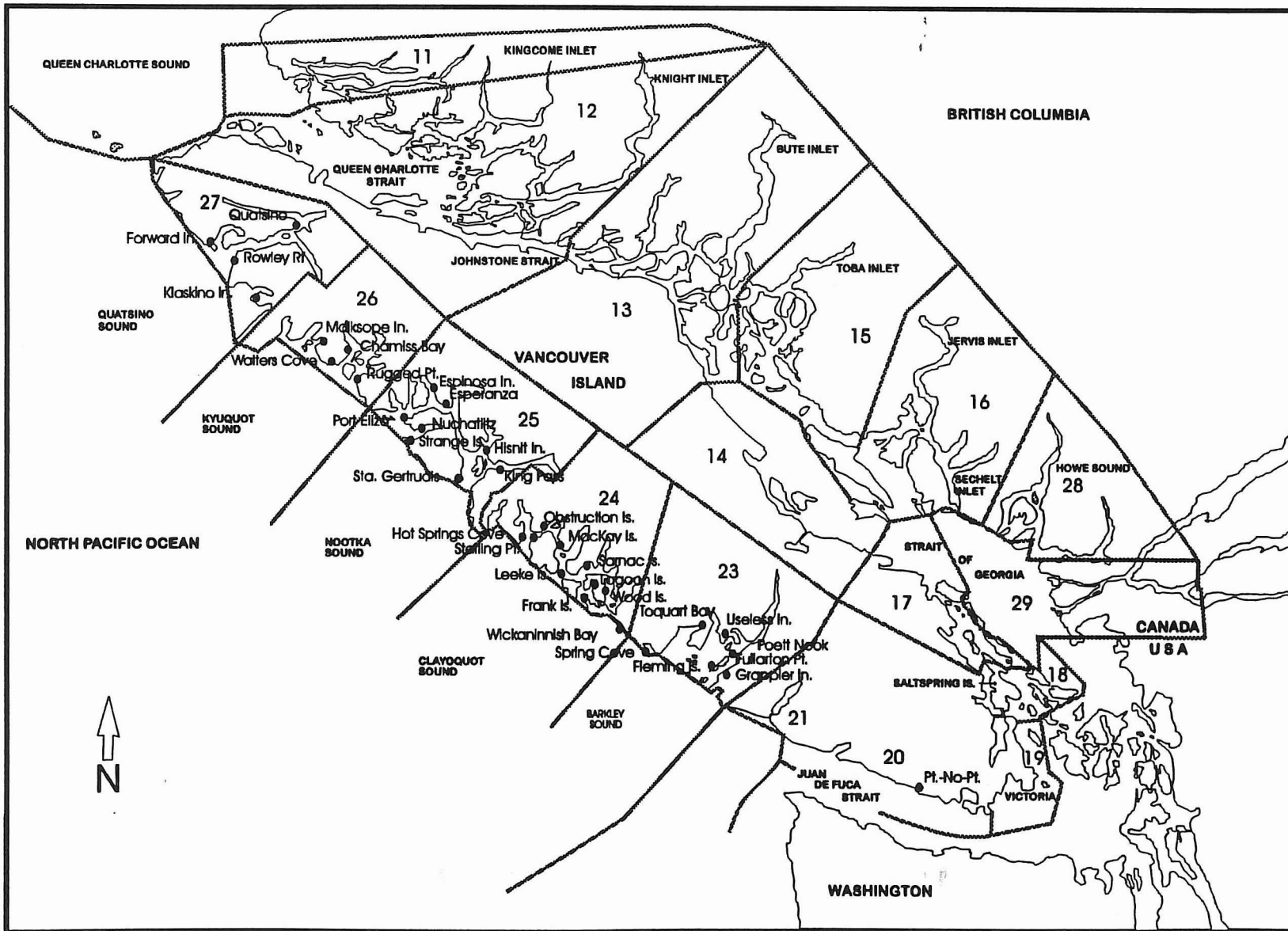


Figure 7. PSP monitoring stations in 1995 for the west coast of Vancouver Island.

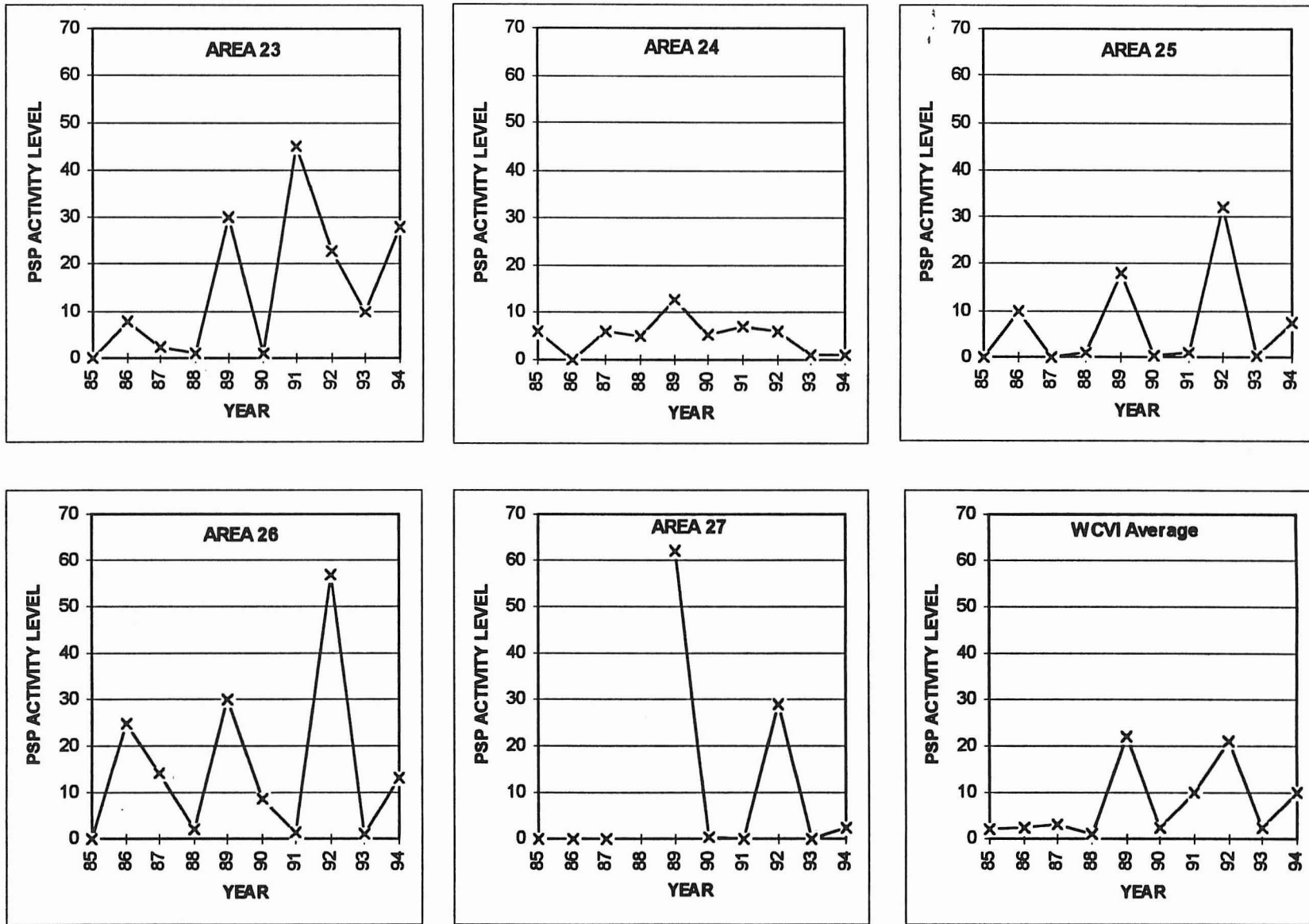


Figure 8. Annual PSP activities on the West Coast of Vancouver Island, 1984 to 1994. PSP levels shown are greater than 210 μ /100g.

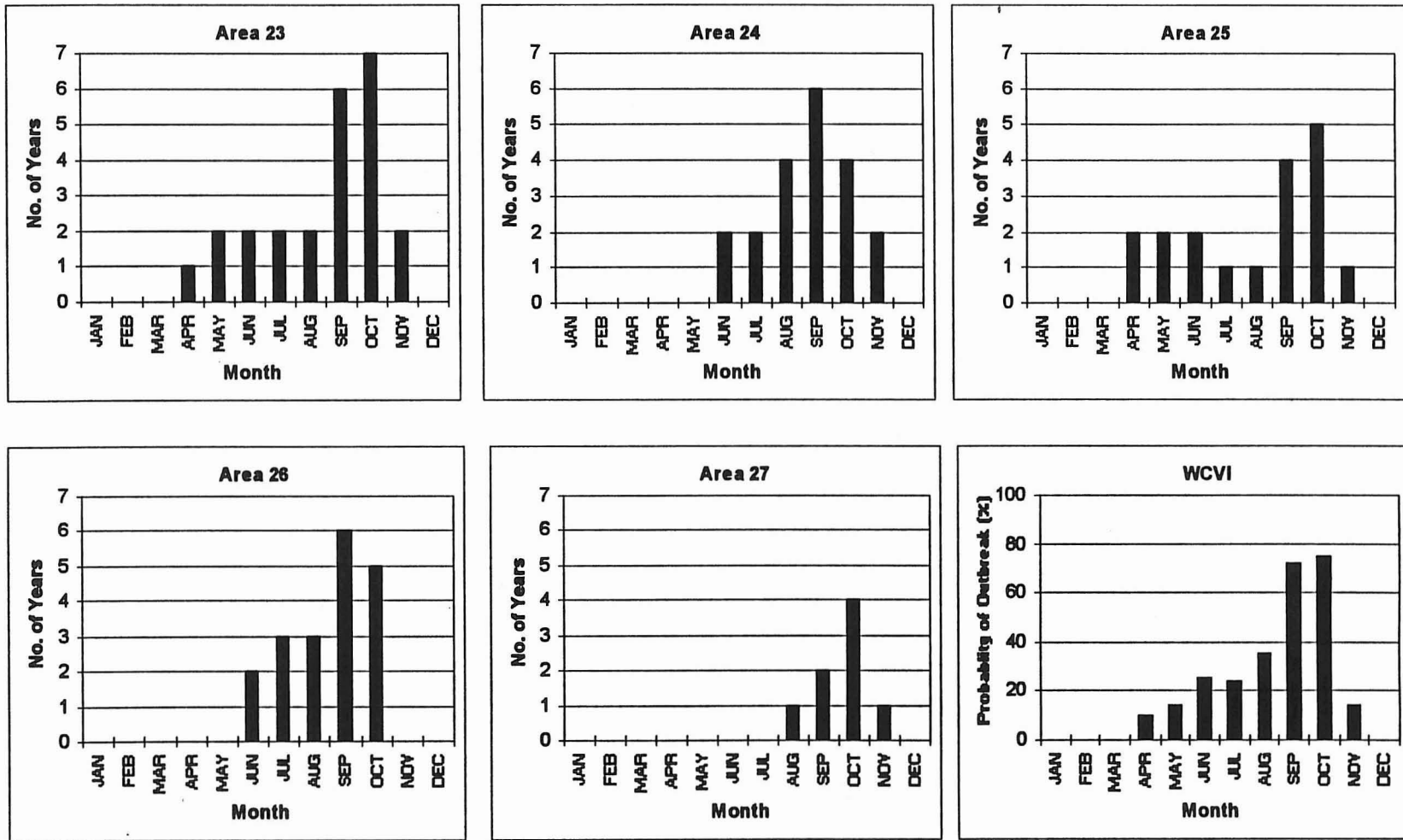


Figure 9. Average monthly PSP outbreaks on the west coast of Vancouver Island, 1988 to 1994. PSP levels are greater than $210 \mu/100g$.

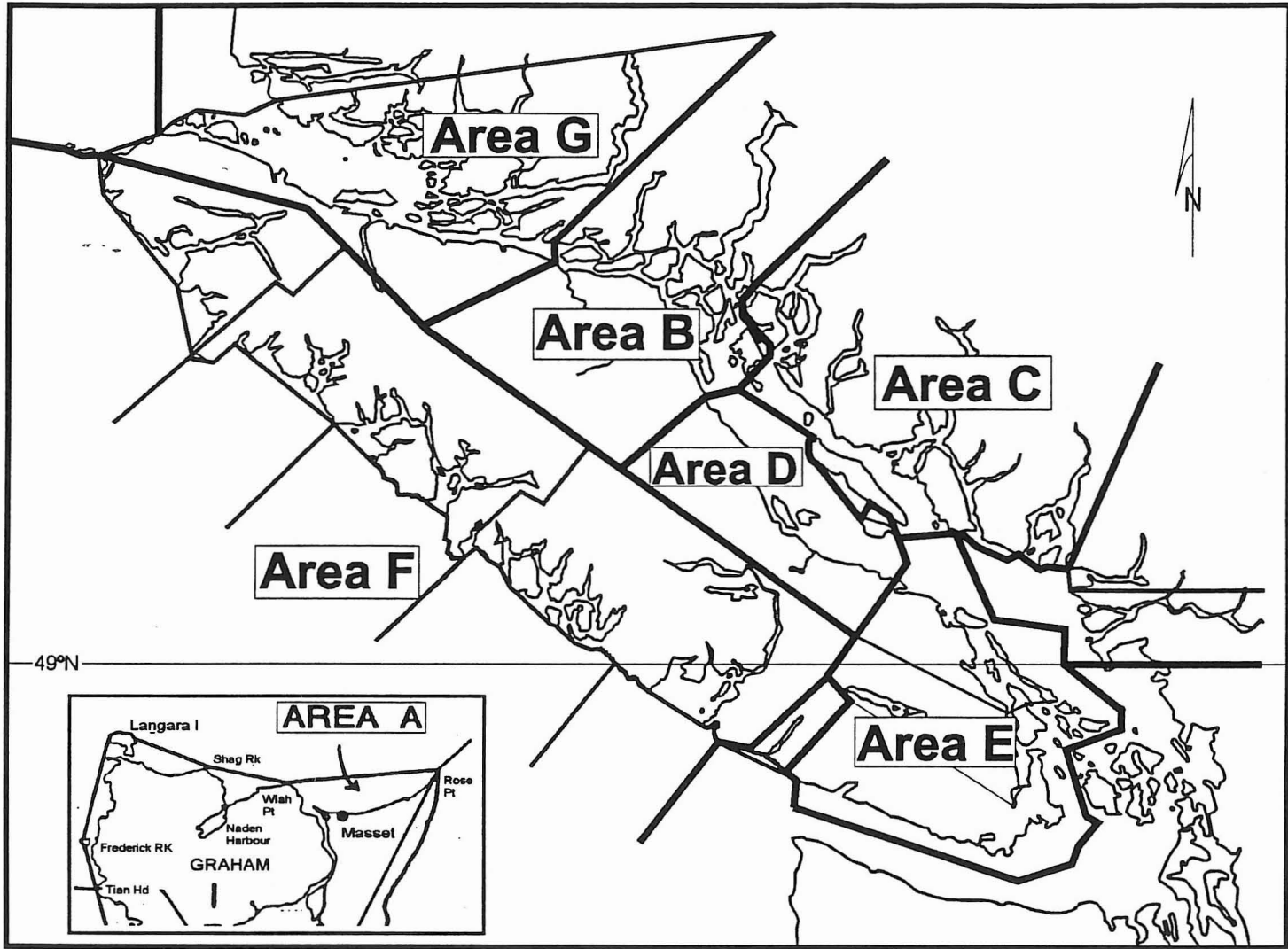


Figure 10. Commercial Clam Harvest Licence Areas (1997).

- A: North Coast
- B: Southern Johnstone Strait/Campbell River
- C: Sunshine Coast
- D: Upper Strait of Georgia

- E: Lower Strait of Georgia (revised 1997)
- F: West Coast of Vancouver Island
- G: Queen Charlotte Sound (revised 1992)

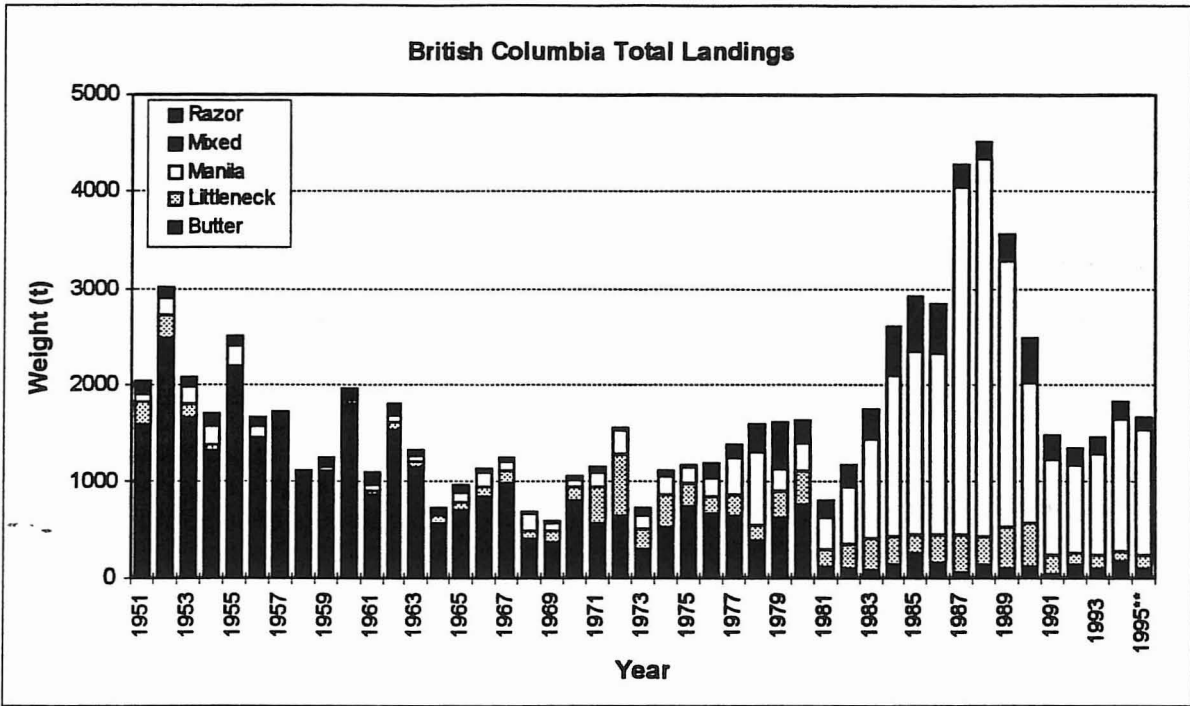


Figure 11. Landings (t) of intertidal clams from British Columbia, 1951 to 1995.

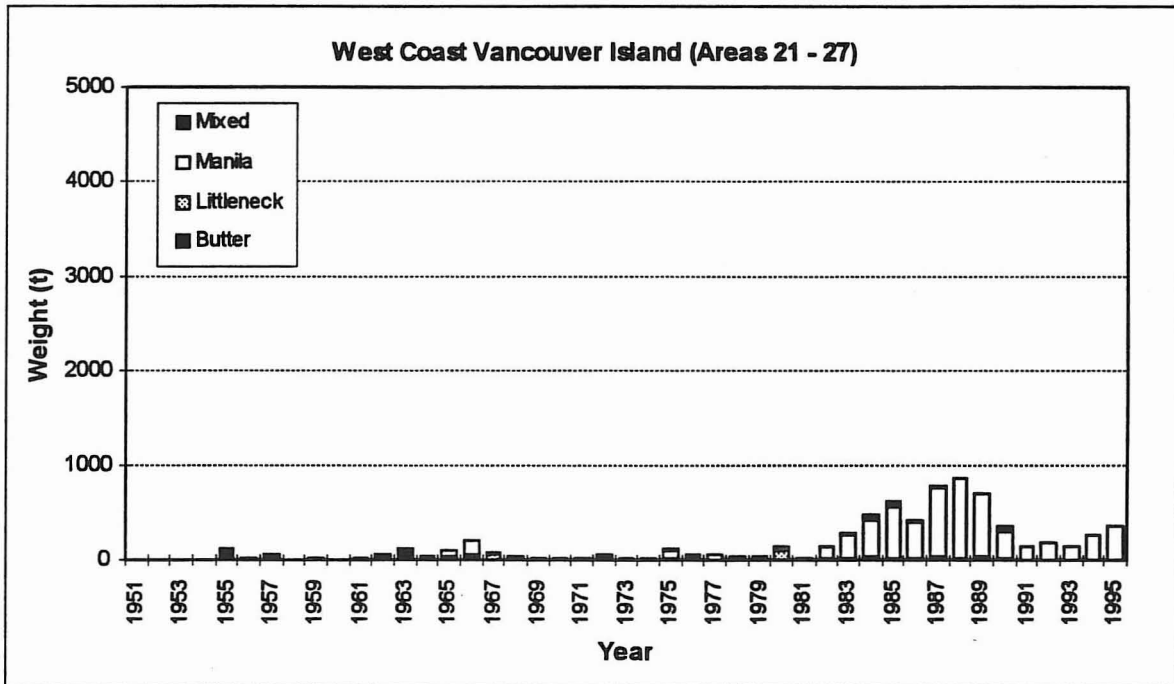


Figure 12. Landings (t) of intertidal clams from the west coast of Vancouver Island, Areas 21 to 27, 1951 to 1995.

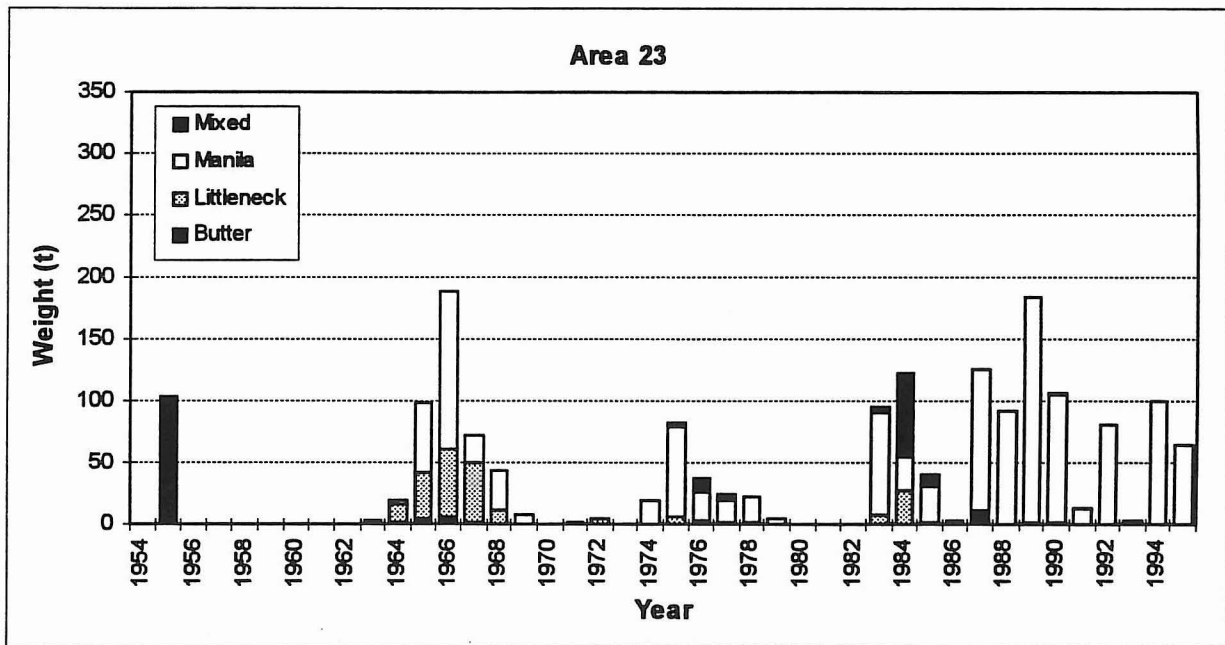
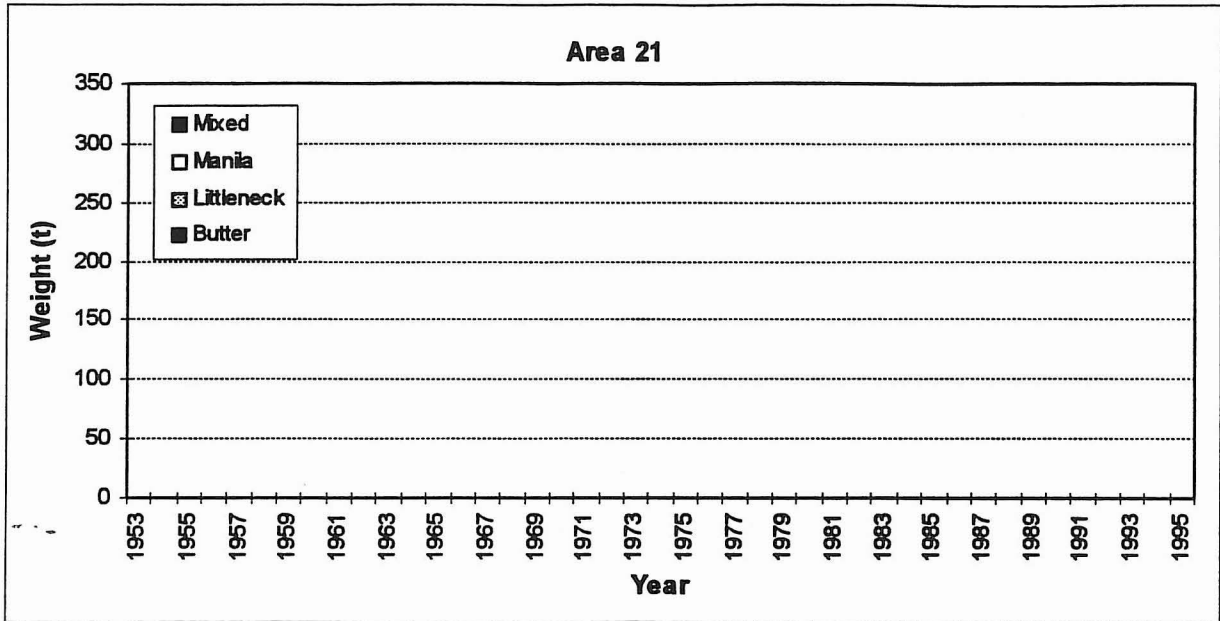


Figure 13. Landings (t) of intertidal clams, Areas 21 and 23, 1951 to 1995.

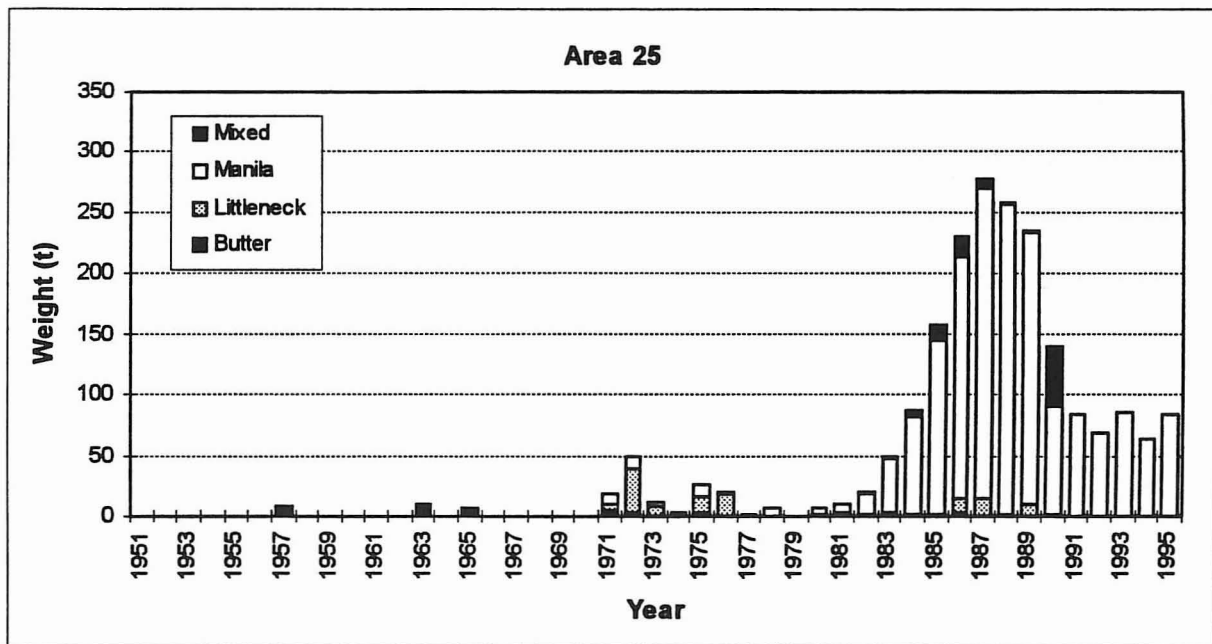
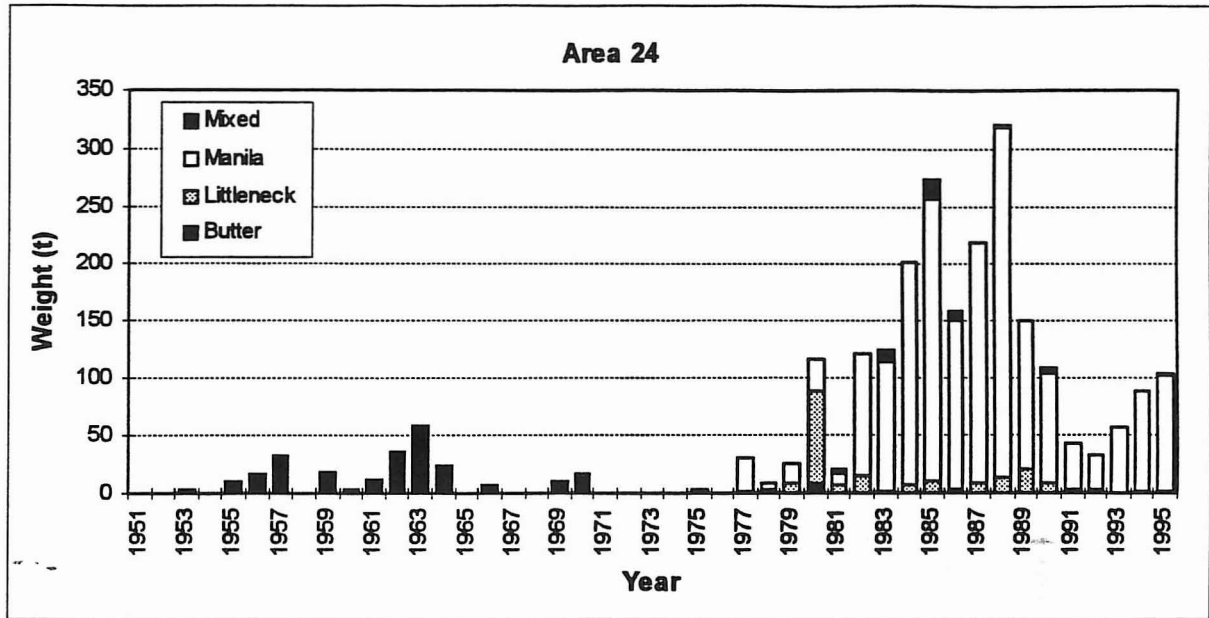


Figure 14. Landings (t) of intertidal clams, Areas 24 and 25, 1951 to 1995.

