The Construction of a Database of Pacific Herring Catches Recorded in British Columbia from 1888 to 1950

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ABSTRACT

Daniel, K. S., P. B. McCarter, and D. E. Hay. 2001. The construction of a database of Pacific herring catches recorded in British Columbia from 1888 to 1950. Can. Tech. Rep. Fish. Aquat. Sci. 2368: 108 p.

This report describes the methods used to construct a computer database for Pacific herring (*Clupea pallasi*) catches in British Columbia from 1888-1950. This database complements the current computer database of herring catches, used for British Columbia herring stock assessments, that begins in October, 1950. Herring catch records between 1888 and 1950 have been published in several documents but previously have not been entered into a single electronic database. Many of these pre-1950 catch records have varying degrees of geographic and temporal precision and this presents some complications for their inclusion in the current 1951-1996 database. This report lists some of the procedures and decisions that were taken to achieve this objective. The 1888-1950 portion of the herring catch database was constructed from several sources in the literature: (1) Annual Reports of the Department of Fisheries (Canada Dept. of Fisheries 1888-1893), (2) Annual Reports of the Department of Marine and Fisheries (Canada Dept. of Marine and Fisheries 1894-1914), (3) Annual Reports of the Fisheries Branch (Canada Dept. of Naval Service, Fisheries Branch 1915-1917), (4) Fisheries Statistics of Canada: British Columbia (Dominion Bureau of Statistics 1919-1933), and (5) several manuscript reports and bulletins (Tester 1934-1945, Isaacson 1945-1950, and Taylor 1964).

RÉSUMÉ

Daniel, K. S., P. B. McCarter, and D. E. Hay. 2001. The construction of a database of Pacific herring catches recorded in British Columbia from 1888 to 1950. Can. Tech. Rep. Fish. Aquat. Sci. 2368: 108 p.

Ce compte rendu décrit les méthodes employées pour construire une base de données informatisée sur les captures de hareng (*Clupea pallasi*) effectuées en Colombie-Britannique au cours de la période comprise entre 1888 et 1950. Cette base sera un complément utile à la base actuellement utilisée pour l'évaluation des stocks de hareng, instituée en octobre 1950. Les chiffres de capture pour la période comprise entre 1888 et 1950 ont été publiés dans plusieurs documents mais n'ont jamais été inscrits dans une base électronique. Les statistiques antérieures à 1950 ont divers degrés de précision géographique et temporelle, ce qui complique leur intégration dans la base de 1950-1996. Ce compte rendu décrit certaines des procédures et des décisions qui ont été prises pour atteindre cet objectif. Le segment de la base qui concerne la période comprise entre 1888 et 1950 a été constitué à partie de plusieurs sources : 1) Rapports annuels du ministère des Pêches et des Océans du Canada pour la période comprise entre 1888 et 1893; 2) Rapports annuels du Department of Marine and Fisheries pour la période comprise entre 1894 et 1914; 3) Rapports annuels de la Direction des pêches (Canada Dept. of Naval Service) pour la période comprise entre 1915 et 1917; 4. Statistiques des pêches du Canada : Colombie-Britannique (Dominion Bureau of Statistics) pour la période comprise entre 1919 et 1933; 5) rapports manuscrits et bulletins établis par Tester 1934-1945, Isaacson 1945-1950 et Taylor 1964).

INTRODUCTION

This report describes the methods and problems concerned with the construction of a computer database for British Columbia herring catches from 1888 to 1950. Post-1950 herring catch records have been entered into a working database and are utilized in annual herring stock assessments and forecasts. These catch data have been described in several reports for the 1950-1951 to 1969-1970 fishing seasons (Hourston and Isaacson 1972) and the 1970-1971 to 1979-1980 fishing seasons (Hourston 1981). More recent data are presented in annual stock assessment documents (Schweigert et al. 1998). Herring catch records between 1888 and 1950 have been published in several documents but have never been entered into an electronic database. These early catch records include: (1) Annual Reports of the Department of Fisheries (Canada Dept. of Fisheries 1888-1893), (2) Annual Reports of the Department of Marine and Fisheries (Canada Dept. of Marine and Fisheries 1894-1914), (3) Annual Reports of the Fisheries Branch (Canada Dept. of Naval Service, Fisheries Branch 1915-1917), (4) Fisheries Statistics of Canada: British Columbia (Dominion Bureau of Statistics 1919-1933), and (5) several manuscript reports and bulletins (Tester 1934-1945, Isaacson 1945-1950, and Taylor 1964).

Most of these early (pre-1950) publications provide catch summations that have less geographic and temporal precision than post-1950 records. These catch records, however, can provide "regional" and sometimes, "statistical area" summations if combined appropriately with the present herring catch database. This information may be useful for a number of purposes, but a specific benefit of including historical catch records in the present database is the extension of mapping capability back into this early period. Construction of this database facilitates mapping of all recorded herring catches from 1888 to the present. Herring catch records can also be mapped in context with other databases including herring tag releases and recoveries, 1936 to 1992 (Daniel et al. 1999) and herring spawn abundance and distribution, 1928 to present (Hay et al. 1989).

DATABASE STRUCTURE: DEFINITIONS OF FIELDS AND CODING CONVENTIONS

A compiled herring catch database for the years 1888 to 1950 is shown in Appendix Table 1. This database was designed to be compatible with an existing database of post-1950 herring catches. Similar fields and coding conventions were used. The first field, ‘Season’, identified the catch season and was designated as a 5-digit number (i.e. 19334 = 1933-1934 fishing season). The season ran from June of one year to mid-March of the following year; however, most herring were caught from October to February (Taylor 1964). Post-1950 herring records have defined the fish season from July 1 to June 30. Herring catch reports prior to 1933 summed catches by calendar or fiscal year rather than by fishing season. The second field in the database identified the catch ‘Year’. The first year of a fishing season (June to mid-March) was entered for all 1933 to 1950 catches (i.e. 1933 was entered into the database for catches made during the 1933-1934 season). The first year of a fiscal year (April 1 to March 31) was entered for all 1909 to 1916 catches (i.e. 1909 was entered into the database for catches made during the 1909-1910 fiscal year). The calendar year was entered in the 'Year' field for all catches recorded

in 1888 to 1908 and 1917 to 1932. Fields 3 and 4, 'Month' and 'Day' recorded the month and day of catches, but this data was available only in 'Pilot House Records' (Tester 1934-1944 and Isaacson 1945-1950) and is shown in Appendix Table 2. The weekly catch records during that time were based on a six-day week, where fishermen fished only half days on weekends. Therefore catch dates in the database were rounded to mid-week dates (the fourth day of the week). However, not all fishing weeks were based on a six-day week. If a five-day fishing week occurred, the third day of the week would be entered into the database. Field 5, 'Position', indicated the geographic precision of catches. An exact or single range of fishing locations was indicated by a "1" and a multiple range of locations and/or statistical areas was indicated by a "9". Field 6, 'LocCode', is a four-digit code, documented by Haist and Rosenfeld (1988), that lists all British Columbia "herring locations" and their "location codes". This location coding system facilitates aggregation into 3 larger geographic groupings (herring sections, statistical areas, and stock assessment regions) and is used extensively in other working databases (i.e. herring biosampling, herring spawn distribution and abundance, and herring tag releases and recoveries). Location codes can also be linked to a set of latitude and longitude co-ordinates for each centroid position of each geographic grouping. Field 7, 'Gear', consisted of a two-digit code which indicated the fishing gear (where: 19=gillnet, 29=herring seine, 20=salmon seine, 21=other seine, 70=beach seine, 50=other trawl, 59=herring trawl, and 01=other gear type). Field 8, 'Catch', recorded herring catch in metric tons. Field 9, 'Disposal', consisted of a single digit code that referred to the manner in which herring were processed (where: 1=reduction, 2=spawn on kelp, 3=bait, 4=fresh fish, 5=bait pond, 6=food fish, and 7=roe). Field 10, 'AreaName', described the fishing locations, using geographical terms of the day. The AreaName should not be confused with the current location naming and coding system. The AreaName field preserves a record of the original citation.

ESTIMATING THE GEOGRAPHIC PRECISION OF CATCHES

Herring catches from 1888 to 1932 were often recorded in geographical ranges along the British Columbia coast, often spanning over several statistical areas (Sources: Canada Dept. of Fisheries 1888-1893; Canada Dept. of Marine and Fisheries 1894-1914; Canada Dept. of Naval Service, Fisheries Branch 1915-1916; and the Dominion Bureau of Statistics 1919-1933). A typical example of a single catch record from this literature would be "Cape Scott VI to Comox River" (Statistical Areas 27 and 12-14). Herring catches from 1933 to 1950, however, (Tester 1934-1945 and Isaacson 1945-1950) were often recorded with greater geographic precision, such as "Deepwater Bay" in Statistical Area 13 or "Barkley Sound" in Statistical Area 23. This higher geographic precision facilitated database entry at the statistical area, "herring section", or sometimes even the "herring location" geographic precision level. Variable level geographic codes were consequently used in the 'LocCode' field of the herring catch database for the years 1888 to 1950. Most herring catches since 1951 have been recorded at the "herring location" (most precise) geographic level (Haist and Rosenfeld 1988). Figures 1-6 show maps of the 6 regions, 30 statistical areas and 108 sections currently in use.

DATA SOURCES AND ENTRY PROCEDURES

Data were entered into 4 separate worksheets corresponding to 4 separate year periods and data sources: (1) 1888-1916 (Canada Dept. of Fisheries 1888-1893, Canada Dept. of Marine and Fisheries 1894-1914, and Canada Dept. of Naval Service, Fisheries Branch 1915-1917), (2) 1917-1932 (Dominion Bureau of Statistics 1917-1932), (3) 1933-1944 (Tester 1945) and (4) 1945-1950 (Isaacson 1945-1950). An additional worksheet was created for the 1933-1950 'Pilot House Records' (Tester 1934-1944 and Isaacson 1945-1950). 'Pilot House Records' comprised a more geographically detailed subset of the 1933-1950 herring catch data, but the cumulative catches of 'Pilot House Records' were considered incomplete, compared to those compiled from landing slips. 'Pilot House Records' (Appendix Table 2) were, therefore, not included in the combined catch database. The four other contiguous worksheets were subsequently concatenated chronologically (1888 to 1950) into a single worksheet and all catches (originally entered in short tons) were converted to metric tons. Multiple herring catch entries (indicated by Field 5, Position = 9) were reduced to single row entries so that catches would sum or table correctly by regional level location codes (Field 6). Regional level location codes, with the least geographic precision, were sometimes assigned when geographic ranges were broad and could not be confined to single statistical areas. Every attempt was made to maintain geographic precision, but occasionally some precision was compromised. The statistical areas with the majority of catch were sometimes entered into the database even though small portions of the catch were caught just across boundary lines in adjacent statistical areas. The combined worksheet of all 1888 to 1950 herring catches (in metric tons) without multiple entries is shown in Appendix Table 1.

