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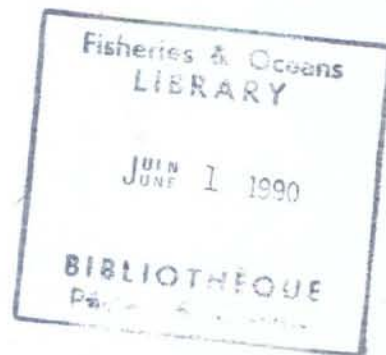
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Spawning Areas of British Columbia Herring: A Review, Geographical Analysis and Classification Volume IV: Lower Central Coast and Johnstone Strait

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May 1989



**Canadian Manuscript Report of
Fisheries and Aquatic Sciences
No. 2019**

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Canadian Manuscript Report of
Fisheries and Aquatic Sciences No. 2019

May 1989

SPAWNING AREAS OF BRITISH COLUMBIA HERRING

A review, geographical analysis and classification

Volume IV

Lower Central Coast and Johnstone Strait

by

D. E. Hay, P. B. McCarter, R. Kronlund and C. Roy

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Cat. No. Fs 97-4/2019E

ISSN 0706-6473

Correct citation for this publication:

Hay, D. E., P. B. McCarter, R. Kronlund, and C. Roy. 1989. Spawning areas of British Columbia herring: a review, geographical analysis and classification. Volume IV. Lower Central Coast and Johnstone Strait. Can. MS Rep. Fish. Aquat. Sci. 2019: 254 p.

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ABSTRACT

Hay, D. E., P. B. McCarter, R. Kronlund and C. Roy. 1989. Spawning areas of British Columbia herring: a review, geographical analysis and classification. Volume IV. Lower Central Coast and Johnstone Strait. Can. MS Rep. Fish. Aquat. Sci. 2019: 254 p.

The geographical distribution of herring spawning in British Columbia, was analysed for 50 years, from 1937 to 1986. The analyses was based on approximately 20,000 records of spawning made annually for different regions of the British Columbia coast by Fishery Officers. For each of about 90 geographical subdivisions of the coast, tables are presented to show the annual frequency of spawns in one kilometer segments of the coast. The intensity of spawning in specific areas is shown by histograms. Separate tables present a statistical summary of spawn records, including mean spawning dates. Tables summarizing roe fishery activity (1972-86) are shown for each location. A descriptive summary including a classification of the ecological importance of herring spawning habitat, is presented for each area.

Key words: herring, spawning, British Columbia

RÉSUMÉ

Hay, D. E., P. B. McCarter, R. Kronlund and C. Roy. 1989. Spawning areas of British Columbia herring : a review, geographical analysis and classification. Volume IV. Lower Central Coast and Johnstone Strait. Can. MS Rep. Fish. Aquat. Sci. 2019: 254 p.

Pendant 50 ans, plus précisément de 1937 à 1986, on a étudié la répartition géographique du frai de hareng en Colombie-Britannique. L'analyse se fonde sur des données extraites d'environ 20 000 rapports annuels sur le frai produits par les agents des pêcherles à l'égard de diverses régions côtières de la Colombie-Britannique. Pour chacune des quelque 90 subdivisions géographiques de la côte, on a dressé des tableaux qui montrent la fréquence annuelle de frai dans des segments d'un kilomètre. Des histogrammes montrent l'intensité du frai dans les secteurs particuliers. Des tableaux distincts donnent un résumé statistique des données de frai, y compris les dates moyennes de frai. Il y a également des tableaux illustrant la pêche de rogue (1972-1986) à chaque endroit. Chaque secteur fait également l'objet d'un résumé descriptif donnant une classification de l'importance écologique du milieu de frai du hareng.

Mots clés : hareng, frai, Colombie-Britannique

INTRODUCTION

In recent years there has been increased awareness and concern by industry, government and the public about the environmental protection of Pacific herring spawning grounds. A number of nearshore developments, such as oil exploratory activities and mariculture establishments could affect some inter- and subtidal spawning areas used by herring. Much of the British Columbia coast, perhaps 12% or more, has been used as a spawning site at least once during the last 50 years (Hay 1985). However, a much smaller proportion of the coast has been used for repetitive spawning over a number of years. The locations that support repetitive spawning deserve the most attention and consideration from possible environmental impacts. This report provides the basis for identifying significant herring spawning areas and locations which support major herring fisheries.

HERRING SPAWNING RECORDS

Detailed records of herring spawns in British Columbia are collected annually by Fishery Officers (Hay and Kronlund 1987). From 1928 to 1986 a total of nearly 20,000 records from over 1100 locations were recorded. The geographical size of a 'location' can vary from an island or cove measuring only 100 m in length or breadth, to bays or inlets more than 50 km in length. Also, geographical spawning locations frequently are 'clustered' so that sometimes many geographical names are used to describe the same general vicinity. Therefore, the continuity of spawnings cannot be examined by considering only single locations; rather, the adjacent locations should also be considered.

About 70% of all Fishery Officer spawn records have an accompanying map or chart showing the geographical position of each spawning. Records without charts consist of narratives or tables describing the position of each spawn relative to a fixed reference point, such as a Bay, Inlet, Island, etc. For spawn records with accompanying charts, we estimated the geographical positions of each spawn according to 0.1 km intervals along shorelines. This was done in all areas where herring were known to have spawned. Sub-divisions or 'sections' of the Statistical Areas (Hourston and Hamer 1979) were used as the smallest geographical unit. Most sections have a 'zero' position which increases, as high as necessary, to include all of the spawning locations. In several cases, spawning overlaps adjacent sections. In these instances, the spawn positions were made to be continuous between sections. Within most sections, herring spawning was not continuous along the shoreline throughout the whole section. Rather, spawning occurred in several different regions of the section, separated by distances without spawnings. This geographical discontinuity of spawning was reflected in the intervals. The 0.1 km intervals were not defined for the entire coastline but rather only for the

general vicinity of herring spawnings. Therefore, there are geographical gaps in the position numbers. Positions of spawning were defined for each of the 110 sections on the coast that had a sufficient number of records for analysis.

Positions were estimated for records that did not have accompanying charts (about 30%). Using the 70% of the records which did have accompanying charts, an average spawn position was calculated for each (approximately 1100) location. These 'estimated' spawning positions are distinguished from the measured positions in the analysis. A few locations had no charted spawn positions or an insufficient number to make a reasonable estimate. In these relatively few instances we assigned an 'estimated position' to some location names. This assigned position is distinguished from the measured and estimated positions in the analysis.

The accuracy of the estimated spawn positions varied with the quality of the record. Some positions were provided on fine-scaled, detailed maps, which allowed an estimated spawn position in our analysis to within 0.1 km or finer. Sometimes, however, only coarse-scaled charts were available so the estimated spawn position was accurate only to 1.0 km or more. In practice, the least precise estimated position involved records with very long spawns, longer than 5 km.

THE FORMAT OF THIS REPORT

This report is organized into about 106 sections corresponding approximately to sections of the major Statistical Areas defined by the Department of Fisheries and Oceans (Hourston and Hamer 1979). Since the work was completed, however, there have been some minor changes in the Statistical Area boundaries. Also, there have been minor changes in the boundaries and names used for sections (Haist and Rosenfeld 1988). These changes, however, do not interfere with the geographical analysis presented in this report but for some future analyses, these new geographical modifications will have to be made.

For each section, geographical location figures and as many as five tables are presented in the following order:

- (1) The first figure shows an overview chart of the location of the section (highlighted) relative to the whole north, or south coast of British Columbia.
- (2) The second figure shows a more detailed chart (or charts) in 1-km sections. For most of the figures, only every second km is labelled.
- (3) Spawn positions, in km segments, by year are summarized in the first table. The symbols on the charts are explained below.
- (4) The second table shows a histogram of the cumulative frequency of spawning per km segment for spawning data pooled over all years from 1937 to 1986. The symbols are explained below.
- (5) The third table is a statistical summary of spawning, by year from 1937 to 1986. Details of each of the columns in the table are explained below.
- (6) The fourth table is a summary narrative which briefly

summarizes and comments on highlights of the preceding data. (7) The last table shows the history of roe fishery catches summarized by location, date, time and hauled roe fishery catch, by gillnet and seines, in each area.

DERIVATION OF SPAWN POSITIONS USED IN THE TABLES

Analysis of spawn position by year (first table in each section)

For any single position on the coast, there are three types of spawn records:

- (i) Type 1: records with a geographical name (for example, Departure Bay near Nanaimo) and a documented geographical position, supported by Fishery Officer chart or map;
- (ii) Type 2: records with no charted position but with a geographical name that was used to describe locations of spawns. From Type 1 records, an 'average' position, in terms of average km segment, of each geographical name was calculated. For each geographical name, the position of all Type 2 records is shown relative to the 'average' position of the Type 1 records. All spawn data taken prior to 1951 and subsequent to 1983 fall into this category because we have not had the resources to measure the spawn positions.
- (iii) Type 3: records with no charted position and a geographical name that was not ever used with 'type 1' spawns. Therefore, the only spawn position that can be used must be roughly estimated by comparing the approximate geographical position relative to the kilometer intervals extended from adjacent spawn records.

The three types of spawn records are shown with different symbols on the tables 'spawn position by year'. In general, most spawn records have the geographic location indicated on charts. Such a spawn record, for a given year and a specific km interval, is indicated by a digit from 1 to 9, representing from one to nine spawn records within that km interval. The digit '1' is the most common record (i.e., a single record) and it could represent a spawn record that occupied (a) the full length interval (i.e., a full km of spawn, perhaps as part of a longer spawning that extended on both sides of the interval) or (b) only part of the interval. For instance, a spawn record of 100 m length would be represented as '1', a single spawning record within that length interval. A spawn record of 500 or 900 m length also would be indicated as '1', or a single record. However, two short adjacent spawn records, say of 100 m length each and occurring within the same km interval, would be indicated by a '2'. Two records occurring at exactly the same place but at different periods would be indicated by a '2'. Similarly, three or more adjacent records within the km interval, or three spawns occurring at different times within the same years but within the km interval would be indicated by the respective digit from '3' to '9'. There are some instances of numerous records of short spawn records, more than nine

per km, and when this occurs the collective records are indicated by the asterisk symbol '*'.

For 'type 2' spawn records (where the geographical position of each record is estimated on the basis of the 'type 1' records with known positions) a single spawn record per km segment is indicated by the small case letter 'a'. Two records are indicated as 'b', three as 'c' and so on until a maximum of 26, shown as 'z'. Instances with more than 26 records per km are indicated with the symbol '#'. There are only a few instances of these symbols in the tables and when they occur, the represented positions are probably too tightly packed relative to the real positions of the spawns. For instance, sometimes when only a geographical name is used as the basis of the spawn position, then that name could apply either to a precise section of the coast (for example, Point Grey, which represents a relatively exact coastal position) or to a broad area (for example, Burrard Inlet which is many km in length). Therefore, type 2 records with geographical names that apply to broad areas will probably appear to be too condensed in the tables of spawn position by year.

Type 3 records are indicated by the hat symbol '^'. There is no attempt to indicated the number of such records per km interval. Therefore a single hat could indicate one or more type 3 spawn records per km segment.

Sometimes, there is more than one type of spawn record per single km interval. This sometimes happens in recent years when precise geographical names are used at one time as well as a new geographical name that has not been used before. Sometimes 'new' or additional names are used to describe some small, late spawns that occur 2-3 weeks after the main spawning activity.

The combination of different types of records, within a single km is as follows:

Record Combination	Symbol
type 1 records only.....1 to 9, then	'*' for 10 or more records
type 2 records only.....a to z, then	'#' for 27 or more records
type 3 records only.....	'^' for 1 or more records
type 1 plus type 2	'\$' for 2 or more records
type 1 plus type 3	'@' for 2 or more records
type 2 plus type 3	'e' for 2 or more records
type 1 plus type 2 plus type 3	'%' for 3 or more records

Analysis of the cumulative spawn frequency by location (second table in each section)

The explanation of this table is similar to that of the first table. The total number of spawn records recorded for a single km interval is shown for each section. As discussed in the explanation for the first table,

there are three types of records of spawn. In this histogram, the cumulative frequency of type 1, 2 and 3 records is indicated by the symbols '*', '0' and 'I' respectively and in the far right column, the total numbers of records per each km interval are indicated. For instance, a single record of a spawn with a known position, would appear as a '1' or '2' adjacent the '*' symbols. The number of intervals affected would depend on whether a single spawn overlapped the interval boundaries. Another example could be a 5 km spawn record, with a calculated spawn position (type 2) record, would be indicated by a '5' or '6' adjacent the '0' symbols.