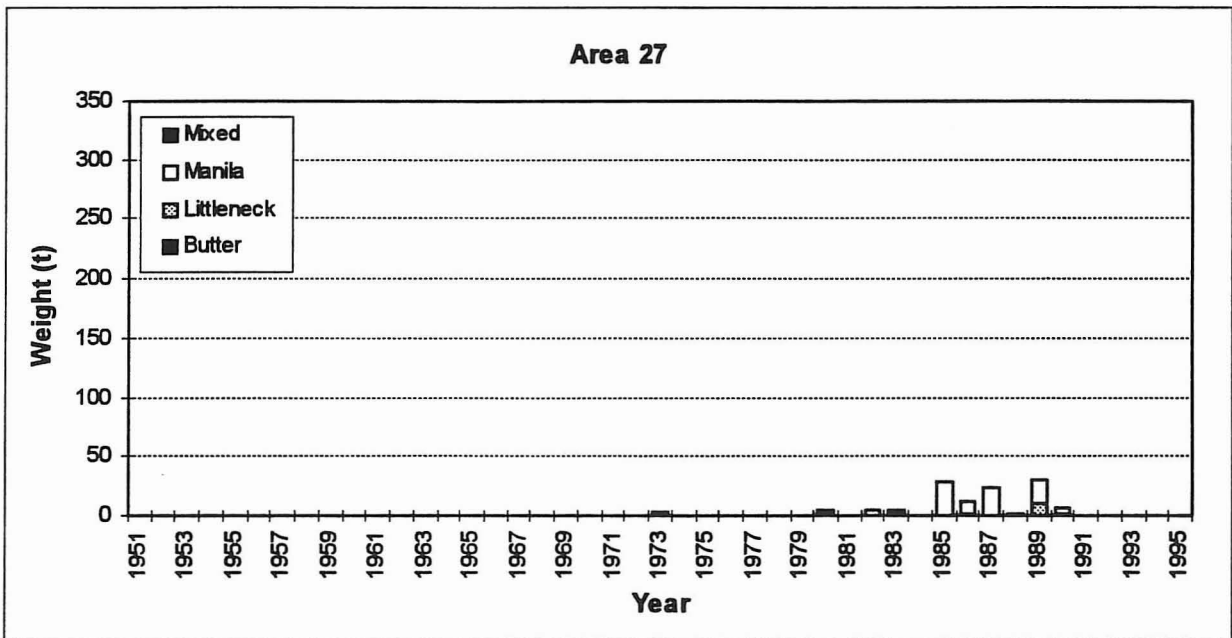
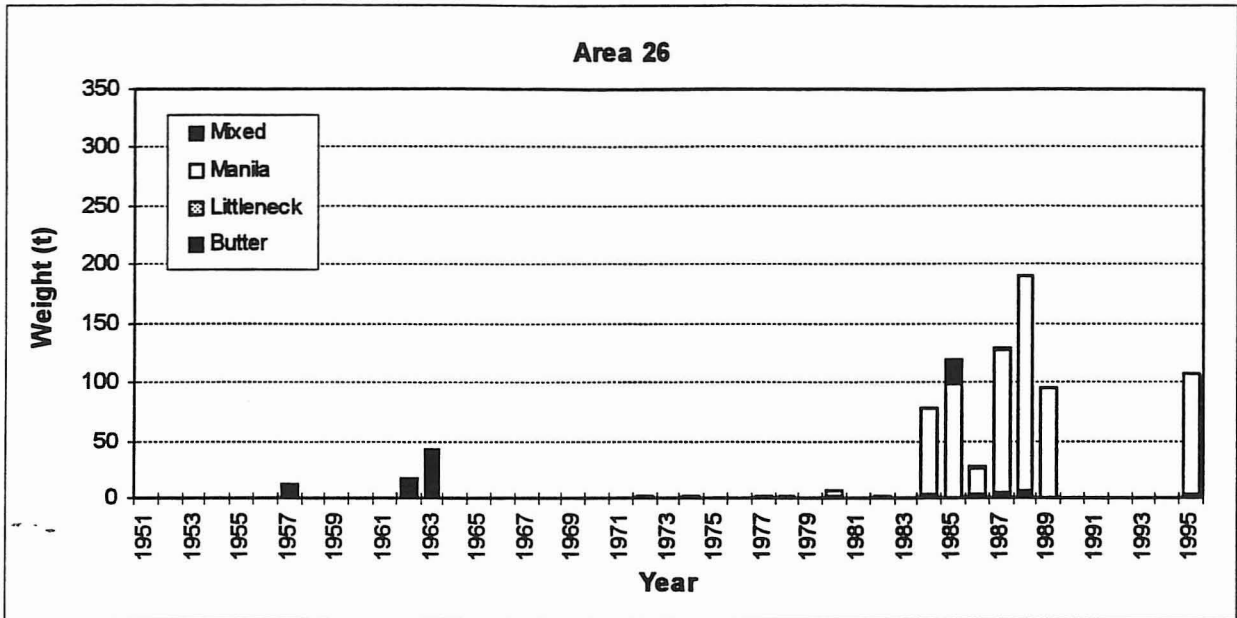


Figure 15. Landings (t) of intertidal clams, Areas 26 and 27, 1951 to 1995.

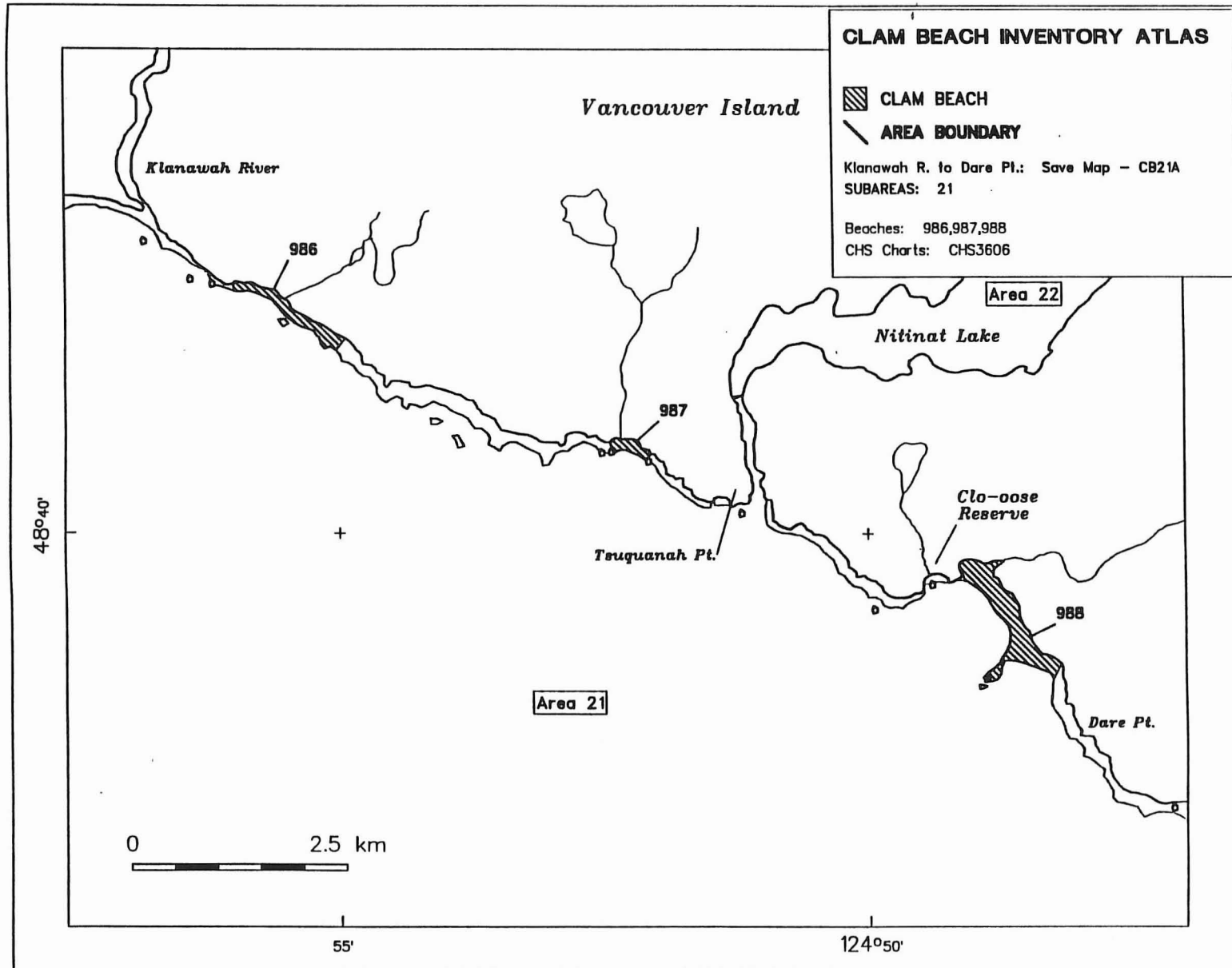
APPENDIX 1.
CLAM BEACH TABLES AND MAPS
AREAS 21 TO 27

Appendix Table 1.1. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 21.

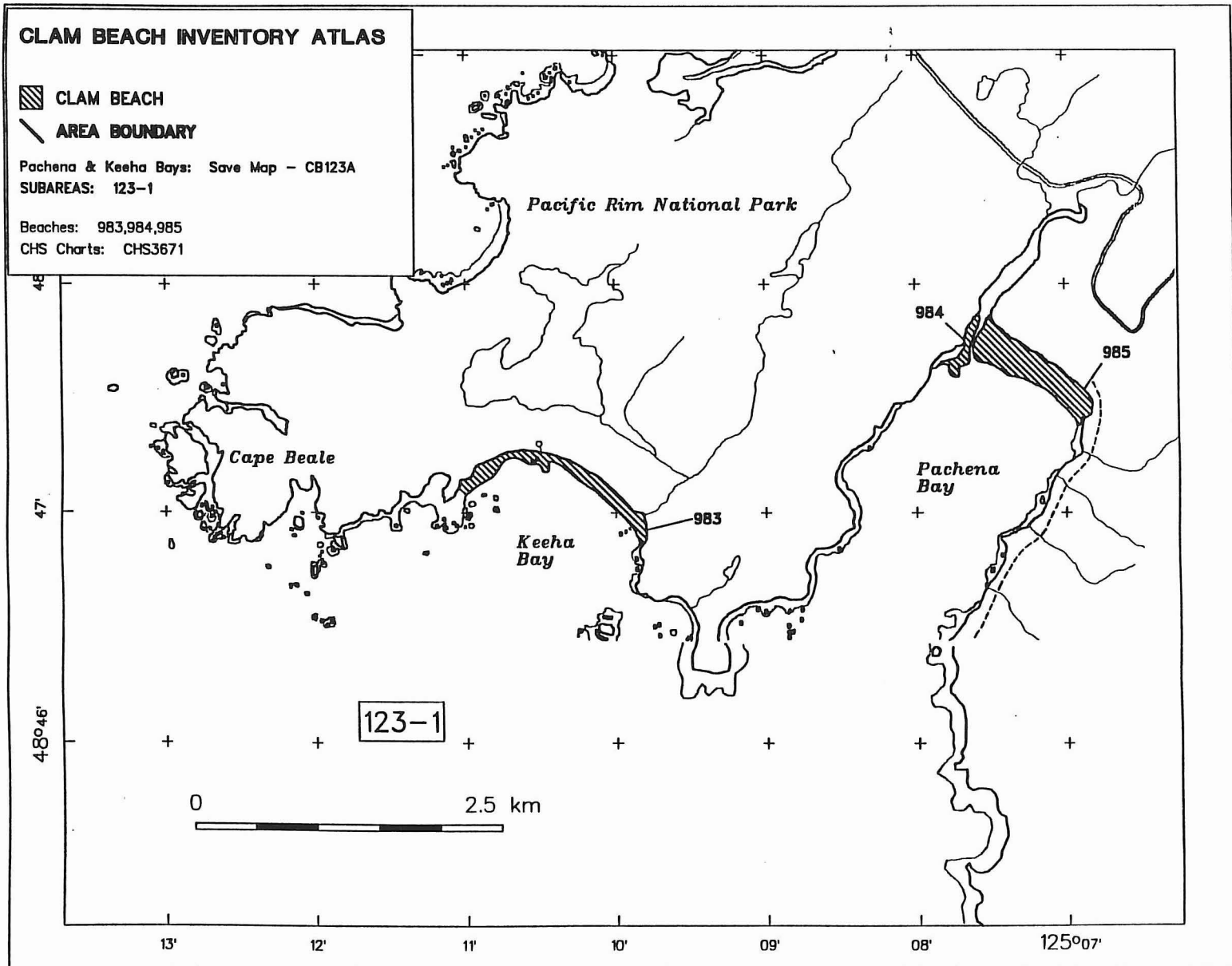
Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
21	0	986	Tsusiat Falls	17.63	
21	0	987	Tsuquanah I.R.	6.20	
21	0	988	Clo-oose Bay	43.56	
Total Beaches:		3	Total Beach Area:	67.39	

Appendix Table 1.2. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 123.

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
123	1	983	Keeha Beach	18.52	
123	1	984	Pachena Bay	4.16	
123	1	985	Pachena Beach	26.71	
Total Beaches:		3	Total Beach Area:	49.39	



Appendix Figure 1.1.



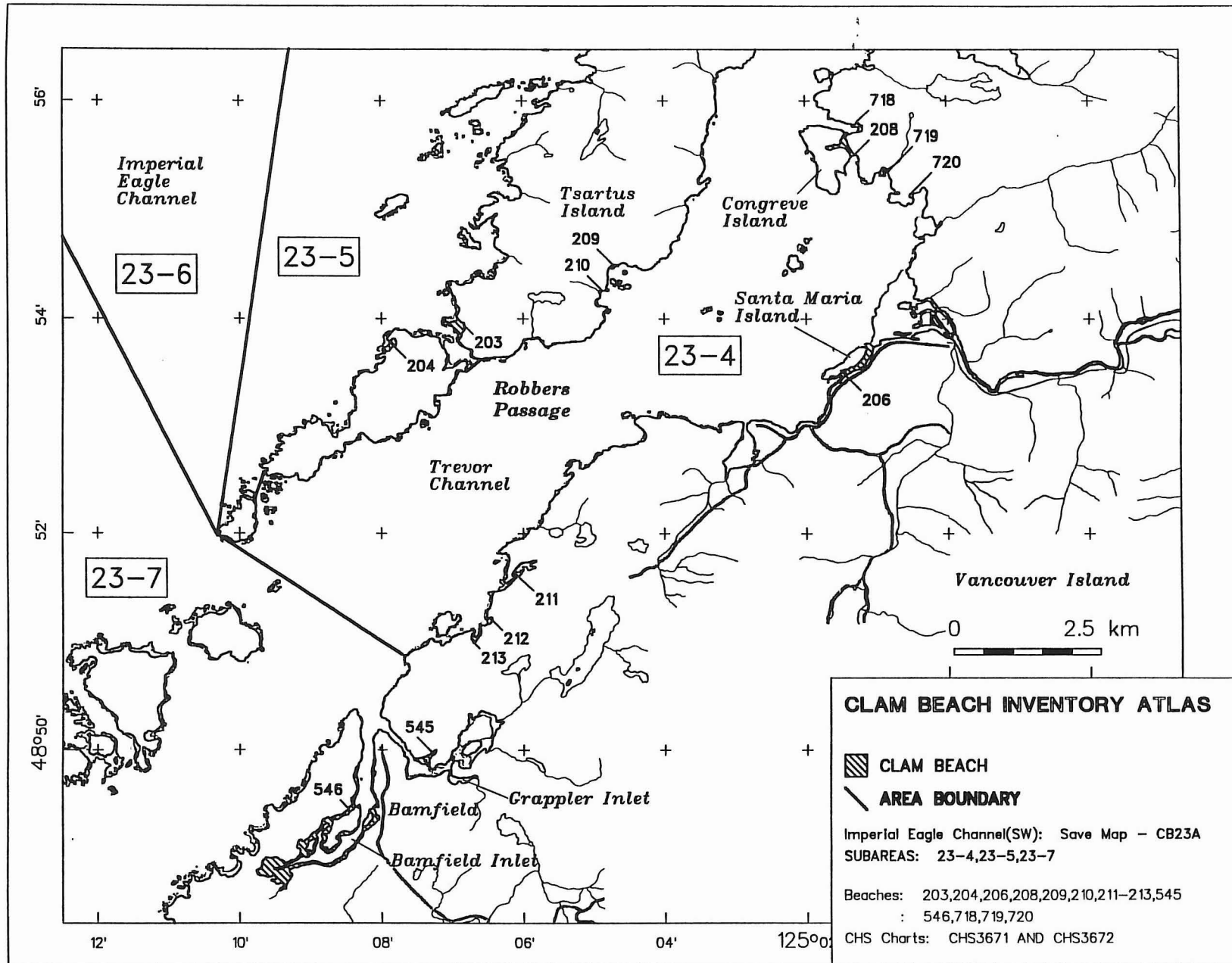
Appendix Figure 1.2.

Appendix Table 1.3. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 23.

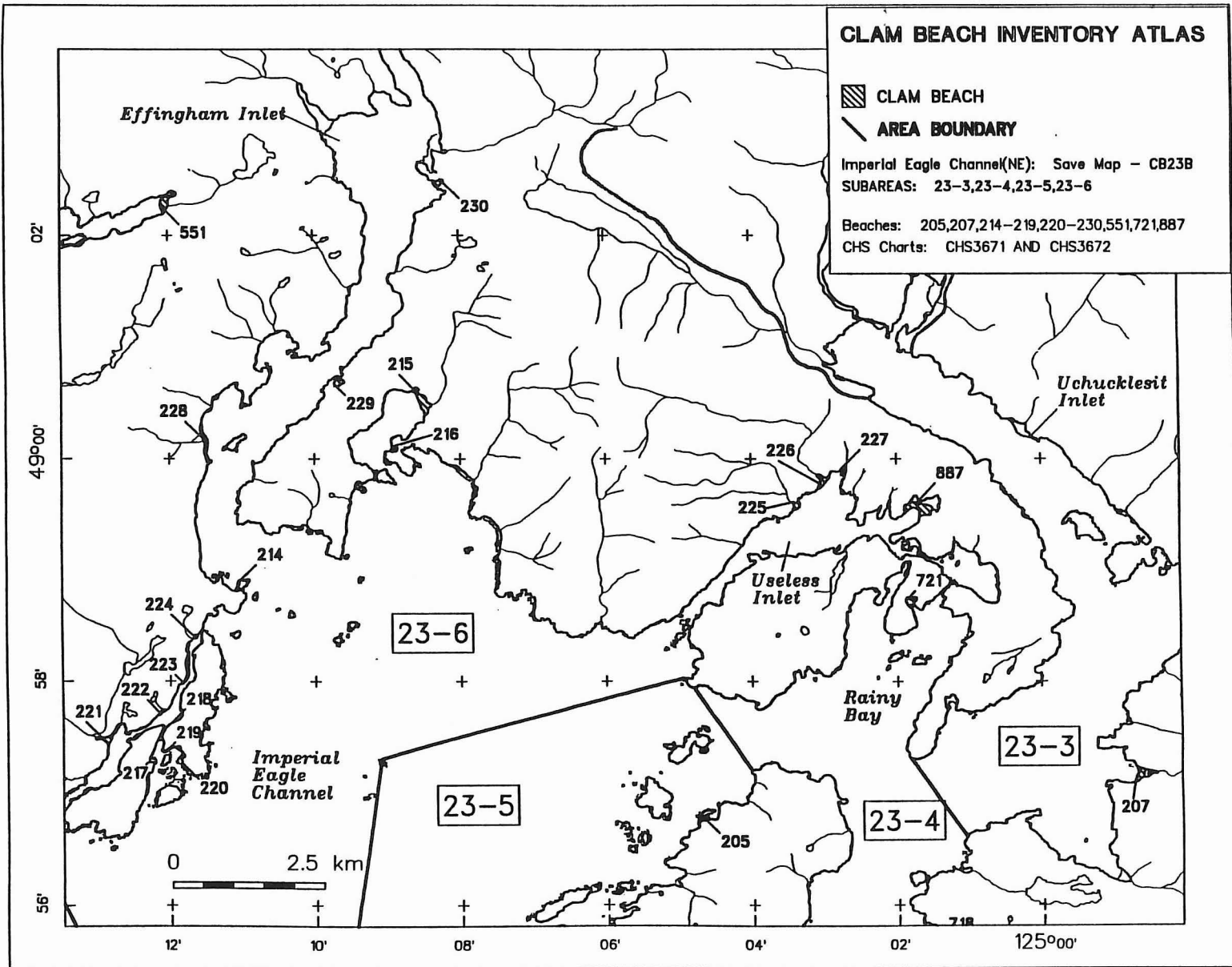
Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	3	207	Ritherson Bay	2.15	
23	4	718	Congreve Island, B	1.39	
23	4	719	Congreve Island, C	1.17	
23	4	720	Congreve Island, D	0.39	
23	4	721	Rainy Bay	0.76	
23	5	203	Robbers Passage	4.46	
23	5	204	Fleming Island	2.50	
23	5	205	Ahmah Island	1.43	
23	5	206	Santa Maria Island	8.44	
23	5	208	Congreve Island	4.79	
23	5	209	Sproat Bay	0.56	
23	5	210	Sproat Bay	0.17	
23	5	211	Roquefeuil Bay	1.68	
23	5	212	Roquefeuil Bay	0.73	
23	5	213	Roquefeuil Bay	1.55	
23	6	214	John Islet	1.25	
23	6	215	Vernon Bay	4.89	
23	6	216	Vernon Bay	0.82	
23	6	217	Alma Russell Islands	0.77	
23	6	218	Alma Russell Islands	1.08	
23	6	219	Alma Russell Islands	1.03	
23	6	220	Alma Russell Islands	1.17	
23	6	221	Julia Passage	2.52	
23	6	222	Julia Passage	0.38	
23	6	223	Julia Passage	2.28	
23	6	224	Julia Passage	0.36	
23	6	225	Useless Inlet	1.07	
23	6	226	Useless Inlet	2.03	
23	6	227	Useless Inlet	0.90	
23	6	228	Effingham Inlet	2.00	
23	6	229	Effingham Inlet	1.79	
23	6	230	Effingham Inlet	1.39	
23	6	887	Useless Inlet, D	6.02	
23	7	545	Grappler Inlet	3.37	
23	7	546	Bamfield Inlet	56.73	
23	8	231	Equis Beach	44.95	
23	8	232	Pinkerton Island	0.65	
23	8	233	Pinkerton Island	9.96	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	8	234	Pinkerton Island	0.28	
23	8	235	Pinkerton Island	0.82	
23	8	236	Pinkerton Island	0.34	
23	8	237	Pinkerton Island	0.47	
23	8	238	Pinkerton Island	0.26	
23	8	239	Pinkerton Island	0.40	
23	8	240	Pinkerton Island	0.45	
23	8	241	Pinkerton Island	0.18	
23	8	242	Hand Island	6.86	
23	8	243	Brabant Islands	1.45	
23	8	244	Brabant Islands	1.55	
23	8	245	Brabant Islands	1.10	
23	8	246	Brabant Islands	2.06	
23	8	247	Treble Island	1.43	
23	8	248	Nettle Island	0.48	
23	8	249	Nettle Island	0.51	
23	8	250	Nettle Island	2.53	
23	8	251	Nettle Island	0.79	
23	8	252	Nettle Island	0.95	
23	8	253	Effingham Island	1.56	
23	8	547	Pinkerton Island	1.51	
23	8	672	Canoe Island	0.44	
23	8	673	Canoe Island	4.40	
23	8	674	Canoe Island	0.86	
23	8	967	Effingham Bay	0.19	
23	8	968	Effingham Bay	0.35	
23	8	969	Effingham Bay	0.43	
23	8	970	Effingham Bay	0.76	
23	8	971	Jacques/Jarvis Lagoon	2.71	
23	8	972	Jacques/Jarvis Lagoon	8.55	
23	8	973	Joe's Bay - Turtle Island	1.59	
23	8	974	Trickett Island	2.62	
23	8	975	Trickett Island	4.13	
23	8	977	Dempster Island	1.88	
23	8	978	Prideaux Island	0.71	
23	8	979	Clarke Island	1.88	
23	8	980	Benson Island	0.90	
23	8	981	Wouwer Island	2.49	
23	8	982	Gibraltar Island	0.93	
23	9	548	Mayne Bay (N)	9.84	
23	9	723	Mayne Bay, A	1.58	

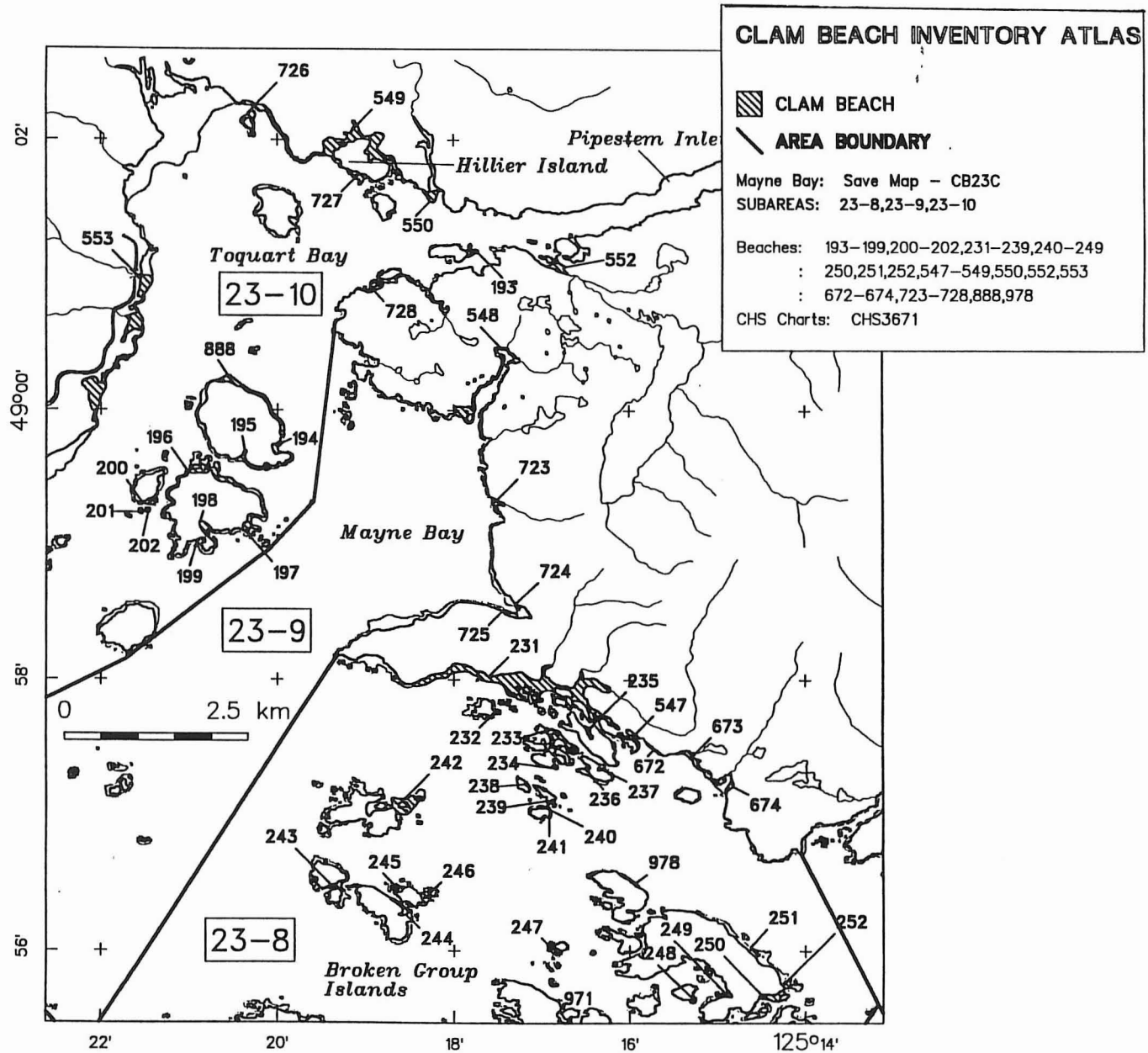
Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	9	724	Mayne Bay, B	0.32	
23	9	725	Mayne Bay, C	1.02	
23	10	193	Bazett Island	1.00	0.1
23	10	194	Stopper Island	1.35	
23	10	195	Stopper Island	2.83	0.2
23	10	196	Stopper Island	8.49	
23	10	197	Stopper Island	2.08	
23	10	198	Stopper Island	1.97	
23	10	199	Stopper Island	0.78	
23	10	200	Stopper Island	0.74	
23	10	201	Stopper Island	0.36	
23	10	202	Stopper Island	0.39	
23	10	549	Hillier Island	25.84	
23	10	550	Pipestem Inlet	2.24	0.5
23	10	551	Pipestem Inlet	3.50	
23	10	552	Pipestem Inlet	2.10	0.2
23	10	553	Toquart Bay	21.83	
23	10	726	Snowden Island (N)	1.51	
23	10	727	Hillier Island	2.14	
23	10	728	Harris Point	6.58	
23	10	888	Stopper Island	5.38	
23	11	554	Ucluelet	19.53	
23	11	555	Ucluelet	1.34	
23	11	556	Ucluelet	5.72	
Total Beaches:		103	Total Beach Area:	371.84	



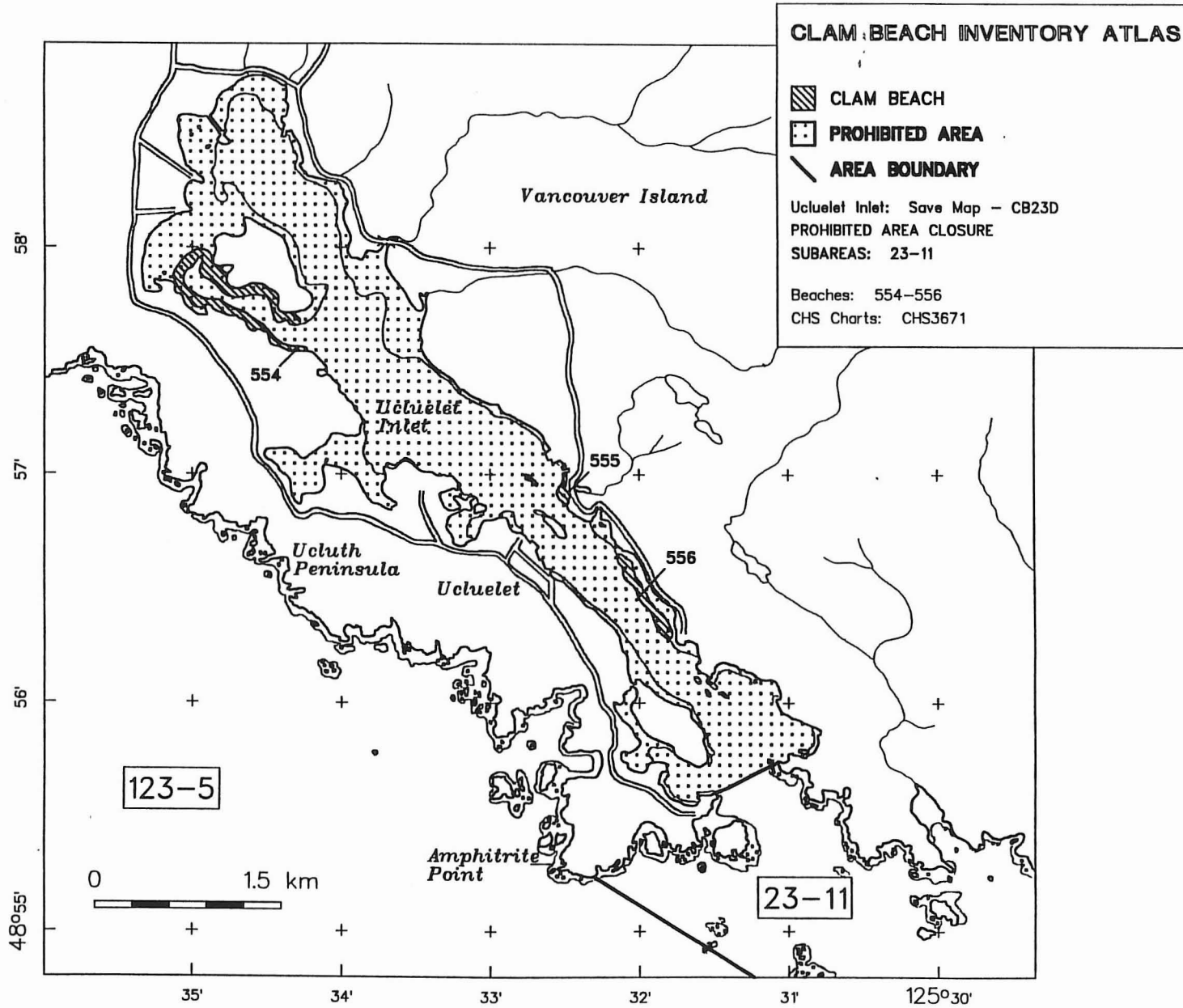
Appendix Figure 1.3.1.