DATABASE SOURCE: CRITERIA AND RECONCILATION OF DIFFERENCES

The most definitive source for all 1888-1950 herring catches entered into the database is Appendix Table 2 in Taylor (1964). Taylor's (1964) bulletin provided an “official” catch per herring population from 1888 to 1962. This official catch was “the catch in tons as furnished from records of the Department of Fisheries” (Tester 1939). Taylor (1964) listed all catches in British Columbia by "Districts" or "Statistical Areas" to the nearest ten short tons. These catch summaries were compared with several earlier publications and the results of these investigations are described chronologically.

1888-1916 Herring Catch Data

Three reports series (Canada Dept. of Fisheries 1888-1893, Canada Dept. of Marine and Fisheries 1894-1914, and Canada Dept. of Naval Service, Fisheries Branch 1915-1916) published catch tables for each province of Canada with catch weights given for the entire province or by 3 districts in British Columbia. "District 1" comprised of Statistical Areas 28 and 29. "District 2" represented the northern half of the province corresponding approximately to Statistical Areas 1 through 10. "District 3" comprised the southern half of the province corresponding approximately to Statistical Areas 11 through 27. For each province, a recapitulation table was also included showing the total catch for each species (a breakdown by fishing area was not shown). These tables were used to corroborate catches from other tables listed as “marketed” or “caught and landed green” for the different districts or fishing areas. We have interpreted green as the total unprocessed catch and marketed as the processed catch (i.e.

smoked). Marketed catches can be equal to or less than the weight of corresponding green state catches.

In most cases the total green state catches were listed for the entire province rather than by individual areas. Tables that listed marketed catch totals were entered in the database for the period 1888 to 1910 only because they were more geographically precise. Between 1911 and 1916, all catches were broken down by both green state and market catch. Since catch weights were higher for green state, these values were entered into the database.

Catches from 1888 to 1909-1910 were recorded in marketed pounds and those from 1910-1911 to 1916-1917 were recorded in Cwt's or hundredth weight (1 Cwt = 1/20 short ton or 100 lbs.). All catches recorded from 1888-1916 were subsequently converted to short tons in order to facilitate comparison with Taylor's (1964) catch summaries. For example, a catch recorded as 100 Cwt would be converted to 5 short tons and a catch recorded as 100 pounds of smoked herring would be converted to 200 pounds (or 0.1 ton) of fresh herring. Table 1 shows a complete list of conversions used to create the database (Tester 1935b, Dominion Bureau of Statistics 1938 and Taylor 1964). Data conversion from pounds or Cwt's to short tons generated 'decimal place' catches that Taylor (1964) appeared to have rounded to the nearest ten short tons.

1917-1932 Herring Catch Data

Herring catch records between 1917 and 1932 were listed in tables that showed total herring captured per calendar year for various fishing areas and marketing methods (Dominion Bureau of Statistics 1919-1933). Since the marketed totals were less than the landed totals only the landed totals were used in the database. The landed totals were in Cwt or hundredth weight (1/20 short ton) and were converted to short tons in the database.

1933-1950 Herring Catch Data

Three main sources were used to compile the database for the 1933-1934 to the 1949-1950 fishing seasons. A series of manuscript reports by Tester (1945), Isaacson (1945-1950), and "Pilot House Records" (Tester 1934-1944 and Isaacson 1945-1950). Pilot House Records were “the estimated catch in tons furnished by those seine boat captains who have compiled records” (Tester 1939). Herring catch summations of Pilot House Records were often less than those documented in official Department of Fisheries reports based on landing slips. Table 2 in Tester (1945) shows official herring catches for the fishing seasons, 1933-1934 to 1943-1944, that closely match Taylor (1964), and Table 1 in Isaacson (1945-1950) shows gross catch statistics for each fishing season that exactly match those of Taylor (1964).

“Recorded” or daily catch tables provided weekly totals and total catch per seine boat for the fishing season for each statistical area (compiled from Pilot House Records). The text portion of each manuscript report was examined in order to determine exactly where these fish were caught within statistical areas. For example, the 1937-1938 Statistical Area 23 fishery occurred (in order of decreasing landings) in Middle Channel, Effingham Inlet, Rainy Bay, Sunshine Bay, Uchucklesit Inlet, Vernon Bay, and Useless Inlet (Tester 1938). Bait, trawl, pilchard fishery, and other catches that were made after the herring season had closed were not

listed in tables, but were documented in the text and transcribed to the database. "Plant records" reported in the manuscript reports were sometimes used in the database when daily records were absent for some statistical areas. For example, daily records were absent in Statistical Area 9, however, plant records reported that catches were made in Moses Inlet (Isaacson 1945). It should also be noted that east coast Vancouver Island (ECVI) fishery catches were recorded by 'single' and 'double' seine gear configurations in manuscript reports (Tester 1939-1942). These 'gear type' catch distinctions were not transcribed into the database.

The working database contains a field called 'Disposal' (defined in the Database Structure section of this report) and it was assumed that most herring catches recorded in Pilot House Records (Tester 1934-1944 and Isaacson 1945-1950) were reduced to fish meal such that the disposal type was designated as "reduction". However, there were a few cases where several disposal types were listed in the reports and the disposal field was left blank in these cases. For example, during the 1937-1938 fishery (Tester 1938) herring was supplied to salteries, reduction plants, kippering houses, and the fresh fish market. 'Double gear' seine herring catches were shipped to salteries and reduction plants during the 1938-1939 season (Tester 1939) while 'single gear' seine catches were canned or reduced during the same season. During the 1939-1940 ECVI fishery (Tester 1940) the herring were either canned, dry salted or reduced. All herring caught along the lower ECVI were canned except in cases where herring were in poor condition during the 1941-1942 fishery (Tester 1942). Reduction was acceptable only when the canneries were running at capacity (Tester 1942). Herring at the head of Knight Inlet were too small for canning such that no fishing occurred at that location during the 1941-1942 season (Tester 1942).

Some important information about the herring fishery was not recorded in the database. First, herring catches were often limited by packer or plant capacity (Tester 1942 and 1944 and Isaacson 1947-1950) (Table 2). Second, statistical areas were often scouted with no or little fishing success (Tester 1941-1942 and 1944 and Isaacson 1945-1950) (Table 3). Third, a bait fishery in Statistical Area 14B (Deep Bay) during the 1946-1947 fishing season was conducted by dogfish boats (Isaacson 1947). Also, during the 1948-1949 season in the Baynes Sound area, a quota extension was granted so that herring could be used for bait or the production of speciality herring products (Isaacson 1949). It should also be noted that many ECVI daily catches were recorded in "dry salted" tons rather than in "green" tons. These catches were converted to green tons using a 1.25 multiplication factor (Table 1). Pilot House Records were all recorded in short tons and did not require conversion. It should also be noted that pilchard, caught primarily in Barkley Sound, Clayoquot Sound, Nootka Sound, Seymour Inlet, Nugent Sound, Sydney Inlet, Hesquiat Harbour, and Klaskish Inlet (Tester 1942-1944) were often mixed with herring and recorded as herring catch during the 1941-1942 to 1943-1944 seasons. Catches of pilchard and other similar appearing species were not documented separately in the literature.

Table 2 in Tester (1945) listed the catches for each statistical area for each season between 1932-1933 and 1943-1944. Certain parts of the text were referenced in order to improve the geographic precision given in the tables. For example, a catch listed as Statistical Area 13 in the tables was later found to be confined to Deepwater Bay and Okisollo Channel (Section 132), a geographic level smaller than a statistical area. In some cases, statistical area catches could not be reduced to smaller spatial units because catches were spread throughout whole statistical areas.

Tester (1945) summed catches only from the regular fall and winter fisheries and consequently may have underestimated the total catch because no (or very few) summer fishery catches were included. This may explain cases where catches listed in Tester (1945) were less than those listed in Taylor (1964). Also, catches in Tester (1945) were recorded to the nearest hundred short tons, such that catch unit conversion was not necessary. Isaacson (1945-1950) lists summer catches in red ink beside statistical area catches, for the seasons 1944-1945 to 1949-1950. These summer catches were added to the total catches, rather than added separately, in the catch database. Similar text-referencing procedures as those described above were followed to improve the geographic precision of the tables. As in Tester (1945) no catch conversion was necessary as all catches in Isaacson (1945-1950) were in short tons.

PILOT HOUSE RECORDS

Between the 1933-1934 and 1936-1937 fishing seasons, mimeographed data sheets were distributed to herring seine boats (Tester 1945). Data collected included the date of catch, estimated tonnage caught, fishing ground locality, and remarks (Tester 1945). Beginning in the 1937-1938 season, "Pilot House Record" books were distributed to seine boat captains with boat licenses. These books contained data sheets where yellow copies were returned to the Pacific Biological Station and white copies were kept by captains (Tester 1945). During the 1941-1942 season, Pilot House Records were changed to include a map showing the statistical divisions along the coast, and two additional columns were added for the "statistical area fished" and the "plant name" where fish were delivered for processing (Tester 1942). The new Pilot House Records consisted of a blue, original copy for the Pacific Biological Station, Nanaimo; a yellow copy for the Department of Fisheries, Vancouver; and a white copy for the fishermen (Tester 1942). The blue and yellow sheets were to be submitted after each week of fishing (Tester 1942). Figure 7 shows an example of a page from a Pilot House Record.

SOURCES OF DATABASE DISCREPANCIES

Sometimes there were discrepancies between various literature sources. These could occur for various reasons, and could be associated with varying definitions of geographical areas and seasons of catches. Other discrepancies were simple, clerical errors or missing data entries. Appendix Table 3 provides a complete list of discrepancies and shows which herring catch weights were transcribed to the database. Discrepancies are described in detail below.

1888-1916 Herring Catch Records

Herring catches were reported by fiscal year (April 1 to March 31) from 1909 to 1917 (Canada Dept. of Marine and Fisheries 1910-1914 and Canada Dept. of the Naval Service, Fisheries Branch 1915-1917). The first year of the fiscal year was entered into the database because Taylor (1964) reported catches this way. Furthermore, entering the second year of a

fiscal year would result in two herring catch totals in 1917, the year when catch records returned to 'calendar year' summations.

There was also some confusion in the fisheries reports regarding herring catches from an area referred to as the "North Coast" (Canada Dept. of Marine and Fisheries 1903-1914 and Canada Dept. of the Naval Service, Fisheries Branch 1915-1917). The present connotation of the North Coast comprises Statistical Areas 3 to 5 or the Prince Rupert District. After comparing catches in these early reports to Taylor (1964) it was determined that the area referred to as the North Coast was actually the lower Central region of BC (catches were reported in the Bella Coola and Bella Bella areas). Since precise catch areas were not provided in many early reports it was decided that North Coast catches would be recorded as multiple locations (Position=9) in Statistical Areas 7-10.

Similar confusion occurred for an area referred to as the "West Coast Mainland" or "Mainland" in the fisheries reports (Canada Dept. of Marine and Fisheries 1906-1912). After comparing these early fisheries reports to Taylor (1964) it was determined that the herring catches occur in the middle east coast Vancouver Island District. Consequently, Statistical Areas 15 and 16 were considered to comprise what was referred to as the West Coast Mainland.