Statistical summary of spawning by location (third table in each section)

This table contains a number of columns that provide a year-by-year quantitative history of spawning, summarized for each section. The explanation for each column is described below:

Column	Heading	Explanation
1	Year	The documented year, between 1937 and 1986.
2	Total records	The total number of spawn records (spawn occurrences) per year.
3	Spawn index	An estimate of the area of spawn (m^2) based on conversion factors that correct for the time trends in estimates of spawn intensity and spawn width (see Hay and Kronlund 1987).
4	Sum length	The total length of spawn in metres, for each year.
5	Av wid	The average width of spawn in metres, for each year.
6	Av int	The average intensity of spawn on a scale of 1 (very light) to 9 (very heavy) (For further explanation, see Hay and Kronlund 1987).
7	Av date	The average spawning date presented by the Day of the year (DOY) where Jan. 1 = DOY 1, Jan. 2 = DOY 2, Feb. 1 = 32 DOY, and so on.
8	SE date	The standard error of the mean weighted spawn date.
9	Wt date	The average <u>weighted</u> spawning date. The date (DOY) of each record is 'weighted' by the length of each record. In most instances, the weighted and unweighted are nearly identical.
10	Min day	The earliest spawn date recorded each year, by DOY
11	Max day	The latest spawn date recorded each year, by DOY

12	Ind day	The number of different days over which spawnings occurred. A single spawn record on a single day would be 1. One single record extending over 5 days would be 5, etc.
13	Ind loc	The number of different spawning locations used. For the total coast, there are a total of about 1100 locations. If there were 10 separate small spawns within the same location, the number would be 1.

Herring spawn summary by location (fourth table in each section)

This table is a narrative based on the following criteria. The 'SPAWNING CONSISTENCY OVER TIME' is described as: (i) 'INFREQUENT' if the spawns were recorded in less than 50 percent of documented years, (ii) 'FREQUENT' if the spawns were recorded in 50 to 79 percent of documented years and (iii) 'CONSTANT' if the spawns were recorded in 80 to 100 percent of documented years. The 'MAGNITUDE OF SPAWNINGS' assessed from 1937 to 1986 for each section is described as: (i) 'VERY SMALL' if there was less than 50 hectares of cumulative spawn area, (ii) 'SMALL' if there was 50-200 hectares of cumulative spawn area, (iii) 'MEDIUM' if there was 201-500 hectares of cumulative spawn area, (iv) 'LARGE' if there was 501-1500 hectares of cumulative spawn area and (v) 'VERY LARGE' if there was greater than 1500 hectares of cumulative spawn area.

The history of roe fishery catches by gear type and by location (fifth table in each section)

This table is based on the hauled catches, as reported in annual information bulletins or industry reports (Chalmers et al. 1981, 1982, 1985, 1986 and Humphreys et al. 1972, 1973 and Webb et al 1974, 1975, 1979 and 1980). Catches, in short tons, hauled on the grounds were cited here as they are the most accurate representation of the LOCATION of catches. They may differ from tables reported in the annual catch summaries or stock assessments and forecast reports (Haist et al. 1988) because these documents are usually based on sales slip records. These other reports should be consulted if more accurate total catch figures by major area are required. Furthermore, the first year of the roe fishery (1971) was not included in this compilation due to incomplete or inconsistent records. Also, it should be noted that hauled catches in parenthesis in table 5 indicates herring catch was from two or more sections.

LIMITATIONS AND APPLICATIONS OF THESE ANALYSES

The precise geographical limits of herring spawning probably are accurate to within a kilometer, more in some specific sites and less in others. The original Fishery Officer records were made with varying degrees

of precision and the degree of precision often depends on the area of the spawning or survey; areas which have a lot of relatively fine-scale geographical detail, such as the Gulf Islands in southern Georgia Strait, probably are more accurate than areas with fewer geographical details, such as the relatively straight shoreline between Parksville and Deep Bay. In general however, the summaries presented here should be reasonable indicators of spawning activity to the nearest kilometer.

This geographical compilation and historical synopsis of herring spawns represents the culmination of several earlier but briefer versions. One of the earlier analyses, presented at the Annual Herring Stock Assessment Meetings as PSARC WORKING PAPER 86-5, had widespread distribution and was used for examination and evaluation of ecologically sensitive areas relative to potential impacts from oil exploration activities and mariculture developments.

During the several years of preparatory work that has gone into this project, we often have heard the criticism that the herring spawning data base has limited value because of alleged errors and omissions in the records. The most frequently cited error attributed to the records is that the data collected on the spawn dimensions were made in a sloppy way and "often by the cook on a patrol vessel"; alternately, we have heard that some Fishery Officers could not be bothered to go out and look for herring spawn rather, they simply noted the presence or absence of seabirds and assumed that herring spawn occurred wherever birds occurred. Undoubtably, some of these stories are correct, but probably for not more than a few of the nearly 20,000 records used in these analysis. Based on detailed examination of the original records, it is clear that the overwhelming majority of the Fishery Officers who report on herring spawns, do it in a dedicated, professional and competent manner, often with detailed comments and charts accompanying the records.

There are, nevertheless, two kinds of systematic error in these records which should be mentioned. The first appears to be a time-dependent trend for Fishery Officers to underestimate spawn width. This occurred mainly in the earlier years, when it was generally believed that most of the spawn was confined to the inter-tidal zone. It has not been until relatively recent times that the significance of the subtidal fraction has been appreciated (Haegele et al. 1983). Also, there has been systematic changes in the spawn intensity measurements, in part reflecting changes in the measurement or rating criteria used over the years (see Hay and Kronlund 1987 for more detail). However, neither of these systematic errors have any effect on the analysis in the present study, which does not involve any presentation of the 'spawn index' which is fully described in Hay and Kronlund (1988). The only other kind of error in the records which can severely affect conclusions presented in these analyses, is that of incompleteness. It is clear that for some locations, records were not collected systematically each year. As much as possible we have attempted to comment on this in the narrative summary tables.

The data and analysis that are presented in this document have been available for the last two years, on request, to anyone with an interest in the historical distribution of herring spawning areas. The analyses already have been used many times for examinations of impacts of different nearshore developments. It appears that one of the most useful aspects of the analyses is that some areas are identified clearly as important spawning locations and

others, with no history of herring spawns, are shown to be not important. There are many locations or km segments, however, which are in between. They have a record of spawning which varies in time. These 'intermediate' spawning locations are the most difficult to evaluate in terms of their importance in maintaining the well being of the herring resource.

In general, we suggest that it is essential to conserve the spawning areas that have a history of repetitive spawning over time. Also, areas immediately adjacent to spawning areas must be protected. Ultimately however, each instance of a nearshore development that might impact herring spawning areas must be decided on its own merits and it should be kept in mind that we still do not understand why some areas are used as spawning areas and others are not. Some locations which are not known as spawning areas appear to have the appropriate vegetative substrate and local oceanographic regimes that are found in documented spawning areas (Hay et al. 1984). Further, herring 'enhancement' does not appear to be possible at the present time (Hay and Marliave 1988). Therefore, if herring spawning habitat is lost, we cannot necessarily expect the impacted stocks to spawn in other locations nor can we realistically expect that new spawning habitat can be created. Finally, throughout this report we have commonly used the word "stock" or "resident stock" that refer to herring that inhabit an area. This usage is for convenience only, and cannot be used as an indicator of any particular uniqueness (genetic or otherwise) of herring from one place to the other.

ACKNOWLEDGMENTS

The authors would like to thank the following people for their efforts in contributing to this document: Blair Bolton, Marilyn Clark, Ken Cooke, Lana Fitzpatrick, Carl Haegle, Vivian Haist, Tod Harmon, Nicola Kanachowski, Jane Koleba, Sheri Martin, Lorena Rosenfeld, Glennis Taylor and Melinda Whiteaker. Several Fishery Officers as well as other Field Service personnel provided useful comments and suggestions.

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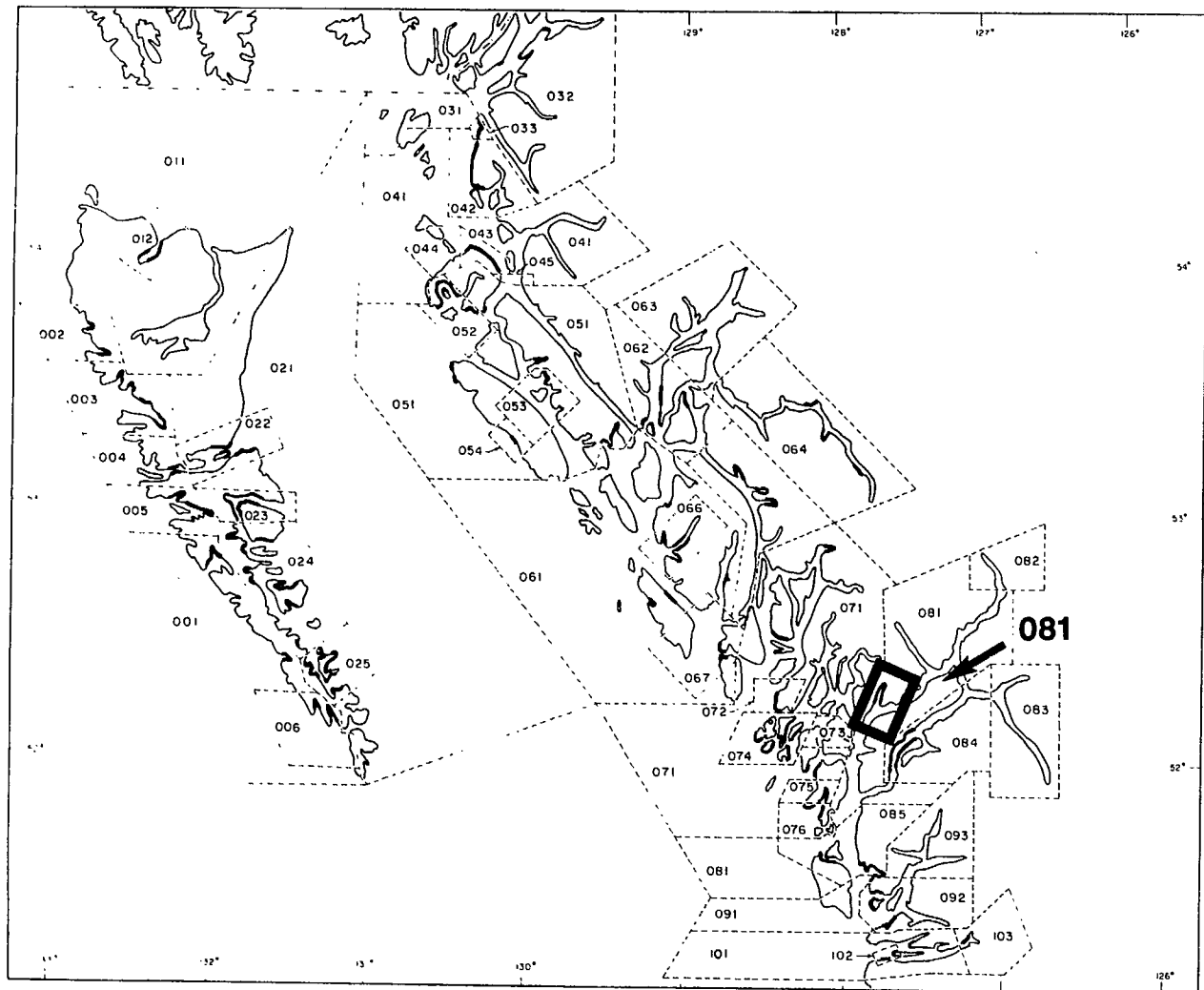


Fig. 081-1. Overview map showing location of section 081, Other Area 8.

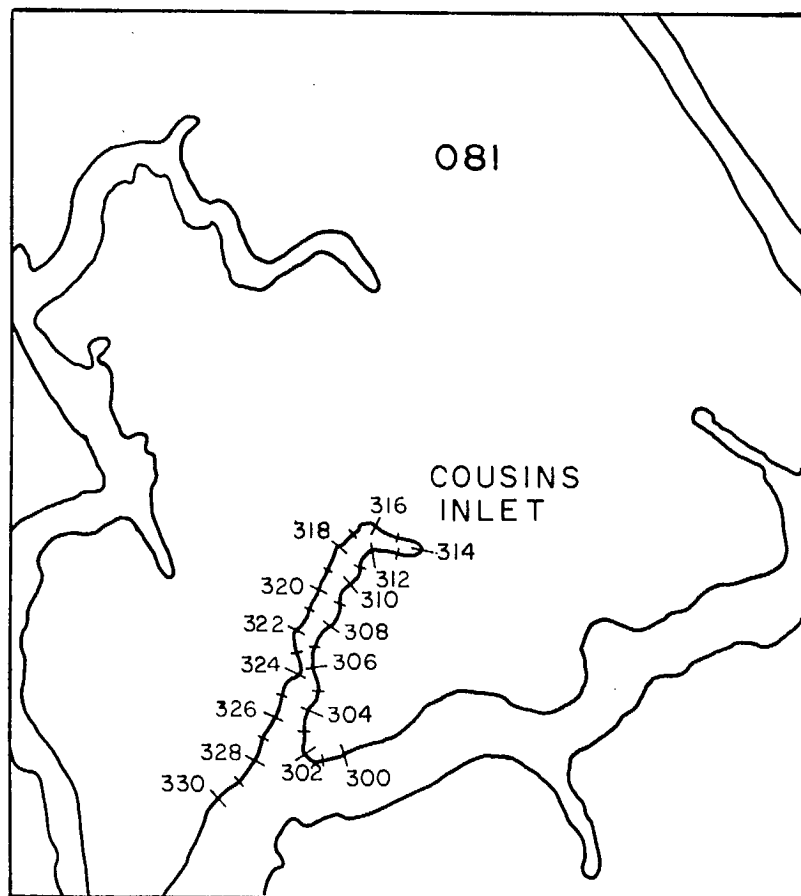


Fig. 081-2. Detailed map of section 081, Other Area 8.