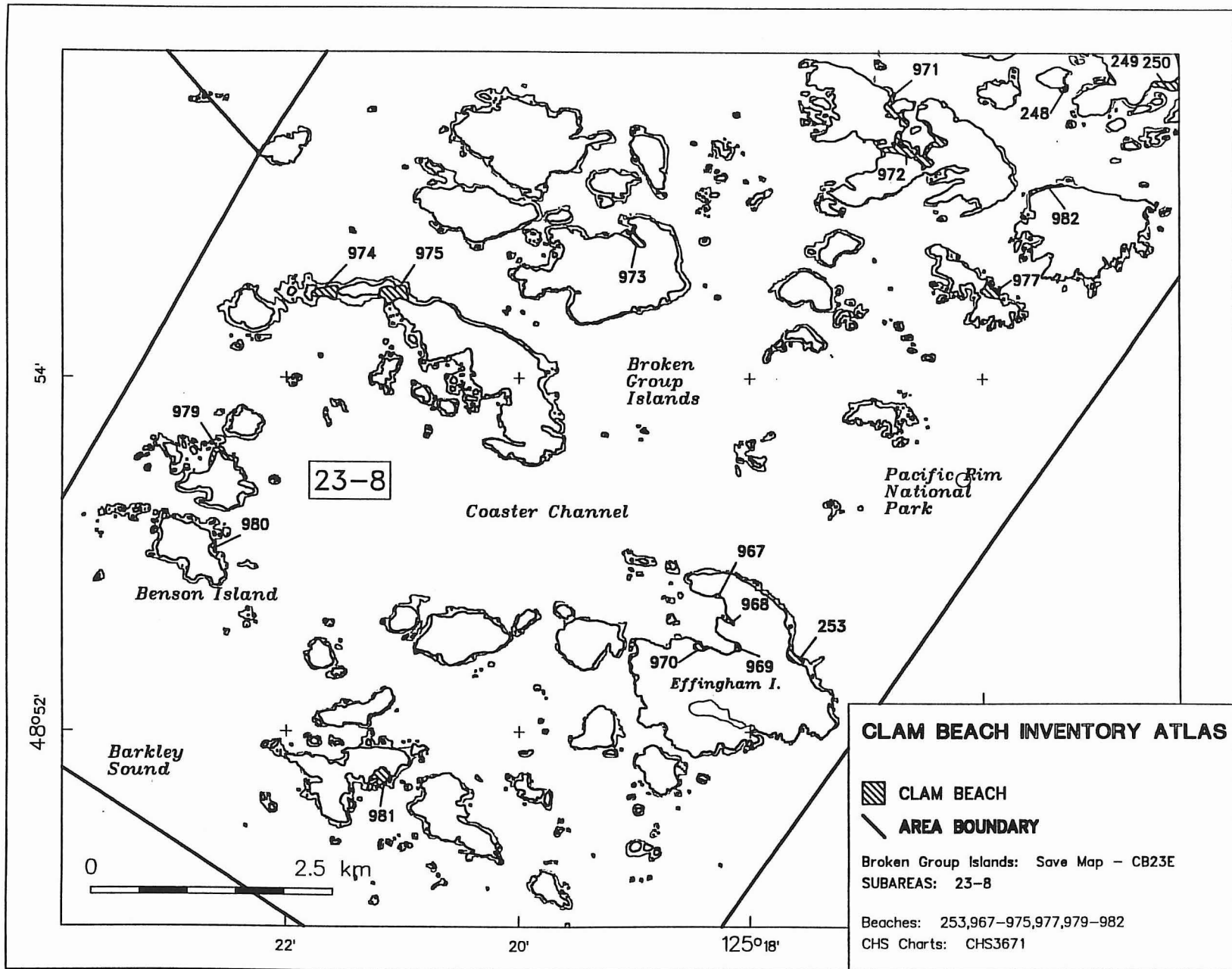
Appendix Figure 1.3.2.



Appendix Figure 1.3.3.



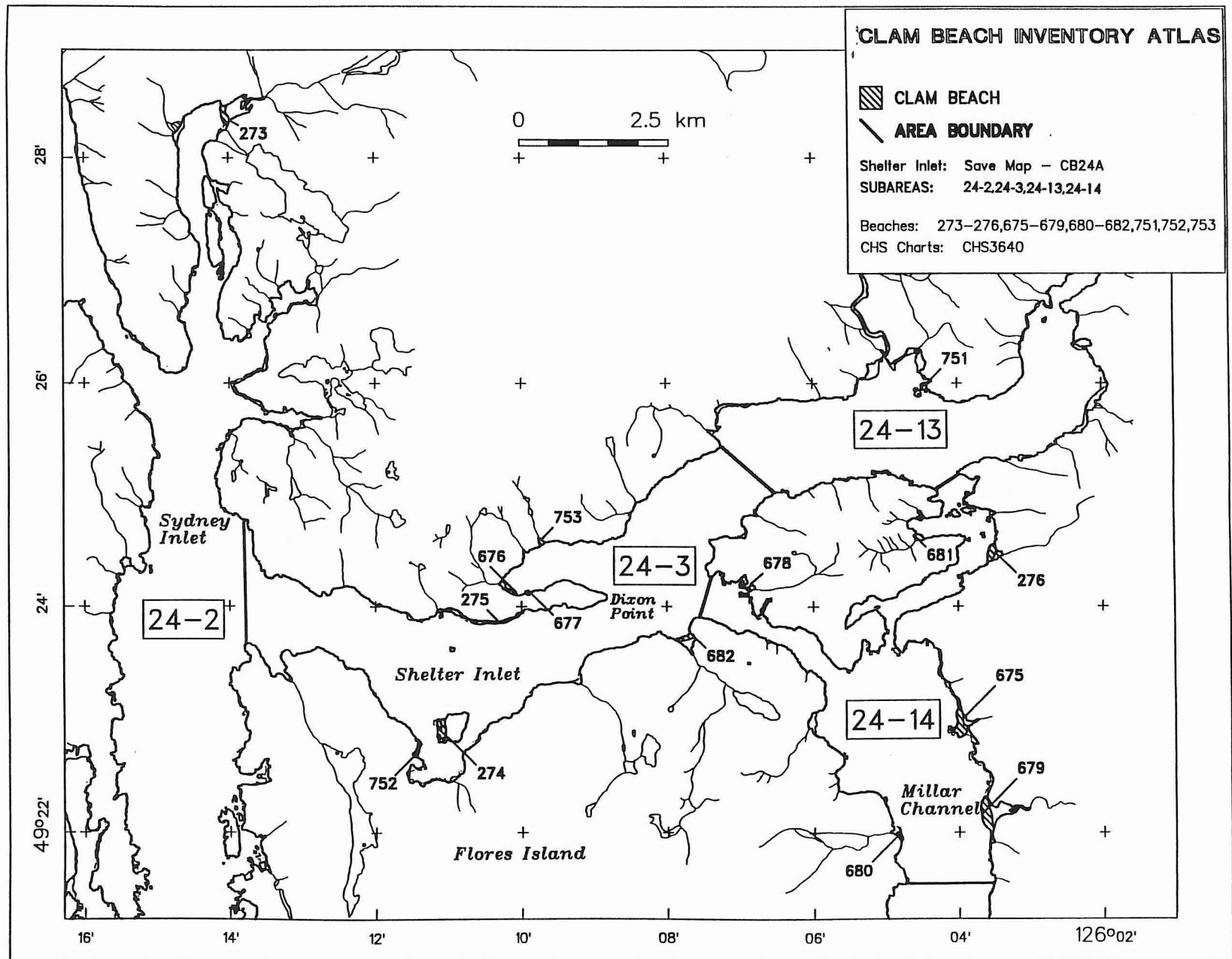
Appendix Figure 1.3.4.



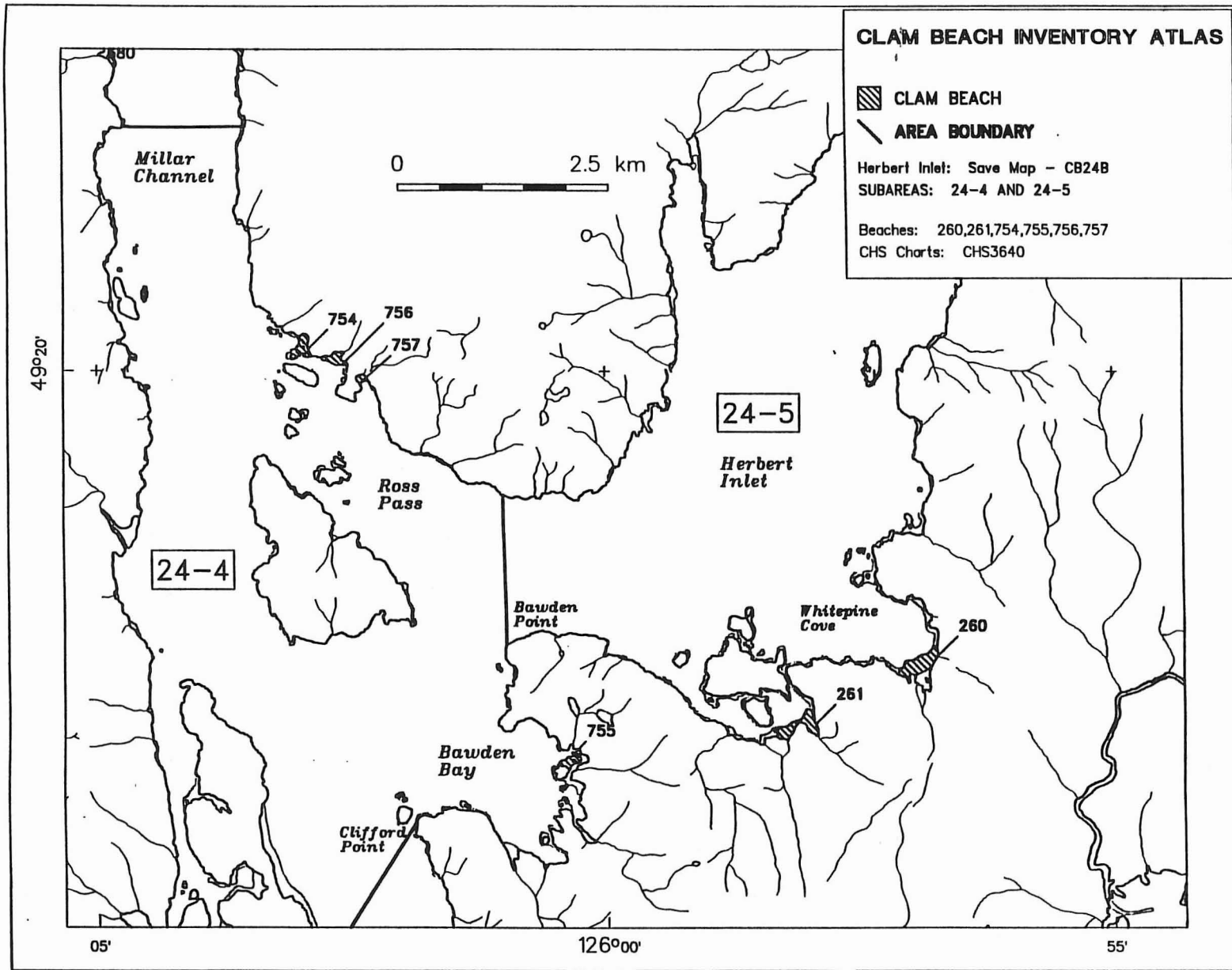
Appendix Figure 1.3.5.

Appendix Table 1.4. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 24.

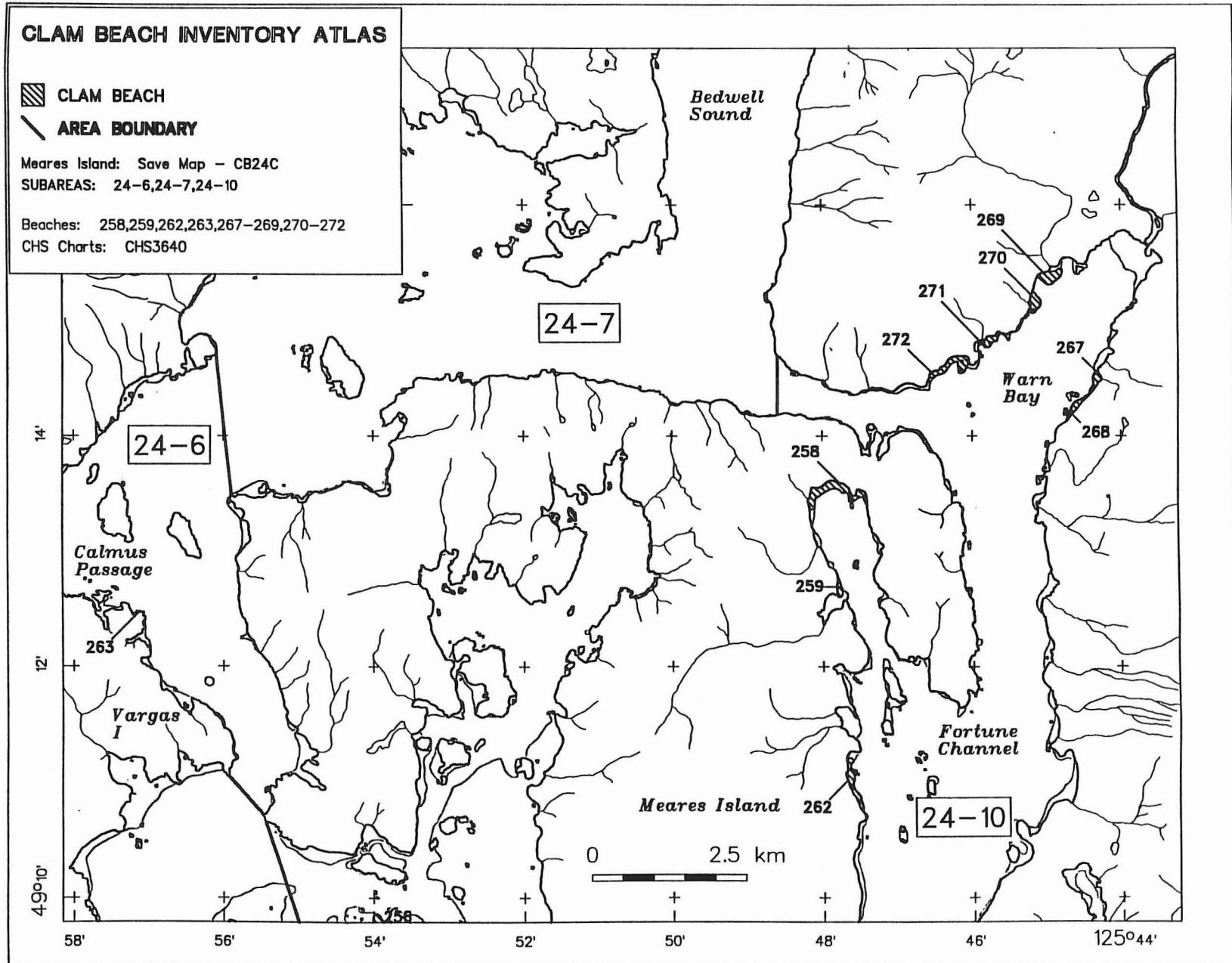
Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
24	1	955	Hesquiat Harbour/Anton Spit	5.32	
24	1	956	Hesquiat Harbour/Rondeault Point	10.74	
24	1	957	Hesquiat Harbour/Rae Basin	7.53	
24	1	958	Hesquiat Harbour/Boat Basin	11.27	
24	2	273	Pretty Girl Cove	3.04	
24	3	274	George Island	3.56	
24	3	275	Whiskey Jenny	5.97	4.3
24	3	676	Whiskey Jenny	1.73	
24	3	677	Whiskey Jenny	0.49	
24	3	682	Shelter Inlet	1.77	
24	3	748	Mckenzie Beach	3.04	
24	3	749	Frank Island	2.38	
24	3	750	Cox Bay	1.94	
24	3	752	Steamer Cove	1.56	
24	3	753	Dixon Bay	0.77	
24	4	754	Ross Pass, A	2.91	
24	4	755	Bawden Bay	2.24	
24	4	756	Ross Pass, B	2.82	
24	4	757	Ross Pass, C	0.98	
24	5	260	Whitepine Cove	8.24	3.0
24	5	261	Little Whitepine	6.39	
24	6	263	Calmus Passage	0.01	
24	9	255	Riley Island	1.86	
24	9	256	Beck Island	2.49	
24	9	257	Morpheus Island	1.63	
24	10	258	Mosquito Harbour	13.85	
24	10	259	Mosquito Harbour	1.81	
24	10	262	Meares Island, A	6.42	
24	10	264	Dawley Pass, B	2.08	
24	10	265	Dawley Pass, B	2.20	
24	10	266	Dawley Pass, A	2.66	
24	10	267	Warn Bay (SE)	2.79	
24	10	268	Warn Bay (SE)	2.82	
24	10	269	Warn Bay	6.03	
24	10	270	Warn Bay	4.19	
24	10	271	Warn Bay	3.39	
24	10	272	Warn Bay	8.40	1.20
24	10	747	Dawley Pass (W), B	3.29	
24	11	254	Indian Bay	3.73	
24	13	276	Sulphur Passage	3.02	1.60
24	13	681	Sulphur Passage	1.30	
24	13	751	Megin River Estuary (SE)	1.19	
24	14	675	Atleo (Millar Channel)	6.02	4.3
24	14	678	Hayden Pass	0.94	
24	14	679	Atleo (Millar Channel)	8.35	
24	14	680	Millar Channel	0.84	
Total Beaches:		46	Total Beach Area:	176.00	



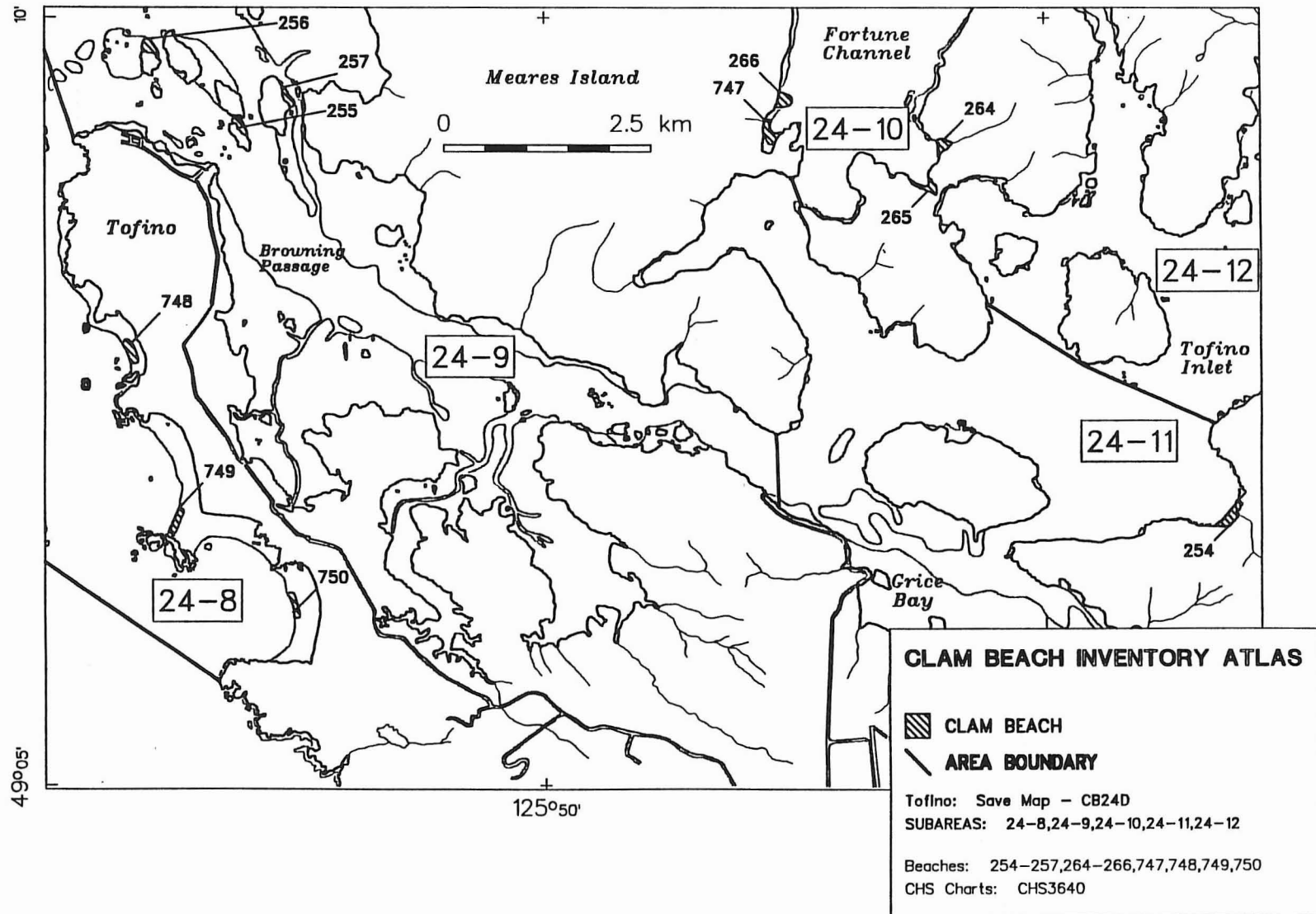
Appendix Figure 1.4.1.



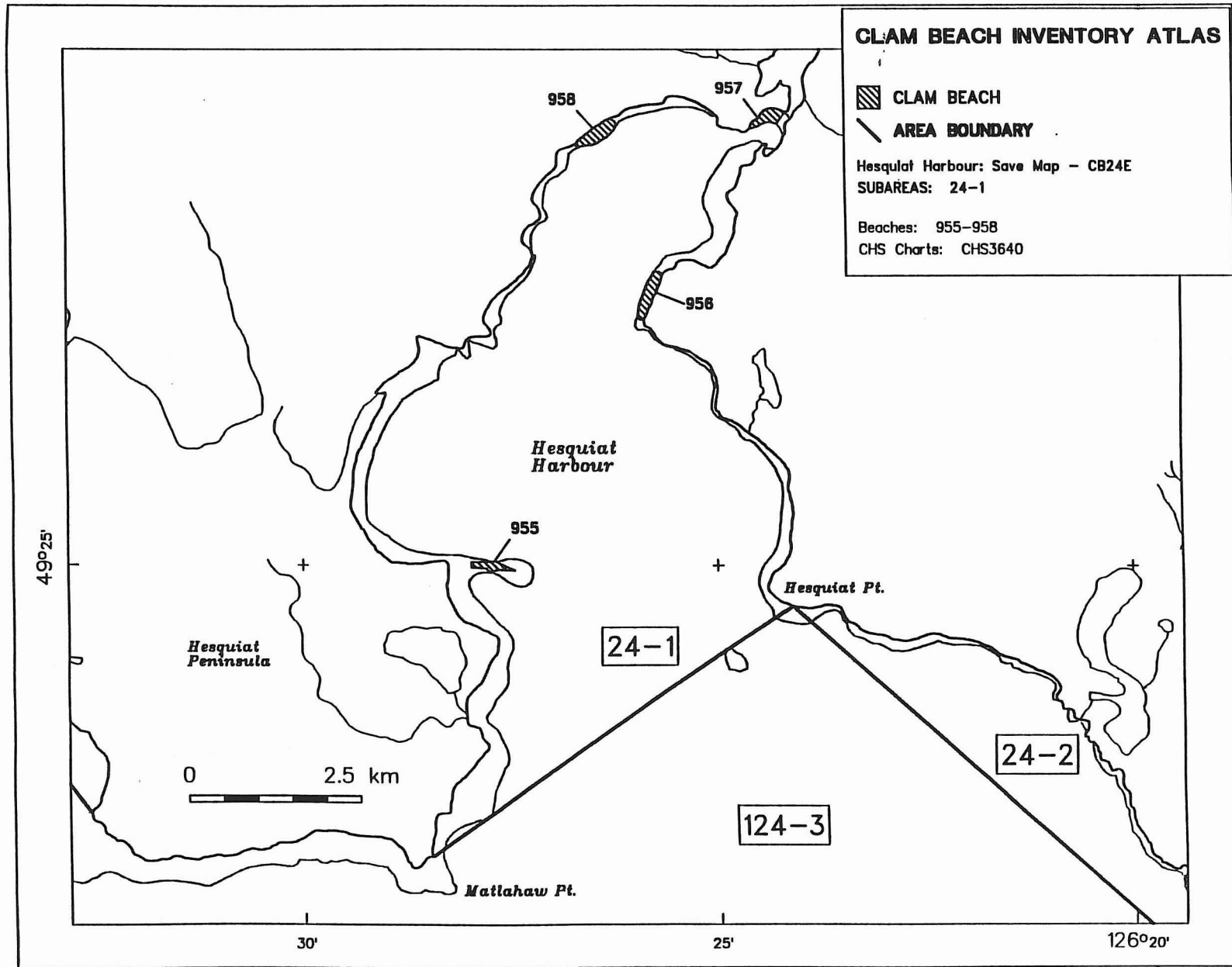
Appendix Figure 1.4.2.



Appendix Figure 1.4.3.



Appendix Figure 1.4.4.





Appendix Figure 1.4.5.

Appendix Table 1.5. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 25.