Herring catches for east coast Queen Charlotte Islands between 1888-1900 (Canada Dept. of Fisheries 1888-1893 and Canada Dept. of Marine and Fisheries 1894-1902) were reported as upper east coast Queen Charlotte Islands in Taylor (1964). Taylor (1964) reported that no catches occurred south of Skidegate until 1938. Therefore these catches were reported in the database as being caught in the upper east side of the Queen Charlotte Islands. Furthermore, all Queen Charlotte Island catches between 1901 to 1907 (Canada Dept. of Marine and Fisheries 1903-1909) were combined and entered in an "Upper Coast Queen Charlotte Island" column in Taylor (1964).

A few discrepancies between herring catches in fisheries reports versus Taylor (1964) were observed, but could not be reconciled. In most cases, only a few tons were involved (1-20 tons) and it is probable that Taylor (1964) rounded the catches to the nearest short ton. Also, any catches less than 10 tons were often indicated with a “+” by Taylor (1964). Conversions of catches listed in early fisheries reports (given in various units) to short tons revealed some of these small discrepancies. For example, between 1893-1895 (Canada Dept. of Marine and Fisheries 1894-1897), the lower ECVI catches in fisheries reports were higher than those recorded in Taylor (1964). In 1896 an upper east coast Queen Charlotte Islands (QCI) herring catch in Taylor (1964) was indicated as a “+” signifying a catch less than 10 tons, however, conversion of earlier fisheries reports produced a catch of 39.50 tons. In the same year, a catch in the lower Central Coast was 10 tons according to Taylor (1964), but was only 2.95 tons after conversion from earlier fisheries report.

'Disposal' codes could be assigned only for some of the 1888-1916 marketed herring catches. Catches that were smoked or salted were assigned the disposal code for 'food'. Fresh and salted weights, however, were combined for 1899-1909 catches and recorded as a single catch weight (Canada Dept. of Marine and Fisheries 1901-1910). Taylor (1964) also determined that these weights were underestimated because the conversion to fresh weight could not be accurately performed on the combined fresh/salted weight. Herring catches between 1888

and 1898 were in herring pounds. Since it was unclear whether the herring pounds referred to fresh fish or a combination of disposal types, no disposal code was assigned for these records (Canada Dept. of Fisheries 1888-1893 and Canada Dept. of Marine and Fisheries 1894-1900). 'Gear' types were not specified for herring catches between 1888 and 1916 (Canada Dept. of Fisheries 1888-1893; Canada Dept. of Marine and Fisheries 1894-1914; and Canada Dept. of the Naval Service, Fisheries Branch 1915-1917). Gillnets were used since 1900 and purse seines since 1910 (Taylor 1964), but herring catches were not recorded by gear type until 1934. Several fishing techniques were documented by Tester (1935b) and this information was used to assign gear types based on the dominant gear type of each period. Drag or beach seines prevailed between 1877 and 1905, drift gillnets between 1906 and 1915, and purse seine gear after 1915.

1917-1932 Herring Catch Records

Only two minor problems were identified during this period. First, neither the disposal type nor the gear type could be determined from the reports (Dominion Bureau of Statistics 1919-1933). Gear type assignments were based on the most dominant gear type as documented by Tester (1935b) and Taylor (1964). Mixed gear types existed during this period, however seine gear prevailed. Second, although most of the catches in the Dominion Bureau of Statistics corresponded with Taylor (1964), a few exceptions were identified and shown in Appendix Table 3. Transcription errors may account for these small discrepancies.

Pilot House Records (Tester 1934-1944 and Isaacson 1945-1950)

Only ECVI and WCVI herring catch total weights were provided in manuscript reports for the 1933-1934 to 1935-1936 fishing seasons (Tester 1934-1936). Tester (1945), however, included additional catch records for the "Northern" region. Northern herring catches were therefore cited from Tester (1945) while ECVI and WCVI herring catches were cited from Tester (1934-1936). Taylor (1964) also listed a herring catch for "District 1" (Statistical Area 28 and 29) for fishing seasons 1933-1934 to 1946-1947. Tester (1934-1944) and Isaacson (1945-1947) manuscript reports did not mention any catch in this district. "District 1" catch weights were consequently entered from Taylor (1964).

Several fishing grounds listed in the manuscript reports (Tester 1934-1945) could not be located in the British Columbia Gazetteer (Canadian Permanent Committee on Geographical Names 1985), Sailing Directions for the British Columbia Coast (Canada Dept. of Fisheries and Oceans and Canadian Hydrographic Service 1990 and 1991), Haist and Rosenfeld (1988), or from Canadian Hydrographic Service marine charts. These fishing grounds included Statistical Area 4 - Japan Inlet (Tester 1934 and 1937 and 1945), Statistical Area 7 - Raft Creek, Doris Lake and Evans Arm (Tester 1942), Statistical Area 13 - Serpentine Pass (Tester 1941-1944), Central region - Nukish Narrows which may have been Nowish Narrows (Tester 1939) and Statistical Area 27 - Bare Island (Tester 1941). Less precise, statistical area location codes were used in the database to indicate these fishing areas.

Not all catch data were listed by week in the tables. Catches for QCI (Tester 1939), Northern BC (Tester 1938), and Central regions (Tester 1939) were listed by month rather than week. In addition, for the Central region during the 1938-1939 season both a monthly and

weekly breakdown for Kwakshua and Safety Cove was provided. Monthly catch statistics were used in the database for consistency. Also, 1934-1935 catch weights for Nanoose Bay and 1936-1937 catch weights for Butler Cove, Japan Inlet, and Prince Rupert Harbour were listed for a two-month period (Tester 1935 and 1937). The first month of this two-month period was entered into the database.

Catch locations were often mentioned in manuscript reports, but corresponding catch weights were not provided. For example, Tester (1944) mentions that the bait fishery in Gunboat Pass, Retreat Pass, Christie Pass, Browning Pass, Jervis Inlet, and Rivers Inlet head was successful; however, catch weights could not be found in the report. During the 1941-1942 season, a catch of 20 tons of fish in Statistical Area 11 was recorded (Tester 1942), but it was unclear whether these fish were pilchard or herring (Tester 1942). The catch was entered into the database as herring.

Several manuscript reports listed two catches per weekly record in the catch tables. In all but one case, typed catch weights rather than weights written in red pencil or in parentheses were entered into the database. These catches occurred in the following areas: ECVI (Tester 1935), Kyuquot Sound (Tester 1936), Barkley Sound (Tester 1939), Central - Laredo Inlet (Tester 1940 and 1942), Statistical Area 3 - Prince Rupert (Tester 1942), Nanoose Bay (Tester 1942), Statistical Area 13 - Deepwater Bay (Tester 1943), Statistical Area 14A - Deep Bay (Tester 1943) and Statistical Area 18 (Tester 1943). An exception was a Clayoquot Sound entry of 70 tons (Tester 1939) in parenthesis. Since there were no other catch entries listed for that date, the 70 ton herring catch was entered into the database. In a 1938-1939 report, some of the catches for the Northern District were whited-out and a new catch weight was written over top (Tester 1939).

1933-1950 Herring Catch Records (Tester 1945 and Isaacson 1945-1950)

Tester (1945) and Isaacson (1945-1950) reports do not include herring catches for "District 1" (Fraser River and Howe Sound). Catches for this area were entered into the database using Taylor (1964).

Although Tester (1945) clarified some fishing locations, other discrepancies remained. For example, Tester (1945) often provided the month of catch but total catch weights under-estimated the catches listed in Table 2 (Tester 1945). Only catch totals from Table 2 were entered into the database. Geographical names were also a problem in Tester (1945). Herring catches reported in the Queen Charlotte Islands (QCI), Statistical Area 1, were referred to as the "north shore QCI" in Tester (1945) and as the "west coast QCI" in Taylor (1964). This potential confusion also occurred in Statistical Area 2 where Tester (1945) listed the area as the "west and east coasts of QCI" while Taylor (1964) referred to it as the "lower east coast of QCI". The fishing locations were consequently taken from Tester (1945) while the corresponding catches entries came from Taylor (1964). Other discrepancies may be apparent because Tester (1945) sometimes listed the presence of a catch with a “+” and herring catch locations often were documented without catch weights.

Three catch discrepancies, thought to be typographical errors, were identified between Taylor (1964) and Tester (1945). Two entries in Table 2 of Tester (1945) were

followed by question marks. The first was indicated beside a 1933-1934, Statistical Area 23 herring catch of 20,000 short tons (600 short tons in Statistical Area 24). Taylor (1964) recorded a combined catch of 16,300 short tons for lower west coast of Vancouver Island (Statistical Areas 23 and 24) for that same season. The second question mark was next to a 1934-1935, Statistical Area 23 catch of 7,000 short tons (0 short tons for Statistical Area 24). Taylor (1964) recorded a combined catch of 6,000 tons for Statistical Areas 23 and 24. During the 1936-1937 season, Tester (1945, Table 2) recorded a catch of 11,000 short tons for Statistical Area 4 (0 short tons for Statistical Areas 3 and 5). Taylor (1964) recorded a catch of 1,000 short tons for Statistical Areas 3 to 5. In each case catch weights were entered into the database from the original source (Tester 1945) rather than from Taylor (1964).

GEOGRAPHICAL CO-ORDINATES OF CATCH RECORDS

A major incentive for the re-construction of the herring catch database was to provide a data set that would support many different kinds of future analyses of catch data recorded prior to 1950. A major specific objective was the documentation of geographical areas for geo-referencing and mapping purposes. In this report, however, for the purposes of brevity, we do not include specific co-ordinates for each geographical name (or region) included in the database. This information is included, however, in the electronic version.

CONCLUSION

Much of this report describes various errors or problems that have occurred in the past, relative to the recording of data on herring catches. We hope that readers will appreciate some of the sources or errors, and appreciate that many are of little consequence to total catch estimation. Sometimes, however, even small catches may have significance to relatively small geographical areas. We also hope that this report will serve as a 'definitive' explanation for the historical catch database, although we do not expect that the catch data will not be subject to future revision. Such revision is possible if there were a thorough review of all information that may exist relative to past catches. Such data may exist in a variety of archival sources, some more than a century old. A complete re-construction from source documents, such as landing slips from packing plants, as well as other documents, would be a major undertaking, far in excess of the resources available for the preparation of the database we describe.

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Table 1. Catch conversion equations used to create the database (Tester 1935b, Dominion Bureau of Statistics 1938, and Taylor 1964).

1 short ton =	0.9072 tonne (metric ton)	= 2000 lb.
1 short ton =	20 cwt	= 2000 lb.
1 ton smoked =	2 tons fresh	= 4000 lb. fresh
1 ton dry-salted =	1.25 tons fresh	= 2500 lb. fresh
1 cwt dry-salted =	1.25 cwt green	= 125 lb. green
1 barrel bait or salted =	2 cwt green	= 200 lb. green
1 barrel pickled =	3 cwt green	= 300 lb. green
1 cwt smoked =	2 cwt green	= 200 lb. green
1 ton meal =	110 cwt green	= 11000 lb. green

Table 2. Statistical areas where herring catches were limited by packer or cannery plant capacity.