Table 081-2. Section 081 - histogram of cumulative spawn frequency over distance

	position(km)																vara	varb	varc	all
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
COUSINS INLET	+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
	312.00	+															0	0	0	0
	313.00	+															0	0	1	1
	314.00	+															0	0	1	1
	315.00	+															0	0	0	0
	+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 081-3. Herring statistical spawn summary for section 081.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	1	0	0	0	3.0	64.0	0.00	0.0	64	64	1	1
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	1	165	55	3	5.0	97.0	0.00	97.0	97	97	1	1
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1971	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1972	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1973	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1974	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1975	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1976	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1977	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	2	165	55	3	4.0	80.5	16.50	97.0	64	97	2	2

Table 081-4. Spawn summary for section 081 from 1937 to 1986.

A. GENERAL:

There is one main spawning area at Cousins Inlet.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Ocean Falls.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There has been only two recorded spawnings in 1938 and 1967.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 2/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 2/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 0.05 Km.
4. CUMULATIVE SPAWN AREA	= 0.02 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 22 (80.5)
2. MEAN WEIGHTED DATE (DOY)	= April 7 (97.0)

F. COMMENTS:

There are only two small spawn records in Cousins Inlet (1938 and 1967) which probably were associated with herring stocks in adjacent sections.

G. ROE FISHERIES:

No major roe fisheries are documented.

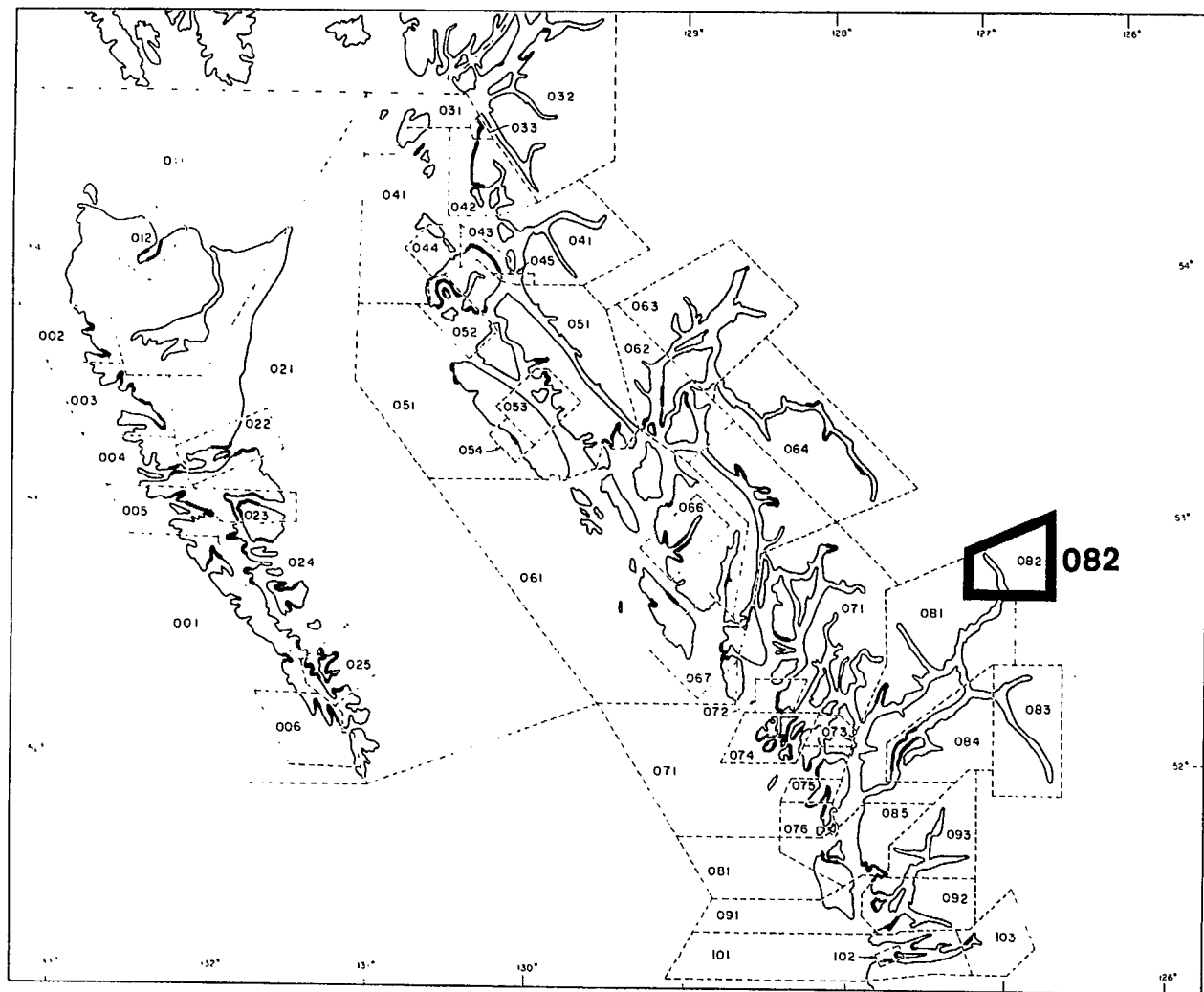


Fig. 082-1. Overview map showing location of section 082, Kimsquit Bay.

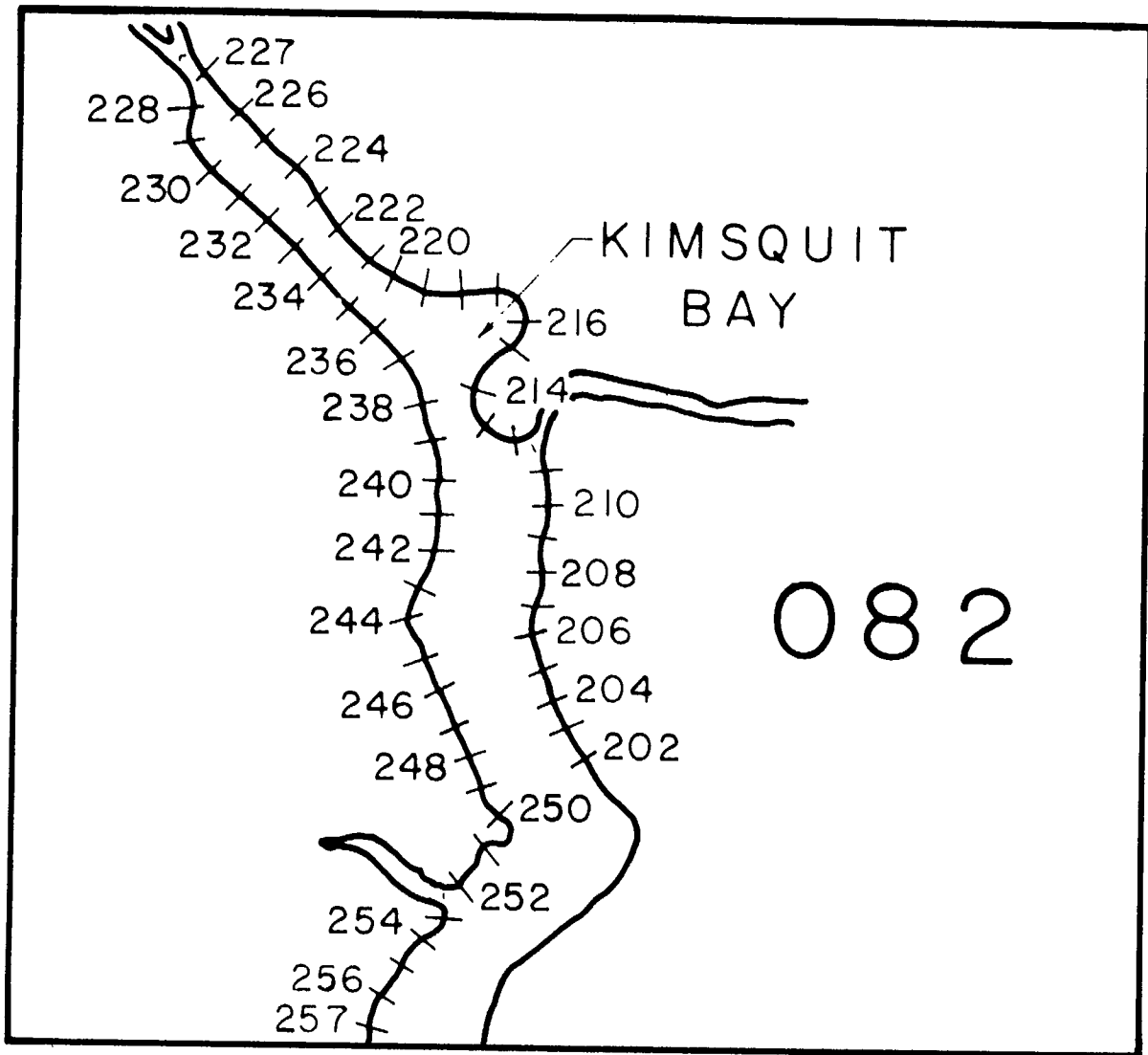


Fig. 082-2. Detailed map of section 082, Kimsquit Bay.

Table 082-1. Section 082 - spawn position by year.

	202.00	212.00	222.00	232.00
1937 +			aaaaaaaaaaaaaaaaaaaa	
1938 +			aaaaaaaaaaaaaaaaaaaa	
1939 +			aaaaaaaaaaaaaaaaaaaa	
1940 +				
1941 +			aaaaaaaa	
1942 +				
1943 +			aaaaaaaa	
1944 +			aaaaaaaa	
1945 +			aabbbba	
1946 +			aaa	
1947 +			bbb	
1948 +				
1949 +				
1950 +				
1951 +				
1952 +				
1953 +				
1954 +				
1955 +			aa	
1956 +				
1957 +				
1958 +				
1959 +				
1960 +				
1961 +				
1962 +				
1963 +				
1964 +				
1965 +				
1966 +				
1967 +				
1968 +				
1969 +			aaa	
1970 +			11111111111111111111	
1971 +	1111111111111111			
1972 +		111111111		
1973 +		112221111	11111111	
1974 +		1111111111	1111111111	
1975 +		1112322211	1111	1121
1976 +		11111		11111111
1977 +				
1978 +		1		
1979 +				
1980 +				
1981 +				
1982 +				
1983 +				
1984 +				
1985 +				
1986 +				

Table 082-2. Section 082 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
KIMSQUIT BAY	201.00	+																0	0	0	0
	202.00	+																0	0	0	0
	203.00	++																1	0	0	1
	204.00	++																1	0	0	1
	205.00	++																1	0	0	1
	206.00	++																1	0	0	1
	207.00	++																1	0	0	1
	208.00	++																1	0	0	1
	209.00	++																1	0	0	1
	210.00	+++																2	0	0	2
	211.00	+++																2	0	0	2
	212.00	+++																3	0	0	3
	213.00	++++000																4	3	0	7
	214.00	+++++000																8	3	0	11
	215.00	+++++000																8	3	0	11
	216.00	+++++000																10	3	0	13
	217.00	+++++000																9	3	0	12
	218.00	+++++000																9	3	0	12
219.00	+++++00000000																5	8	0	13	
220.00	+++++00000000																4	9	0	13	
221.00	+++++00000000																4	8	0	12	
222.00	+++++0000000000																3	11	0	14	
223.00	+++++0000000000																2	11	0	13	
224.00	+++++0000000000																3	11	0	14	
225.00	+++++00000000																2	8	0	10	
226.00	+++++0000000																2	7	0	9	
227.00	+++++000000																2	6	0	8	
228.00	+++++000																1	3	0	4	
229.00	+++++000																2	3	0	5	
230.00	+++++000																2	3	0	5	
231.00	+++++000																5	3	0	8	
232.00	+++++000																4	3	0	7	
233.00	+++++000																4	3	0	7	
234.00	+++++																4	0	0	4	
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 082-2 (cont'd.)