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
25	4	287	Hisnit Inlet	7.66	
25	4	288	Hisnit Inlet	0.76	
25	4	289	Hisnit Inlet	0.64	
25	4	296	Hisnit Inlet	1.15	
25	4	317	Tlupana Inlet, A	5.19	
25	4	318	Tlupana Inlet, B	0.72	
25	4	319	Tlupana Inlet, C	0.60	
25	5	701	Head Bay	2.59	
25	5	702	Head Bay	3.79	
25	5	703	Head Bay	8.98	
25	5	704	Head Bay	1.39	
25	5	705	Head Bay	1.05	
25	5	706	Head Bay	0.71	
25	6	278	Ewin Inlet	1.97	
25	6	279	Ewin Inlet	0.29	
25	6	280	Bligh Island (W)	0.41	
25	6	281	Santa Gertrudis Cove	0.79	
25	6	282	Santa Gertrudis Cove	0.82	
25	6	284	Strange Island (N Tip)	2.04	
25	6	290	Spanish Pilot Group	0.70	
25	6	291	Spanish Pilot Group	0.76	
25	6	292	Kendrick Inlet	9.09	
25	6	293	Kendrick Inlet	1.83	
25	6	294	Kendrick Inlet	1.93	
25	6	295	Kendrick Inlet	0.86	
25	7	283	Yuquot	0.95	
25	8	285	Jewitt Cove (N)	1.58	
25	8	286	Tsowwin Narrows	7.32	
25	9	297	Mcbride Bay	2.14	
25	9	298	Mcbride Bay	0.57	
25	9	299	Haven Cove	1.28	
25	9	938	Barr Creek	5.50	
25	9	940	Hecate (N)	1.75	
25	9	941	Ceepeecee Ways	2.06	
25	11	301	Nuchatlitz Creek	4.88	1.5
25	11	324	Little Espinosa Inlet, A	3.10	
25	11	325	Little Espinosa Inlet, B	6.19	
25	11	326	Espinosa Inlet., C	10.83	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
25	11	327	Espinosa Inlet, B	5.11	
25	11	683	Espinosa Inlet, A	3.21	
25	11	886	Espinosa Inlet, D	1.59	
25	11	933	Espinosa Inlet, C	5.05	
25	11	934	Espinosa Inlet, D	1.83	
25	11	935	Espinosa Inlet, E	2.57	
25	11	936	Espinosa Inlet, F	1.29	
25	12	302	Queen Cove	3.74	
25	12	303	Queen Cove	8.32	
25	12	304	Queen Cove	0.62	
25	12	309	Port Eliza, A	2.04	
25	12	310	Eliza Island	0.88	
25	12	311	Eliza Island	1.09	
25	12	347	Port Eliza, B	5.04	
25	12	348	Port Eliza, B	2.38	
25	13	277	Louie Bay	21.88	
25	13	300	Graveyard Bay	0.83	
25	13	305	Apple Creek	1.09	
25	13	306	Garden Point	4.91	
25	13	307	Garden Point	0.50	
25	13	308A	Garden Point (E), A	1.21	
25	13	308B	Garden Point (E), B	6.76	
25	13	308C	Garden Point (E), C	1.12	
25	13	320	Nuchatlitz, B	0.69	
25	13	321	Nuchatlitz, A	1.34	
25	13	322	Nuchatlitz, A	1.31	
25	13	323	Nuchatlitz, A	0.55	
25	13	684	Graveyard Bay	2.98	
25	13	937A	Ehatisaht (N), A	0.75	
25	13	937B	Ehatisaht (N), B	0.54	
25	13	939A	Saltery Bay, A	0.85	
25	13	939B	Saltery Bay, B	1.52	
25	13	939C	Saltery Bay, C	1.02	
25	14	312	Inner Basin	2.05	
25	14	313	Inner Basin	1.33	
25	14	314	Inner Basin	0.79	
25	14	315	Mary Basin	14.37	5.0
25	14	316	Mary Basin	17.15	8.0
25	14	346	Inner Basin (Head)	11.79	5.0
Total Beaches:		77	Total Beach Area:	246.96	

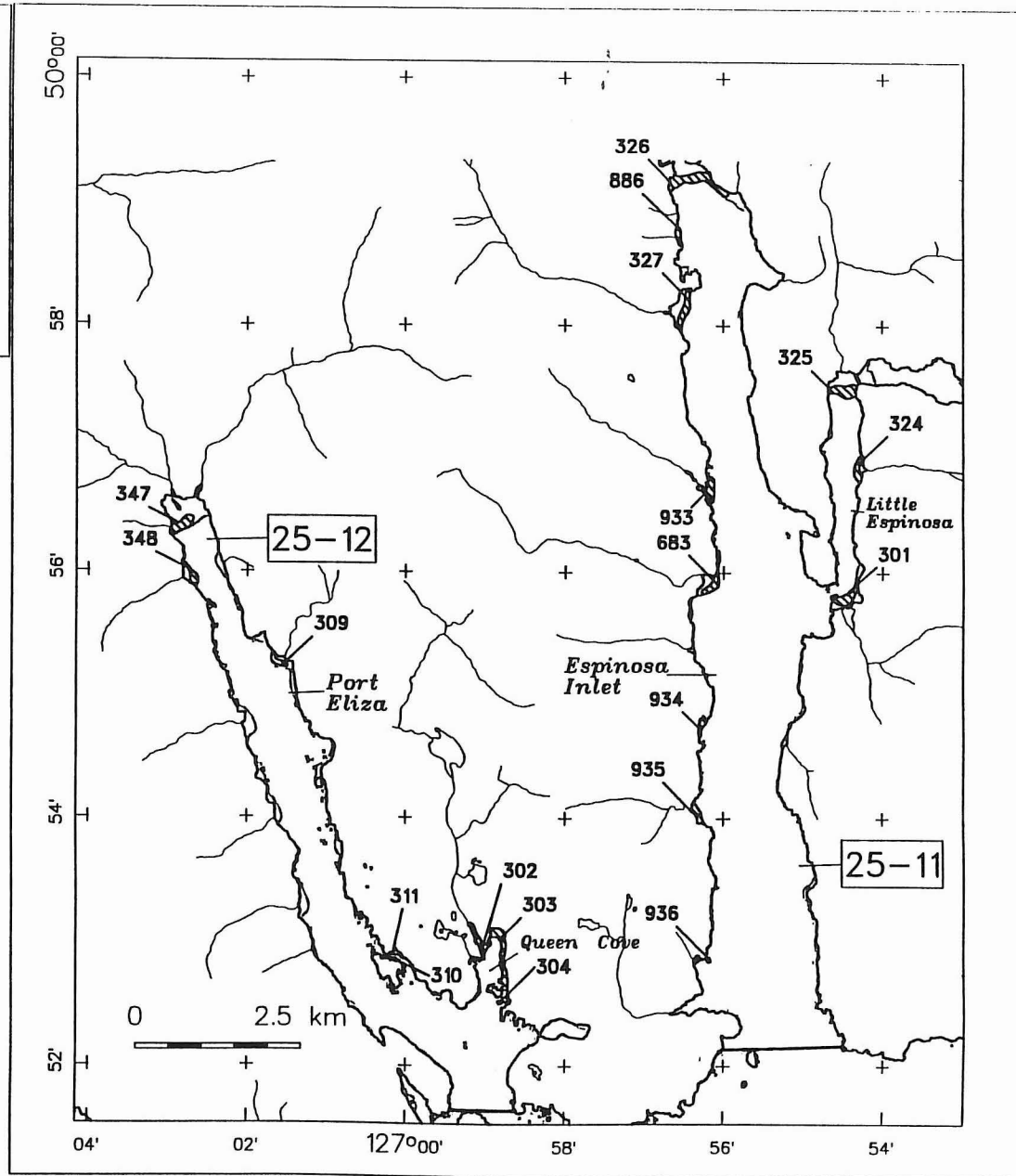
GLAM BEACH INVENTORY ATLAS

-  CLAM BEACH
-  AREA BOUNDARY

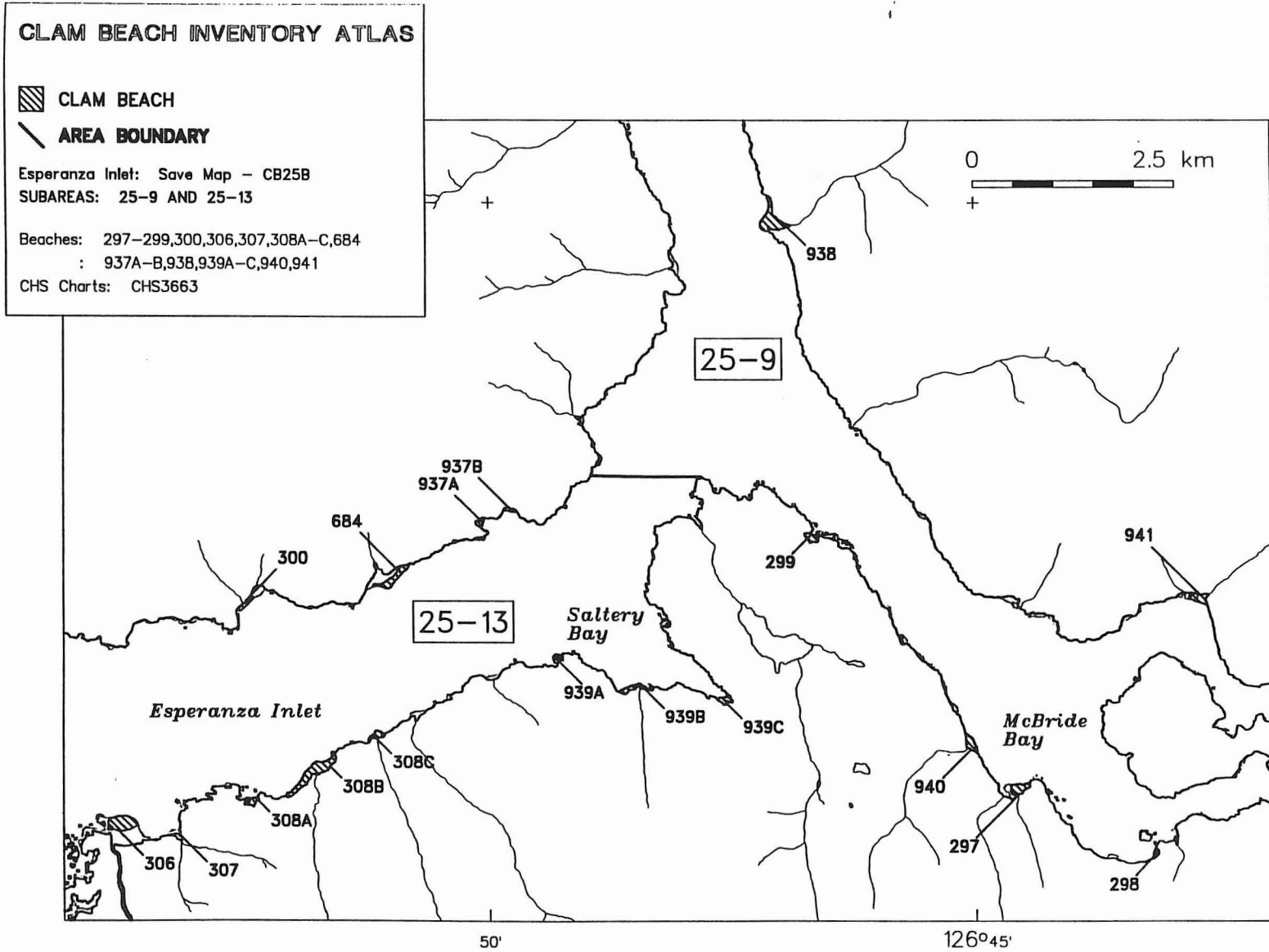
Espinosa Inlet: Save Map - CB25A
SUBAREAS: 25-11 AND 25-12

Beaches: 301-304,309-311,324-327,347,348
: 683,886,933,934,935,936

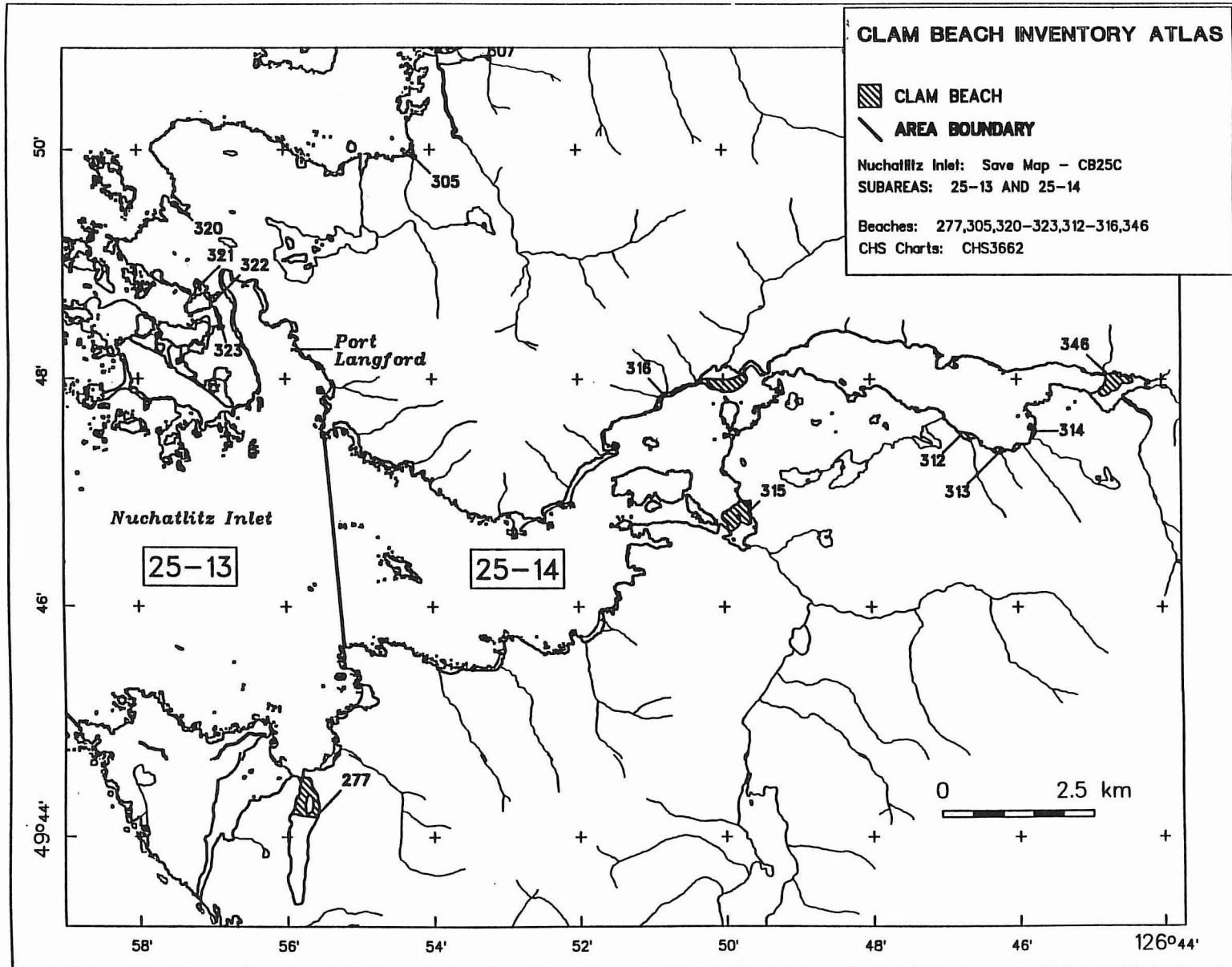
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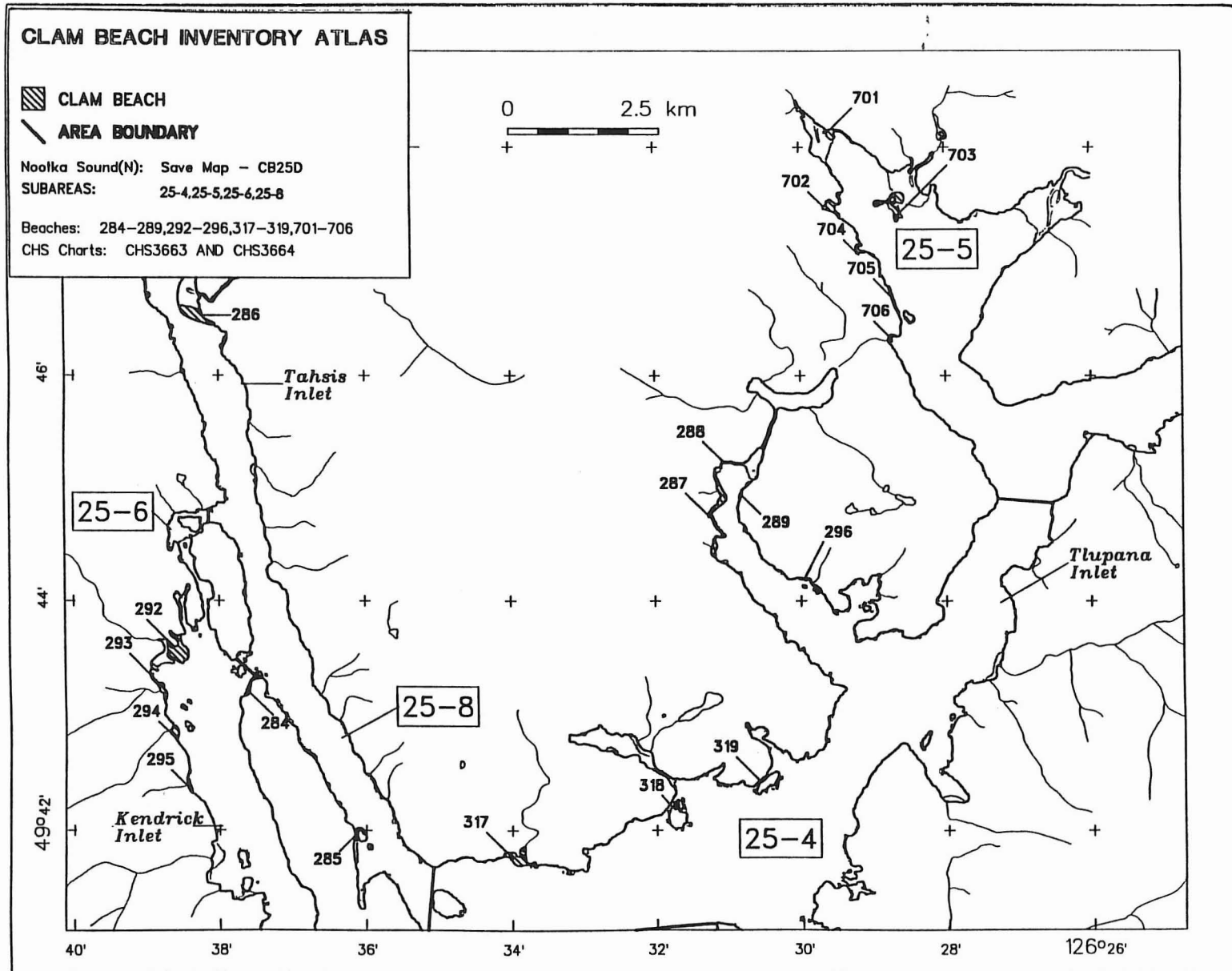
Appendix Figure 1.5.1.



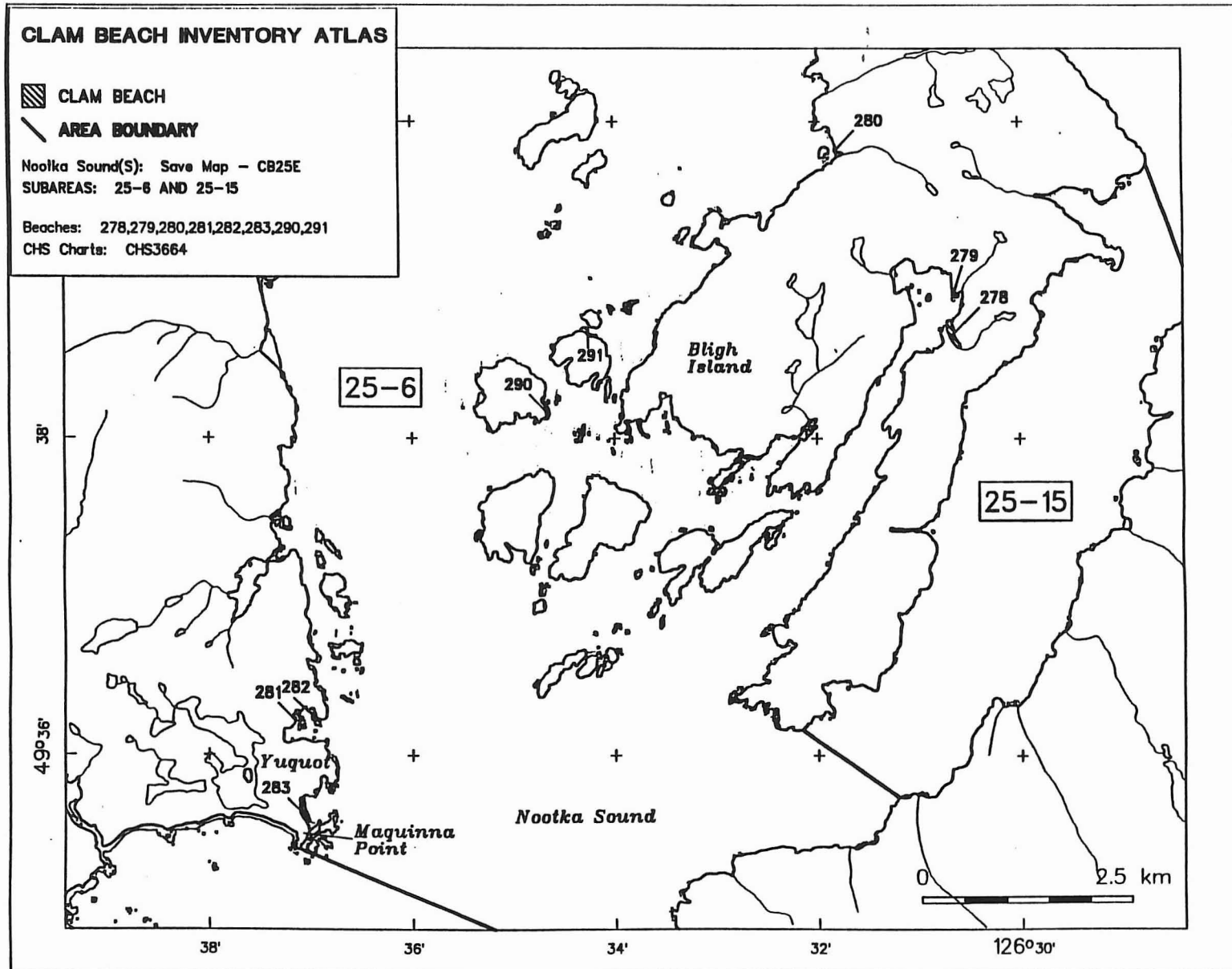
Appendix Figure 1.5.2.



Appendix Figure 1.5.3.



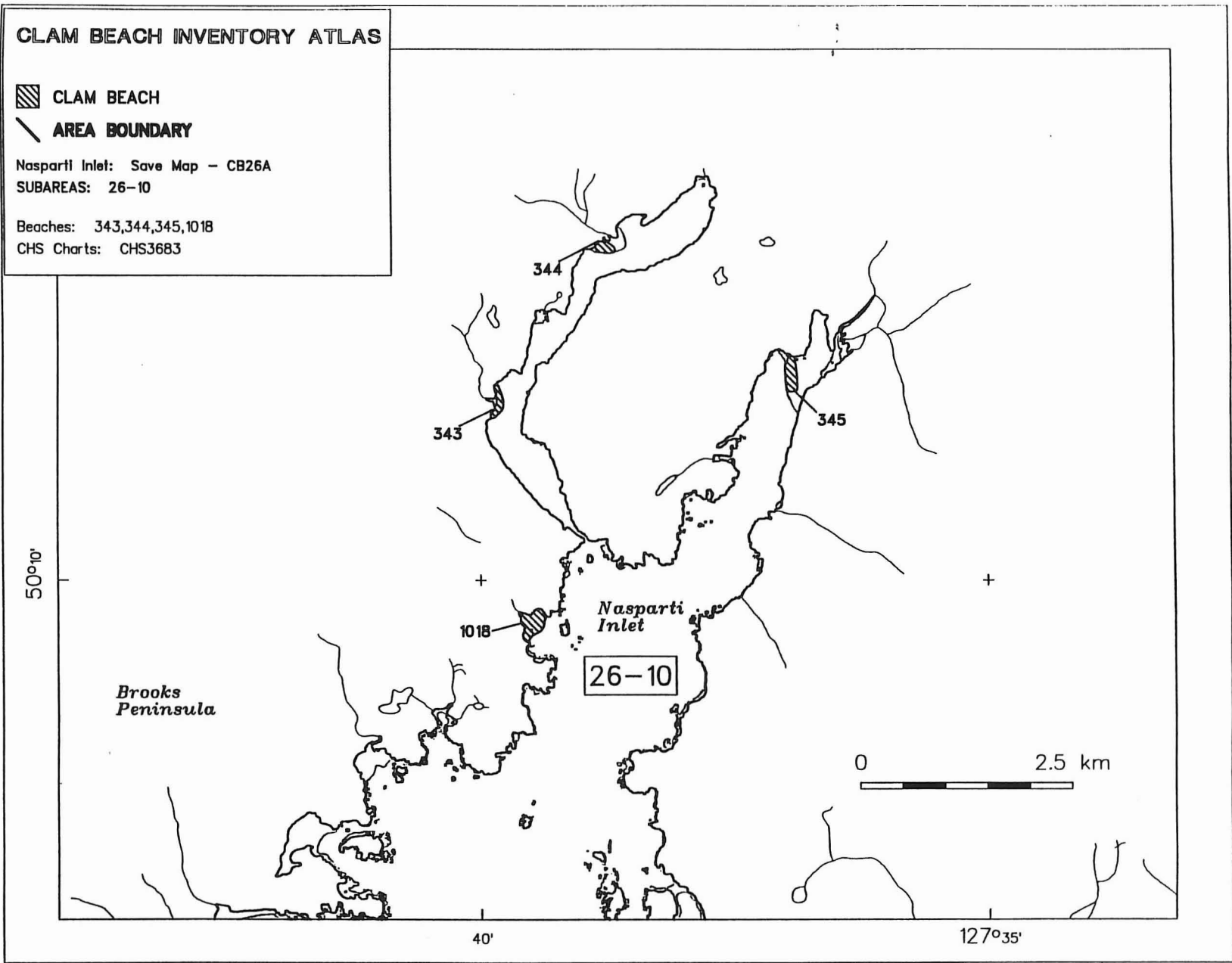
Appendix Figure 1.5.4.



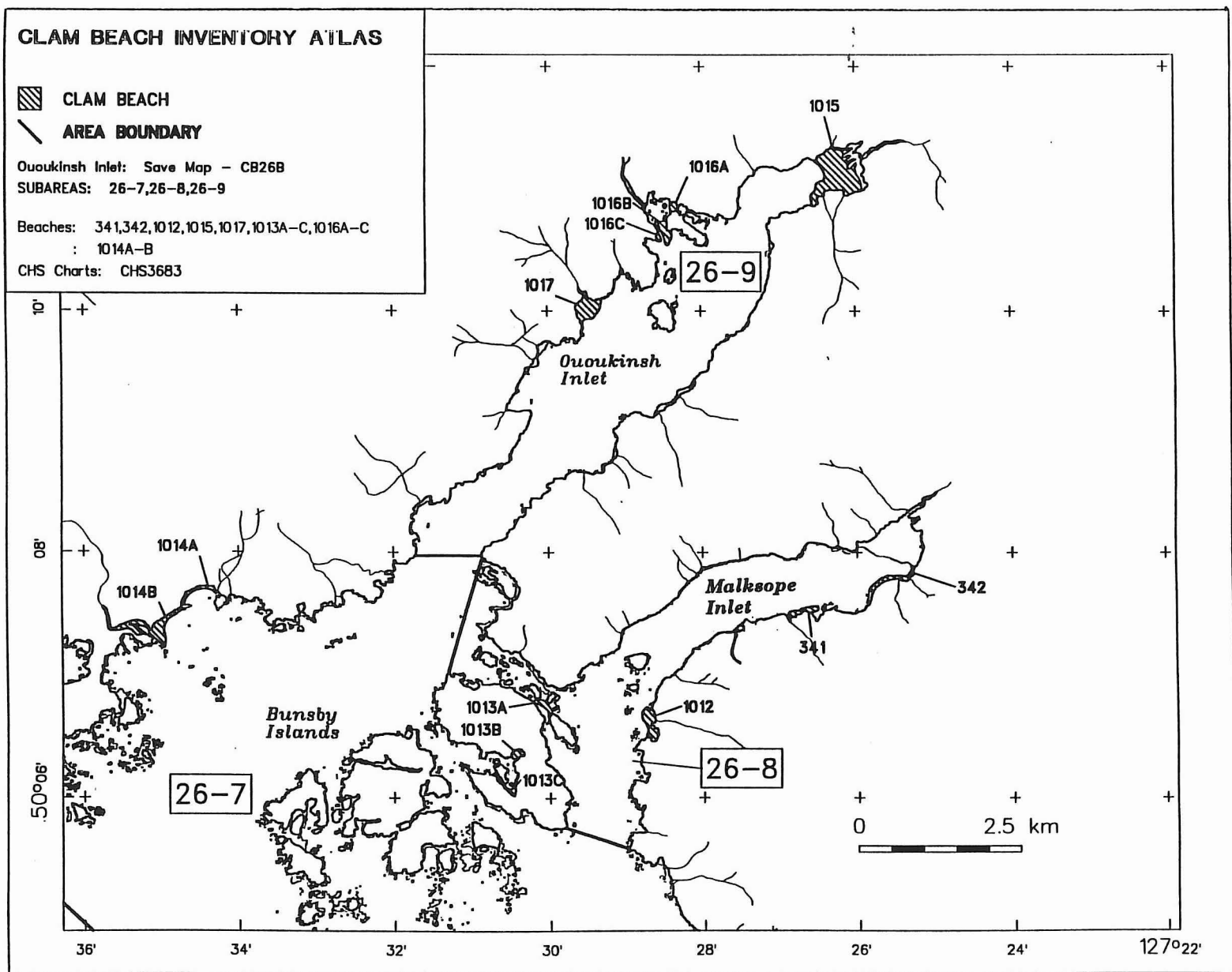
Appendix Figure 1.5.5.

Appendix Table 1.6. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 26. Table

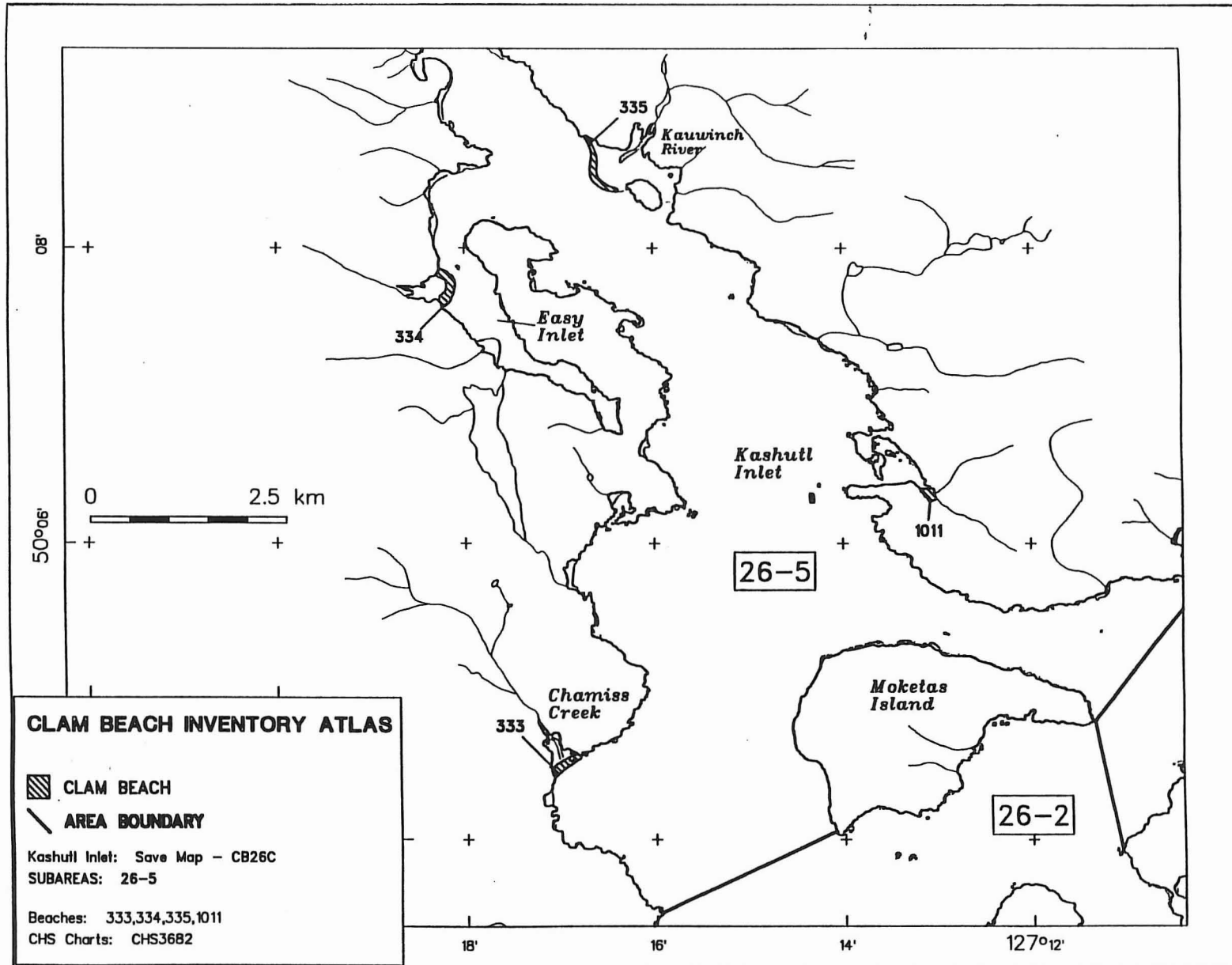
Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
26	1	337	Atkis and Kamils Islands	3.81	
26	1	338	Atkis and Kamils Islands	2.61	
26	2	328	Unsworth Point	1.53	
26	2	329	Unsworth Point	3.54	
26	2	906	East Pinnacle Channel	0.29	
26	3	330	Amai Inlet	3.99	
26	3	331	Cachalot Inlet	3.32	
26	3	332	Amai Point (Opposite)	1.16	
26	4	1007	Tahsish Inlet - I.R.	10.93	
26	4	1008	Tahsish Inlet - Artlish River	21.14	
26	4	1009	Fair Harbour	24.05	
26	4	1010	South of Yaku Bay	0.84	
26	5	1011	Hankin Cove	2.12	
26	5	333	Chamiss Bay	3.84	
26	5	334	Easy Inlet	5.82	
26	5	335	Kauwinch River	5.75	
26	6	336	Amos Island	1.02	
26	6	339	Mclean Island	2.09	
26	6	340	Clannick Cove, A	7.22	
26	6	884	Clannick Cove, B	5.88	
26	6	885	Crowther Channel	3.61	
26	6	907	Mckay Cove	5.05	
26	6	908	Racoon Point	0.65	
26	7	1014A	Battle Bay	3.01	
26	7	1014B	Battle Bay	13.52	
26	8	1012	Malksope Inlet	7.27	
26	8	1013A	Bunsby Islands	2.12	
26	8	1013B	Bunsby Islands	2.32	
26	8	1013C	Bunsby Islands	2.89	
26	8	341	Malksope Inlet	3.55	
26	8	342	Malksope Inlet	4.78	
26	9	1015	Ououkinsh River	36.87	
26	9	1016A	Power River	1.76	
26	9	1016B	Power River	4.09	
26	9	1016C	Power River	0.76	
26	9	1017	Ououkinsh Inlet	10.42	
26	10	1018	Naspart Inlet	7.27	
26	10	343	Johnson Lagoon	2.87	
26	10	344	Johnson Lagoon	2.48	
26	10	345	Naspart Inlet	5.09	
Total Beaches:		40	Total Beach Area:	231.33	



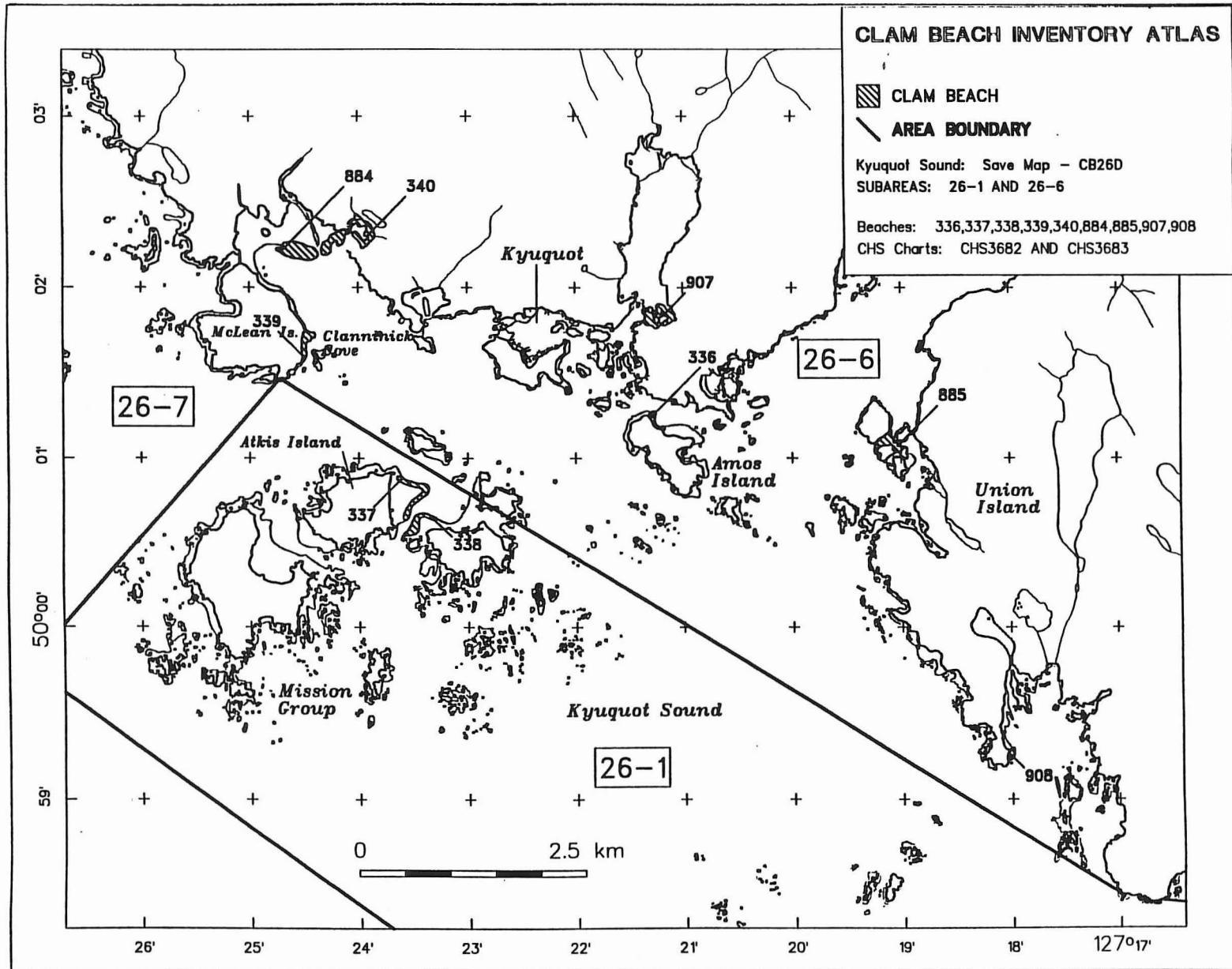
Appendix Figure 1.6.1.