Season	**Statistical Area**	**Comments**	**Reference**
1941-42	17, 18	Limited by cannery capacity	Tester 1942
1943-44	7	Limited by packer capacity	Tester 1944a
1946-47	18	Limited by packer capacity	Isaacson 1947
1947-48	5	Limited by packer and plant capacity	Isaacson 1948
1948-49	4, 7, 14B (Nanoose Bay)	Limited by packer and plant capacity	Isaacson 1949
1949-50	13, 14A (Deep Bay area)	Limited by packer and plant capacity	Isaacson 1950

Table 3. Statistical areas or fishing grounds that were scouted yet no fish were found.

Season	Statistical Area or Fishing Ground Name	Reference	Comments from Reference
1940-41	Kitkatlah Inlet, Ogden Channel, Captain Cove, Petrel Channel, Mink-Trap Bay, Grenville Channel, Klewnuggit Inlet, Lowe Inlet, Barnard Cove, South Bentinck Arm, Cascade Inlet, Dean Channel, Cousins Inlet, Evans Arm, Raymond Passage, Deer Passage, Pendrell Sound, Bute Inlet, Toba Inlet, Waddington Channel, Pryce Channel, Teak-erne Arm and Talbot Cove	Tester 1941	Scouted after area closure.
1941-42	14A	Tester 1942	
1941-42	Prince Rupert Harbour, Mink Trap Bay, Port Stephens, Captain's Cove, Union Pass, Aaltanhash Inlet, Kwakshua Pass, Nootka Sound proper.	Tester 1942	No fishing success
1943-44	Statistical Areas 8, 10, 11	Tester 1944a	
1943-44	Statistical Area 3, 4, 17	Tester 1944a	For bait, not much success
1944-45	Statistical Areas 4, 10, 11, 14A (Deep Bay)	Tester 1945a	
1944-45	Statistical Area 3 (Wark Channel, Khutzemateen Inlet and vicinity)	Tester 1945a	Possibly scouted – no records
1945-46	Statistical Areas 3 (Portland Inlet & vicinity), 4 (Prince Rupert & vicinity), 8, 9, 10	Isaacson 1946	
1946-47	Statistical Areas 4, 8, 9, 10, 11, 26, Howe Sound, Point Grey, Cape Lazo, International Border	Isaacson 1947	
1947-48	Statistical Areas 3, 4	Isaacson 1948	
1947-48	Statistical Area 27	Isaacson 1948	No reported scouting yet author believes the area may have been scouted
1948-49	QCI	Isaacson 1949	Unlikely was scouted but patrol boat did scout East Coast of Moresby Island in early March
1948-49	Statistical Areas 3, 5,10, 11, 24	Isaacson 1949	
1948-49	Statistical Area 27	Isaacson 1949	No record of scouting yet Isaacson (1949) indicated some
1949-50	QCI	Isaacson 1950	

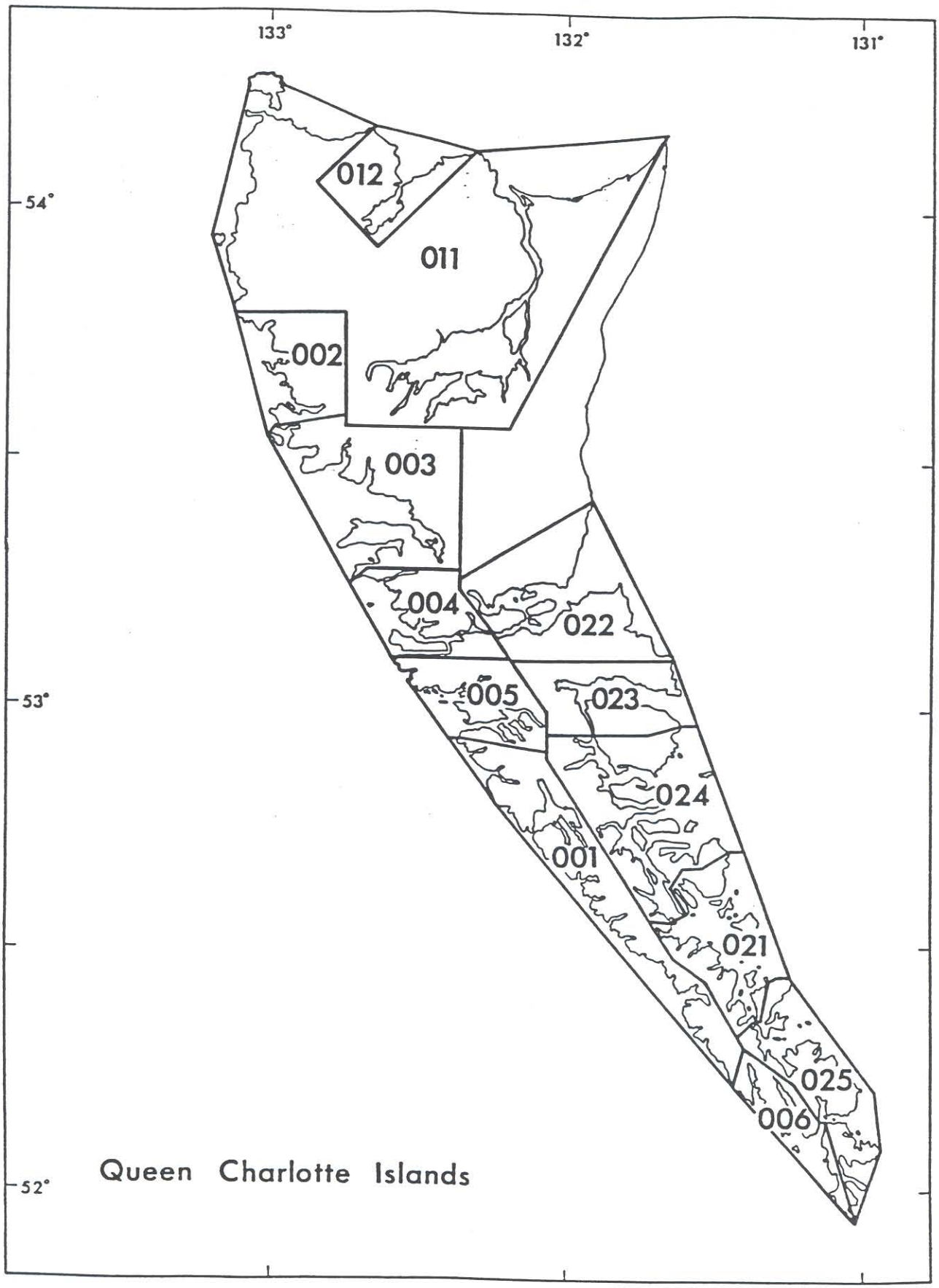

Fig. 1. Herring sections in the Queen Charlotte Islands - Region 1 (Haist and Rosenfeld 1988).

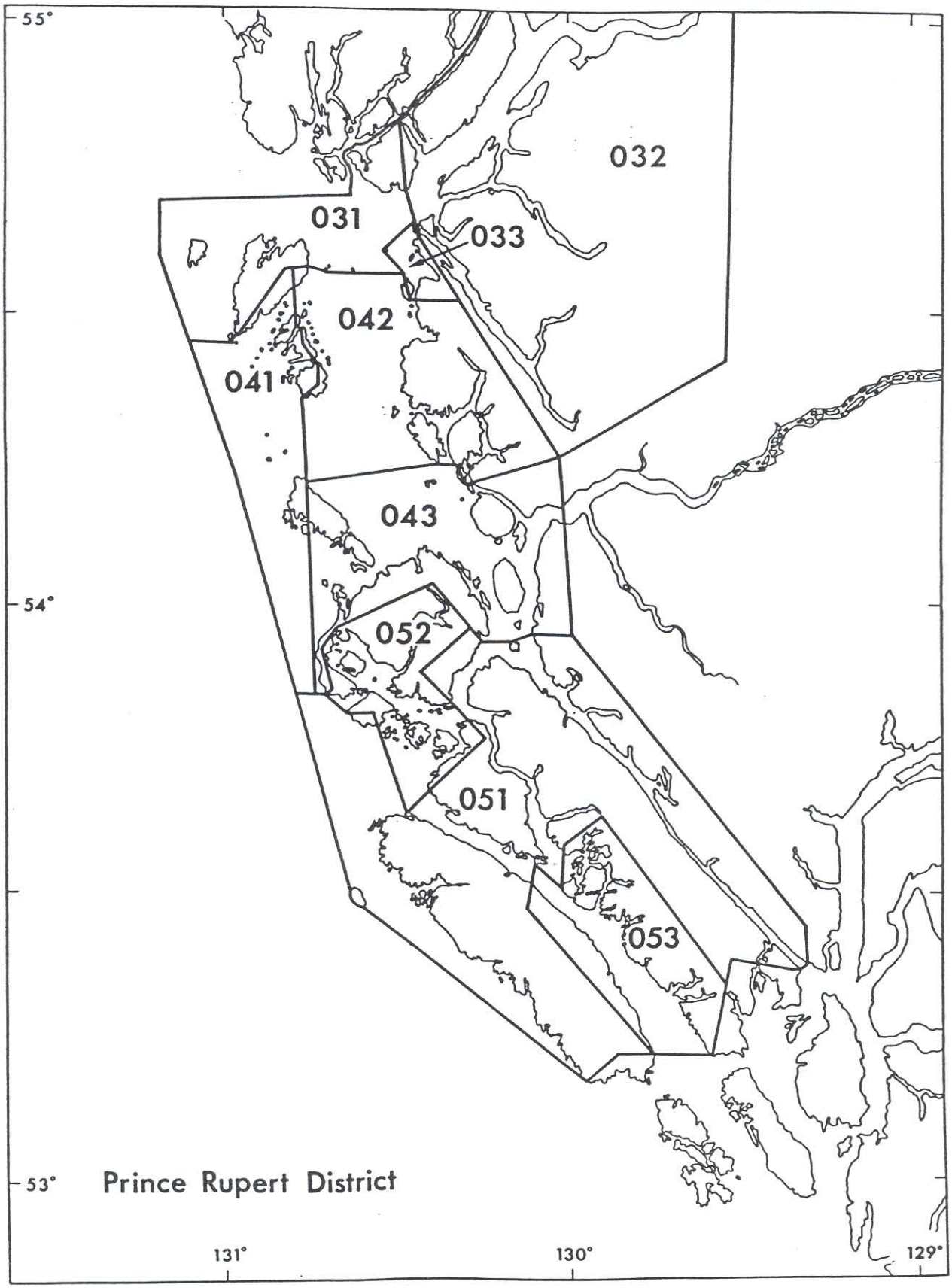

Fig. 2. Herring sections in the Prince Rupert District - Region 2 (Haist and Rosenfeld 1988).