position(km)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
235.00	*****																4	0	0	4
236.00	*****																4	0	0	4
237.00	****																3	0	0	3
238.00	***																2	0	0	2
239.00	**																2	0	0	2
240.00	*																2	0	0	2
241.00																	1	0	0	1
242.00																	0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 082-3. Herring statistical spawn summary for section 082.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	1	44862	19304	0	3.0	66.0	0.00	66.0	66	66	1	1
1938	1	44862	19304	0	1.0	65.0	0.00	65.0	65	65	1	1
1939	1	44862	19304	0	1.0	71.0	0.00	71.0	71	71	1	1
1940	1	0	0	0	3.0	64.0	0.00	0.0	64	64	1	1
1941	1	18692	8043	0	3.0	60.0	0.00	60.0	60	60	1	1
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	1	18055	7769	4	3.0	66.0	0.00	66.0	66	66	1	1
1944	1	19117	8226	3	3.0	85.0	0.00	85.0	85	85	1	1
1945	2	20179	8683	5	4.0	79.0	0.00	79.0	79	79	1	1
1946	1	6372	2742	4	3.0	74.0	0.00	74.0	74	74	1	1
1947	2	11683	5027	6	3.0	79.0	0.00	79.0	79	79	1	1
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	1	2124	914	4	3.0	91.0	0.00	91.0	91	91	1	1
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	1	3186	1371	91	1.0	90.0	0.00	90.0	90	90	1	1
1970	1	56078	24130	8	4.0	69.0	0.00	69.0	69	69	1	1
1971	2	33647	14478	5	5.0	85.5	0.50	85.6	85	86	2	2
1972	1	19117	8226	5	5.0	69.0	0.00	69.0	69	69	1	1
1973	3	42483	18280	2	3.7	76.0	0.00	76.0	76	76	1	1
1974	2	40359	17366	2	1.0	79.0	0.00	79.0	79	79	1	2
1975	10	43968	18919	6	2.4	81.0	0.00	81.0	81	81	1	1
1976	3	24428	10511	7	2.7	78.0	0.00	78.0	78	78	1	1
1977	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1978	1	2124	914	18	1.0	66.0	0.00	66.0	66	66	1	1
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	37	496200	213511	8	2.8	77.1	1.19	73.7	60	91	15	2

Table 082-4. Spawn summary for section 082 from 1937 to 1986.

A. GENERAL:

There is one main spawning area at the head of Dean Channel centered in the Kimsquit Bay area.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Bella Coola and Ocean Falls.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There have been two main spawning episodes, 1937-47 and 1969-78.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 19/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 19/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 213.5 Km.
4. CUMULATIVE SPAWN AREA	= 49.6 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 18 (77.1)
2. MEAN WEIGHTED DATE (DOY)	= March 15 (73.7)

F. COMMENTS:

Spawnings in the headwaters of the deep inlets probably represent those of distinct stocks. Neither sections 082 or 083 have histories of continuous spawnings. Kimsquit Bay has records of only 38 spawns with a mean time of March 18 which is evidence that it probably is part of the stock of the Bentinck Arms (section 083) which has a similar time of March 13.

G. ROE FISHERIES:

No major roe fisheries are documented.

1. The first part of the report deals with the general situation of the country and the progress of the work during the year.

2. The second part of the report deals with the results of the work during the year and the progress of the work during the year.

3. The third part of the report deals with the results of the work during the year and the progress of the work during the year.

4. The fourth part of the report deals with the results of the work during the year and the progress of the work during the year.

5. The fifth part of the report deals with the results of the work during the year and the progress of the work during the year.

6. The sixth part of the report deals with the results of the work during the year and the progress of the work during the year.

7. The seventh part of the report deals with the results of the work during the year and the progress of the work during the year.

8. The eighth part of the report deals with the results of the work during the year and the progress of the work during the year.

9. The ninth part of the report deals with the results of the work during the year and the progress of the work during the year.

10. The tenth part of the report deals with the results of the work during the year and the progress of the work during the year.

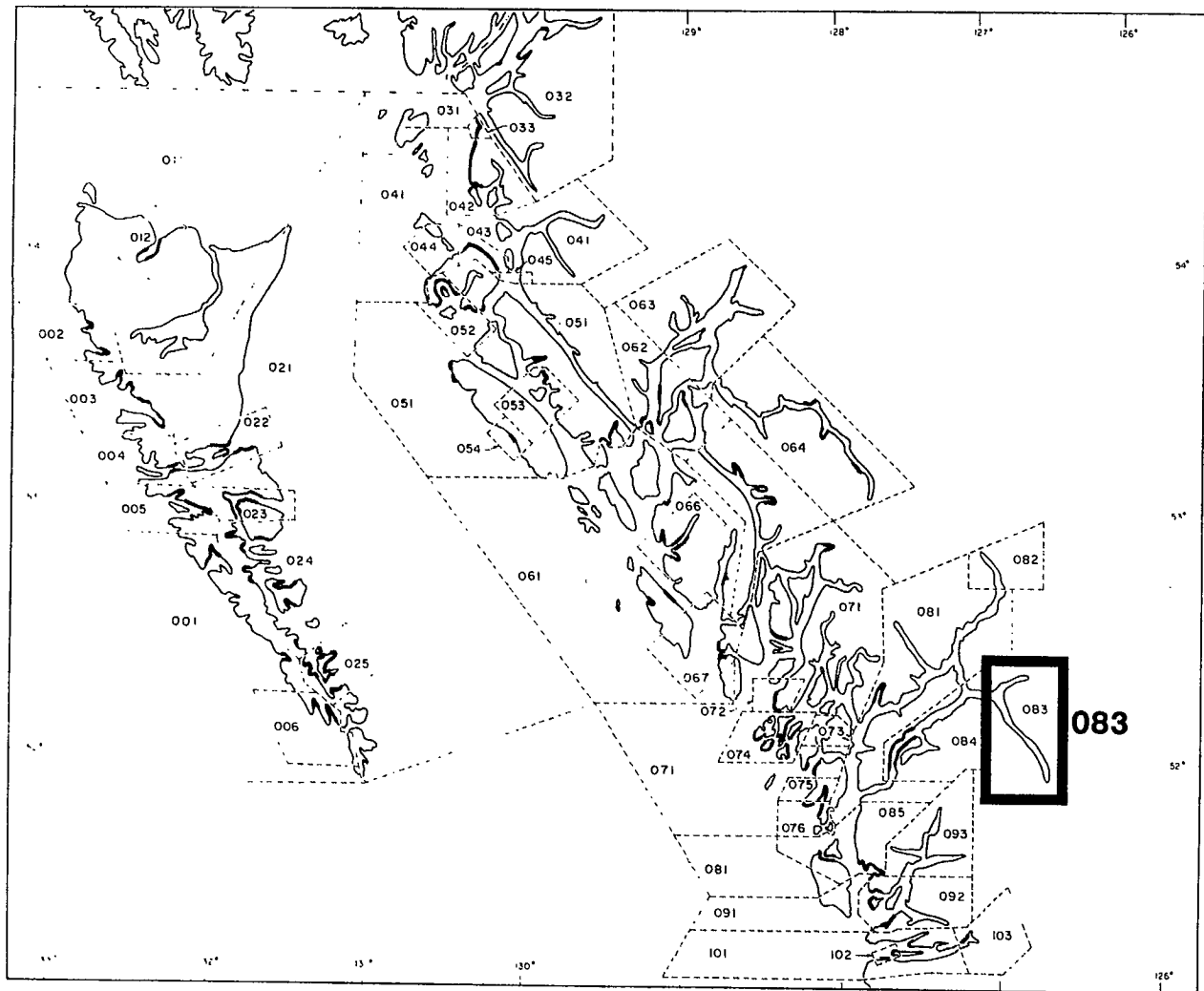


Fig. 083-1. Overview map showing location of section 083, Bentinck Arms.

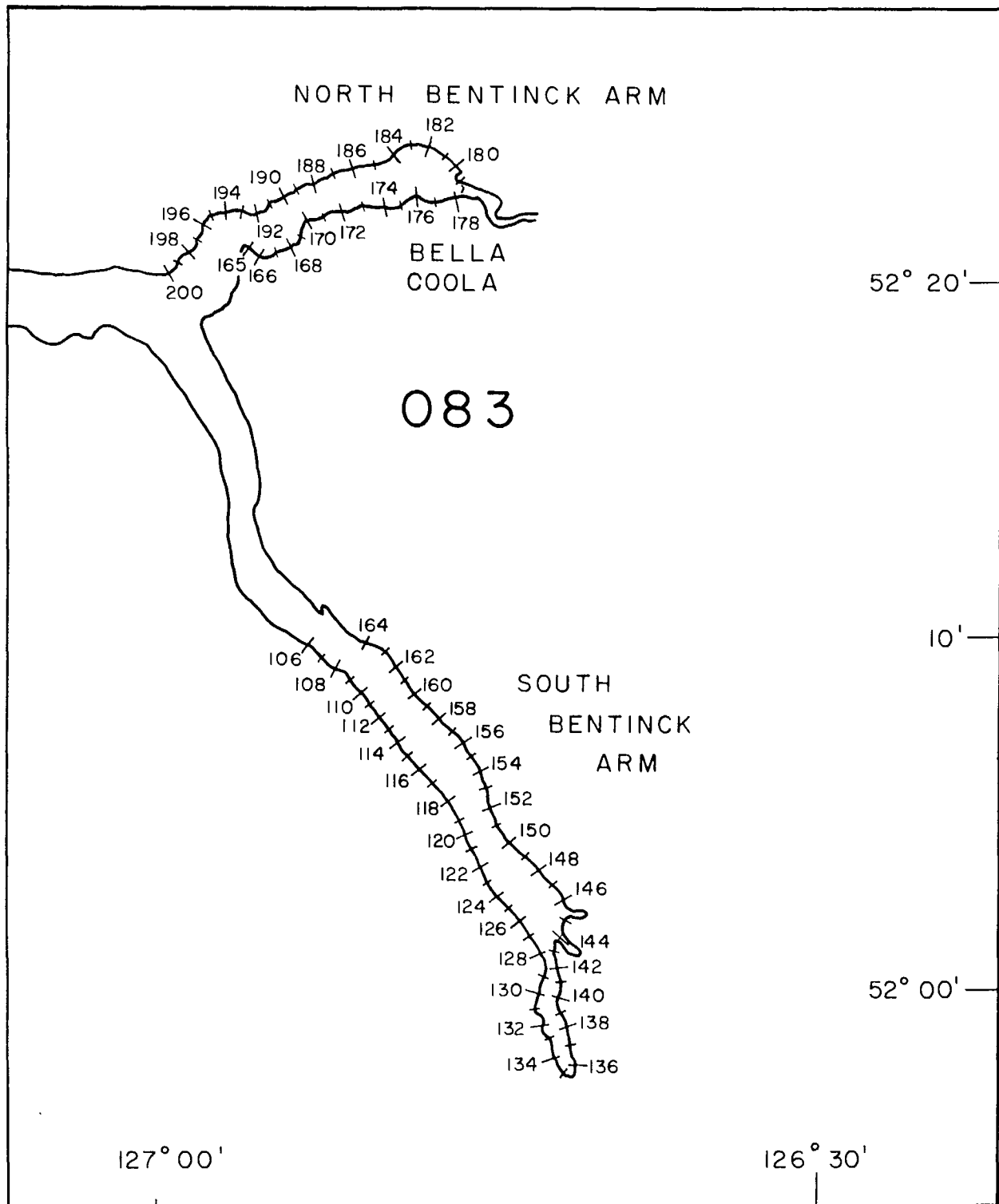


Fig. 083-2. Detailed map of section 083, Bentinck Arms.

Table 083-1. Section 083 - spawn position by year.