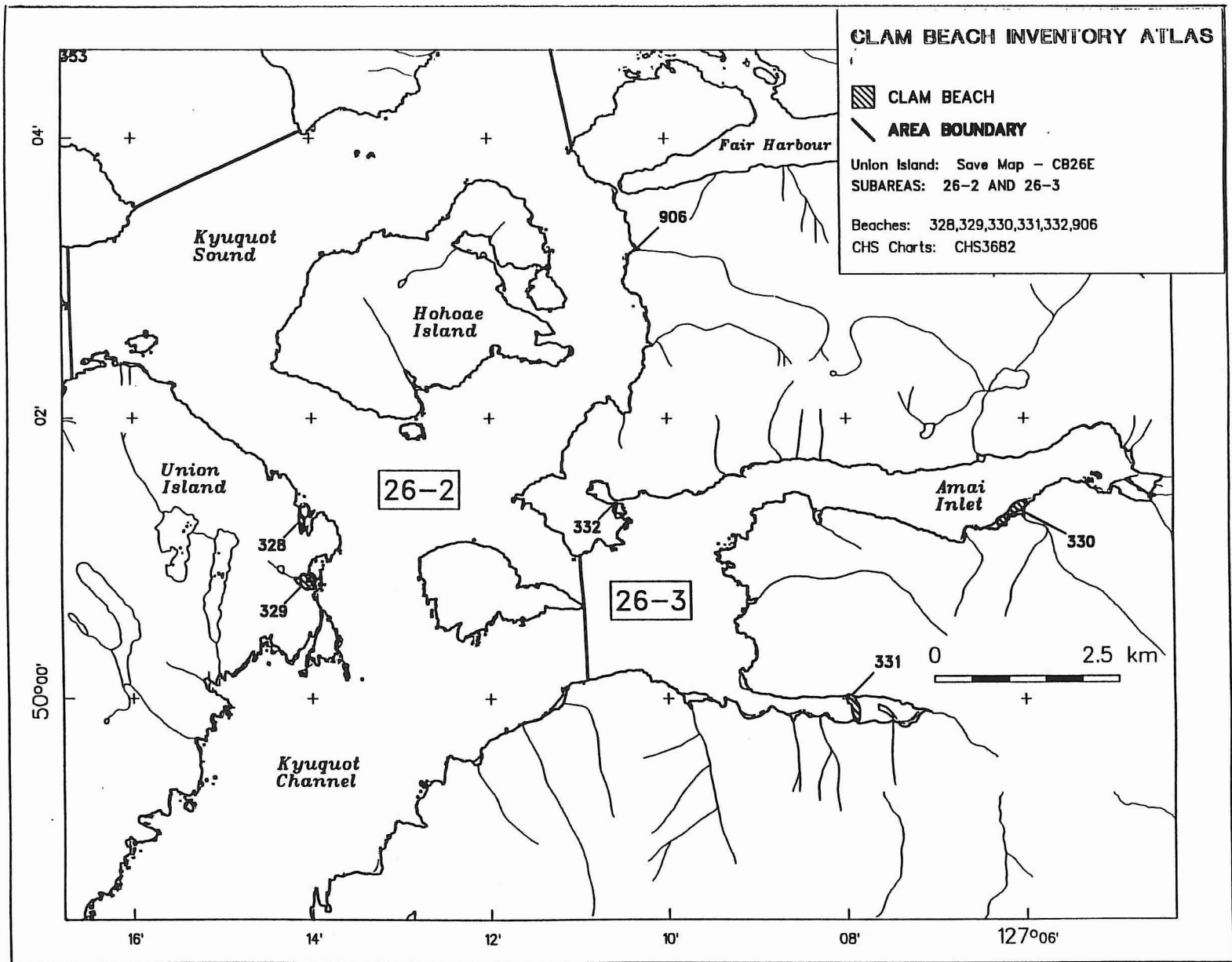
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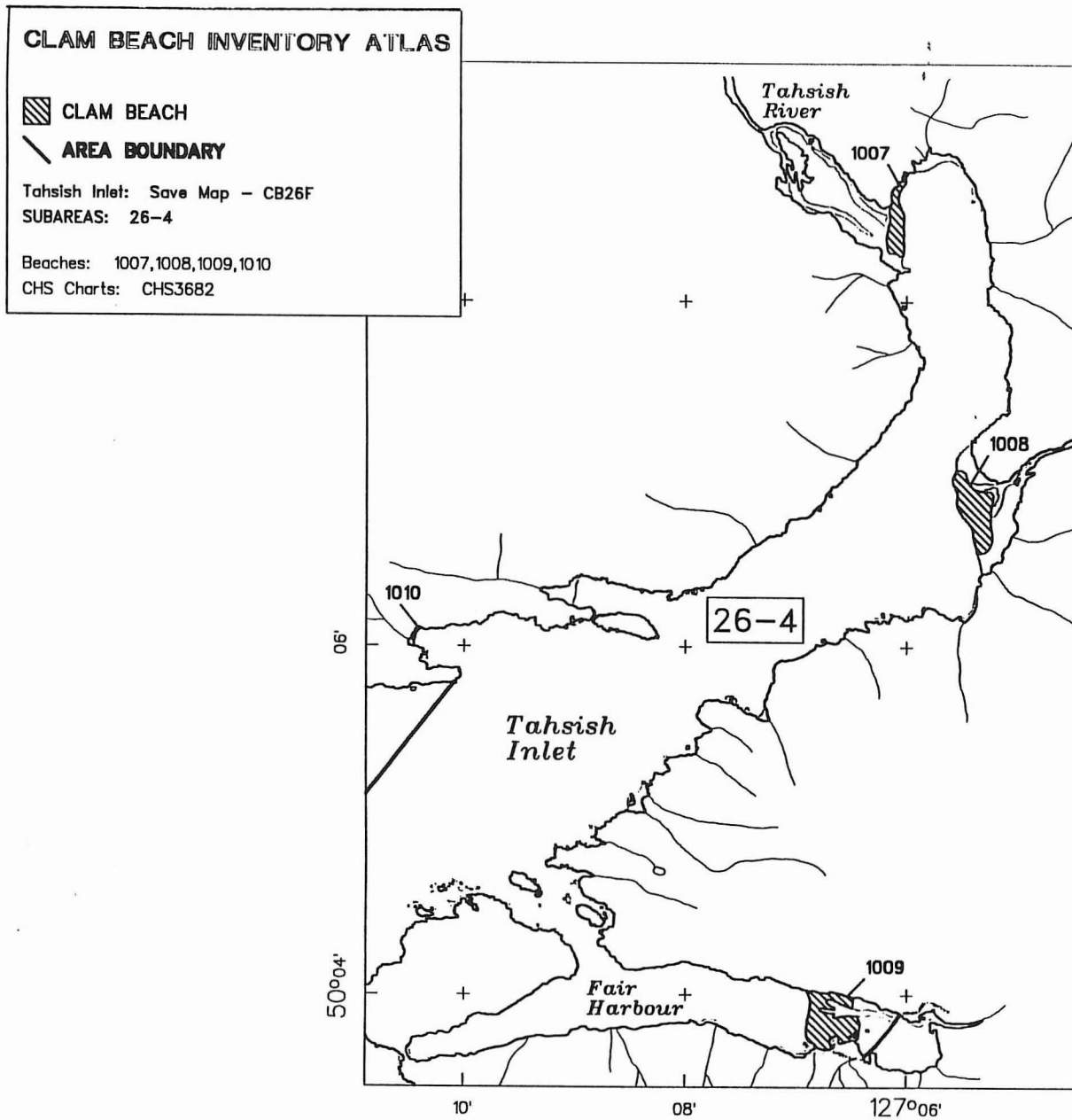
Appendix Figure 1.6.3.



Appendix Figure 1.6.4.



Appendix Figure 1.6.5.





Appendix Figure 1.6.6.

Appendix Table 1.7. British Columbia Clam Beach Inventory, sorted by Subarea for Management Area 27.

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
27	3	391	Winter Harbour	20.4	
27	3	392	Winter Harbour	16.12	
27	3	393	Winter Harbour	38.26	
27	3	394	Forward Inlet	12.11	
27	3	395	Forward Inlet	13.62	
27	5	349	Side Bay	28.61	
27	5	350	Klaskino Anchorage	27.15	
27	5	359	Klaskino Inlet (Head)	2.26	
27	5	360	Klaskino Inlet (Head)	1.85	
27	5	361	Klaskino Inlet (Head)	0.67	
27	5	362	Klaskino Inlet (Head)	6.40	
27	5	363	Klaskino Inlet (Head)	1.98	
27	5	707	Klaskino Inlet	2.16	
27	5	708	Klaskino Inlet	1.63	
27	5	709	Klaskino Inlet	1.63	
27	5	710	Klaskino Inlet	0.95	
27	6	351	Klaskish Basin	9.77	
27	6	352	Klaskish Anchorage	11.84	
27	6	353	Shields Cove	12.00	
27	6	354	Orchard Point (S)	10.68	
27	7	364	Koskino Creek	3.94	
27	7	365	Mahatta River	11.49	
27	7	369	Smith Cove	8.53	
27	7	370	Kultus Cove	5.10	
27	7	371	Ilstad Island	7.69	
27	7	372	Percy Ledge	12.07	
27	7	375	Mahatta Creek	13.66	
27	7	376	Drake Island	2.12	
27	7	377	Drake Island	2.83	
27	7	378	Drake Island	1.60	
27	7	379	Koprino Harbour	33.15	
27	7	380	Koprino Harbour	11.14	
27	7	381	Koprino Harbour	5.18	
27	7	383	Kloutchlimmis River	16.52	
27	7	384	Kloutchlimmis River	12.88	
27	7	385	Quatsino Sound	12.48	
27	7	386	Quatsino Sound	10.13	
27	7	734	Cleagh Creek	2.17	

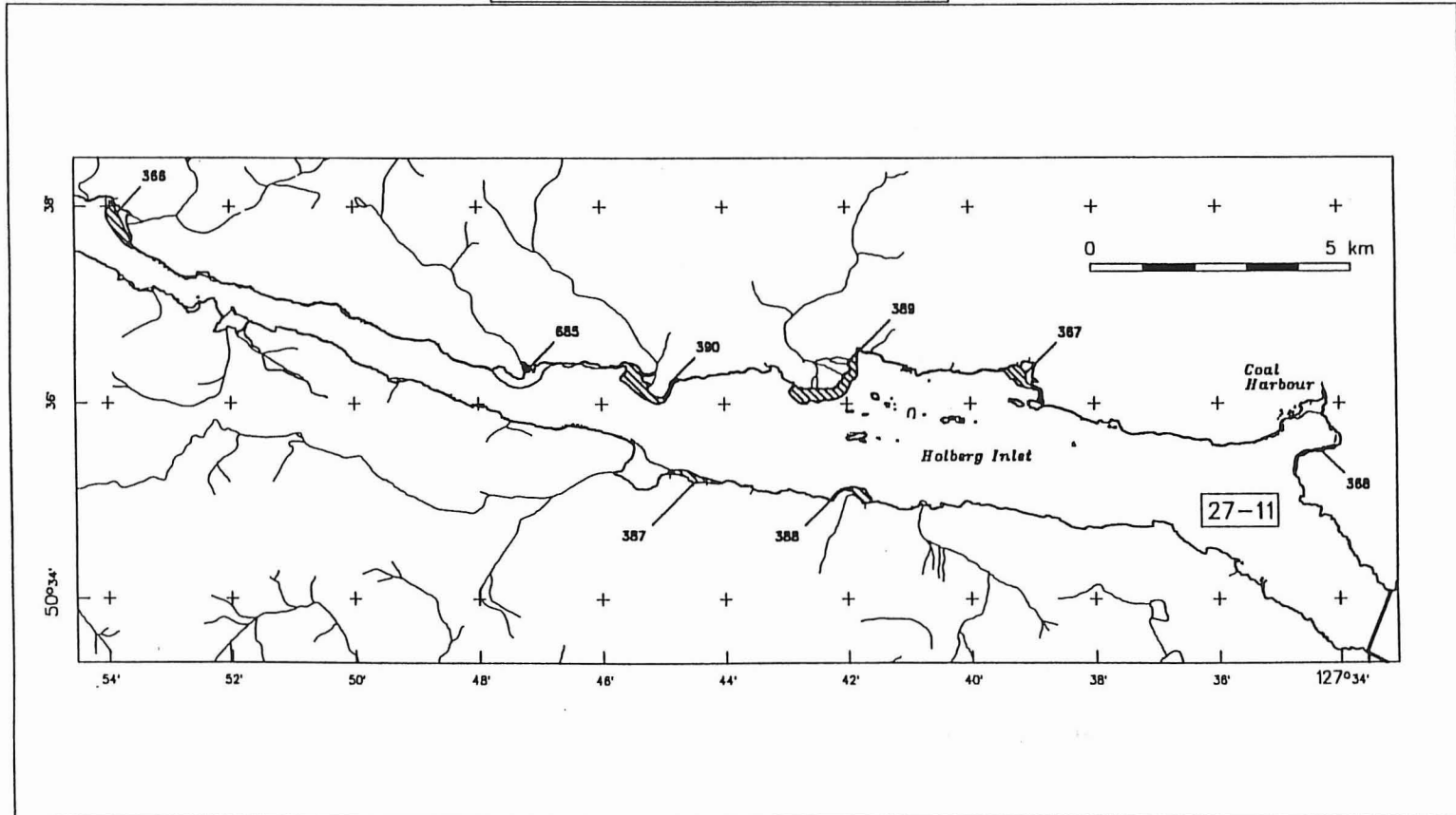
Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
27	7	889A	Mahatta River (W)	3.77	
27	7	889B	Salmon Island	0.66	
27	7	890	Schloss Island	1.47	
27	8	382	Atkins Cove	4.41	
27	9	686	Quattische Island	3.10	
27	9	687	Kwokwesta Creek	5.31	
27	9	373	Hecate Cove	1.84	
27	9	374	Kokwind Cove	2.54	
27	11	366	Clesklagh Creek	15.35	
27	11	367	Apple Bay	13.25	
27	11	368	Coal Harbour	5.27	
27	11	387	Holberg Inlet (S)	8.90	
27	11	388	Holberg Inlet (S)	8.21	
27	11	389	Holberg Inlet (N)	35.53	
27	11	390	Holberg Inlet (N)	26.28	
27	11	685	Holberg Inlet (N)	0.54	
Total Beaches:		54	Total Beach Area:	529.20	

CLAM BEACH INVENTORY ATLAS

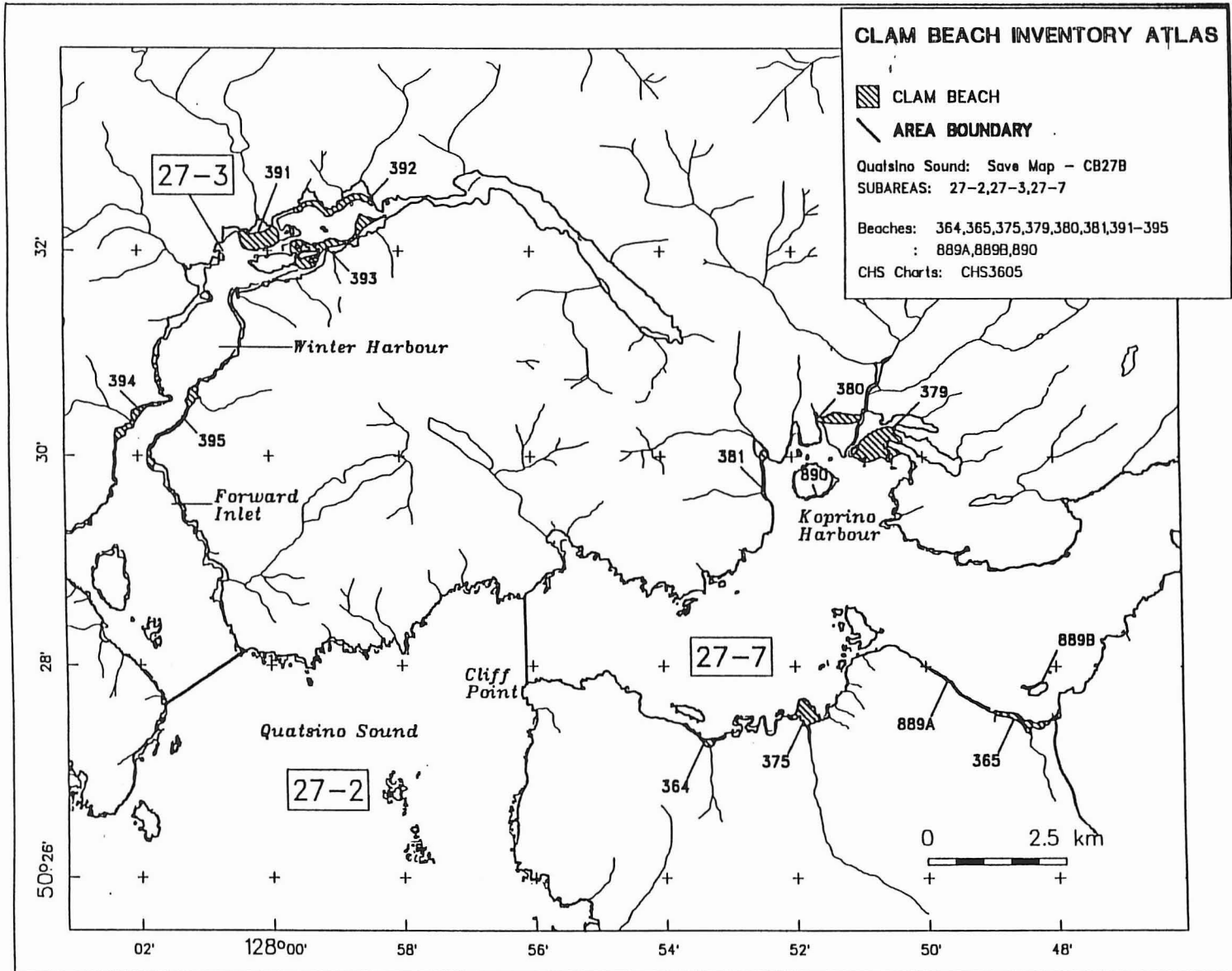
-  CLAM BEACH
-  AREA BOUNDARY

Holberg Inlet: Save Map - CB27A
SUBAREAS: 27-11

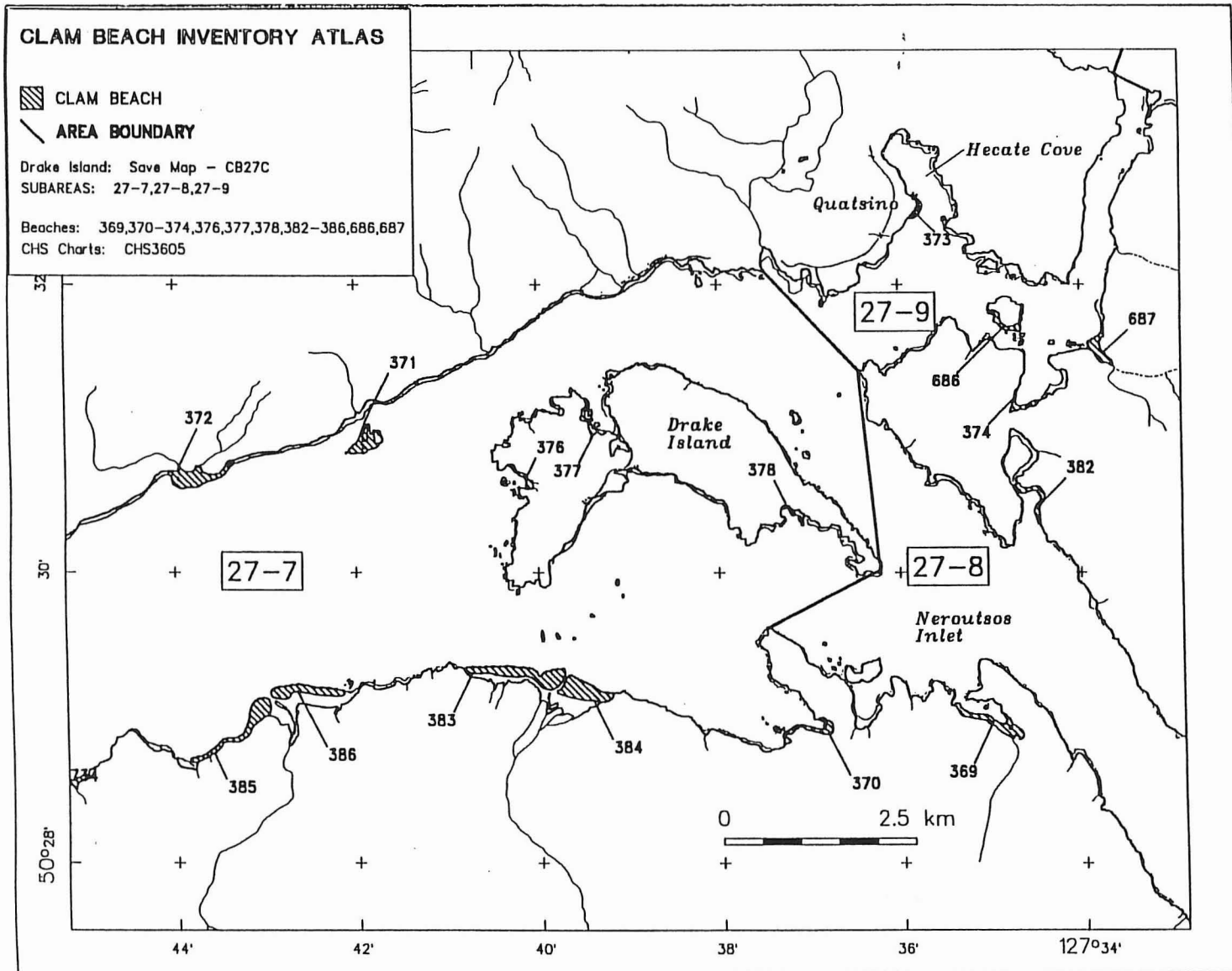
Beaches: 366,367,368,387,388,389,390,685
CHS Charts: CHS3605



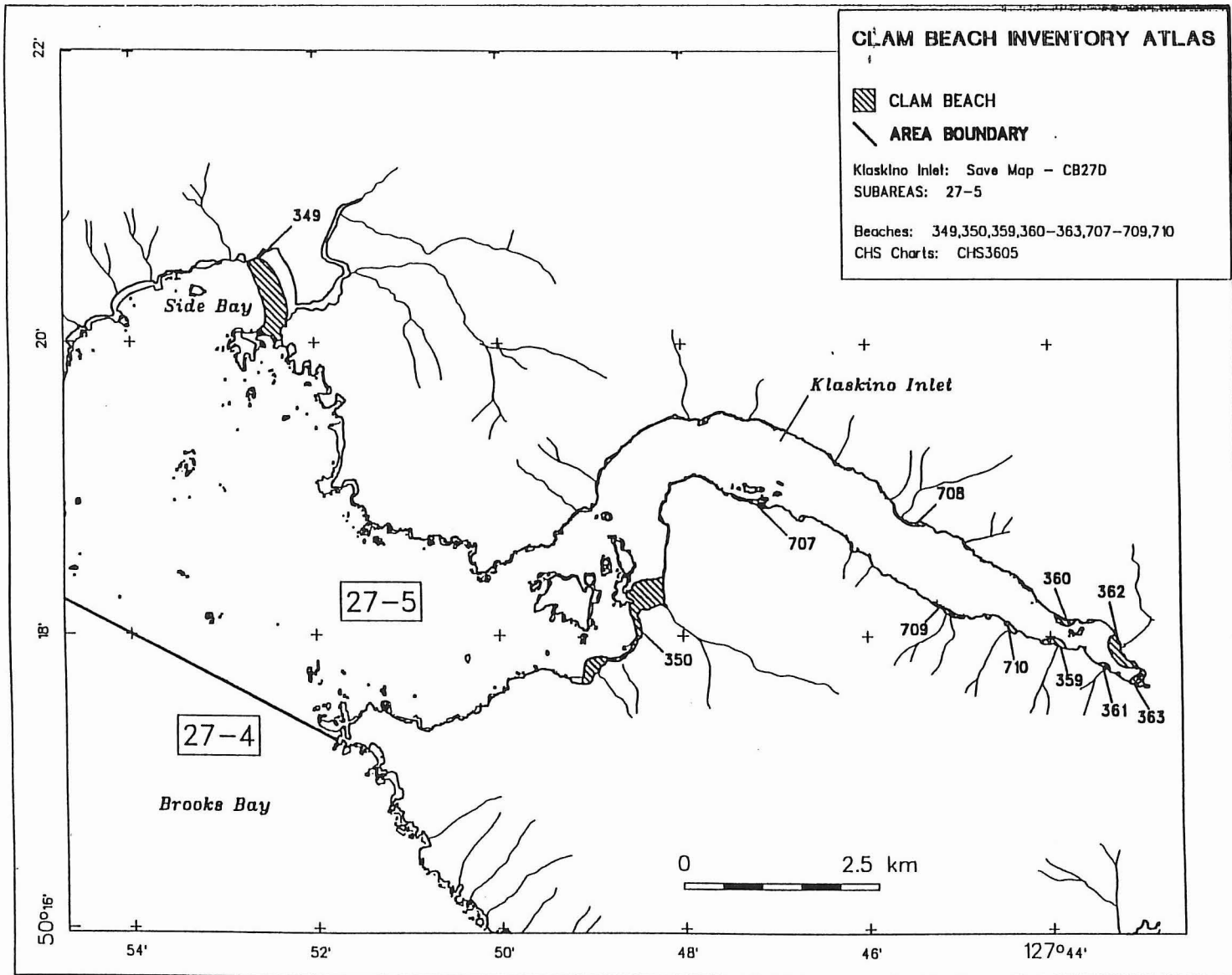
Appendix Figure 1.7.1.