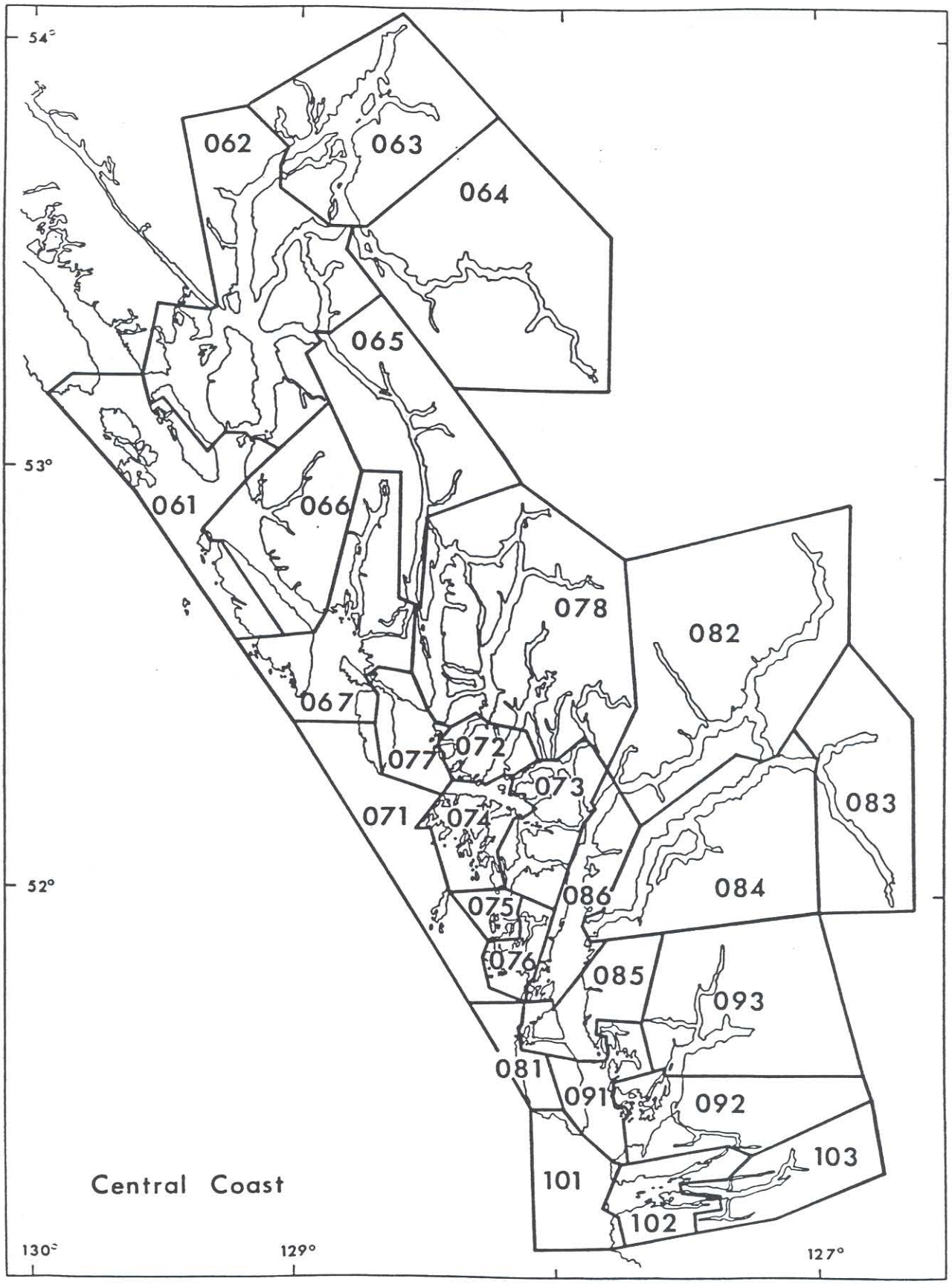

Fig. 3. Herring sections in the Central Coast - Region 3 (Haist and Rosenfeld 1988).

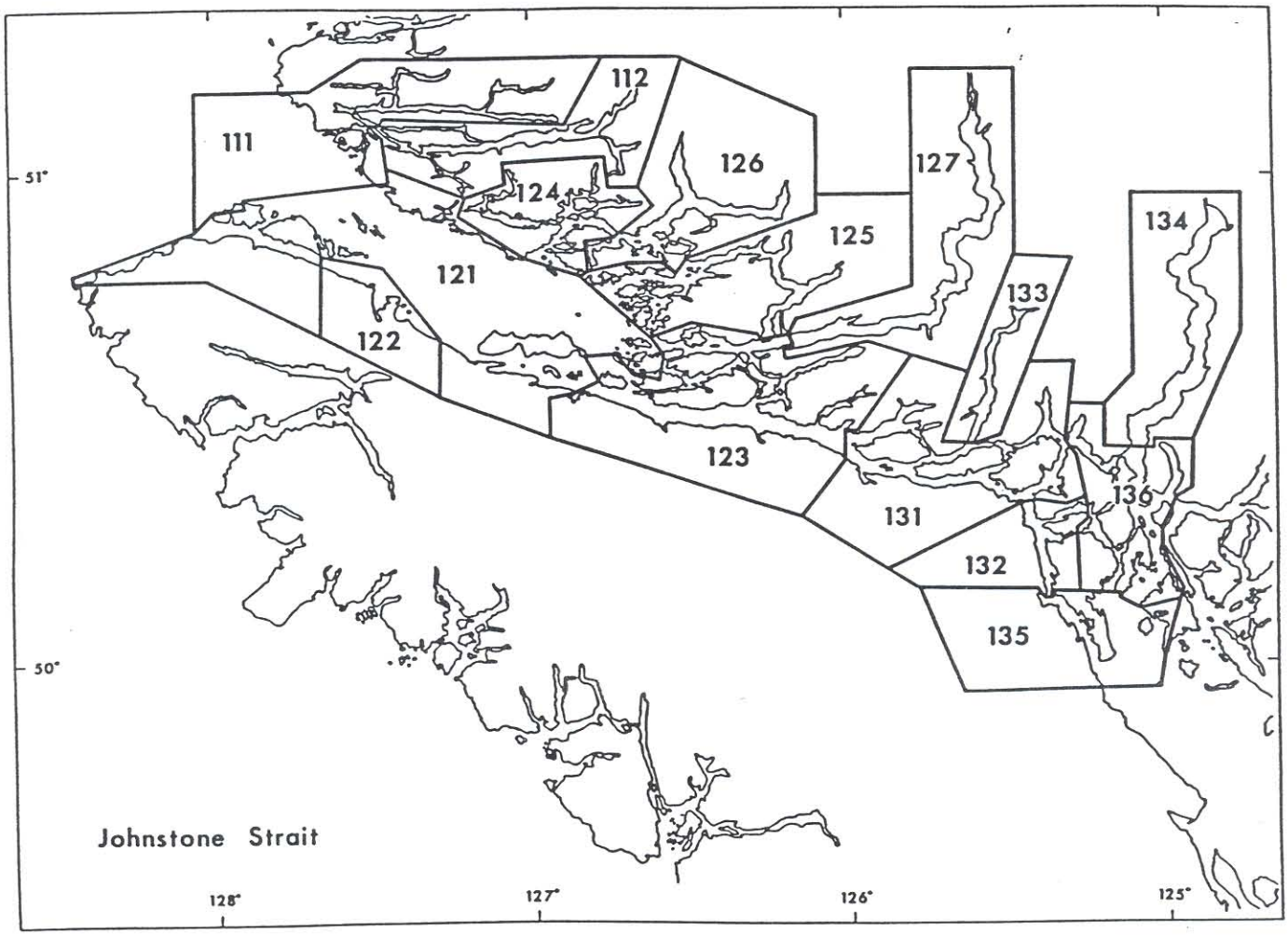

Fig. 4. Herring sections in Johnstone Strait - Region 4 (Haist and Rosenfeld 1988).

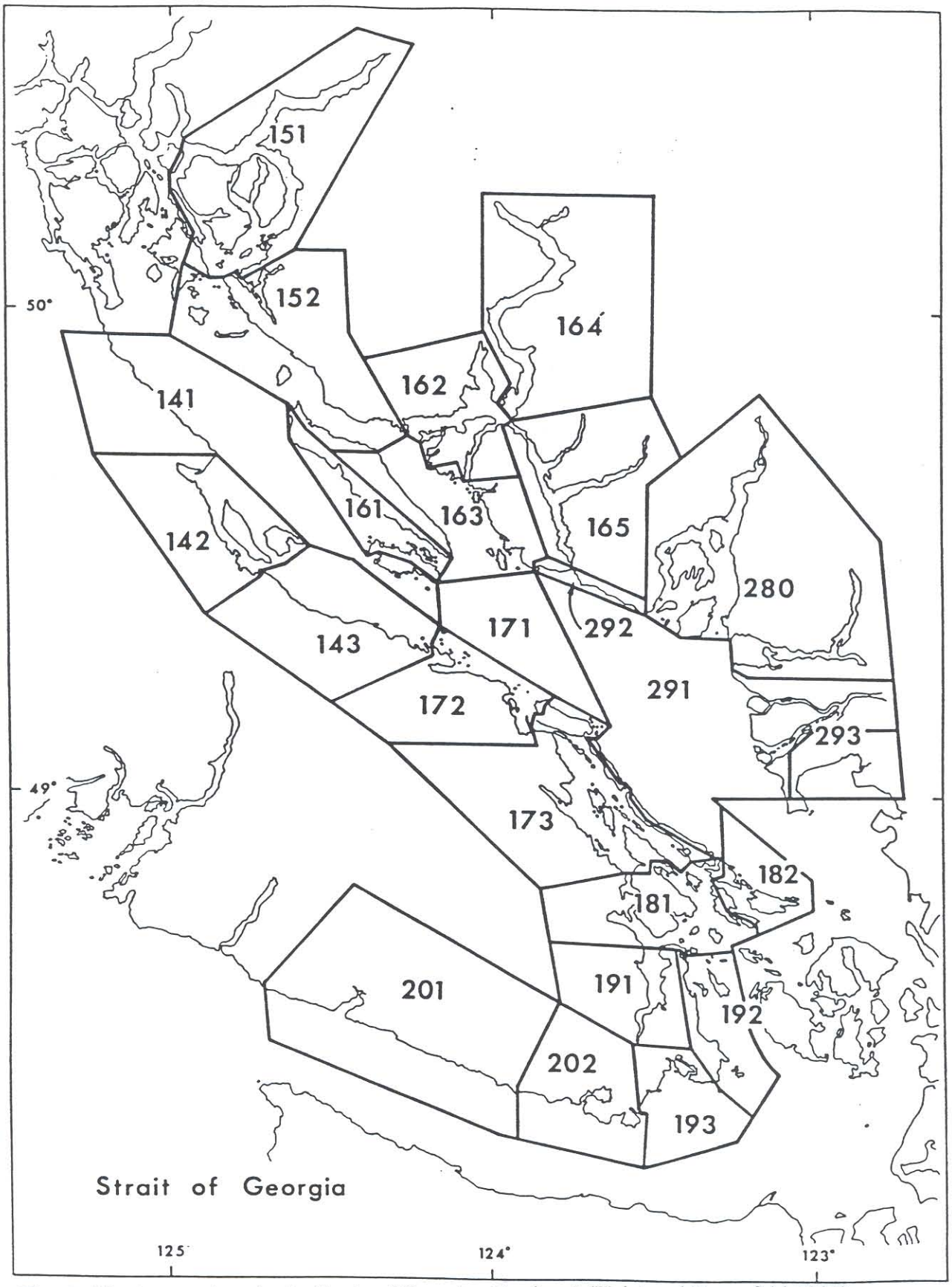

Fig. 5. Herring sections in the Strait of Georgia - Region 5 (Haist and Rosenfeld 1988).