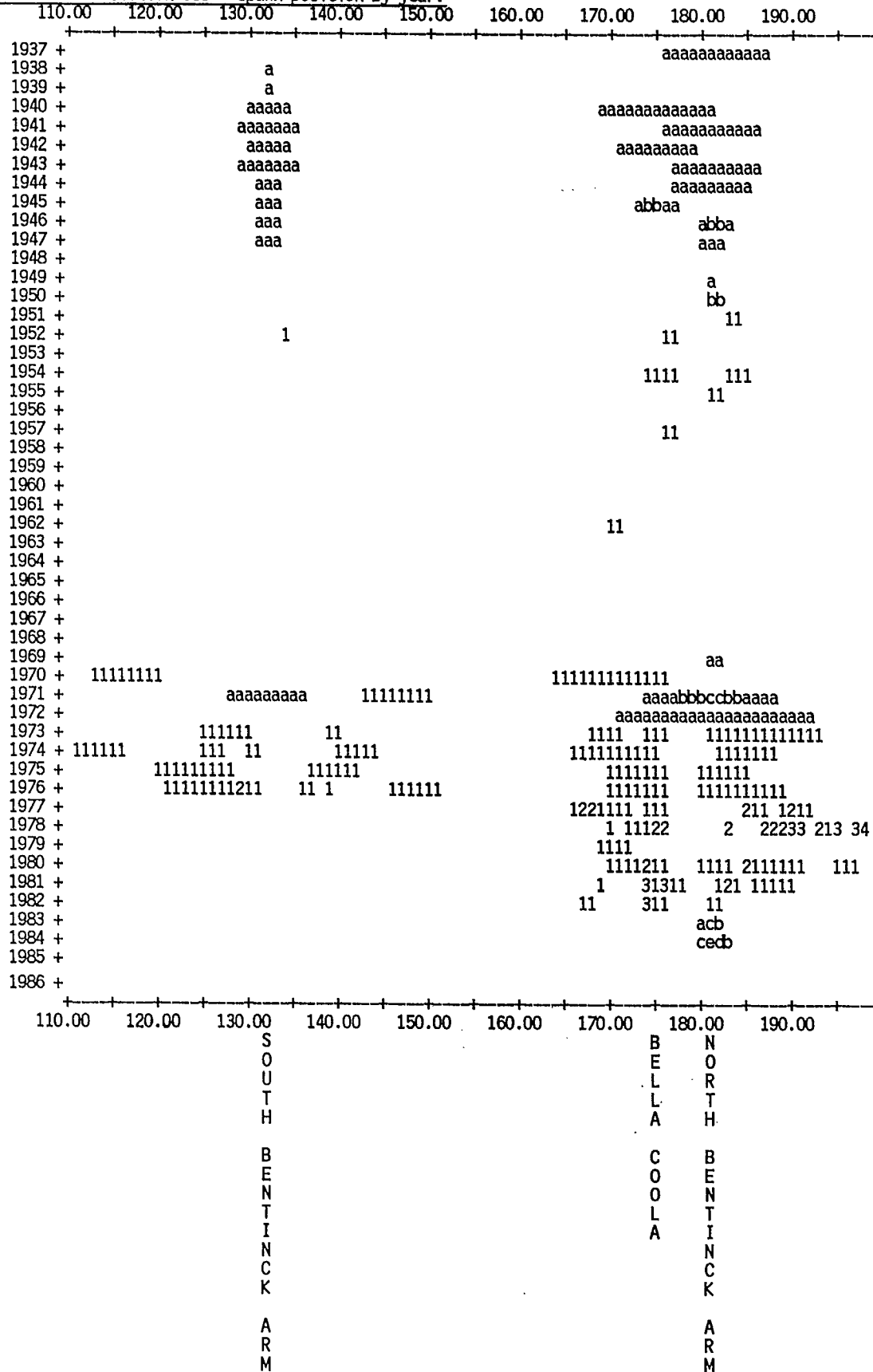


Table 083-2. Section 083 -histogram of cumulative spawn frequency over distance

position(km)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
109.00 +																	0	0	0	0
110.00 +																	0	0	0	0
111.00 +*																	1	0	0	1
112.00 +*																	1	0	0	1
113.00 +**																	2	0	0	2
114.00 +**																	2	0	0	2
115.00 +**																	2	0	0	2
116.00 +**																	2	0	0	2
117.00 +*																	1	0	0	1
118.00 +*																	1	0	0	1
119.00 +*																	1	0	0	1
120.00 +**																	2	0	0	2
121.00 +**																	2	0	0	2
122.00 +**																	2	0	0	2
123.00 +**																	2	0	0	2
124.00 +**0																	2	1	0	3
125.00 +**00																	4	1	0	5
126.00 +**00																	4	1	0	5
127.00 +**00																	4	1	0	5
128.00 +**00																	3	2	0	5
129.00 +**0000																	3	4	0	7
130.00 +**000000																	3	6	0	9
131.00 +**0000000000																	2	10	0	12
132.00 +000000000000																	0	12	0	12
133.00 +0000000000																	0	10	0	10
134.00 +*000000																	1	6	0	7
135.00 +0000																	0	4	0	4
136.00 +*00																	1	2	0	3
137.00 +**0																	2	1	0	3
138.00 +*0																	1	1	0	2
139.00 +**0																	3	1	0	4
140.00 +**0																	3	1	0	4
141.00 +**																	2	0	0	2
142.00 +**																	2	0	0	2
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

SOUTH BENTINCK ARM

Table 083-2 (cont'd.)

position(km)																				
+-----+																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
143.00	***																2	0	0	2
144.00	***																2	0	0	2
145.00	+																1	0	0	1
146.00	***																2	0	0	2
147.00	***																2	0	0	2
148.00	***																2	0	0	2
149.00	***																2	0	0	2
150.00	***																2	0	0	2
151.00	+																1	0	0	1
152.00	+																0	0	0	0
153.00	+																0	0	0	0
154.00	+																0	0	0	0
155.00	+																0	0	0	0
156.00	+																0	0	0	0
157.00	+																0	0	0	0
158.00	+																0	0	0	0
159.00	+																0	0	0	0
160.00	+																0	0	0	0
161.00	+																0	0	0	0
162.00	+																0	0	0	0
163.00	+																0	0	0	0
164.00	+																1	0	0	1
165.00	+																1	0	0	1
166.00	***																3	0	0	3
167.00	*****																5	0	0	5
168.00	*****																6	0	0	6
169.00	*****0																6	1	0	7
170.00	*****00																10	1	0	11
171.00	*****000																9	3	0	12
172.00	*****000																8	3	0	11
173.00	*****0000																6	5	0	11
174.00	*****0000000																16	7	0	23
175.00	*****0000000																12	7	0	19
176.00	*****00000000																15	8	0	23
177.00	*****000000000																4	10	0	14
+-----+																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

BELLA COOLA

Table 083-2 (cont'd.)

	position(km)																vara	varb	varc	all
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
178.00	+	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10	0	11
179.00	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
180.00	+	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	20	0	23
181.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	41	0	47
182.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	35	0	43
183.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	14	0	25
184.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	8	0	15
185.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	7	0	16
186.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0	12
187.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	4	0	12
188.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3	0	10
189.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	9
190.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	9
191.00	+	*****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	7
192.00	+	**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3
193.00	+	***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
194.00	+	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
195.00	+	****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
196.00	+	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
197.00	+	****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
198.00	+	****	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
199.00	+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200.00	+		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 083-3. Herring statistical spawn summary for section 083.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	1	13884	11260	0	3.0	66.0	0.00	66.0	66	66	1	1
1938	2	991	804	0	3.0	64.0	0.00	64.0	64	64	1	2
1939	1	991	804	0	3.0	67.0	0.00	67.0	67	67	1	1
1940	2	19834	16086	0	4.0	70.0	0.00	68.8	70	70	1	2
1941	2	19835	16087	0	3.0	60.0	0.00	60.0	60	60	1	2
1942	2	15867	12869	4	4.0	56.0	0.00	56.0	56	56	1	2
1943	2	19158	15538	4	3.0	66.0	0.00	66.0	66	66	1	2
1944	2	12127	9835	3	3.0	75.0	0.00	75.0	75	75	1	2
1945	3	7325	5941	3	3.0	74.0	0.00	74.0	74	74	1	2
1946	3	5635	4570	4	3.0	74.0	0.00	74.0	74	74	1	2
1947	2	5071	4113	5	3.0	81.0	0.00	81.0	81	81	1	2
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	1	226	183	5	3.0	79.0	0.00	79.0	79	79	1	1
1950	2	2254	1828	5	5.0	110.0	0.00	93.5	110	110	1	1
1951	1	1353	1097	3	3.0	77.0	0.00	77.0	77	77	1	1
1952	2	1353	1097	3	3.0	84.0	0.00	84.0	84	84	1	2
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	2	6762	5484	5	4.0	78.5	12.50	79.7	66	91	2	1
1955	1	789	640	4	3.0	95.0	0.00	95.0	95	95	1	1
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	1	1239	1005	5	3.0	82.0	0.00	82.0	82	82	1	1
1958	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	1	2254	1828	3	3.0	93.0	0.00	93.0	93	93	1	1
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	1	676	548	10	3.0	83.0	0.00	83.0	83	83	1	1
1970	2	22809	18499	4	4.0	73.5	4.50	72.5	69	78	2	2
1971	5	43952	35646	4	5.0	85.0	3.44	82.4	76	96	5	2
1972	1	25784	20912	5	5.0	83.0	0.00	83.0	83	83	1	1
1973	5	26596	21570	2	3.0	83.4	1.94	81.7	79	89	3	2
1974	6	32682	26506	2	1.8	83.0	0.00	83.0	83	83	1	2
1975	5	29020	23536	5	1.0	80.0	2.45	79.3	74	84	2	2
1976	7	38317	31076	2	1.9	79.0	1.29	80.3	77	84	2	2
1977	10	15226	12349	6	1.8	63.0	0.00	63.0	63	63	1	1
1978	31	7758	6292	4	2.3	68.5	2.10	74.3	60	84	2	1
1979	1	4508	3656	5	2.0	65.0	0.00	65.0	65	65	1	1
1980	6	20004	16224	4	1.7	75.0	0.00	75.0	75	75	1	1
1981	12	9356	7588	5	0.0	65.1	0.50	64.3	63	68	5	2
1982	6	4740	3844	4	0.0	74.0	0.00	74.0	74	74	1	1
1983	3	4020	3260	1	0.0	57.0	0.00	57.0	57	57	1	1
1984	5	11220	9100	2	0.0	63.0	0.00	63.0	63	63	1	1
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	16	25400	20600	2	0.0	68.0	0.00	68.0	68	68	1	1
All	155	459015	372275	4	2.6	71.8	0.82	74.3	56	110	30	3

Table 083-4. Spawn summary for section 083 from 1937 to 1986.

A. GENERAL:

- There are two main spawning areas at the head of Burke Channel:
- (i) North Bentinck Arm (Bella Coola) and
 - (ii) South Bentinck Arm

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Bella Coola.

C. SPAWNING CONSISTENCY OVER TIME: FREQUENT

There have been two main spawning episodes, 1937-57 and 1969-86 with intermittent spawnings in other years.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

- | | |
|---|-------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 36/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 36/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 372.3 Km. |
| 4. CUMULATIVE SPAWN AREA | = 45.9 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|-------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = March 13 (71.8) |
| 2. MEAN WEIGHTED DATE (DOY) | = March 15 (74.3) |

F. COMMENTS:

Spawnings in the headwaters of these deep inlets probably represent those of distinct stocks but neither sections 082 or 083 have histories of continuous spawnings. North Bentinck Arm, however, has only two major time gaps. Spawns were recorded there from 1936 to 1957, with only three single year gaps, and from 1969 to 1986 with one gap. Between 1957 and 1969 only one spawn was recorded. A total of 158 spawnings were recorded with a mean time of March 13. Kimsquit Bay (section 082) to the north has a mean time of March 18 which suggests that it probably is part of the Bentinck Arms stock.

G. ROE FISHERIES:

No major roe fisheries are documented.