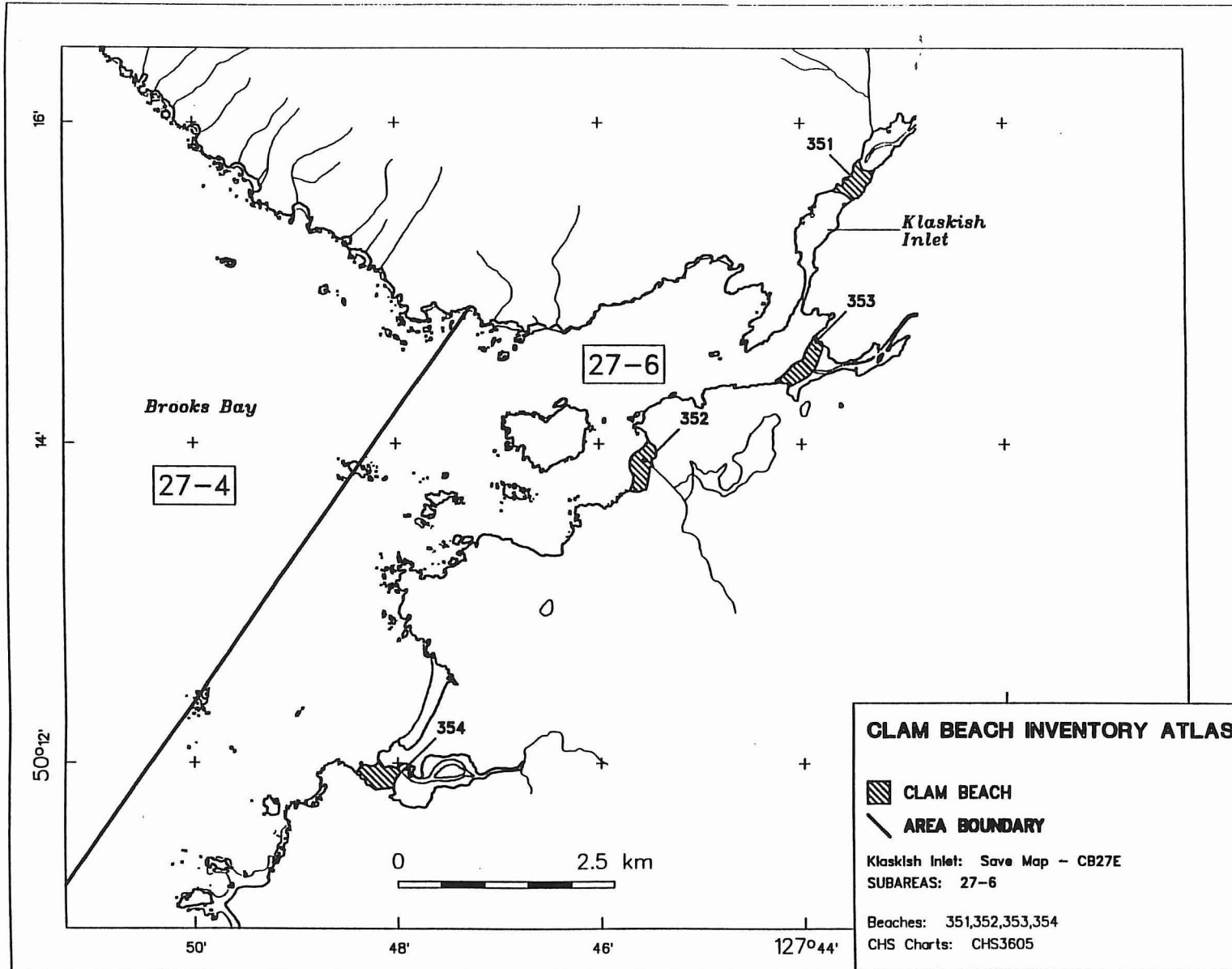
Appendix Figure 1.7.2.



Appendix Figure 1.7.3.



Appendix Figure 1.7.4.



Appendix Figure 1.7.5.

APPENDIX 2.

**DESCRIPTIONS, TABLE AND MAPS OF AREAS CLOSED
TO THE COMMERCIAL INTERTIDAL CLAM FISHERY,
AREAS 21 TO 27, FOR ABORIGINAL OR RECREATIONAL
HARVEST, INCLUDING PARK CLOSURES**

**From the 1997 DFO Pacific Region Management Plan for Intertidal
Clams (Manila, Littleneck, Butter and Razor Clams)**

Descriptions of areas closed to the commercial intertidal clam fishery in Areas 21 to 27, as allocations for Native food, social and ceremonial harvest, recreational harvest or Park/Reserve closures.

Area 23

Area 23 - Santa Maria Island, Numukamis Bay Beaches: that portion of Subarea 23-4, lying inside a line from the northernmost point of land of the Sarita River Indian Reserve thence in a southerly direction to the northernmost point of Santa Maria Island, thence along the western shoreline of Santa Maria Island to the most southwestern point of Santa Maria Island, thence to the northern point of Christie Bay. (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 23 - Pacific Rim National Park - Broken Island Group: That portion of Subarea 23-8, described as all waters and intertidal foreshore of Pacific Rim National Park - Broken Island Group. (Park)

Area 24

Area 24 - Whiskey Jenny Beach (Shelter Inlet): That portion of Subarea 24-3, described as those waters and intertidal foreshore lying inside a line bounded on the east by a point of land located eight cables west of Dixon Point in Shelter Inlet and bounded on the west to a point of land located 1.6 nautical miles from Dixon Point. This beach is locally known as Whiskey Jenny Beach. (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 24 - Bawden Bay: That portion of Subarea 24-4, described as those waters and intertidal foreshore lying inside a line from Bawden Point to Clifford Point. (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 24 - Whitepine Cove: That portion of Subarea 24-5, described as those waters and intertidal foreshores lying inside of a line drawn from Bawden Point to the most southern tip of Binns Island, thence due east to Vancouver Island. (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 24 - Hesquiat Harbour: All waters of Subarea 24-1. (Recreational and Aboriginal for food, social and ceremonial purposes)

Pacific Rim National Park (Grice Bay, McBey Islets): The waters of Tofino Inlet within Pacific Rim National Park including McBey Islets and Dinner Island in Tsapee Narrows, Browning Passage in Subarea 24-9 and Grice Bay west and south of Indian Island in Subarea 24-11, as shown in Appendix Figure 2.8. (Park)

Area 25

Area 25 - Head of Espinosa Inlet: That portion of Subarea 25-11, described as all the intertidal foreshore lying between concrete, yellow-dyed markers at the head of Espinosa Inlet fronting the Indian Reserve. (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 25 - Queen Cove: That portion of Subarea 25-12, described as all the waters and intertidal foreshore lying inside a line drawn from a point of land located four cables southerly of Saddle Point at the NW corner to the entrance of Queens Cove, to a point of land bearing 136° true on the opposite shore. This area would encompass Queen Cove entirely (Queens Cove). (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 26

Area 26 - Tahsish River Provincial Park: That portion of Subarea 26-4 described as all the intertidal foreshore lying inside or westerly of a line commencing at the most southern point of I.R. 11 thence true south to the Vancouver Island shore.

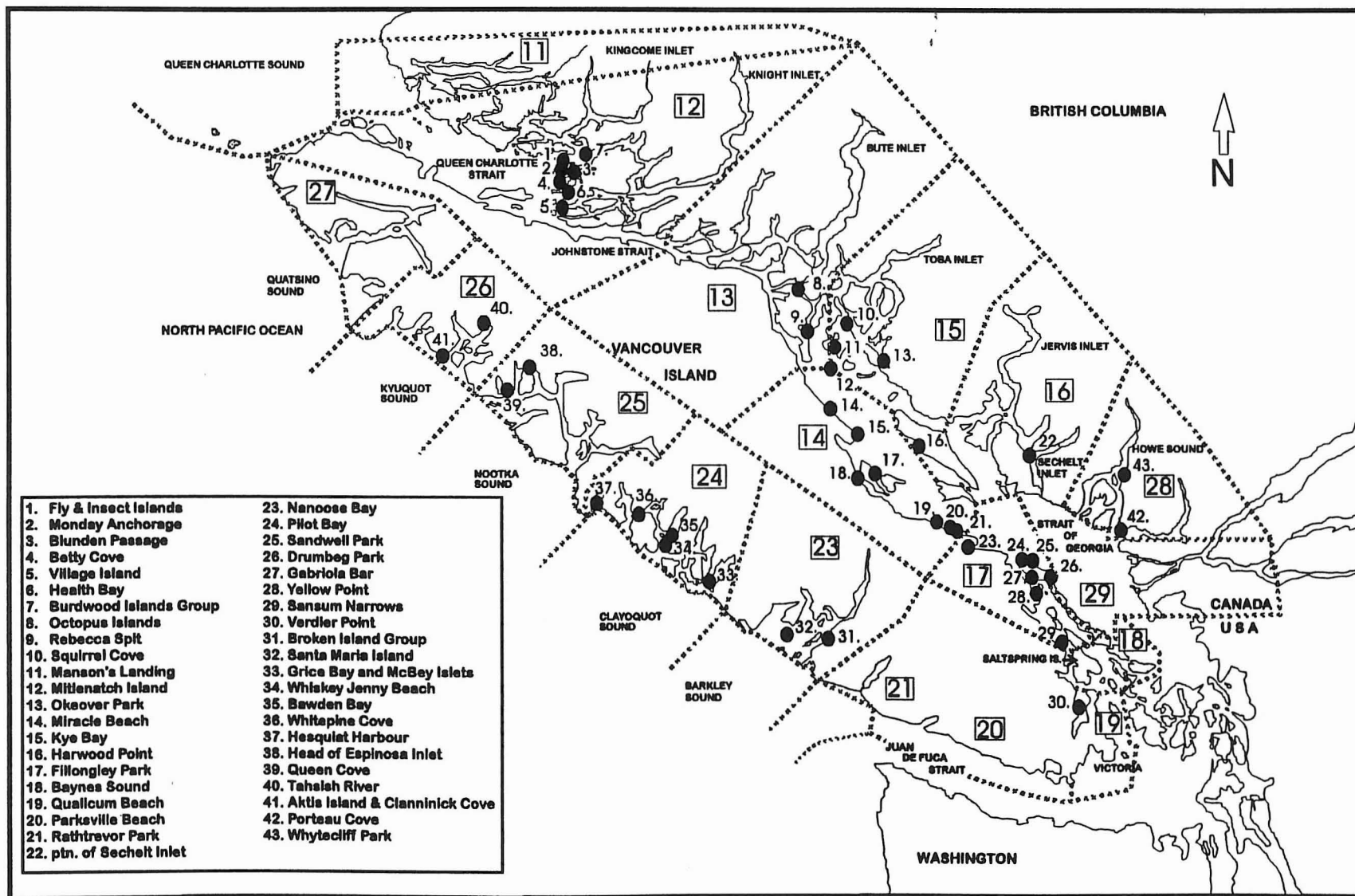
Area 26 - Aktis Island: That portion of Subarea 26-1 described as all the intertidal foreshore surrounding Aktis Island. (Recreational and Aboriginal for food, social and ceremonial purposes)

Area 26 - Clanninick Cove: That portion of Subarea 26-6 described as those waters lying inside a line drawn between the two headlands located on either shore at the entrance to Clanninick Cove. (Recreational and Aboriginal for food, social and ceremonial purposes).

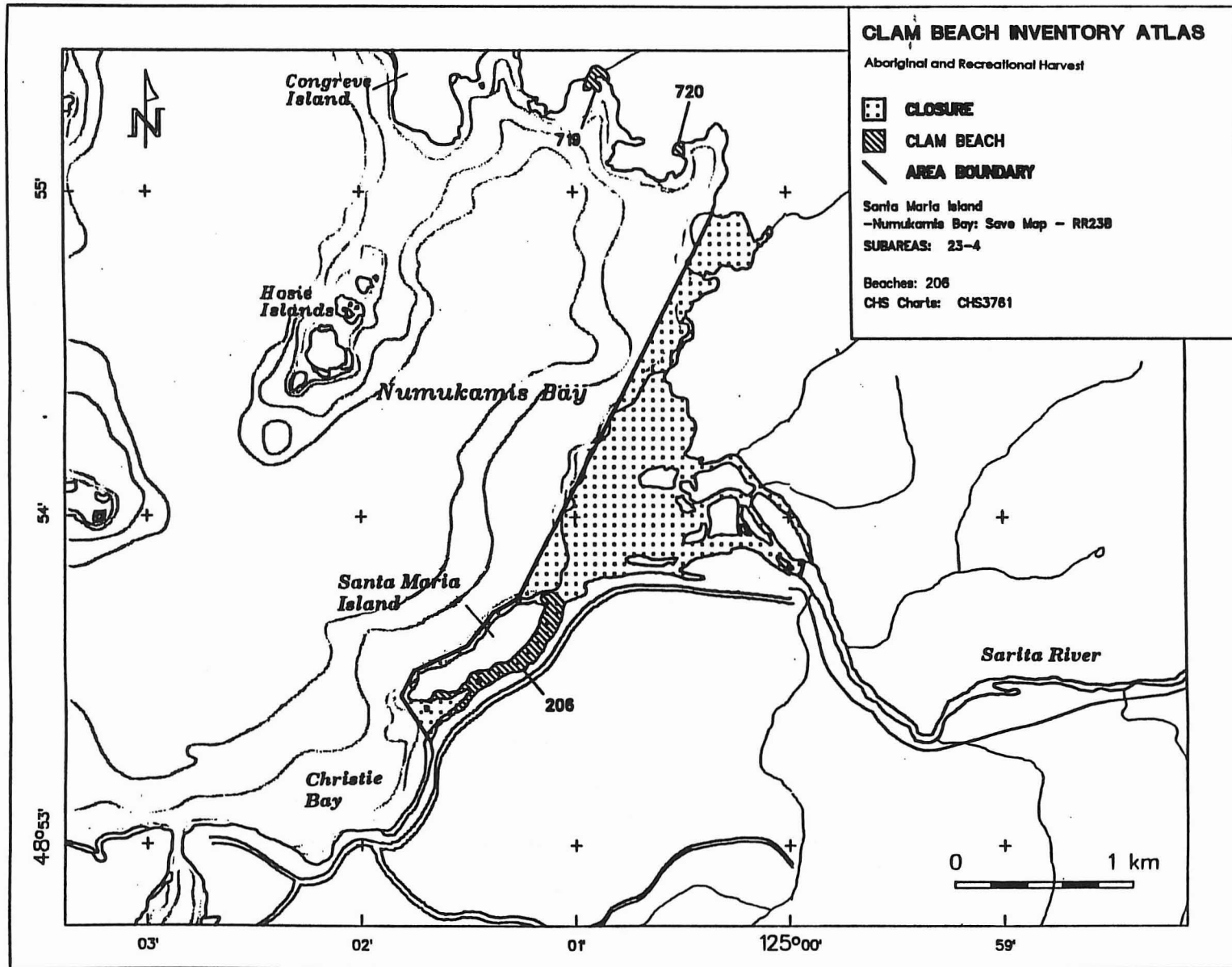
Appendix Table 2.1. Known clam beaches within Aboriginal harvest, park or recreational reserve closures, from the Clam Beach Inventory Database.

Area	Subarea	Beach #	Beach Location	Closure Name	Closure Type	Beach Area (ha)	Clam Area (ha)
23	4	206	Santa Maria Island	Numukamis Bay	Aboriginal harvest	8.44	
23	8	242	Hand Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	6.86	
23	8	243	Brabant Islands	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.45	
23	8	244	Brabant Islands	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.55	
23	8	245	Brabant Islands	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.1	
23	8	246	Brabant Islands	Pacific Rim Park /Broken Is.	Recreational reserve or park	2.06	
23	8	247	Treble Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.43	
23	8	248	Nettle Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.48	
23	8	249	Nettle Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.51	
23	8	250	Nettle Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	2.53	
23	8	251	Nettle Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.79	
23	8	252	Nettle Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.95	
23	8	253	Effingham Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.56	
23	8	967	Effingham Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.19	
23	8	968	Effingham Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.35	
23	8	969	Effingham Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.43	
23	8	970	Effingham Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.76	
23	8	971	Jacques/Jarvis Lagoon	Pacific Rim Park /Broken Is.	Recreational reserve or park	2.71	
23	8	972	Jacques/Jarvis Lagoon	Pacific Rim Park /Broken Is.	Recreational reserve or park	8.55	
23	8	973	Joe's Bay, Turtle Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.59	
23	8	974	Trickett Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	2.62	
23	8	975	Trickett Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	4.13	
23	8	977	Dempster Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.88	
23	8	979	Clarke Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	1.88	
23	8	980	Benson Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.9	
23	8	981	Wouwer Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	2.49	
23	8	982	Gibraltar Island	Pacific Rim Park /Broken Is.	Recreational reserve or park	0.93	
24	1	955	Anton Spit	Hesquiatic Harbour	Aboriginal harvest	5.32	
24	1	956	Rondeault Point	Hesquiatic Harbour	Aboriginal harvest	10.74	
24	1	957	Rae Basin	Hesquiatic Harbour	Aboriginal harvest	7.53	
24	1	958	Boat Basin	Hesquiatic Harbour	Aboriginal harvest	11.27	

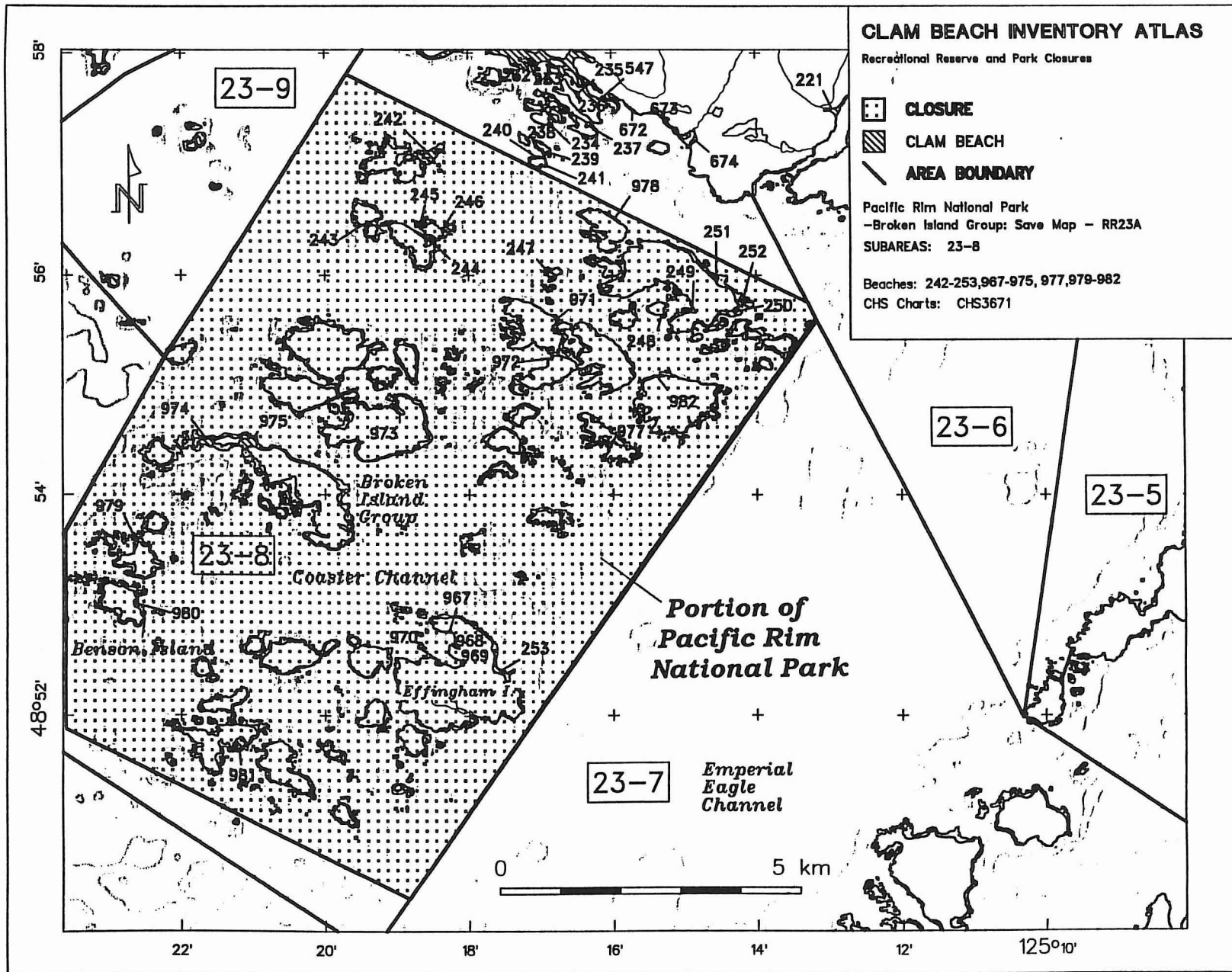
Area	Subarea	Beach #	Beach Location	Closure Name	Closure Type	Beach Area (ha)	Clam Area (ha)	
24	3	275	Whiskey Jenny Beach	Shelter Inlet	Aboriginal harvest	5.97		
24	4	755	Bawden Bay	Bawden Bay	Aboriginal harvest	2.24		
24	5	260	Whitepine Cove	Whitepine Cove	Aboriginal harvest	8.24		
24	5	261	Little Whitepine	Whitepine Cove	Aboriginal harvest	6.39		
25	11	326	Espinosa Inlet, C	Head of Espinosa Inlet	Aboriginal harvest	10.83		
25	12	302	Queen Cove	Queen Cove	Aboriginal harvest	3.74		
25	12	303	Queen Cove	Queen Cove	Aboriginal harvest	8.32		
25	12	304	Queen Cove	Queen Cove	Aboriginal harvest	0.62		
26	1	337	Aktis and Kamils Islands	Aktis Island	Aboriginal harvest	3.81		
26	4	1007	Tahsish Inlet I.R.	Tahsish River Provincial Park	Recreational reserve or park	10.93		
26	6	339	McLean Island	Clanninick Cove	Aboriginal harvest	2.09		
26	6	340	Clanninick Cove, A	Clanninick Cove	Aboriginal harvest	7.22		
26	6	884	Clanninick Cove, B	Clanninick Cove	Aboriginal harvest	5.88		
Total Beaches:		44						
Total Beach Area:		170.26						
Total Clam Area:		n/a						



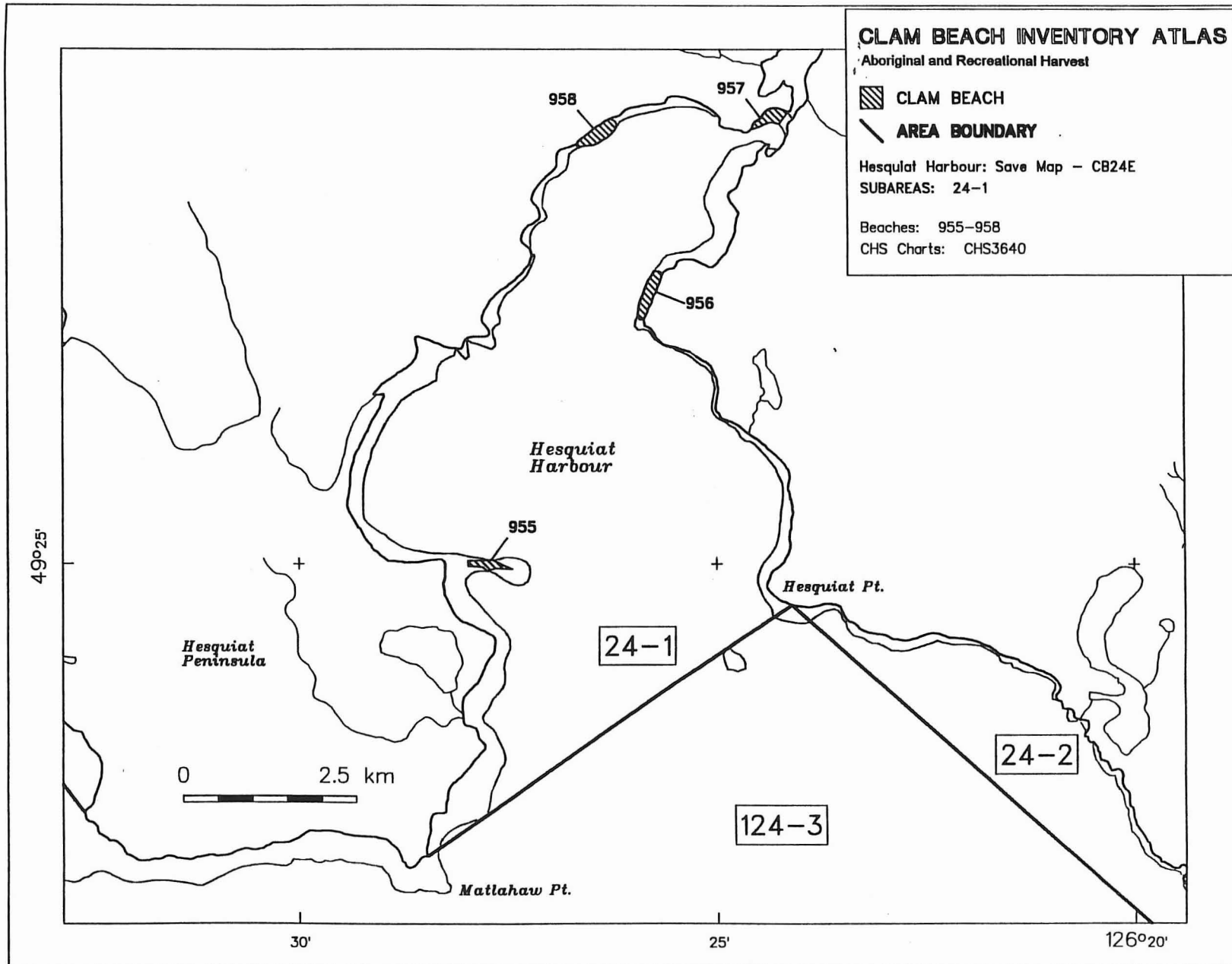
Appendix Figure 2.1. Commercial closures in 1997 for park, recreational or Aboriginal clam harvest.



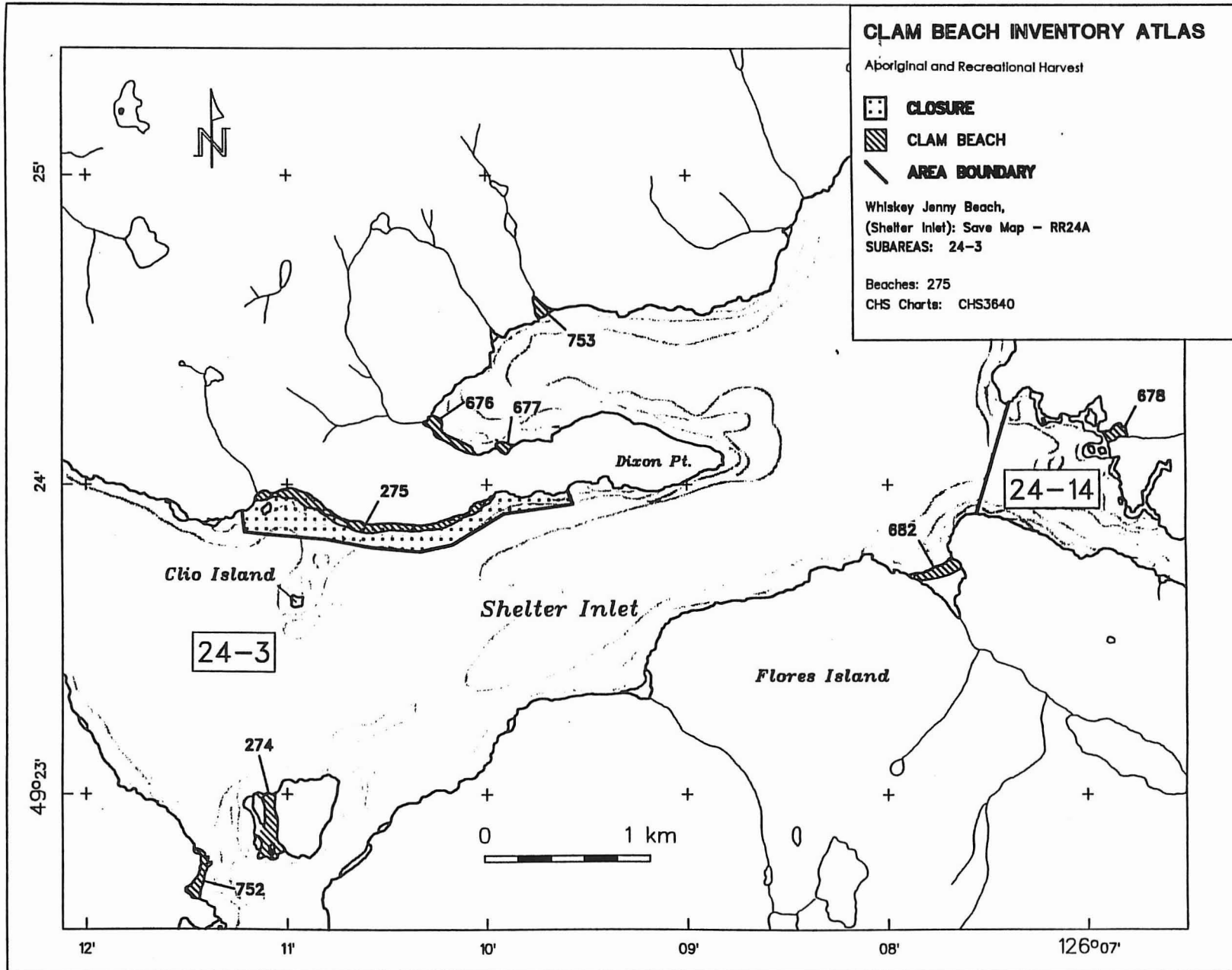
Appendix Figure 2.2.



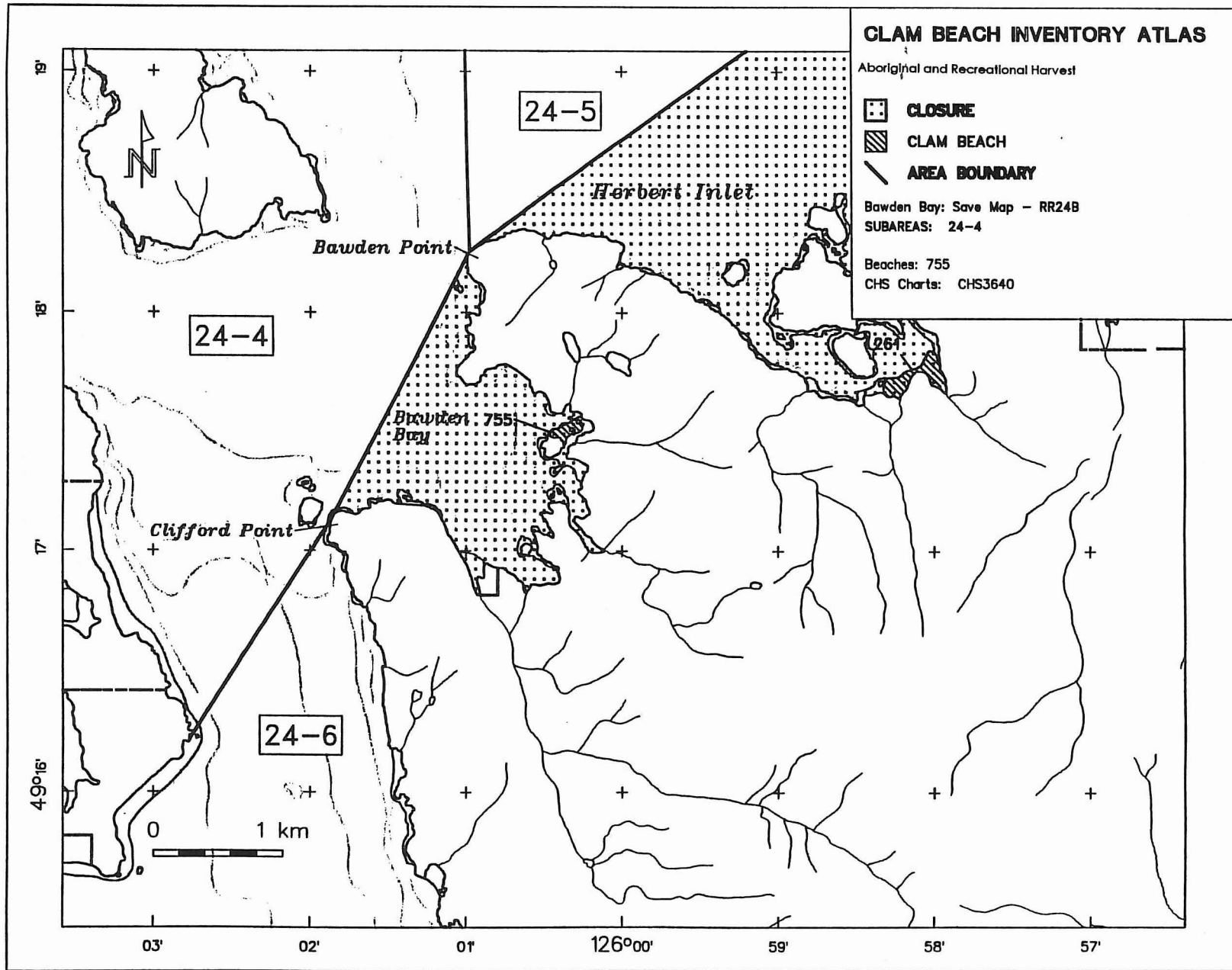
Appendix Figure 2.3. Pacific Fishery Management Area 23-8, a portion of the Broken Group Islands, Pacific Rim National Park.