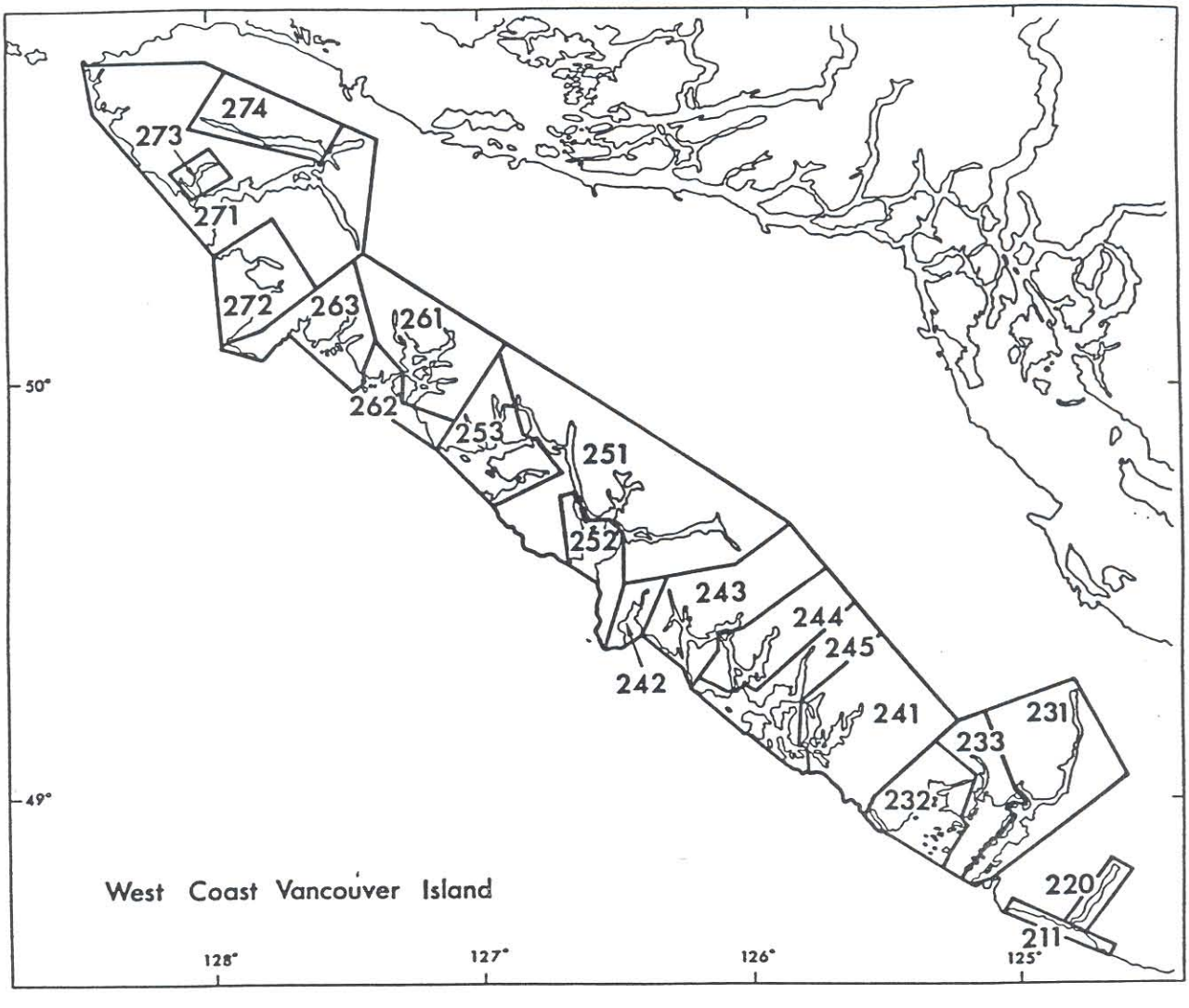

Fig. 6. Herring sections on the west coast of Vancouver Island - Region 6 (Haist and Rosenfeld 1988).

HERRING CATCH STATISTICS

MAKE AT LEAST ONE ENTRY EACH DAY

SERIAL Nº 466

SUBMIT TO PLANT BOOKKEEPER AT THE END OF EACH WEEK

YEAR 1943 DOMINION LICENSE NO. 68 SEINE BOAT Western CAPTAIN J. Smith

DATE	TIME OF SET	CATCH TONS GREEN	PLANT DELIVERED TO	FISHING AREA NO.	FISHING LOCALITY	REMARKS
Oct 18	6 A.M.	60	Imperial	18	Satellite channel	W. sound
	7 P.M.	X		18	"	no fish
19	AM	—		—	—	Travelling
	8 P.M.	110	Imperial	13	Deepwater Bay	Lots of fish, blowing S.E
20	AM	—		13	"	no packers
	6:30 P.M.	45	"	13	"	good weather
21	8 A.M.	50	"	13	"	"
	6 P.M	X		13	"	fish deep
22	AM	—		—		Travelling
	6 PM	75	Imperial	14A	Nanoose Bay	
23	3 PM	50	Phoenix	14A	"	
	8 PM	X		14A	"	snagged seine
24		—		—		repairing seine

Please Note. USE X in catch columns to indicate fishing but no fish caught.
USE — in catch columns to indicate that boat is not fishing.
ALWAYS give the fishing area number whether or not fish are caught.

Fig. 7. A page from "Pilot House Records" (Tester 1945)

Appendix Table 3. Herring catch summation discrepancies between various literature sources: (1) 1888-1916 (Canada Dept. of Fisheries 1888-1893; Canada Dept. of Marine and Fisheries 1894-1914; and Canada Dept. of Naval Service, Fisheries Branch 1915-1917), (2) 1917-1932 (Dominion Bureau of Statistics 1917-1932), (3) 1933-1944 (Tester 1945), (4) 1945-1950 (Isaacson 1945-1950) and (5) Taylor (1964). Herring catch weights transcribed to the database are shown in bold.

		Catch (short tons) as recorded by literature source				
Year	**Location**	**(1) 1888-1916**	**(2) 1917-1932**	**(3) 1933-1944**	**(4) 1945-1950**	**(5) Taylor**
1888	West Coast QCI	**0.25**				+
1888	Upper East Coast QCI	**5.00**				10.00
1888	Lower East Coast VI	**25.00**				20.00
1888	Lower East Coast VI	**0.50**				+
1888	District No. 1	**38.70**				40.00
1889	West Coast QCI	**2.00**				+
1889	Upper East Coast QCI	**12.00**				10.00
1889	Northern	**2.00**				+
1889	Middle East Coast VI	**5.00**				+
1889	Lower East Coast VI	**106.00**				100.00
1889	Lower West Coast VI	**5.50**				+
1889	District No. 1	**38.50**				40.00
1890	West Coast QCI	**2.00**				+
1890	Upper East Coast QCI	**2.00**				+
1890	Middle East Coast VI	**5.00**				+
1890	Lower East Coast VI	**82.00**				80.00
1890	Lower West Coast VI	**4.50**				+
1890	District No. 1	**96.75**				100.00
1891	West Coast QCI	**7.00**				10.00
1891	Upper East Coast QCI	**24.50**				30.00
1891	Northern	**4.50**				+
1891	Middle East Coast VI	**6.00**				10.00
1891	Lower East Coast VI	**82.00**				80.00
1891	Lower West Coast VI	**6.00**				10.00
1891	District No. 1	**89.00**				90.00
1892	West Coast QCI	**8.00**				10.00
1892	Upper East Coast QCI	**28.00**				30.00
1892	Northern	**4.50**				+
1892	Middle East Coast VI	**8.00**				10.00
1892	Lower East Coast VI	**80.00**				80.00
1892	Lower West Coast VI	**2.00**				+
1892	District No. 1	**137.00**				140.00
1893	West Coast QCI	**10.50**				10.00
1893	Upper East Coast QCI	**29.50**				30.00
1893	Northern	**2.50**				+