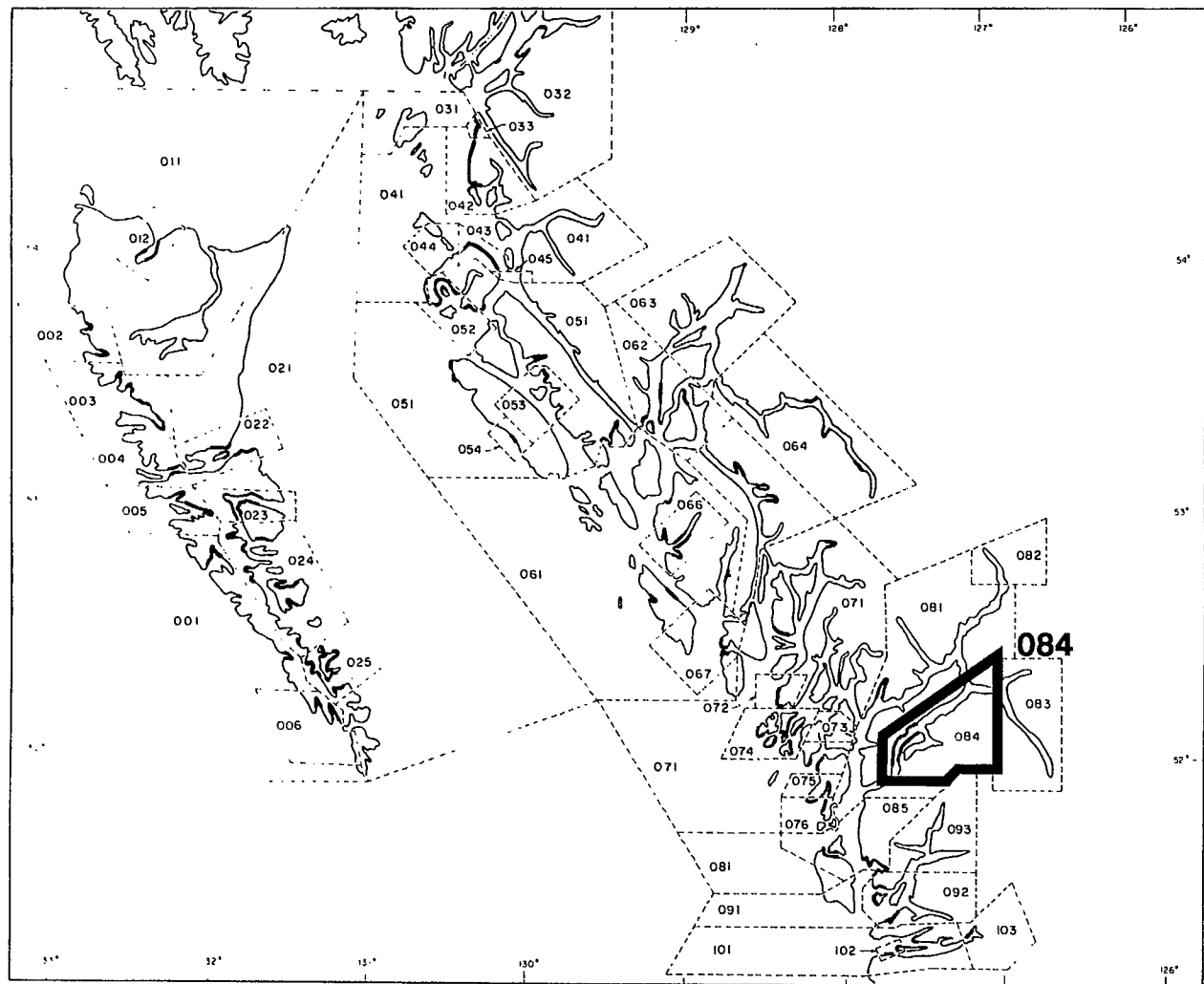


Fig. 084-1. Overview map showing location of section 084, Burke Channel.

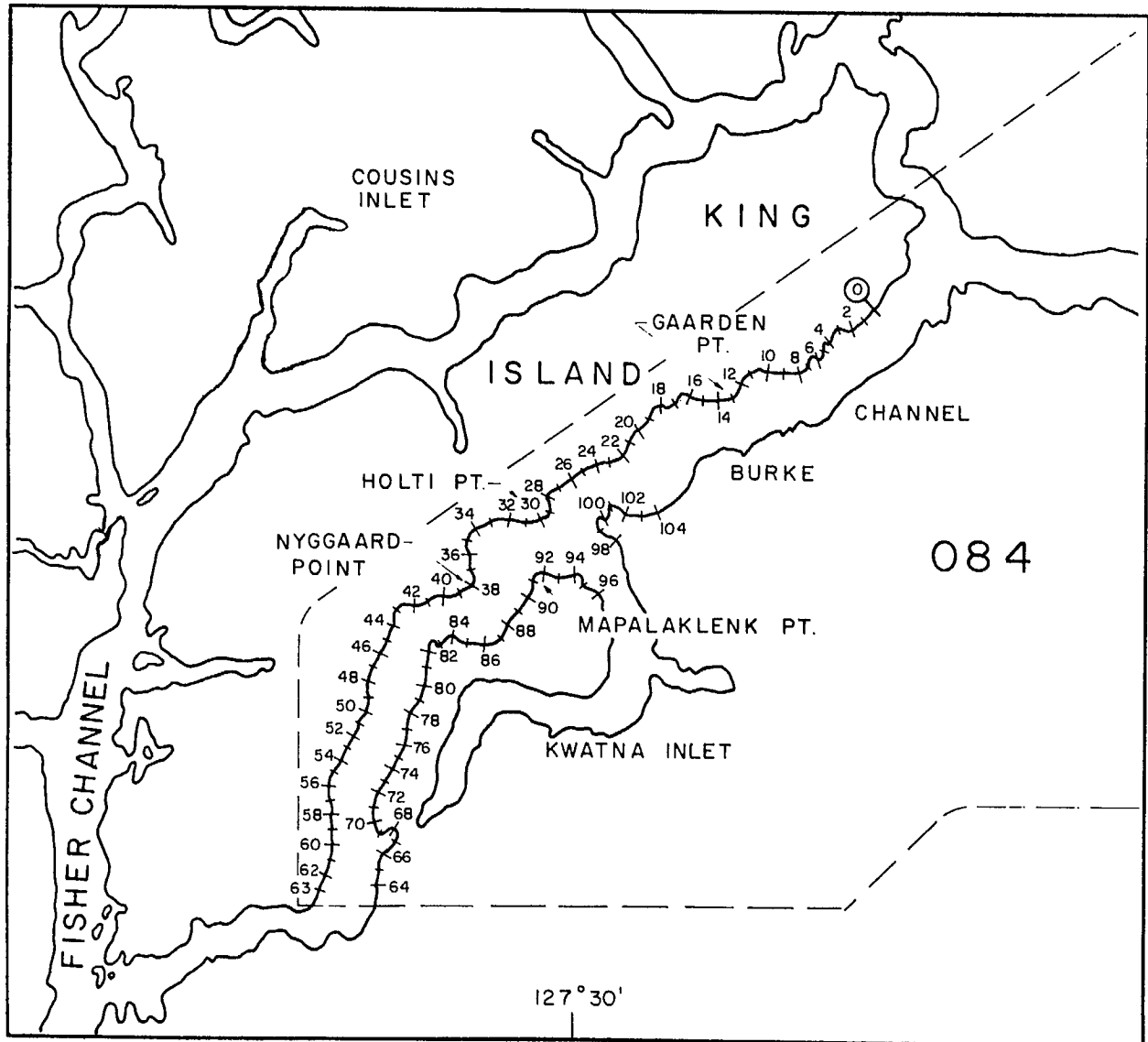


Fig. 084-2. Detailed map of section 084, Burke Channel.

Table 084-1. Section 084 - spawn position by year.

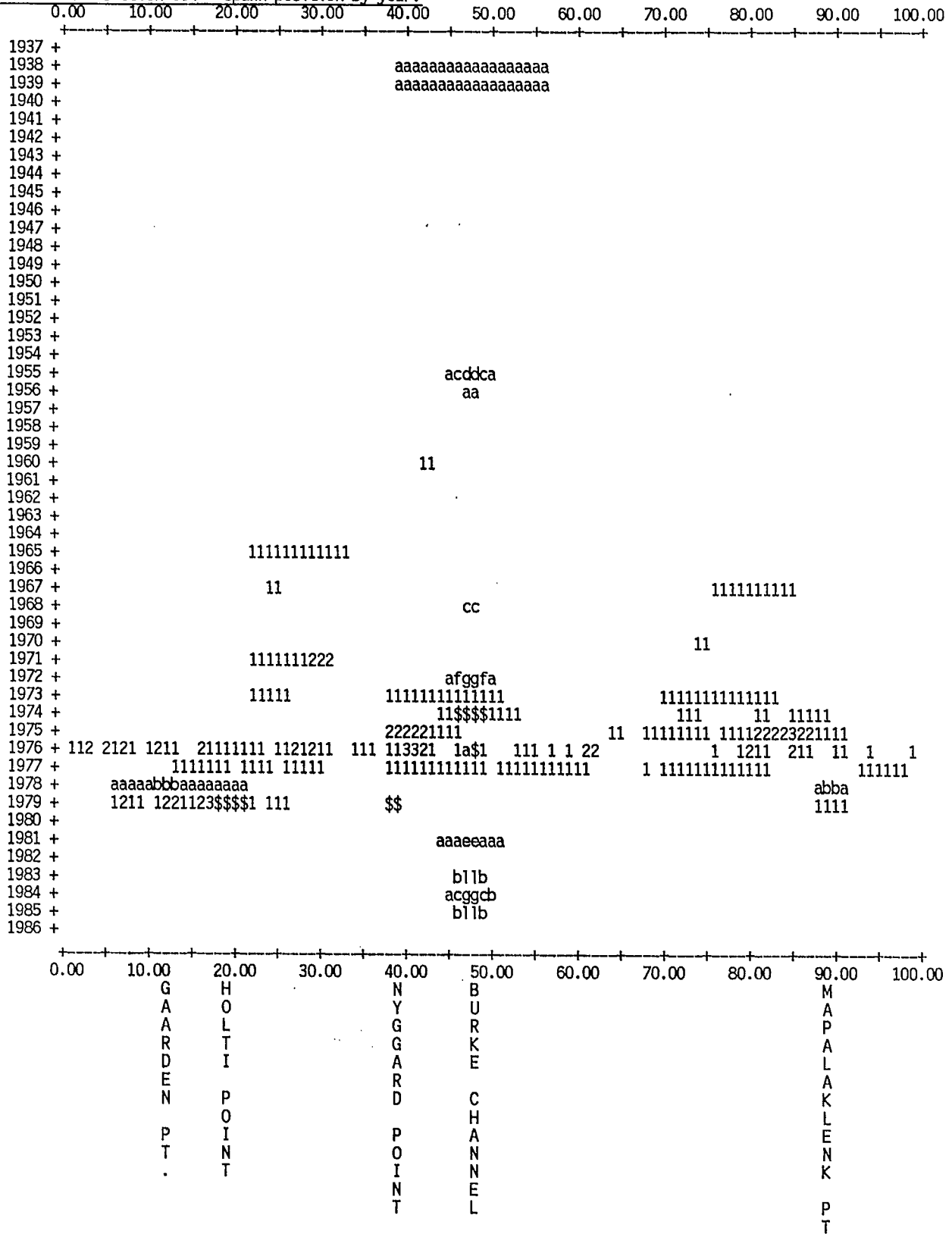


Table 084-2. Section 084 - histogram of cumulative spawn frequency over distance

position(km)		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
		+-----+																			
	0.00 +																	0	0	0	0
	1.00 +*																	1	0	0	1
	2.00 +*																	1	0	0	1
	3.00 +**																	2	0	0	2
	4.00 +																	0	0	0	0
	5.00 +**																	2	0	0	2
	6.00 +**0																	2	1	0	3
	7.00 +***0																	4	1	0	5
	8.00 +**0																	2	1	0	3
	9.00 +*0																	1	1	0	2
	10.00 +*0																	1	1	0	2
GAARDEN PT.	11.00 +***00																	3	2	0	5
	12.00 +***00																	3	2	0	5
	13.00 +****00																	4	2	0	6
	14.00 +**0																	2	1	0	3
	15.00 +**0																	2	1	0	3
	16.00 +*****0																	5	1	0	6
	17.00 +*****0																	5	1	0	6
	18.00 +*****00																	5	2	0	7
HOLT POINT	19.00 +***000000																	3	6	0	9
	20.00 +**000000																	2	6	0	8
	21.00 +***00																	3	2	0	5
	22.00 +*****																	6	0	0	6
	23.00 +*****																	5	0	0	5
	24.00 +*****																	6	0	0	6
	25.00 +*****																	6	0	0	6
	26.00 +*****																	6	0	0	6
	27.00 +*****																	5	0	0	5
	28.00 +****																	4	0	0	4
	29.00 +*****																	6	0	0	6
	30.00 +*****																	5	0	0	5
	31.00 +****																	4	0	0	4
	32.00 +*																	1	0	0	1
	33.00 +*																	1	0	0	1
		+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 084-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
NYGGARD POINT	34.00	+	*															1	0	0	1
	35.00	+	*															1	0	0	1
	36.00	+	*															1	0	0	1
	37.00	+																0	0	0	0
	38.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	6	1	0	7
	39.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	7	3	0	10
	40.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	7	2	0	9
	41.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	7	2	0	9
	42.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	7	2	0	9
	43.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	5	2	0	7
	44.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4	3	0	7
	45.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4	6	0	10
	46.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	5	22	0	27
	47.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	72	0	75
BURKE CHANNEL	48.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4	72	0	76
	49.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4	22	0	26
	50.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	7	0	9
	51.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	3	0	6
	52.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	2	0	4
	53.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	2	0	5
	54.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	2	0	4
	55.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	2	0	4
	56.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	2	0	3
	57.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	0	0	2
	58.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	0	0	1
	59.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	0	0	2
	60.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	0	0	1
	61.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	0	0	3
	62.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	0	0	2
	63.00	+																0	0	0	0
	64.00	+	*															1	0	0	1
	65.00	+	*															1	0	0	1
	66.00	+																0	0	0	0
	67.00	+																0	0	0	0
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 084-2 (cont'd.)

position(km)		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																							
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75					vara	varb	varc	all
68.00	***																				2	0	0	2	
69.00	+																				1	0	0	1	
70.00	***																				3	0	0	3	
71.00	***																				3	0	0	3	
72.00	****																				4	0	0	4	
73.00	****																				4	0	0	4	
74.00	*****																				5	0	0	5	
75.00	****																				4	0	0	4	
76.00	****																				4	0	0	4	
77.00	****																				4	0	0	4	
78.00	****																				4	0	0	4	
79.00	*****																				5	0	0	5	
80.00	*****																				6	0	0	6	
81.00	*****																				7	0	0	7	
82.00	*****																				7	0	0	7	
83.00	****																				4	0	0	4	
84.00	***																				3	0	0	3	
85.00	*****																				7	0	0	7	
86.00	****																				4	0	0	4	
87.00	****																				4	0	0	4	
88.00	***0																				3	1	0	4	
89.00	***00																				3	2	0	5	
90.00	***00																				3	2	0	5	
91.00	***0																				3	1	0	4	
92.00	+																				0	0	0	0	
93.00	+																				1	0	0	1	
94.00	***																				2	0	0	2	
95.00	+																				1	0	0	1	
96.00	+																				1	0	0	1	
97.00	+																				1	0	0	1	
98.00	+																				1	0	0	1	
99.00	+																				1	0	0	1	
100.00	+																				0	0	0	0	
101.00	+																				1	0	0	1	
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75					vara	varb	varc	all

MAPALAKLENK PT.