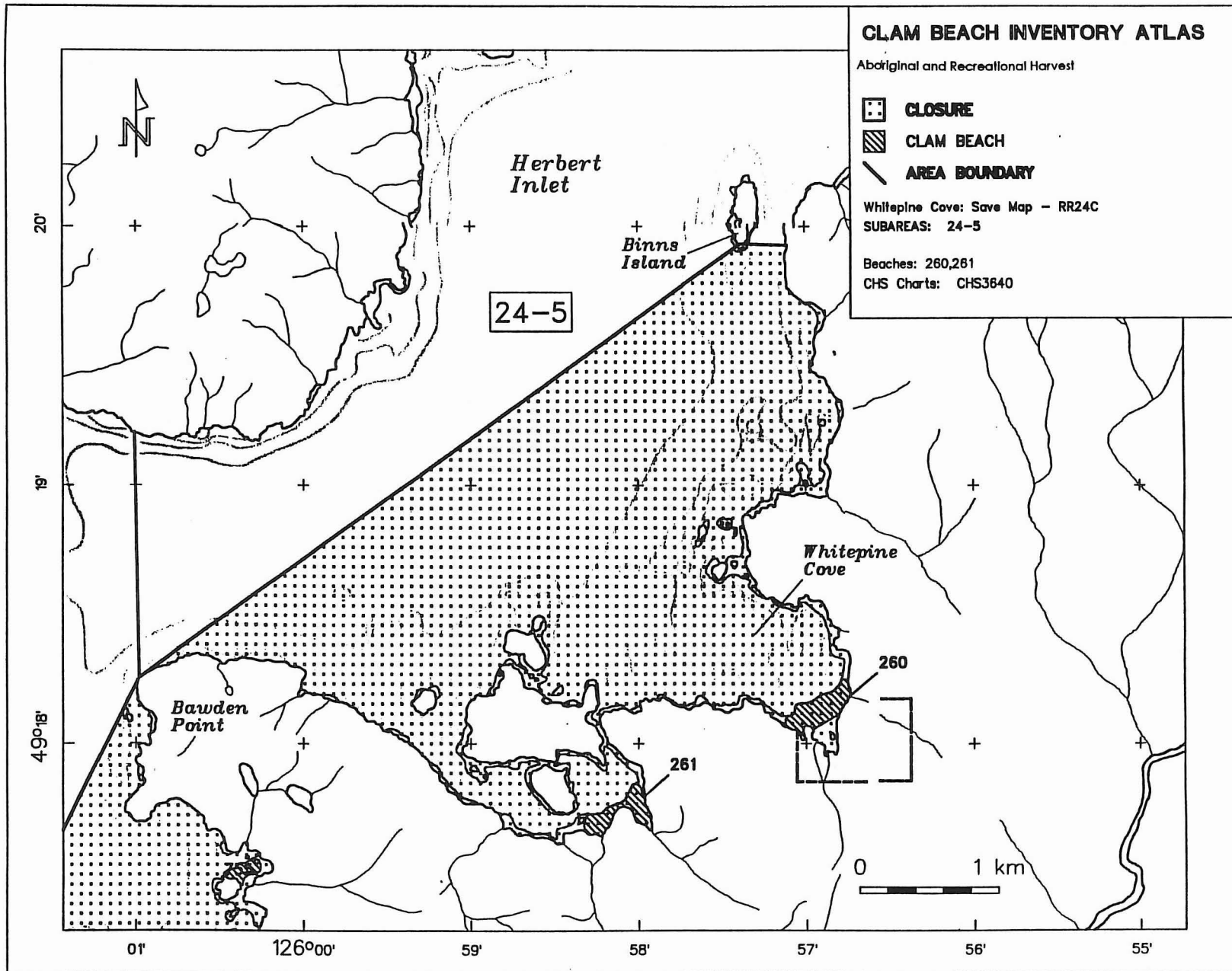
Appendix Figure 2.4.



Appendix Figure 2.5.



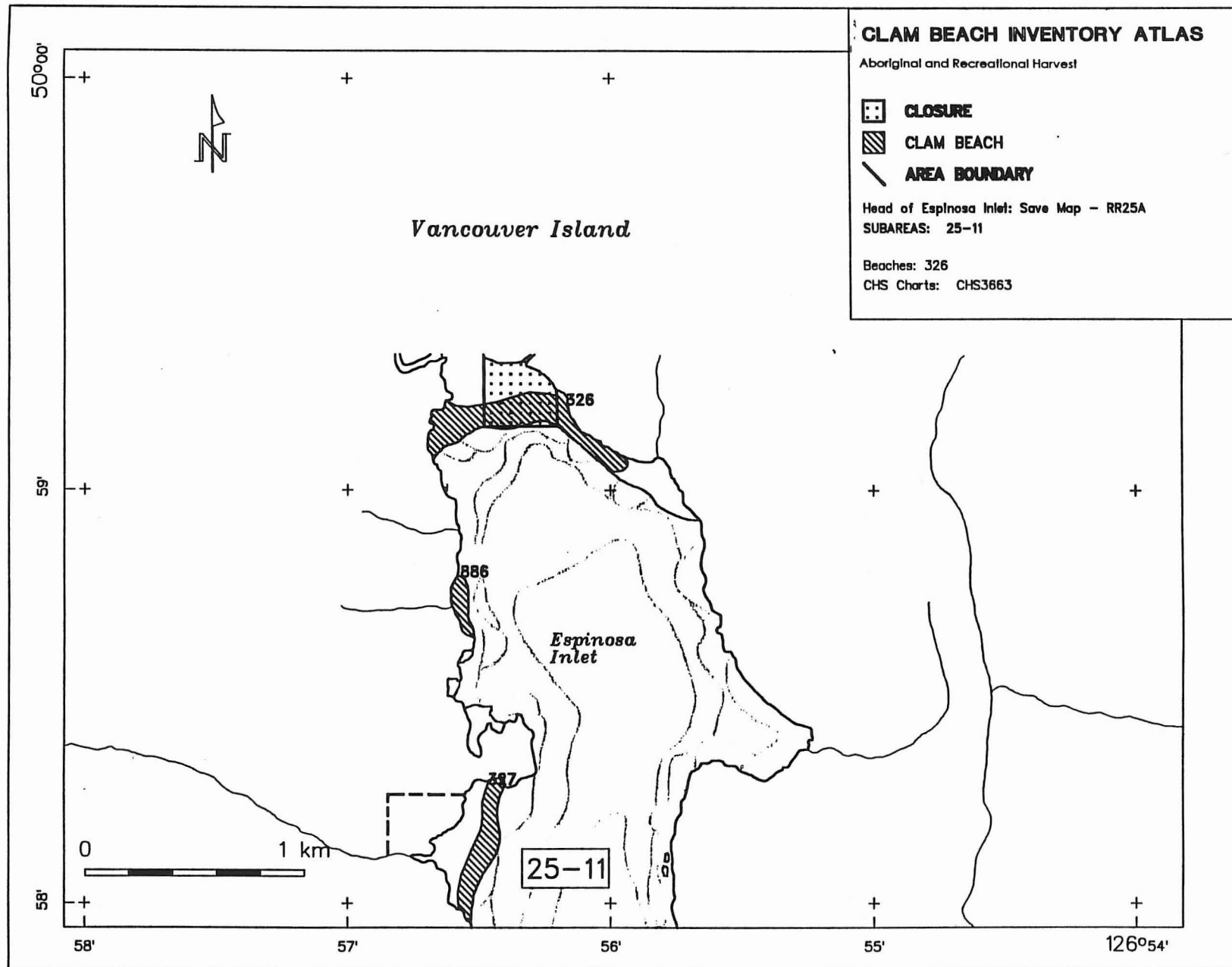
Appendix Figure 2.6.



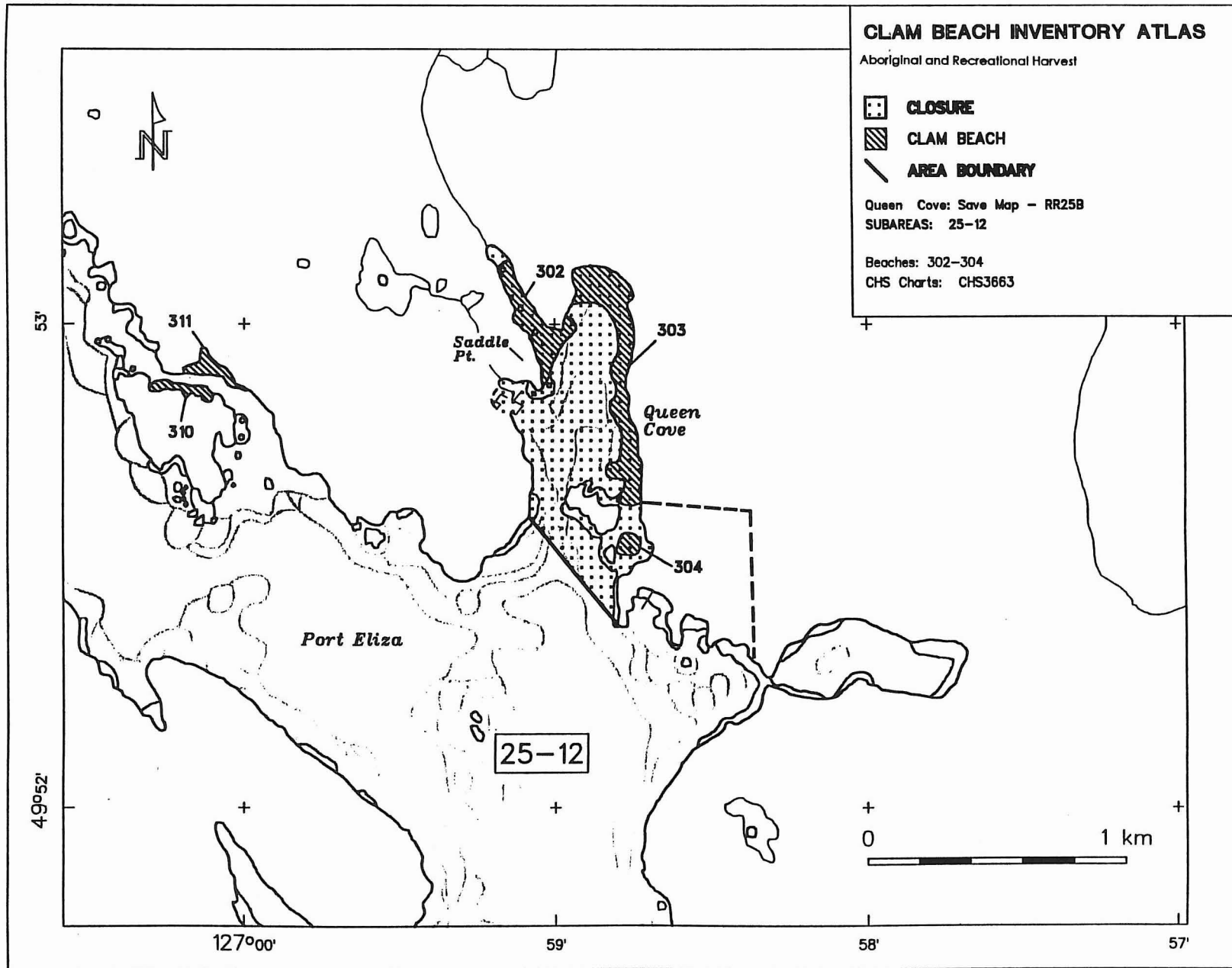
Appendix Figure 2.7.



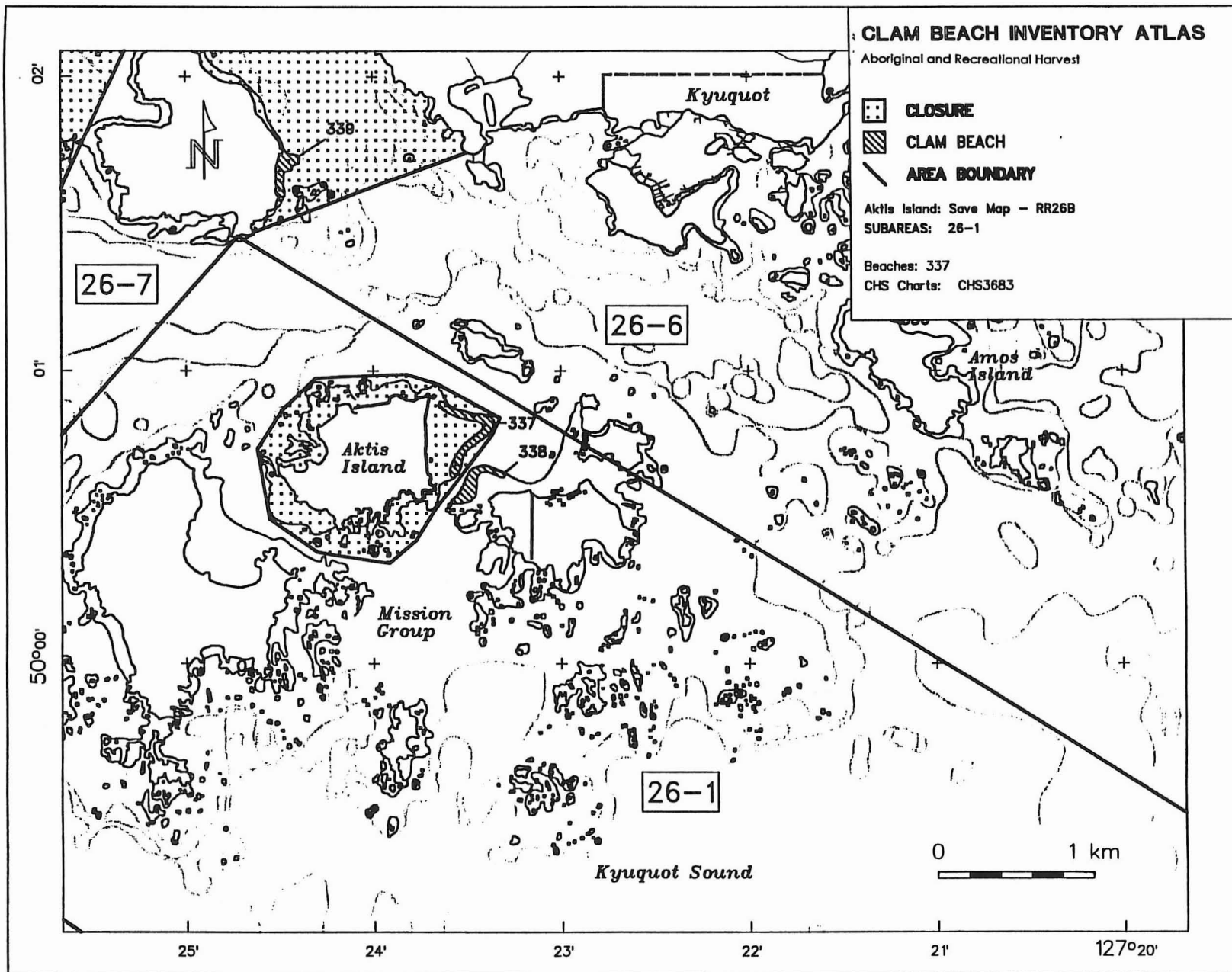
Appendix Figure 2.8. Pacific Rim National Park Closure: Grice Bay and McBey Islets.



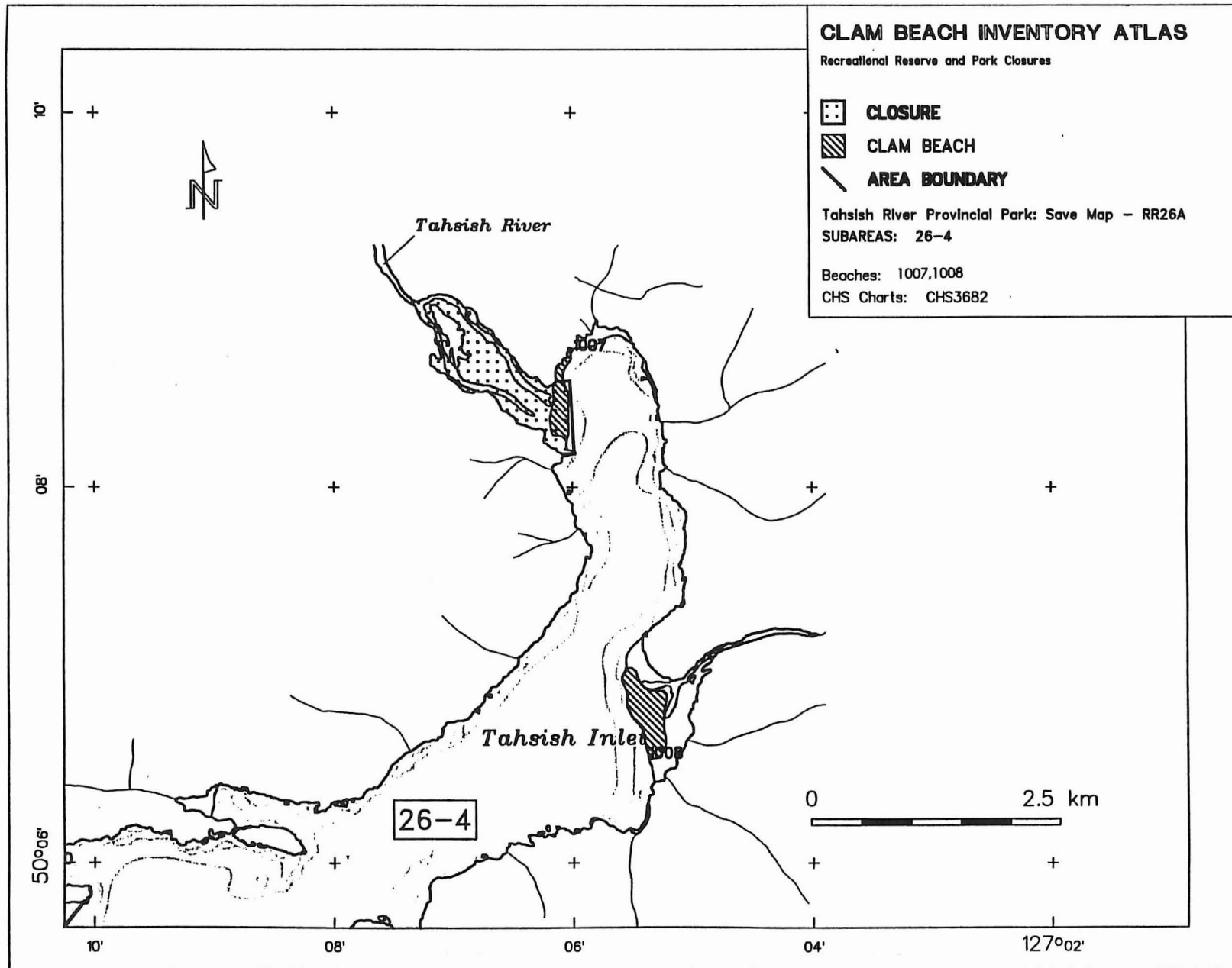
Appendix Figure 2.9.



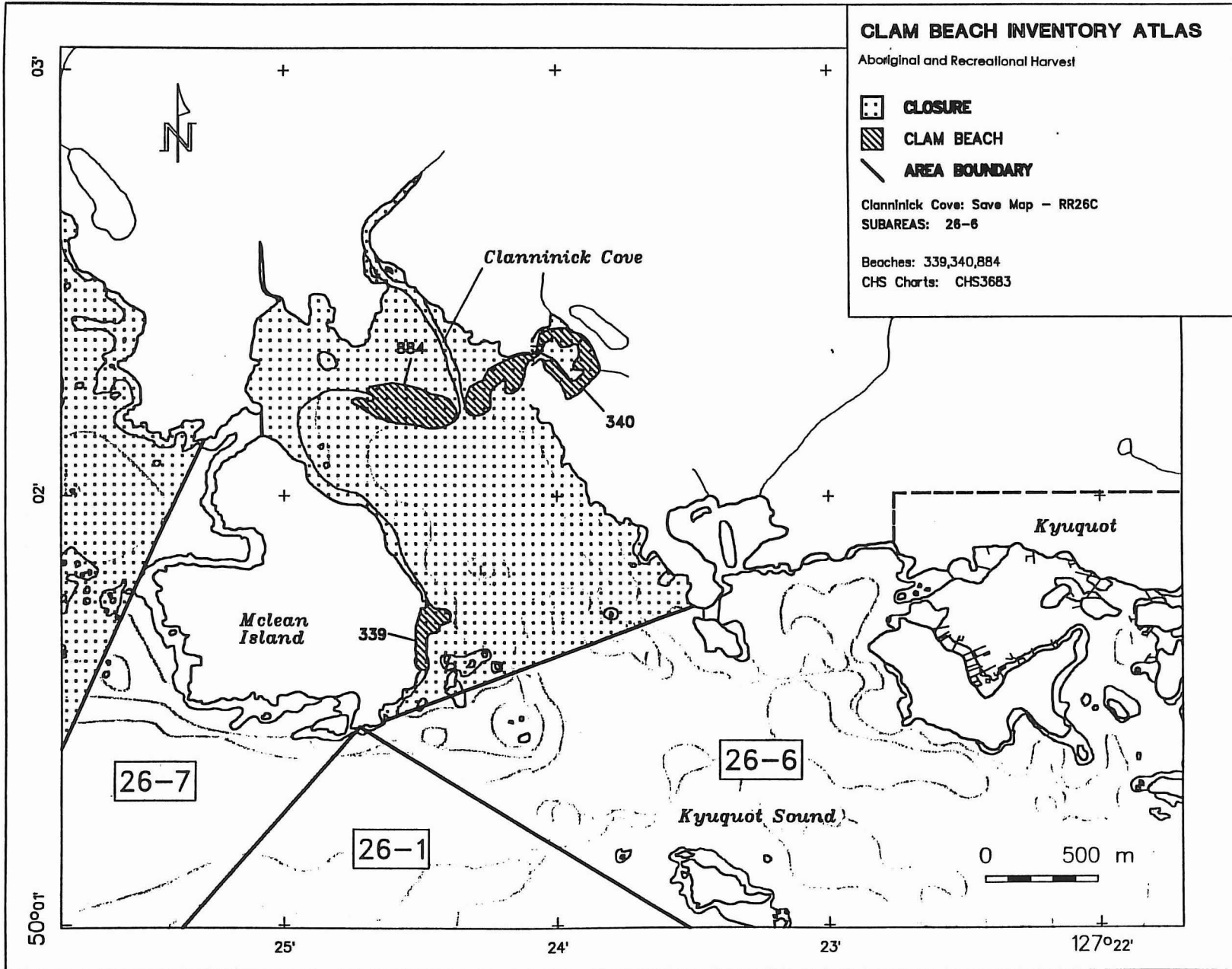
Appendix Figure 2.10.



Appendix Figure 2.11.



Appendix Figure 2.12.



Appendix Figure 2.13.

APPENDIX 3.

DESCRIPTIONS OF CONTAMINATED CLOSURES, AREAS 21 TO 27

**From the 1997 DFO Pacific Region Management Plan for Intertidal
Clams (Manila, Littleneck, Butter and Razor Clams)**

Note: This list is provided for general information only. Closures may change at any time. For up to date information, please contact the local Fisheries office.

SEWAGE CONTAMINATED AREAS 21 to 27

Any Canadian fisheries waters of the Pacific Ocean within 125 m of

- (a) any wharf, dock, platform or other structure used for vessel moorage; or
- (b) any permanently anchored floating structures, including float homes, barges, platforms and vessels.

Area 21

(There are no contaminated closures identified in Area 21)

Area 23

1. The waters and foreshore of Bamfield Inlet and Grappler Inlet lying inside a line drawn from Aguilar Point light to the harbour limit on the opposite shore.
2. The waters and foreshore of Ucluelet Inlet lying inside a line drawn from the tip of the southern headland of Spring Cove on Ucluth Peninsula to the tip of the southern headland of Stuart Bay on the opposite side. (**Prohibited Area**)
3. The waters and foreshore of Cigarette Cove, Entrance Inlet, lying inside of a line drawn across the entrance to the cove at its narrowest point.
4. The waters and foreshore of the small unnamed bay immediately northeast of Congreve Island, lying inside a line drawn from the westernmost point of the southern headland of the bay due north to the opposite shore.
5. The foreshore of Alberni Inlet from River Point to a point 480 m south.
6. That portion of Useless Inlet, Barkley Sound, lying within a 150 m radius of the mouth of the unnamed creek, entering the north side of Useless Inlet, at 48°59.59'N latitude and 125°03.45'W longitude.

Area 24

1. The waters and foreshore of Van Nevel Channel and Duffin Passage bounded by a line from Usatzes Point to the eastern point of Beck Island, thence to the western point of Stockham Island, thence to the most southern tip of Stubbs Island, thence south to the green navigation buoy, and thence directly east to the shore of Esowista Peninsula.
2. The waters and foreshore located inside a 150 m radius from the mouth of the unnamed creek at 49°14'30"N latitude and 125°44'15"W longitude, located south of Virge Creek on the east side of Warn Bay.

3. The waters and foreshore located inside 200 meter radius from the head of the unnamed cove on Meares Island at 49°11'5"N latitude and 125°47'43"W longitude, directly west of Dark Island in Fortune Channel.

Area 25

1. The waters and foreshore of Friendly Cove, lying inside a line drawn from Yuquot Point to the navigation light on San Rafael Island and thence due north to Nootka Island.
2. The waters and foreshore of Valdes Bay, Hisnit Inlet, Nootka Sound, lying inside a line drawn from the southern headland of Valdes Bay to the northwest tip of the unnamed island in the bay, thence due east to a point on shore of Valdes Bay.
3. The waters and foreshore of Kendrick Inlet, Nootka Island, within a 300 m radius of the Onion Lake Logging Company dock.
4. The waters and foreshore at the head of Tlupana Inlet, Nootka Sound, inside a line drawn from the unnamed point on the east side of the inlet immediately northwest of Perpendicular Bluff, due west to the opposite shore.
5. The waters and foreshore at the head of Inner Basin, Nootka Island lying inside a line drawn from the headland on the north side at 49°48.10'N latitude and 126°47.06'W longitude thence south to a point on land at 49°47.76'N latitude and 126°47.06'W longitude.
6. The waters and foreshore at the head of Port Eliza, Esperanza Inlet, lying inside a line drawn from the southern tip of the small unnamed peninsula on the western shore of Port Eliza due east to the opposite shore.

Area 26

1. The foreshore at the head of Yaku Bay, Tahsish Inlet, Kyuquot Sound.
2. The foreshore at the head of Hankin Cove, Kashutl Inlet.
3. The foreshore at the head of McKay Cove, Kyuquot Sound.
4. The waters and foreshore of Walters Cove, Kyuquot Sound, lying inside a line drawn from the western headland of Walters Cove to the Gayward Rock light, thence to the eastern tip of Rolston Island, thence to the western headland at the entrance of McKay Cove.
5. The waters and foreshore located inside a line drawn from the headland on the north side of the head of Malksope Inlet at 50°08.05'N latitude and 127°26.00'W longitude, thence southerly to the islet on the south side of the inlet at 50°07.50'N latitude and 127°26.00'W longitude.
6. The waters and foreshore at the head of Ououkinsh Inlet, north of an east-west line drawn through the northern tip of the southernmost Hisnit Islands.

7. The waters and foreshore of Kashutl Inlet lying within a 900 m radius of Chamiss Point.
8. All that portion of the intertidal area of Kashutl Inlet from a point on land at 50°08.75'N latitude and 127°16.74'W longitude thence easterly to the western tip of an unnamed island at 50°08.43'N latitude and 127°16.26'W longitude thence northerly to the end of an unnamed peninsula at 50°08.61'N latitude and 127°16.08'W longitude.
9. The waters and foreshore of Chamiss Bay, Kashutl Inlet, lying inside a line drawn from the point on land at 50°04.40'N latitude and 127°17.10'W longitude thence southeasterly to a headland at 50°03.95'N latitude and 127°16.80'W longitude.
10. The foreshore at the head of Cachalot Inlet, Kyuquot Sound.

Area 27

1. The waters and foreshore of the bay at the mouth of Cleagh Creek, Quatsino Sound, lying inside a line drawn from the eastern headland to the western headland of the bay.
2. The waters and foreshore lying within an 800 m radius of the creek entering at the settlement of Mahatta River, Quatsino Sound.
3. The waters and foreshore of Koprino Harbour, Quatsino Sound, lying inside a line at 50°30.00'N latitude drawn from the entrance to Spencer Cove through Schloss Island to the opposite shore.
4. The waters and foreshore of Winter Harbour, lying north of a line drawn from Greenwood Point to the mouth of Quashtin Creek, and west and south of a line drawn from the mouth of Denad Creek through the western tip of Wedel Island to the opposite shore of Winter Harbour.
5. The foreshore at the head of Holberg Inlet.
6. The waters and foreshore of Hecate Cove, Quatsino Sound, lying inside a line drawn from the eastern shore at 50°32.70'N latitude and 127°35.48'W longitude thence west to a point on land at 50°32.70'N latitude and 127°35.89'W longitude.
7. The waters and foreshore of Kokwina Cove, Quatsino Sound, lying inside a line drawn from a point of land on the western entrance at 50°31.50'N latitude and 127°34.61'W longitude thence to the east to a point on shore at 50°31.50'N latitude and 127°34.33'W longitude.

APPENDIX 4.

TABLE OF CLAM BEACHES SORTED BY LOCATION NAME

AREAS 21 TO 27

Appendix Table 4.1. British Columbia Clam Beach Inventory, sorted by Location for Management Areas 21 to 27.