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1893	Middle East Coast VI	**10.50**				10.00
1893	Lower East Coast VI	**81.20**				70.00
1893	Lower West Coast VI	**3.50**				+
1893	District No. 1	**125.00**				120.00
1894	West Coast QCI	**7.80**				10.00
1894	Upper East Coast QCI	**20.00**				30.00
1894	Northern	**2.50**				+
1894	Middle East Coast VI	**11.30**				10.00
1894	Lower East Coast VI	**87.00**				80.00
1894	Lower West Coast VI	**29.50**				30.00
1894	District No. 1	**100.50**				100.00
1895	West Coast QCI	**7.80**				10.00
1895	Upper East Coast QCI	**3.58**				+
1895	Northern	**2.50**				+
1895	Middle East Coast VI	**43.15**				40.00
1895	Lower East Coast VI	**77.40**				70.00
1895	Lower West Coast VI	**4.75**				+
1895	District No. 1	**13.00**				10.00
1896	West Coast QCI	**11.25**				10.00
1896	Upper East Coast QCI	**39.50**				+
1896	Lower Central	**2.95**				10.00
1896	Middle East Coast VI	**4.00**				+
1896	Lower East Coast VI	**76.00**				80.00
1896	Lower West Coast VI	**13.50**				10.00
1896	District No. 1	**69.35**				80.00
1897	West Coast QCI	**13.15**				10.00
1897	Upper East Coast QCI	**12.50**				10.00
1897	Northern	**2.50**				+
1897	Middle East Coast VI	**7.50**				10.00
1897	Lower East Coast VI	**140.00**				140.00
1897	Lower West Coast VI	**6.00**				10.00
1897	District No. 1	**85.00**				80.00
1898	West Coast QCI	**15.00**				10.00
1898	Upper East Coast QCI	**12.50**				10.00
1898	Northern	**2.50**				+
1898	Lower Central	**10.00**				10.00
1898	Middle East Coast VI	**8.50**				10.00
1898	Lower East Coast VI	**157.00**				160.00
1898	Lower West Coast VI	**14.00**				10.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1898	District No. 1	**190.00**				190.00
1899	West Coast QCI	**15.00**				10.00
1899	Upper East Coast QCI	**17.50**				20.00
1899	Northern	**2.50**				+
1899	Lower Central	**10.00**				10.00
1899	Middle East Coast VI	**8.50**				10.00
1899	Lower East Coast VI	**157.00**				160.00
1899	Lower West Coast VI	**14.00**				10.00
1899	District No. 1	**275.00**				270.00
1900	West Coast QCI	**15.00**				10.00
1900	Upper East Coast QCI	**17.50**				20.00
1900	Northern	**5.00**				10.00
1900	Lower Central	**12.50**				10.00
1900	Middle East Coast VI	**14.00**				10.00
1900	Lower East Coast VI	**207.00**				210.00
1900	Lower West Coast VI	**14.00**				10.00
1900	District No. 1	**383.00**				380.00
1901	Upper East Coast QCI	**19.00**				20.00
1901	Northern	**3.50**				10.00
1901	Lower Central	**12.50**				10.00
1901	Middle East Coast VI	**14.00**				10.00
1901	Lower East Coast VI	**199.50**				200.00
1901	Lower West Coast VI	**14.00**				10.00
1901	District No. 1	**395.00**				390.00
1902	Upper East Coast QCI	**20.00**				20.00
1902	Northern	**8.50**				10.00
1902	Lower Central	**40.00**				40.00
1902	Middle East Coast VI	**41.00**				40.00
1902	Lower East Coast VI	**280.95**				580.00
1902	Lower West Coast VI	**39.75**				40.00
1902	District No. 1	**544.10**				540.00
1903	Upper East Coast QCI	**19.00**				20.00
1903	Northern	**8.70**				10.00
1903	Lower Central	**40.00**				40.00
1903	Middle East Coast VI	**41.00**				40.00
1903	Lower East Coast VI	**967.50**				970.00
1903	Lower West Coast VI	**40.70**				40.00
1903	District No. 1	**1,211.79**				1,210.00
1904	Upper East Coast QCI	**25.00**				20.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1904	Northern	**7.00**				10.00
1904	Lower Central	**47.50**				50.00
1904	Middle East Coast VI	**43.50**				40.00
1904	Lower East Coast VI	**1,185.25**				1,180.00
1904	Lower West Coast VI	**85.00**				80.00
1904	District No. 1	**1,581.16**				1,580.00
1905	Upper East Coast QCI	**26.00**				30.00
1905	Northern	**9.00**				10.00
1905	Lower Central	**47.50**				50.00
1905	Upper East Coast VI	**13.50**				10.00
1905	Middle East Coast VI	**81.65**				80.00
1905	Lower East Coast VI	**2,155.50**				2,150.00
1905	Lower West Coast VI	**38.25**				40.00
1905	District No. 1	**60.00**				60.00
1906	Upper East Coast QCI	**32.00**				30.00
1906	Northern	**9.50**				10.00
1906	Lower Central	**50.00**				50.00
1906	Upper East Coast VI	**13.00**				10.00
1906	Middle East Coast VI	**84.90**				80.00
1906	Lower East Coast VI	**4,382.25**				4,380.00
1906	Lower West Coast VI	**40.75**				40.00
1906	District No. 1	**38.00**				40.00
1907	Upper East Coast QCI	**38.00**				40.00
1907	Northern	**8.40**				10.00
1907	Lower Central	**52.00**				50.00
1907	Upper East Coast VI	**14.00**				10.00
1907	Middle East Coast VI	**85.30**				80.00
1907	Lower East Coast VI	**9,583.00**				9,580.00
1907	Lower West Coast VI	**40.75**				40.00
1907	District No. 1	**44.00**				40.00
1908	Upper East Coast QCI	**42.50**				40.00
1908	Northern	**9.00**				10.00
1908	Lower Central	**664.00**				660.00
1908	Upper East Coast VI	**13.20**				10.00
1908	Middle East Coast VI	**56.35**				60.00
1908	Lower East Coast VI	**21,803.00**				21,810.00
1908	Lower West Coast VI	**41.35**				40.00
1908	District No. 1	**33.00**				30.00
1909	Upper East Coast QCI	**58.00**				60.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1909	Northern	**19.70**				20.00
1909	Lower Central	**77.50**				80.00
1909	Upper East Coast VI	**13.40**				10.00
1909	Middle East Coast VI	**58.90**				60.00
1909	Lower East Coast VI	**35,345.90**				36,260.00
1909	Lower West Coast VI	**43.30**				10.00
1909	District No. 1	**35.00**				30.00
1910	Upper East Coast QCI	**53.75**				50.00
1910	Northern	**14.25**				10.00
1910	Lower Central	**581.50**				580.00
1910	Upper East Coast VI	**11.75**				10.00
1910	Middle East Coast VI	**1,267.75**				1,270.00
1910	Lower East Coast VI	**8,932.45**				8,930.00
1910	Lower West Coast VI	**32.75**				30.00
1910	District No. 1	**2,865.45**				2,860.00
1911	Upper East Coast QCI	**80.00**				80.00
1911	Northern	**136.00**				130.00
1911	Lower Central	**1,104.50**				1,100.00
1911	Upper East Coast VI	**12.00**				10.00
1911	Middle East Coast VI	**1,550.00**				1,550.00
1911	Lower East Coast VI	**22,408.50**				22,410.00
1911	Lower West Coast VI	**990.00**				990.00
1911	District No. 1	**991.10**				990.00
1912	Upper East Coast QCI	**364.00**				360.00
1912	Northern	**6,971.20**				7,020.00
1912	Lower Central	**1,003.75**				1,000.00
1912	Upper East Coast VI	**13.75**				10.00
1912	Middle East Coast VI	**342.50**				340.00
1912	Lower East Coast VI	**23,457.75**				23,460.00
1912	Lower West Coast VI	**1,455.00**				1,450.00
1912	Upper West Coast VI	**530.00**				530.00
1912	District No. 1	**2,340.00**				2,340.00
1913	Upper East Coast QCI	**375.00**				370.00
1913	Northern	**2,185.50**				2,180.00
1913	Lower Central	**551.50**				550.00
1913	Upper East Coast VI	**18.00**				20.00
1913	Middle East Coast VI	**352.50**				350.00
1913	Lower East Coast VI	**25,378.00**				25,380.00
1913	Lower West Coast VI	**2,102.50**				2,100.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1913	Upper West Coast VI	**15.00**				20.00
1913	District No. 1	**1,475.10**				1,475.00
1914	Upper East Coast QCI	**894.00**				890.00
1914	Northern	**2309.00**				2,300.00
1914	Lower Central	**200.00**				200.00
1914	Upper East Coast VI	**12.00**				10.00
1914	Middle East Coast VI	**396.40**				400.00
1914	Lower East Coast VI	**18,927.50**				18,930.00
1914	Lower West Coast VI	**3,680.30**				3,680.00
1914	Upper West Coast VI	**18.10**				20.00
1914	District No. 1	**1,725.00**				1,730.00
1915	Northern	**937.50**				940.00
1915	Lower Central	**522.00**				520.00
1915	Middle East Coast VI	**2,538.70**				2,540.00
1915	Lower East Coast VI	**15,250.45**				15,250.00
1915	Lower West Coast VI	**2,648.90**				2,650.00
1915	Upper West Coast VI	**18.75**				20.00
1915	District No. 1	**1,456.30**				1,460.00
1916	Northern	**985.00**				980.00
1916	Lower Central	**567.50**				570.00
1916	Middle East Coast VI	**2,496.00**				2,500.00
1916	Lower East Coast VI	**16,066.95**				16,070.00
1916	Lower West Coast VI	**2,576.50**				2,580.00
1916	District No. 1	**2,108.25**				2,110.00
1917	Upper East Coast QCI		**9.45**			9.00
1917	Northern		**995.00**			990.00
1917	Lower Central		**426.40**			430.00
1917	Middle East Coast VI		**1,092.45**			1,090.00
1917	Lower East Coast VI		**15,205.60**			15,210.00
1917	Lower West Coast VI		**3,642.50**			3,640.00
1917	Upper West Coast VI		**78.10**			80.00
1917	District No. 1		**2,912.50**			2,910.00
1918	Northern		**584.75**			580.00
1918	Lower Central		**645.55**			640.00
1918	Middle East Coast VI		**607.24**			610.00
1918	Lower East Coast VI		**13,153.05**			13,150.00
1918	Lower West Coast VI		**11,853.95**			11,920.00
1918	Upper West Coast VI		**2.80**			+
1918	District No. 1		**4,998.85**			5,000.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1919	Northern		**1,033.70**			1,030.00
1919	Lower Central		**124.35**			120.00
1919	Middle East Coast VI		**231.80**			230.00
1919	Lower East Coast VI		**3,957.35**			3,960.00
1919	Lower West Coast VI		**20,009.10**			20,040.00
1919	District No. 1		**3,005.60**			3,010.00
1920	Northern		**1,025.00**			1,020.00
1920	Lower Central		**404.00**			400.00
1920	Middle East Coast VI		**144.65**			140.00
1920	Lower East Coast VI		**15,386.10**			15,390.00
1920	Lower West Coast VI		**31,978.95**			31,980.00
1920	District No. 1		**1,129.15**			1,130.00
1921	Northern		**1,785.50**			1,780.00
1921	Lower Central		**321.00**			320.00
1921	Middle East Coast VI		**348.45**			350.00
1921	Lower East Coast VI		**20,250.80**			20,250.00
1921	Lower West Coast VI		**23,461.00**			23,460.00
1921	District No. 1		**1,076.55**			1,080.00
1922	Northern		**2,025.90**			2,030.00
1922	Middle East Coast VI		**264.25**			260.00
1922	Lower East Coast VI		**25,498.25**			25,500.00
1922	Lower West Coast VI		**21,528.40**			21,530.00
1922	District No. 1		**809.15**			810.00
1923	Northern		**2,068.00**			2,070.00
1923	Lower Central		**840.40**			840.00
1923	Middle East Coast VI		**180.85**			130.00
1923	Lower East Coast VI		**15,766.20**			15,770.00
1923	Lower West Coast VI		**32,137.25**			32,140.00
1923	Upper West Coast VI		**160.75**			160.00
1923	District No. 1		**637.70**			640.00
1924	Northern		**1,353.30**			1,350.00
1924	Lower Central		**902.70**			900.00
1924	Middle East Coast VI		**134.00**			130.00
1924	Lower East Coast VI		**18,301.80**			18,300.00
1924	Lower West Coast VI		**35,400.05**			35,400.00
1924	Upper West Coast VI		**928.40**			930.00
1924	District No. 1		**961.00**			960.00
1925	Northern		**1,632.75**			1,630.00
1925	Lower Central		**552.10**			550.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1925	Upper East Coast VI		**84.00**			80.00
1925	Middle East Coast VI		**176.90**			180.00
1925	Lower East Coast VI		**37,709.85**			37,750.00
1925	Lower West Coast VI		**31,062.05**			31,060.00
1925	District No. 1		**676.10**			680.00
1926	Northern		**2,034.25**			2,030.00
1926	Lower Central		**76.30**			80.00
1926	Middle East Coast VI		**26.35**			30.00
1926	Lower East Coast VI		**37,699.95**			37,700.00
1926	Lower West Coast VI		**21,780.20**			21,780.00
1926	Upper West Coast VI		**1,920.00**			1,920.00
1926	District No. 1		**1,523.40**			1,520.00
1927	Northern		**3,935.70**			3,940.00
1927	Lower Central		**430.75**			430.00
1927	Middle East Coast VI		**42.00**			40.00
1927	Lower East Coast VI		**34,350.50**			34,350.00
1927	Lower West Coast VI		**29,841.05**			29,840.00
1927	Upper West Coast VI		**14,186.50**			14,190.00
1927	District No. 1		**3,425.80**			3,240.00
1928	Upper East Coast QCI		**7.20**			10.00
1928	Northern		**6,308.40**			6,310.00
1928	Upper Central		**570.50**			570.00
1928	Middle East Coast VI		**139.10**			140.00
1928	Lower East Coast VI		**46,210.80**			46,210.00
1928	Lower West Coast VI		**12,040.20**			12,050.00
1928	Upper West Coast VI		**7,476.25**			7,480.00
1928	District No. 1		**4,003.75**			4,000.00
1929	Upper East Coast QCI		**52.50**			50.00
1929	Northern		**6,118.00**			6,120.00
1929	Upper Central		**182.60**			180.00
1929	Upper East Coast VI		**81.00**			80.00
1929	Middle East Coast VI		**94.20**			90.00
1929	Lower East Coast VI		**43,693.05**			43,690.00
1929	Lower West Coast VI		**7,547.10**			7,550.00
1929	Upper West Coast VI		**2,359.05**			2,360.00
1929	District No. 1		**5,744.05**			5,475.00
1930	Upper East Coast QCI		**15.50**			10.00
1930	Northern		**7,643.15**			7,640.00
1930	Upper Central		**211.90**			210.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1930	Lower Central		**51.05**			50.00
1930	Lower East Coast VI		**34,619.00**			34,620.00
1930	Lower West Coast VI		**12,966.50**			12,970.00
1930	Upper West Coast VI		**2,964.50**			2,960.00
1930	District No. 1		**2,625.90**			2,630.00
1931	Upper East Coast QCI		**57.00**			60.00
1931	Northern		**8,520.60**			8,520.00
1931	Upper Central		**38.30**			40.00
1931	Lower Central		**26.10**			20.00
1931	Upper East Coast VI		**357.00**			360.00
1931	Middle East Coast VI		**70.10**			70.00
1931	Lower East Coast VI		**42,620.65**			42,620.00
1931	Lower West Coast VI		**6,760.85**			6,760.00
1931	Upper West Coast VI		**15,218.40**			15,220.00
1931	District No. 1		**385.00**			380.00
1932	Northern		**2,701.65**			2,700.00
1932	Lower Central		**282.70**			280.00
1932	Middle East Coast VI		**19.25**			20.00
1932	Lower East Coast VI		**14,286.25**			14,290.00
1932	Lower West Coast VI		**5,981.40**			5,980.00
1932	Upper West Coast VI		**26,403.10**			26,400.00
1932	District No. 1		**485.85**			490.00
1933-34	Northern			**2,700.00**		2,700.00
1933-34	Lower East Coast VI			**28,200.00**		28,200.00
1933-34	Lower West Coast VI			**20,600.00**		16,300.00
1933-34	Upper West Coast VI			**2,300.00**		2,300.00
1933-34	District No. 1			0.00		**350.00**
1934-35	Northern			**5,400.00**		5,400.00
1934-35	Lower East Coast VI			**16,700.00**		16,700.00
1934-35	Lower West Coast VI			**7,000.00**		6,000.00
1934-35	District No. 1			0.00		**680.00**
1935-36	Northern			**4,500.00**		4,500.00
1935-36	Lower East Coast VI			**17,100.00**		17,100.00
1935-36	Lower West Coast VI			**13,300.00**		12,100.00
1935-36	Upper West Coast VI			**11,500.00**		12,900.00
1935-36	District No. 1			0.00		**1850.00**
1936-37	Northern			**11,000.00**		1,000.00
1936-37	Upper Central			**100.00**		100.00
1936-37	Lower Central			**19,200.00**		19,300.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1936-37	Lower East Coast VI			**24,700.00**		24,700.00
1936-37	Lower West Coast VI			**23,700.00**		23,700.00
1936-37	Upper West Coast VI			**17,000.00**		16,900.00
1936-37	District No. 1			0.00		**340.00**
1937-38	West Coast QCI			**100.00**		100.00
1937-38	Lower East Coast QCI			**100.00**		100.00
1937-38	Northern			**16,000.00**		16,000.00
1937-38	Upper Central			**6,500.00**		6,500.00
1937-38	Lower Central			**19,900.00**		19,900.00
1937-38	Lower East Coast VI			**25,100.00**		25,100.00
1937-38	Lower West Coast VI			**15,300.00**		15,300.00
1937-38	Upper West Coast VI			**15,000.00**		15,000.00
1937-38	District No. 1			0.00		**20.00**
1938-39	West Coast QCI			**500.00**		400.00
1938-39	Lower East Coast QCI			**2,300.00**		2,300.00
1938-39	Northern			**19,200.00**		19,200.00
1938-39	Upper Central			**9,800.00**		9,800.00
1938-39	Lower Central			**34,100.00**		34,100.00
1938-39	Lower East Coast VI			**26,300.00**		26,300.00
1938-39	Lower West Coast VI			**7,000.00**		7,000.00
1938-39	Upper West Coast VI			**8,100.00**		8,100.00
1938-39	District No. 1			0.00		**610.00**
1939-40	Lower East Coast QCI			**7,800.00**		7,900.00
1939-40	Northern			**20,900.00**		20,900.00
1939-40	Upper Central			**38,100.00**		38,000.00
1939-40	Lower Central			**19,600.00**		19,600.00
1939-40	Upper East Coast VI			**8,600.00**		8,600.00
1939-40	Middle East Coast VI			**11,400.00**		11,400.00
1939-40	Lower East Coast VI			**32,300.00**		32,300.00
1939-40	Lower West Coast VI			**6,900.00**		6,900.00
1939-40	Upper West Coast VI			**9,600.00**		9,600.00
1939-40	District No. 1			0.00		**250.00**
1940-41	Lower East Coast QCI			**6,300.00**		6,300.00
1940-41	Northern			**5,700.00**		5,900.00
1940-41	Upper Central			**7,400.00**		7,400.00
1940-41	Lower Central			**3,200.00**		3,200.00
1940-41	Upper East Coast VI			**10,200.00**		10,200.00
1940-41	Middle East Coast VI			**4,700.00**		5,200.00
1940-41	Lower East Coast VI			**32,400.00**		32,400.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1940-41	Lower West Coast VI			**14,300.00**		14,300.00
1940-41	Upper West Coast VI			**10,800.00**		10,800.00
1940-41	District No. 1			0.00		**100.00**
1941-42	Lower East Coast QCI			**2,500.00**		2,500.00
1941-42	Northern			**18,900.00**		18,900.00
1941-42	Upper Central			**11,000.00**		11,000.00
1941-42	Lower Central			**1,800.00**		1,800.00
1941-42	Upper East Coast VI			**3,000.00**		3,000.00
1941-42	Middle East Coast VI			**8,400.00**		8,400.00
1941-42	Lower East Coast VI			**49,000.00**		48,900.00
1941-42	Lower West Coast VI			**3,400.00**		3,400.00
1941-42	Upper West Coast VI			**13,700.00**		13,700.00
1941-42	District No. 1			0.00		**70.00**
1942-43	Upper Central			**2,100.00**		2,100.00
1942-43	Lower Central			**2,800.00**		2,900.00
1942-43	Upper East Coast VI			**3,100.00**		3,100.00
1942-43	Middle East Coast VI			**10,900.00**		10,900.00
1942-43	Lower East Coast VI			**43,900.00**		44,200.00
1942-43	Lower West Coast VI			**3,500.00**		3,500.00
1942-43	Upper West Coast VI			**13,300.00**		13,300.00
1942-43	District No. 1			0.00		**230.00**
1943-44	Northern			**300.00**		600.00
1943-44	Upper Central			**800.00**		900.00
1943-44	Lower Central			**37,100.00**		37,100.00
1943-44	Upper East Coast VI			**2,700.00**		2,700.00
1943-44	Middle East Coast VI			**5,600.00**		5,600.00
1943-44	Lower East Coast VI			**42,400.00**		42,400.00
1943-44	Lower West Coast VI			**9,100.00**		9,100.00
1943-44	District No. 1			0.00		**270.00**
1944-45	Northern				**1,300.00**	1,300.00
1944-45	Upper Central				**35,200.00**	35,200.00
1944-45	Lower Central				**4,200.00**	4,200.00
1944-45	Upper East Coast VI				**7,900.00**	7,900.00
1944-45	Middle East Coast VI				**4,800.00**	4,800.00
1944-45	Lower East Coast VI				**39,500.00**	39,500.00
1944-45	Lower West Coast VI				**12,000.00**	12,000.00
1944-45	Upper West Coast VI				**8,400.00**	8,400.00
1944-45	District No. 1				0.00	**490.00**
1945-46	Northern				**1,600.00**	1600.00