Table 084-2 (cont'd.)

position(km)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
102.00	+	*															1	0	0	1
103.00	+	*															1	0	0	1
104.00	+	*															1	0	0	1
105.00	+	*															1	0	0	1
106.00	+																0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 084-3. Herring statistical spawn summary for section 084.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	1	63363	16086	0	3.0	67.0	0.00	67.0	67	67	1	1
1939	1	63363	16086	0	3.0	69.0	0.00	69.0	69	69	1	1
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	4	46803	11882	5	6.0	183.0	0.00	183.0	183	183	1	1
1956	1	4321	1097	4	5.0	153.0	0.00	153.0	153	153	1	1
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	1	1800	457	14	5.0	160.0	0.00	160.0	160	160	1	1
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	1	45003	11425	2	7.0	164.0	0.00	164.0	164	164	1	1
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	3	37803	9597	6	5.0	154.0	0.00	154.0	154	154	1	1
1968	3	6121	1554	5	5.7	150.0	0.00	150.0	150	150	1	1
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	1	4680	1188	3	1.0	161.0	0.00	161.0	161	161	1	1
1971	3	36723	9323	5	6.7	154.7	9.82	162.0	142	174	3	1
1972	7	91062	23118	2	5.6	156.0	0.00	156.0	156	156	1	1
1973	3	117366	29796	3	7.0	167.3	7.67	171.8	152	175	2	1
1974	23	141134	35830	2	5.7	149.7	1.54	155.4	139	169	10	1
1975	7	149410	37931	3	4.0	163.4	3.21	162.2	155	172	3	1
1976	44	147460	37436	5	5.2	153.0	1.60	151.2	140	182	13	1
1977	10	189659	48149	3	4.8	158.5	0.96	159.0	156	166	4	1
1978	5	77433	19658	3	4.6	143.2	2.31	141.0	138	150	3	3
1979	23	102973	26142	3	2.8	138.8	1.65	138.6	132	155	6	4
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	5	47524	12065	2	0.0	145.0	0.00	145.0	145	145	1	1
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	12	55028	13970	3	0.0	145.6	0.40	146.1	145	149	3	1
1984	7	69326	17600	4	0.0	144.0	0.00	144.0	144	144	1	1
1985	12	39366	9994	2	0.0	158.0	0.00	158.0	158	158	1	1
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	177	1537723	390384	3	4.8	150.6	1.06	148.4	67	183	39	5

Table 084-4. Spawn summary for section 084 from 1937 to 1986.

A. GENERAL:

There is one main spawning area in Burke Channel centered in the Nyggard Point vicinity.

B. COMPLETENESS OF RECORDS:

Probably all spawning records prior to 1967 are incomplete.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1967 except for the years, 1969, 1980, 1982 and 1986.

D. MAGNITUDE OF SPAWNINGS: SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 22/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 16/20 (1967-86)
3. CUMULATIVE SPAWN LENGTH	= 390.4 Km.
4. CUMULATIVE SPAWN AREA	= 153.8 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= May 31 (150.6)
2. MEAN WEIGHTED DATE (DOY)	= May 28 (148.4)

F. COMMENTS:

Burke Channel represents a unique late spawning stock of fish with a mean time of May 31. The latest mean spawn time is recorded as July 2 based on four spawns in 1955. The records of spawns in Burke Channel begin in 1955, with 177 recorded since. There are eleven years with no records of spawns and it is uncertain whether this represents incomplete records or a genuine absence of spawn. It is interesting to speculate that this group of fish may sometimes use alternate spawning sites elsewhere on the coast, such as Hawkesbury Island or other places which have distinctly later spawning times. Another interesting aspect of the Burke Channel fish is their close spawning proximity to a cluster of earlier spawning centers on the central coast to the west, and to smaller, earlier spawning groups to the east, in the headwaters of Dean Channel and Bentinck Arms.

G. ROE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 3/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 3/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 824 tons
4. MEAN GILLNET CATCH/YEAR	= 293 tons

Table 084-5. History of roe fishery catches by gear type in Burke Channel.

SECT. 084	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	-	-	-	-	-	-	-	-
1973	24/05- 11/06	432	850	Burke Ch.	-	-	-	-
1974	15/05- 15/06	48	335	Burke Ch.	15/05- 15/06	720	60	Burke Ch.
1975	27/05- 06/06	234	1288	Burke Ch.	01/06- 07/06	144	557	Burke Ch.
1976	-	-	-	-	/06- 18/06	-	262	Burke Ch.
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

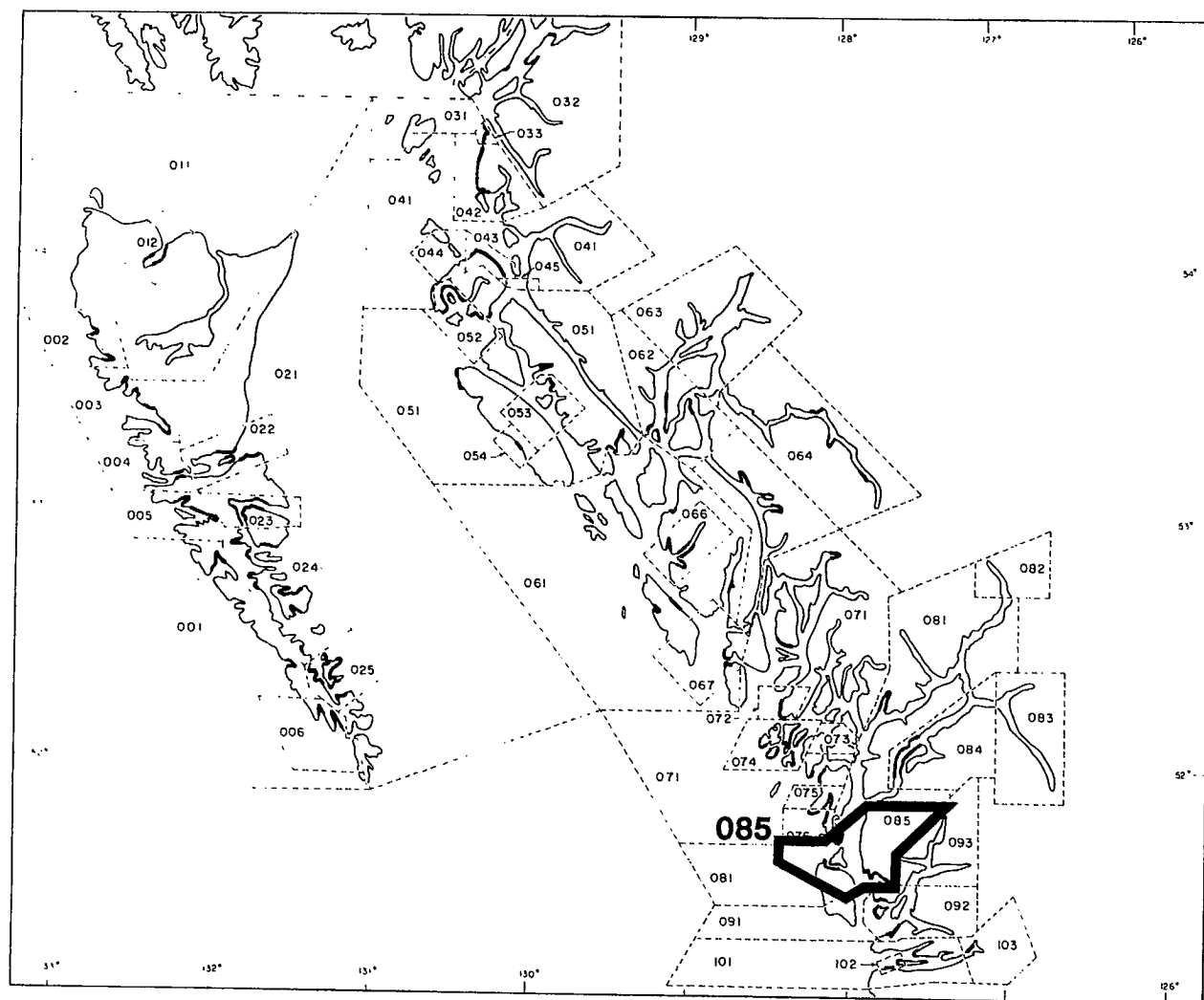


Fig. 085-1. Overview map showing location of section 085, Kwakshua Channel.

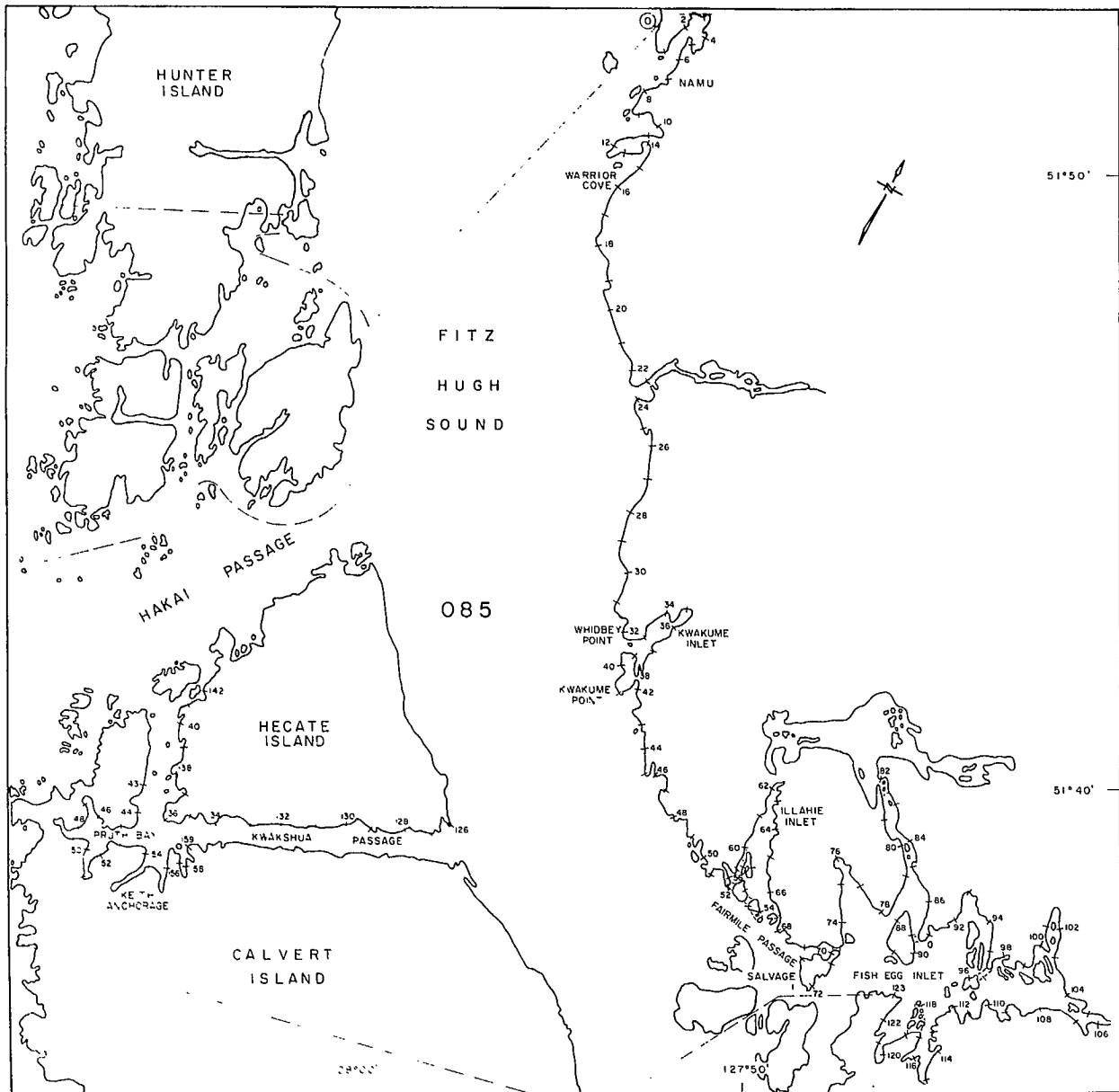


Fig. 085-2. Detailed map of section 085, Kwakshua Channel.