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	5	205	Ahmah Island	1.43	
23	6	218	Alma Russell Islands	1.08	
23	6	219	Alma Russell Islands	1.03	
23	6	217	Alma Russell Islands	0.77	
23	6	220	Alma Russell Islands	1.17	
26	3	330	Amai Inlet	3.99	
26	3	332	Amai Point (Opposite)	1.16	
26	6	336	Amos Island	1.02	
27	11	367	Apple Bay	13.25	
25	13	305	Apple Creek	1.09	
27	8	382	Atkins Cove	4.41	
26	1	338	Atkis And Kamils Islands	2.61	
26	1	337	Atkis And Kamils Islands	3.81	
24	14	675	Atleo (Millar Channel)	6.02	
24	14	679	Atleo (Millar Channel)	8.35	
23	7	546	Bamfield Inlet	56.73	
25	9	938	Barr Creek	5.50	
26	7	1014B	Battle Bay	13.52	
26	7	1014A	Battle Bay	3.01	
24	4	755	Bawden Bay	2.24	
23	10	193	Bazett Island	1.00	
24	9	256	Beck Island	2.49	
23	8	980	Benson Island	0.90	
25	6	280	Bligh Island (W)	0.41	
23	8	243	Brabant Islands	1.45	
23	8	244	Brabant Islands	1.55	
23	8	245	Brabant Islands	1.10	
23	8	246	Brabant Islands	2.06	
26	8	1013B	Bunsby Islands	2.32	
26	8	1013A	Bunsby Islands	2.12	
26	8	1013C	Bunsby Islands	2.89	
26	3	331	Cachalot Inlet	3.32	
24	6	263	Calmus Passage	0.01	
23	8	674	Canoe Island	0.86	
23	8	673	Canoe Island	4.40	
23	8	672	Canoe Island	0.44	
25	9	941	Ceepeecee Ways	2.06	
26	5	333	Chamiss Bay	3.84	
26	6	340	Clannick Cove, A	7.22	
26	6	884	Clannick Cove, B	5.88	
23	8	979	Clarke Island	1.88	
27	7	734	Cleagh Creek	2.17	
27	11	366	Clesklagh Creek	15.35	
21	0	988	Clo-oose Bay	43.56	
27	11	368	Coal Harbour	5.27	
23	5	208	Congreve Island	4.79	
23	4	718	Congreve Island, B	1.39	
23	4	719	Congreve Island, C	1.17	
23	4	720	Congreve Island, D	0.39	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
24	3	750	Cox Bay		1.94
26	6	885	Crowther Channel		3.61
24	10	747	Dawley Pass (W), B		3.29
24	10	266	Dawley Pass, A		2.66
24	10	265	Dawley Pass, B		2.20
24	10	264	Dawley Pass, B		2.08
23	8	977	Dempster Island		1.88
24	3	753	Dixon Bay		0.77
27	7	378	Drake Island		1.60
27	7	376	Drake Island		2.12
27	7	377	Drake Island		2.83
26	2	906	East Pinnacle Channel		0.29
26	5	334	Easy Inlet		5.82
23	8	967	Effingham Bay		0.19
23	8	968	Effingham Bay		0.35
23	8	969	Effingham Bay		0.43
23	8	970	Effingham Bay		0.76
23	6	228	Effingham Inlet		2.00
23	6	229	Effingham Inlet		1.79
23	6	230	Effingham Inlet		1.39
23	8	253	Effingham Island		1.56
25	13	937A	Ehatisaht (N), A		0.75
25	13	937B	Ehatisaht (N), B		0.54
25	12	310	Eliza Island		0.88
25	12	311	Eliza Island		1.09
23	8	231	Equis Beach	44.95	
25	11	683	Espinosa Inlet, A		3.21
25	11	327	Espinosa Inlet, B		5.11
25	11	933	Espinosa Inlet, C		5.05
25	11	934	Espinosa Inlet, D		1.83
25	11	886	Espinosa Inlet, D		1.59
25	11	935	Espinosa Inlet, E		2.57
25	11	936	Espinosa Inlet, F		1.29
25	11	326	Espinosa Inlet, C	10.83	
25	6	279	Ewin Inlet		0.29
25	6	278	Ewin Inlet		1.97
26	4	1009	Fair Harbour	24.05	
23	5	204	Fleming Island		2.50
27	3	394	Forward Inlet	12.11	
27	3	395	Forward Inlet	13.62	
24	3	749	Frank Island		2.38
25	13	307	Garden Point		0.50
25	13	306	Garden Point		4.91
25	13	308A	Garden Point (E), A		1.21
25	13	308B	Garden Point (E), B		6.76
25	13	308C	Garden Point (E), C		1.12
24	3	274	George Island		3.56
23	8	982	Gibraltar Island		0.93
23	7	545	Grappler Inlet		3.37
25	13	684	Graveyard Bay		2.98
25	13	300	Graveyard Bay		0.83
23	8	242	Hand Island		6.86

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
26	5	1011	Hankin Cove	2.12	
23	10	728	Harris Point	6.58	
25	9	299	Haven Cove	1.28	
24	14	678	Hayden Pass	0.94	
25	5	701	Head Bay	2.59	
25	5	706	Head Bay	0.71	
25	5	705	Head Bay	1.05	
25	5	704	Head Bay	1.39	
25	5	703	Head Bay	8.98	
25	5	702	Head Bay	3.79	
25	9	940	Hecate (N)	1.75	
27	9	373	Hecate Cove	1.84	
24	1	955	Hesquiat Harbour/Anton Spit	5.32	
24	1	958	Hesquiat Harbour/Boat Basin	11.27	
24	1	957	Hesquiat Harbour/Rae Basin	7.53	
24	1	956	Hesquiat Harbour/Rondeault Point	10.74	
23	10	549	Hillier Island	25.84	
23	10	727	Hillier Island	2.14	
25	4	288	Hisnit Inlet	0.76	
25	4	289	Hisnit Inlet	0.64	
25	4	287	Hisnit Inlet	7.66	
25	4	296	Hisnit Inlet	1.15	
27	11	685	Holberg Inlet (N)	0.54	
27	11	389	Holberg Inlet (N)	35.53	
27	11	390	Holberg Inlet (N)	26.28	
27	11	387	Holberg Inlet (S)	8.90	
27	11	388	Holberg Inlet (S)	8.21	
27	7	371	Ilstad Island	7.69	
24	11	254	Indian Bay	3.73	
25	14	313	Inner Basin	1.33	
25	14	312	Inner Basin	2.05	
25	14	314	Inner Basin	0.79	
25	14	346	Inner Basin (Head)	11.79	
23	8	972	Jacques/Jarvis Lagoon	8.55	
23	8	971	Jacques/Jarvis Lagoon	2.71	
25	8	285	Jewitt Cove (N)	1.58	
23	8	973	Joe's Bay - Turtle Island	1.59	
23	6	214	John Islet	1.25	
26	10	343	Johnson Lagoon	2.87	
26	10	344	Johnson Lagoon	2.48	
23	6	224	Julia Passage	0.36	
23	6	221	Julia Passage	2.52	
23	6	223	Julia Passage	2.28	
23	6	222	Julia Passage	0.38	
26	5	335	Kauwinch River	5.75	
123	1	983	Keeha Beach	18.52	
25	6	295	Kendrick Inlet	0.86	
25	6	293	Kendrick Inlet	1.83	
25	6	292	Kendrick Inlet	9.09	
25	6	294	Kendrick Inlet	1.93	
27	5	350	Klaskino Anchorage	27.15	
27	5	710	Klaskino Inlet	0.95	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
27	5	709	Klaskino Inlet	1.63	
27	5	708	Klaskino Inlet	1.63	
27	5	707	Klaskino Inlet	2.16	
27	5	359	Klaskino Inlet (Head)	2.26	
27	5	361	Klaskino Inlet (Head)	0.67	
27	5	362	Klaskino Inlet (Head)	6.40	
27	5	360	Klaskino Inlet (Head)	1.85	
27	5	363	Klaskino Inlet (Head)	1.98	
27	6	352	Klaskish Anchorage	11.84	
27	6	351	Klaskish Basin	9.77	
27	7	384	Kloutchlimmis River	12.88	
27	7	383	Kloutchlimmis River	16.52	
27	9	374	Kokwind Cove	2.54	
27	7	380	Koprino Harbour	11.14	
27	7	381	Koprino Harbour	5.18	
27	7	379	Koprino Harbour	33.15	
27	7	364	Koskino Creek	3.94	
27	7	370	Kultus Cove	5.10	
27	0	687	Kwokwesta Creek	5.31	
25	11	324	Little Espinosa Inlet, A	3.10	
25	11	325	Little Espinosa Inlet, B	6.19	
24	5	261	Little Whitepine	6.39	
25	13	277	Louie Bay	21.88	
27	7	375	Mahatta Creek	13.66	
27	7	365	Mahatta River	11.49	
27	7	889A	Mahatta River (W)	3.77	
26	8	341	Malksope Inlet	3.55	
26	8	342	Malksope Inlet	4.78	
26	8	1012	Malksope Inlet	7.27	
25	14	315	Mary Basin	14.37	
25	14	316	Mary Basin	17.15	
23	9	548	Mayne Bay (N)	9.84	
23	9	723	Mayne Bay, A	1.58	
23	9	724	Mayne Bay, B	0.32	
23	9	725	Mayne Bay, C	1.02	
25	9	297	Mcbride Bay	2.14	
25	9	298	Mcbride Bay	0.57	
26	6	907	Mckay Cove	5.05	
24	3	748	Mckenzie Beach	3.04	
26	6	339	Mclean Island	2.09	
24	10	262	Meares Island, A	6.42	
24	13	751	Megin River Estuary (SE)	1.19	
24	14	680	Millar Channel	0.84	
24	9	257	Morpheus Island	1.63	
24	10	259	Mosquito Harbour	1.81	
24	10	258	Mosquito Harbour	13.85	
26	10	345	Nasparti Inlet	5.09	
26	10	1018	Nasparti Inlet	7.27	
23	8	251	Nettle Island	0.79	
23	8	249	Nettle Island	0.51	
23	8	248	Nettle Island	0.48	
23	8	252	Nettle Island	0.95	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	8	250	Nettle Island	2.53	
25	11	301	Nuchatlitz Creek	4.88	
25	13	322	Nuchatlitz, A	1.31	
25	13	321	Nuchatlitz, A	1.34	
25	13	323	Nuchatlitz, A	0.55	
25	13	320	Nuchatlitz, B	0.69	
27	6	354	Orchard Point (S)	10.68	
26	9	1017	Ououkinsh Inlet	10.42	
26	9	1015	Ououkinsh River	36.87	
123	1	984	Pachena Bay	4.16	
123	1	985	Pachena Beach	26.71	
27	7	372	Percy Ledge	12.07	
23	8	235	Pinkerton Island	0.82	
23	8	241	Pinkerton Island	0.18	
23	8	236	Pinkerton Island	0.34	
23	8	239	Pinkerton Island	0.40	
23	8	237	Pinkerton Island	0.47	
23	8	234	Pinkerton Island	0.28	
23	8	233	Pinkerton Island	9.96	
23	8	232	Pinkerton Island	0.65	
23	8	547	Pinkerton Island	1.51	
23	8	240	Pinkerton Island	0.45	
23	8	238	Pinkerton Island	0.26	
23	10	552	Pipestem Inlet	2.10	
23	10	551	Pipestem Inlet	3.50	
23	10	550	Pipestem Inlet	2.24	
25	12	309	Port Eliza, A	2.04	
25	12	348	Port Eliza, B	2.38	
25	12	347	Port Eliza, B	5.04	
26	9	1016A	Power River	1.76	
26	9	1016C	Power River	0.76	
26	9	1016B	Power River	4.09	
24	2	273	Pretty Girl Cove	3.04	
23	8	978	Prideaux Island	0.71	
27	7	385	Quatsino Sound	12.48	
27	7	386	Quatsino Sound	10.13	
27	0	686	Quattische Island	3.10	
25	12	302	Queen Cove	3.74	
25	12	304	Queen Cove	0.62	
25	12	303	Queen Cove	8.32	
26	6	908	Racoon Point	0.65	
23	4	721	Rainy Bay	0.76	
24	9	255	Riley Island	1.86	
23	3	207	Ritherson Bay	2.15	
23	5	203	Robbers Passage	4.46	
23	5	211	Roquefeuil Bay	1.68	
23	5	212	Roquefeuil Bay	0.73	
23	5	213	Roquefeuil Bay	1.55	
24	4	754	Ross Pass, A	2.91	
24	4	756	Ross Pass, B	2.82	
24	4	757	Ross Pass, C	0.98	
27	7	889B	Salmon Island	0.66	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
25	13	939A	Saltery Bay, A	0.85	
25	13	939B	Saltery Bay, B	1.52	
25	13	939C	Saltery Bay, C	1.02	
25	6	281	Santa Gertrudis Cove	0.79	
25	6	282	Santa Gertrudis Cove	0.82	
23	5	206	Santa Maria Island	8.44	
27	7	890	Schloss Island	1.47	
24	3	682	Shelter Inlet	1.77	
27	6	353	Shields Cove	12.00	
27	5	349	Side Bay	28.61	
27	7	369	Smith Cove	8.53	
23	0	726	Snowden Island (N)	1.51	
26	4	1010	South Of Yaku Bay	0.84	
25	6	290	Spanish Pilot Group	0.70	
25	6	291	Spanish Pilot Group	0.76	
23	5	209	Sproat Bay	0.56	
23	5	210	Sproat Bay	0.17	
24	3	752	Steamer Cove	1.56	
23	10	198	Stopper Island	1.97	
23	10	194	Stopper Island	1.35	
23	10	196	Stopper Island	8.49	
23	10	195	Stopper Island	2.83	
23	10	888	Stopper Island	5.38	
23	10	202	Stopper Island	0.39	
23	10	199	Stopper Island	0.78	
23	10	200	Stopper Island	0.74	
23	10	201	Stopper Island	0.36	
23	10	197	Stopper Island	2.08	
25	6	284	Strange Island (N Tip)	2.04	
24	13	276	Sulphur Passage	3.02	
24	13	681	Sulphur Passage	1.30	
26	4	1008	Tahsish Inlet - Artlish River	21.14	
26	4	1007	Tahsish Inlet - I.R.	10.93	
25	4	317	Tlupana Inlet, A	5.19	
25	4	318	Tlupana Inlet, B	0.72	
25	4	319	Tlupana Inlet, C	0.60	
23	10	553	Toquart Bay	21.83	
23	8	247	Treble Island	1.43	
23	8	974	Trickett Island	2.62	
23	8	975	Trickett Island	4.13	
25	8	286	Tsowwin Narrows	7.32	
21	0	987	Tsuquanah I.R.	6.20	
21	0	986	Tsusiat Falls	17.63	
23	11	554	Ucluelet	19.53	
23	11	556	Ucluelet	5.72	
23	11	555	Ucluelet	1.34	
26	2	328	Unsworth Point	1.53	
26	2	329	Unsworth Point	3.54	
23	6	226	Useless Inlet	2.03	
23	6	227	Useless Inlet	0.90	
23	6	225	Useless Inlet	1.07	
23	6	887	Useless Inlet, D	6.02	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	6	216	Vernon Bay	0.82	
23	6	215	Vernon Bay	4.89	
24	10	272	Warn Bay	8.40	
24	10	271	Warn Bay	3.39	
24	10	270	Warn Bay	4.19	
24	10	269	Warn Bay	6.03	
24	10	268	Warn Bay (SE)	2.82	
24	10	267	Warn Bay (SE)	2.79	
24	3	677	Whiskey Jenny	0.49	
24	3	676	Whiskey Jenny	1.73	
24	3	275	Whiskey Jenny	5.97	
24	5	260	Whitepine Cove	8.24	
27	3	391	Winter Harbour	20.40	
27	3	392	Winter Harbour	16.12	
27	3	393	Winter Harbour	38.26	
23	8	981	Wouwer Island	2.49	
25	7	283	Yuquot	0.95	
Total Beaches:		326	Total Beach Area:	1672.11	

APPENDIX 5.

TABLE OF CLAM BEACHES SORTED BY CLAM BEACH NUMBER

AREAS 21 TO 27

Appendix Table 5.1. British Columbia Clam Beach Inventory, sorted by Clam Beach Number for Management Areas 21 to 27.

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	10	193	Bazett Island	1.00	
23	10	194	Stopper Island	1.35	
23	10	195	Stopper Island	2.83	
23	10	196	Stopper Island	8.49	
23	10	197	Stopper Island	2.08	
23	10	198	Stopper Island	1.97	
23	10	199	Stopper Island	0.78	
23	10	200	Stopper Island	0.74	
23	10	201	Stopper Island	0.36	
23	10	202	Stopper Island	0.39	
23	5	203	Robbers Passage	4.46	
23	5	204	Fleming Island	2.50	
23	5	205	Ahmah Island	1.43	
23	5	206	Santa Maria Island	8.44	
23	3	207	Ritherson Bay	2.15	
23	5	208	Congreve Island	4.79	
23	5	209	Sproat Bay	0.56	
23	5	210	Sproat Bay	0.17	
23	5	211	Roquefeuil Bay	1.68	
23	5	212	Roquefeuil Bay	0.73	
23	5	213	Roquefeuil Bay	1.55	
23	6	214	John Islet	1.25	
23	6	215	Vernon Bay	4.89	
23	6	216	Vernon Bay	0.82	
23	6	217	Alma Russell Islands	0.77	
23	6	218	Alma Russell Islands	1.08	
23	6	219	Alma Russell Islands	1.03	
23	6	220	Alma Russell Islands	1.17	
23	6	221	Julia Passage	2.52	
23	6	222	Julia Passage	0.38	
23	6	223	Julia Passage	2.28	
23	6	224	Julia Passage	0.36	
23	6	225	Useless Inlet	1.07	
23	6	226	Useless Inlet	2.03	
23	6	227	Useless Inlet	0.90	
23	6	228	Effingham Inlet	2.00	
23	6	229	Effingham Inlet	1.79	
23	6	230	Effingham Inlet	1.39	
23	8	231	Equis Beach	44.95	
23	8	232	Pinkerton Island	0.65	
23	8	233	Pinkerton Island	9.96	
23	8	234	Pinkerton Island	0.28	
23	8	235	Pinkerton Island	0.82	
23	8	236	Pinkerton Island	0.34	
23	8	237	Pinkerton Island	0.47	
23	8	238	Pinkerton Island	0.26	
23	8	239	Pinkerton Island	0.40	
23	8	240	Pinkerton Island	0.45	
23	8	241	Pinkerton Island	0.18	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	8	242	Hand Island	6.86	
23	8	243	Brabant Islands	1.45	
23	8	244	Brabant Islands	1.55	
23	8	245	Brabant Islands	1.10	
23	8	246	Brabant Islands	2.06	
23	8	247	Treble Island	1.43	
23	8	248	Nettle Island	0.48	
23	8	249	Nettle Island	0.51	
23	8	250	Nettle Island	2.53	
23	8	251	Nettle Island	0.79	
23	8	252	Nettle Island	0.95	
23	8	253	Effingham Island	1.56	
24	11	254	Indian Bay	3.73	
24	9	255	Riley Island	1.86	
24	9	256	Beck Island	2.49	
24	9	257	Morpheus Island	1.63	
24	10	258	Mosquito Harbour	13.85	
24	10	259	Mosquito Harbour	1.81	
24	5	260	Whitepine Cove	8.24	
24	5	261	Little Whitepine	6.39	
24	10	262	Meares Island, A	6.42	
24	6	263	Calmus Passage	0.01	
24	10	264	Dawley Pass, B	2.08	
24	10	265	Dawley Pass, B	2.20	
24	10	266	Dawley Pass, A	2.66	
24	10	267	Warn Bay (SE)	2.79	
24	10	268	Warn Bay (SE)	2.82	
24	10	269	Warn Bay	6.03	
24	10	270	Warn Bay	4.19	
24	10	271	Warn Bay	3.39	
24	10	272	Warn Bay	8.40	
24	2	273	Pretty Girl Cove	3.04	
24	3	274	George Island	3.56	
24	3	275	Whiskey Jenny	5.97	
24	13	276	Sulphur Passage	3.02	
25	13	277	Louie Bay	21.88	
25	6	278	Ewin Inlet	1.97	
25	6	279	Ewin Inlet	0.29	
25	6	280	Bligh Island (W)	0.41	
25	6	281	Santa Gertrudis Cove	0.79	
25	6	282	Santa Gertrudis Cove	0.82	
25	7	283	Yuquot	0.95	
25	6	284	Strange Island (N Tip)	2.04	
25	8	285	Jewitt Cove (N)	1.58	
25	8	286	Tsowwin Narrows	7.32	
25	4	287	Hisnit Inlet	7.66	
25	4	288	Hisnit Inlet	0.76	
25	4	289	Hisnit Inlet	0.64	
25	6	290	Spanish Pilot Group	0.70	
25	6	291	Spanish Pilot Group	0.76	
25	6	292	Kendrick Inlet	9.09	
25	6	293	Kendrick Inlet	1.83	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
25	6	294	Kendrick Inlet	1.93	
25	6	295	Kendrick Inlet	0.86	
25	4	296	Hisnit Inlet	1.15	
25	9	297	Mcbride Bay	2.14	
25	9	298	Mcbride Bay	0.57	
25	9	299	Haven Cove	1.28	
25	13	300	Graveyard Bay	0.83	
25	11	301	Nuchatlitz Creek	4.88	
25	12	302	Queen Cove	3.74	
25	12	303	Queen Cove	8.32	
25	12	304	Queen Cove	0.62	
25	13	305	Apple Creek	1.09	
25	13	306	Garden Point	4.91	
25	13	307	Garden Point	0.50	
25	13	308A	Garden Point (E), A	1.21	
25	13	308B	Garden Point (E), B	6.76	
25	13	308C	Garden Point (E), C	1.12	
25	12	309	Port Eliza, A	2.04	
25	12	310	Eliza Island	0.88	
25	12	311	Eliza Island	1.09	
25	14	312	Inner Basin	2.05	
25	14	313	Inner Basin	1.33	
25	14	314	Inner Basin	0.79	
25	14	315	Mary Basin	14.37	
25	14	316	Mary Basin	17.15	
25	4	317	Tlupana Inlet, A	5.19	
25	4	318	Tlupana Inlet, B	0.72	
25	4	319	Tlupana Inlet, C	0.60	
25	13	320	Nuchatlitz, B	0.69	
25	13	321	Nuchatlitz, A	1.34	
25	13	322	Nuchatlitz, A	1.31	
25	13	323	Nuchatlitz, A	0.55	
25	11	324	Little Espinosa Inlet, A	3.10	
25	11	325	Little Espinosa Inlet, B	6.19	
25	11	326	Espinosa Inlet, C	10.83	
25	11	327	Espinosa Inlet, B	5.11	
26	2	328	Unsworth Point	1.53	
26	2	329	Unsworth Point	3.54	
26	3	330	Amai Inlet	3.99	
26	3	331	Cachalot Inlet	3.32	
26	3	332	Amai Point (Opposite)	1.16	
26	5	333	Chamiss Bay	3.84	
26	5	334	Easy Inlet	5.82	
26	5	335	Kauwinch River	5.75	
26	6	336	Amos Island	1.02	
26	1	337	Atkis And Kamils Islands	3.81	
26	1	338	Atkis And Kamils Islands	2.61	
26	6	339	Mclean Island	2.09	
26	6	340	Clannick Cove, A	7.22	
26	8	341	Malksope Inlet	3.55	
26	8	342	Malksope Inlet	4.78	
26	10	343	Johnson Lagoon	2.87	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
26	10	344	Johnson Lagoon	2.48	
26	10	345	Nasparti Inlet	5.09	
25	14	346	Inner Basin (Head)	11.79	
25	12	347	Port Eliza, B	5.04	
25	12	348	Port Eliza, B	2.38	
27	5	349	Side Bay	28.61	
27	5	350	Klaskino Anchorage	27.15	
27	6	351	Klaskish Basin	9.77	
27	6	352	Klaskish Anchorage	11.84	
27	6	353	Shields Cove	12.00	
27	6	354	Orchard Point (S)	10.68	
27	5	359	Klaskino Inlet (Head)	2.26	
27	5	360	Klaskino Inlet (Head)	1.85	
27	5	361	Klaskino Inlet (Head)	0.67	
27	5	362	Klaskino Inlet (Head)	6.40	
27	5	363	Klaskino Inlet (Head)	1.98	
27	7	364	Koskino Creek	3.94	
27	7	365	Mahatta River	11.49	
27	11	366	Clesklagh Creek	15.35	
27	11	367	Apple Bay	13.25	
27	11	368	Coal Harbour	5.27	
27	7	369	Smith Cove	8.53	
27	7	370	Kultus Cove	5.10	
27	7	371	Iltad Island	7.69	
27	7	372	Percy Ledge	12.07	
27	9	373	Hecate Cove	1.84	
27	9	374	Kokwind Cove	2.54	
27	7	375	Mahatta Creek	13.66	
27	7	376	Drake Island	2.12	
27	7	377	Drake Island	2.83	
27	7	378	Drake Island	1.60	
27	7	379	Koprino Harbour	33.15	
27	7	380	Koprino Harbour	11.14	
27	7	381	Koprino Harbour	5.18	
27	8	382	Atkins Cove	4.41	
27	7	383	Kloutchlimmis River	16.52	
27	7	384	Kloutchlimmis River	12.88	
27	7	385	Quatsino Sound	12.48	
27	7	386	Quatsino Sound	10.13	
27	11	387	Holberg Inlet (S)	8.90	
27	11	388	Holberg Inlet (S)	8.21	
27	11	389	Holberg Inlet (N)	35.53	
27	11	390	Holberg Inlet (N)	26.28	
27	3	391	Winter Harbour	20.40	
27	3	392	Winter Harbour	16.12	
27	3	393	Winter Harbour	38.26	
27	3	394	Forward Inlet	12.11	
27	3	395	Forward Inlet	13.62	
23	7	545	Grappler Inlet	3.37	
23	7	546	Bamfield Inlet	56.73	
23	8	547	Pinkerton Island	1.51	
23	9	548	Mayne Bay (N)	9.84	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
23	10	549	Hillier Island	25.84	
23	10	550	Pipestem Inlet	2.24	
23	10	551	Pipestem Inlet	3.50	
23	10	552	Pipestem Inlet	2.10	
23	10	553	Toquart Bay	21.83	
23	11	554	Ucluelet	19.53	
23	11	555	Ucluelet	1.34	
23	11	556	Ucluelet	5.72	
23	8	672	Canoe Island	0.44	
23	8	673	Canoe Island	4.40	
23	8	674	Canoe Island	0.86	
24	14	675	Atleo (Millar Channel)	6.02	
24	3	676	Whiskey Jenny	1.73	
24	3	677	Whiskey Jenny	0.49	
24	14	678	Hayden Pass	0.94	
24	14	679	Atleo (Millar Channel)	8.35	
24	14	680	Millar Channel	0.84	
24	13	681	Sulphur Passage	1.30	
24	3	682	Shelter Inlet	1.77	
25	11	683	Espinosa Inlet, A	3.21	
25	13	684	Graveyard Bay	2.98	
27	11	685	Holberg Inlet (N)	0.54	
27	0	686	Quattische Island	3.10	
27	0	687	Kwokwesta Creek	5.31	
25	5	701	Head Bay	2.59	
25	5	702	Head Bay	3.79	
25	5	703	Head Bay	8.98	
25	5	704	Head Bay	1.39	
25	5	705	Head Bay	1.05	
25	5	706	Head Bay	0.71	
27	5	707	Klaskino Inlet	2.16	
27	5	708	Klaskino Inlet	1.63	
27	5	709	Klaskino Inlet	1.63	
27	5	710	Klaskino Inlet	0.95	
23	4	718	Congreve Island, B	1.39	
23	4	719	Congreve Island, C	1.17	
23	4	720	Congreve Island, D	0.39	
23	4	721	Rainy Bay	0.76	
23	9	723	Mayne Bay, A	1.58	
23	9	724	Mayne Bay, B	0.32	
23	9	725	Mayne Bay, C	1.02	
23	0	726	Snowden Island (N)	1.51	
23	10	727	Hillier Island	2.14	
23	10	728	Harris Point	6.58	
27	7	734	Cleagh Creek	2.17	
24	10	747	Dawley Pass (W), B	3.29	
24	3	748	Mckenzie Beach	3.04	
24	3	749	Frank Island	2.38	
24	3	750	Cox Bay	1.94	
24	13	751	Megin River Estuary (SE)	1.19	
24	3	752	Steamer Cove	1.56	
24	3	753	Dixon Bay	0.77	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
24	4	754	Ross Pass, A	2.91	
24	4	755	Bawden Bay	2.24	
24	4	756	Ross Pass, B	2.82	
24	4	757	Ross Pass, C	0.98	
26	6	884	Clannick Cove, B	5.88	
26	6	885	Crowther Channel	3.61	
25	11	886	Espinosa Inlet, D	1.59	
23	6	887	Useless Inlet, D	6.02	
23	10	888	Stopper Island	5.38	
27	7	889A	Mahatta River (W)	3.77	
27	7	889B	Salmon Island	0.66	
27	7	890	Schloss Island	1.47	
26	2	906	East Pinnacle Channel	0.29	
26	6	907	Mckay Cove	5.05	
26	6	908	Racoon Point	0.65	
25	11	933	Espinosa Inlet, C	5.05	
25	11	934	Espinosa Inlet, D	1.83	
25	11	935	Espinosa Inlet, E	2.57	
25	11	936	Espinosa Inlet, F	1.29	
25	13	937A	Ehatisaht (N), A	0.75	
25	13	937B	Ehatisaht (N), B	0.54	
25	9	938	Barr Creek	5.50	
25	13	939A	Saltery Bay, A	0.85	
25	13	939B	Saltery Bay, B	1.52	
25	13	939C	Saltery Bay, C	1.02	
25	9	940	Hecate (N)	1.75	
25	9	941	Ceepeecee Ways	2.06	
24	1	955	Hesquiat Harbour/Anton Spit	5.32	
24	1	956	Hesquiat Harbour/Rondeault Point	10.74	
24	1	957	Hesquiat Harbour/Rae Basin	7.53	
24	1	958	Hesquiat Harbour/Boat Basin	11.27	
23	8	967	Effingham Bay	0.19	
23	8	968	Effingham Bay	0.35	
23	8	969	Effingham Bay	0.43	
23	8	970	Effingham Bay	0.76	
23	8	971	Jacques/Jarvis Lagoon	2.71	
23	8	972	Jacques/Jarvis Lagoon	8.55	
23	8	973	Joe's Bay - Turtle Island	1.59	
23	8	974	Trickett Island	2.62	
23	8	975	Trickett Island	4.13	
23	8	977	Dempster Island	1.88	
23	8	978	Prideaux Island	0.71	
23	8	979	Clarke Island	1.88	
23	8	980	Benson Island	0.90	
23	8	981	Wouwer Island	2.49	
23	8	982	Gibraltar Island	0.93	
123	1	983	Keeha Beach	18.52	
123	1	984	Pachena Bay	4.16	
123	1	985	Pachena Beach	26.71	
21	0	986	Tsusiat Falls	17.63	
21	0	987	Tsuquanah I.R.	6.20	
21	0	988	Clo-oose Bay	43.56	

Area	Subarea	Clam Beach #	Location	Beach Area (ha)	Clam Area (ha)
26	4	1007	Tahsish Inlet - I.R.	10.93	
26	4	1008	Tahsish Inlet - Artlish River	21.14	
26	4	1009	Fair Harbour	24.05	
26	4	1010	South Of Yaku Bay	0.84	
26	5	1011	Hankin Cove	2.12	
26	8	1012	Malksope Inlet	7.27	
26	8	1013B	Bunsby Islands	2.32	
26	8	1013A	Bunsby Islands	2.12	
26	8	1013C	Bunsby Islands	2.89	
26	7	1014B	Battle Bay	13.52	
26	7	1014A	Battle Bay	3.01	
26	9	1015	Ououkinsh River	36.87	
26	9	1016A	Power River	1.76	
26	9	1016C	Power River	0.76	
26	9	1016B	Power River	4.09	
26	9	1017	Ououkinsh Inlet	10.42	
26	10	1018	Nasparti Inlet	7.27	
Total Beaches:		326	Total Beach Area:	1672.11	