Appendix Table 3 – (Cont'd)

Year	Location	Catch (short tons) as recorded by literature source (1) 1888-1916	(2) 1917-1932	(3) 1933-1944	(4) 1945-1950	(5) Taylor
1945-46	Upper Central				**12,900.00**	12,900.00
1945-46	Lower Central				**100.00**	100.00
1945-46	Upper East Coast VI				**7,100.00**	7,100.00
1945-46	Middle East Coast VI				**5,700.00**	5,700.00
1945-46	Lower East Coast VI				**40,000.00**	40,000.00
1945-46	Lower West Coast VI				**25,900.00**	25,900.00
1945-46	Upper West Coast VI				**1,600.00**	1,600.00
1945-46	District No. 1				0.00	**290.00**
1946-47	Northern				**4,300.00**	4,300.00
1946-47	Upper Central				**5,800.00**	5,800.00
1946-47	Lower Central				**3,000.00**	3,000.00
1946-47	Upper East Coast VI				**7,500.00**	7,500.00
1946-47	Middle East Coast VI				**8,000.00**	8,000.00
1946-47	Lower East Coast VI				**36,500.00**	36,500.00
1946-47	Lower West Coast VI				**37,000.00**	37,000.00
1946-47	Upper West Coast VI				**22,000.00**	22,000.00
1946-47	District No. 1				0.00	**240.00**
1947-48	Northern				**39,000.00**	39,000.00
1947-48	Upper Central				**2,500.00**	2,500.00
1947-48	Lower Central				**26,000.00**	26,000.00
1947-48	Upper East Coast VI				**7,400.00**	7,400.00
1947-48	Middle East Coast VI				**11,800.00**	11,800.00
1947-48	Lower East Coast VI				**39,900.00**	39,900.00
1947-48	Lower West Coast VI				**25,300.00**	25,300.00
1947-48	Upper West Coast VI				**19,900.00**	19,900.00
1948-49	Northern				**17,800.00**	17,800.00
1948-49	Upper Central				**9,100.00**	9,100.00
1948-49	Lower Central				**53,600.00**	53,600.00
1948-49	Upper East Coast VI				**1,800.00**	1,800.00
1948-49	Middle East Coast VI				**14,100.00**	14,100.00
1948-49	Lower East Coast VI				**40,100.00**	40,100.00
1948-49	Lower West Coast VI				**21,800.00**	21,800.00
1948-49	Upper West Coast VI				**34,100.00**	34,100.00
1949-50	Northern				**40,300.00**	40,300.00
1949-50	Upper Central				**27,600.00**	27,600.00
1949-50	Lower Central				**13,900.00**	13900.00
1949-50	Upper East Coast VI				**9,000.00**	9,000.00
1949-50	Middle East Coast VI				**14,800.00**	14,800.00
1949-50	Lower East Coast VI				**40,300.00**	40,300.00

Appendix Table 3 – (Cont'd)

		Catch (short tons) as recorded by literature source				
Year	**Location**	**(1) 1888-1916**	**(2) 1917-1932**	**(3) 1933-1944**	**(4) 1945-1950**	**(5) Taylor**
1949-50	Lower West Coast VI				**31,200.00**	31,200.00
1949-50	Upper West Coast VI				**6,100.00**	6,100.00