Table 085-1. Section 085 - spawn position by year.

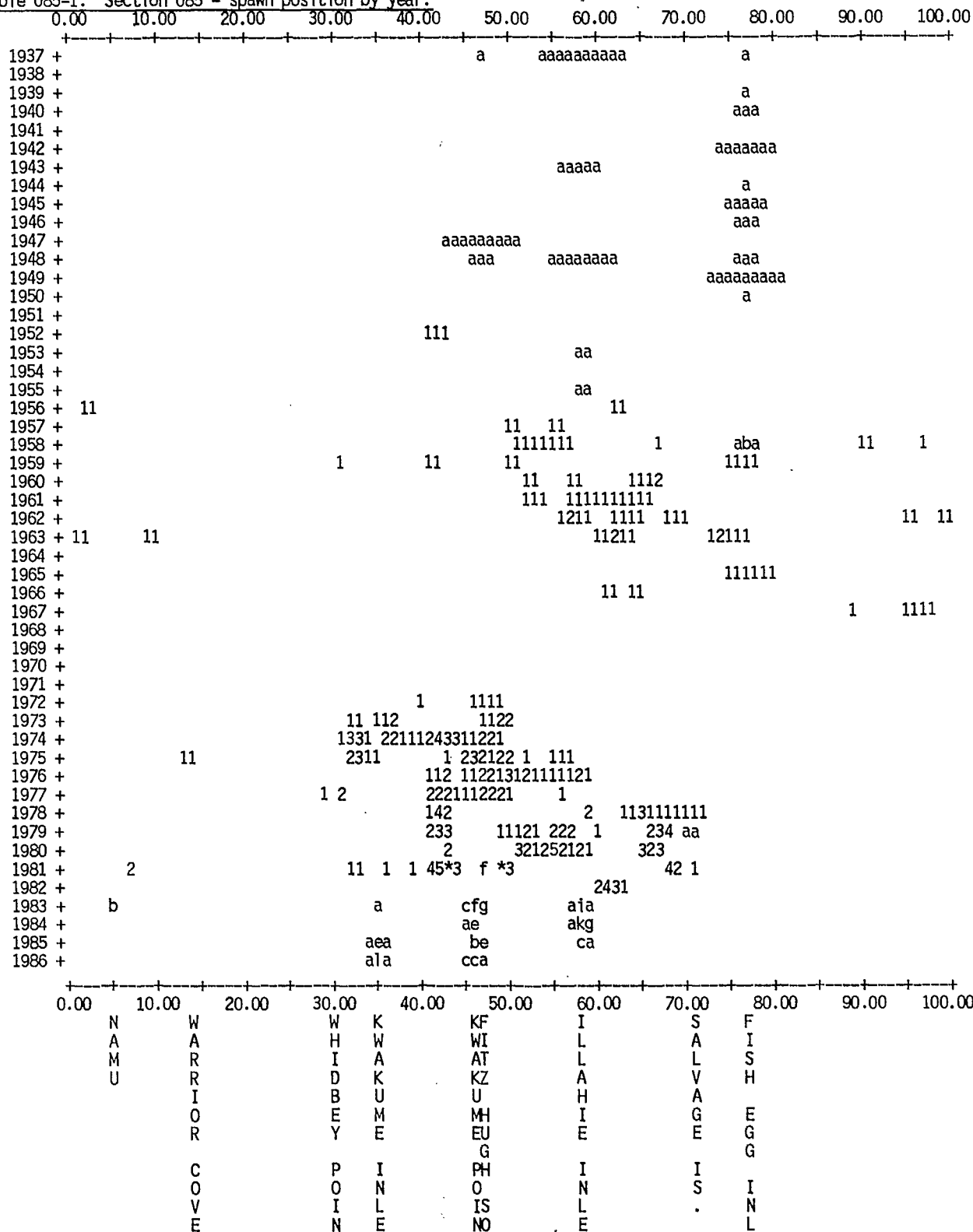


Table 085-1 (cont'd). Section 085 (cont'd) - spawn position by year.

	100.00	110.00	120.00	130.00	140.00	150.00
1937 +						
1938 +						
1939 +						
1940 +						
1941 +						
1942 +					aa	
1943 +						
1944 +						
1945 +						
1946 +						
1947 +						
1948 +						
1949 +						
1950 +						
1951 +						
1952 +						
1953 +						
1954 +						
1955 +						
1956 +						
1957 +						
1958 +						
1959 +				121		
1960 +				1		
1961 +		1111				
1962 +1						
1963 +						
1964 +						11
1965 +				111		
1966 +						
1967 +						
1968 +						
1969 +						
1970 +			11111			
1971 +						
1972 +						
1973 +				1	1111111	
1974 +				21	1 111 12	
1975 +				22	1 1211221	
1976 +				322211	11 1	
1977 +				211222	12\$12	
1978 +				1	1 111	
1979 +					1411	
1980 +				121413	1 1 142221	
1981 +				11	22112432	
1982 +					11211\$\$\$2112	
1983 +						
1984 +				afa	bl	
1985 +				kb	h	
1986 +				pc	ad	
				ca	ad	
	100.00	110.00	120.00	130.00	140.00	150.00
				K		K
				W		E
				A		I
				K		T
				S		H
				H		
				U		A
				A		N
						C
				C		H
				H		O
				A		R

Table 085-2. Section 085 -histogram of cumulative spawn frequency over distance

position(km)		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
		+-----+																			
NAMU	0.00 +																	0	0	0	0
	1.00 +*																	1	0	0	1
	2.00 +**																	2	0	0	2
	3.00 +*																	1	0	0	1
	4.00 +																	0	0	0	0
	5.00 +00																	0	2	0	2
	6.00 +																	0	0	0	0
	7.00 +**																	2	0	0	2
	8.00 +																	0	0	0	0
	9.00 +*																	1	0	0	1
WARRIOR COVE	10.00 +*																	1	0	0	1
	11.00 +																	0	0	0	0
	12.00 +																	0	0	0	0
	13.00 +*																	1	0	0	1
	14.00 +*																	1	0	0	1
	15.00 +																	0	0	0	0
	16.00 +																	0	0	0	0
	17.00 +																	0	0	0	0
	18.00 +																	0	0	0	0
	19.00 +																	0	0	0	0
WHIDBEY POINT	20.00 +																	0	0	0	0
	21.00 +																	0	0	0	0
	22.00 +																	0	0	0	0
	23.00 +																	0	0	0	0
	24.00 +																	0	0	0	0
	25.00 +																	0	0	0	0
	26.00 +																	0	0	0	0
	27.00 +																	0	0	0	0
	28.00 +																	0	0	0	0
	29.00 +*																	1	0	0	1
	30.00 +																	0	0	0	0
	31.00 +****																	4	0	0	4
	32.00 +*****																	7	0	0	7
		+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 085-2 (cont'd.)

		position(km)																vara	varb	varc	all	
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75					
KWAKUME INLET	33.00	*****																	8	0	0	8
	34.00	***00																	2	2	0	4
	35.00	***000000000000000000																	2	18	0	20
	36.00	*****00																	4	2	0	6
	37.00	*****																	4	0	0	4
	38.00	+																	1	0	0	1
	39.00	++																	2	0	0	2
	40.00	++																	2	0	0	2
	41.00	*****																	14	0	0	14
	42.00	*****																	21	0	0	21
KWAKUME POINT FITZ HUGH SOUND	43.00	*****0																	26	1	0	27
	44.00	*****0																	7	1	0	8
	45.00	*****00000000																	5	8	0	13
	46.00	*****0000000000000000																	7	18	0	25
	47.00	*****000000000000000000																	10	22	0	32
	48.00	*****00																	9	2	0	11
	49.00	*****0																	20	1	0	21
	50.00	*****0																	14	1	0	15
	51.00	*****0																	8	1	0	9
	52.00	*****																	10	0	0	10
ILLAHIE INLE/FAIRMILE PAS	53.00	*****																	6	0	0	6
	54.00	*****0																	5	1	0	6
	55.00	*****00																	11	2	0	13
	56.00	*****000																	10	3	0	13
	57.00	*****00000																	10	5	0	15
	58.00	*****000000000000000000																	7	28	0	35
	59.00	*****00000000000000																	6	14	0	20
	60.00	*****000																	5	3	0	8
	61.00	*****00																	7	2	0	9
	62.00	*****00																	9	2	0	11
63.00	*****0																	6	1	0	7	
64.00	*****																	6	0	0	6	
65.00	*****																	10	0	0	10	
66.00	*****																	7	0	0	7	

Table 085-2(cont'd.)

		position(km)																vara	varh	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
SALVAGE IS.	67.00	*****																10	0	0	10
	68.00	*****																10	0	0	10
	69.00	****																4	0	0	4
	70.00	***0																2	1	0	3
	71.00	***0																2	1	0	3
	72.00	+																1	0	0	1
	73.00	***0																1	1	0	2
	74.00	***00																2	2	0	4
	75.00	***000																3	3	0	6
	76.00	***0000000																3	7	0	10
FISH EGG INLET	77.00	***0000000000000																3	12	0	15
	78.00	***0000000																2	7	0	9
	79.00	***000																1	3	0	4
	80.00	***00																1	2	0	3
	81.00	***0																0	1	0	1
	82.00	+																0	0	0	0
	83.00	+																0	0	0	0
	84.00	+																0	0	0	0
	85.00	+																0	0	0	0
	86.00	+																0	0	0	0
	87.00	+																0	0	0	0
	88.00	+																0	0	0	0
	89.00	***																1	0	0	1
	90.00	***																1	0	0	1
	91.00	***																1	0	0	1
	92.00	+																0	0	0	0
	93.00	+																0	0	0	0
	94.00	+																0	0	0	0
	95.00	***																2	0	0	2
	96.00	***																2	0	0	2
	97.00	***																2	0	0	2
	98.00	***																1	0	0	1
	99.00	***																1	0	0	1
	100.00	***																1	0	0	1
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varh	varc	all

Table 085-2 (cont'd.)

position(km)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				
101.00 +																	0	0	0	0
102.00 +																	0	0	0	0
103.00 +																	0	0	0	0
104.00 +																	0	0	0	0
105.00 +																	0	0	0	0
106.00 +																	0	0	0	0
107.00 +																	0	0	0	0
108.00 +																	0	0	0	0
109.00 +																	0	0	0	0
110.00 +																	0	0	0	0
111.00 +																	0	0	0	0
112.00 +																	0	0	0	0
113.00 +																	0	0	0	0
114.00 +																	0	0	0	0
115.00 +																	0	0	0	0
116.00 +																	0	0	0	0
117.00 +																	0	0	0	0
118.00 +																	0	0	0	0
119.00 +																	0	0	0	0
120.00 +																	0	0	0	0
121.00 +																	0	0	0	0
122.00 +																	0	0	0	0
123.00 +																	0	0	0	0
124.00 +																	0	0	0	0
125.00 +																	0	0	0	0
126.00 +																	0	0	0	0
127.00 +*																	1	0	0	1
128.00 +*																	1	0	0	1
129.00 +*																	1	0	0	1
130.00 +*																	1	0	0	1
131.00 +																	0	0	0	0
132.00 +																	0	0	0	0
133.00 +																	0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+				

Table 085-2 (cont'd.)

position(km)		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
	134.00	+																0	0	0	0
	135.00	+	*															1	0	0	1
	136.00	+	*	*	*													3	0	0	3
	137.00	+	*	*	*	*												4	0	0	4
	138.00	+	*	*	*													2	0	0	2
	139.00	+	*	*	*	*	*											5	0	0	5
	140.00	+	*															1	0	0	1
	141.00	+	*	*	*													3	0	0	3
	142.00	+																0	0	0	0
	143.00	+	*															1	0	0	1
	144.00	+	*	*														2	0	0	2
	145.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	12	1	0	13
KWAKSHUA CHA/PRUTH BAY	146.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	9	40	0	49
	147.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4	8	0	12
	148.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	8	0	0	8
	149.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	7	0	0	7
	150.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	12	0	0	12
	151.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	6	0	0	6
	152.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	9	0	0	9
	153.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	13	5	0	18
KEITH ANCHORAGE	154.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	22	30	0	52
	155.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	15	0	0	15
	156.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	10	0	0	10
	157.00	+	*	*	*													3	0	0	3
	158.00	+	*	*	*													3	0	0	3
	159.00	+																0	0	0	0
	160.00	+																0	0	0	0

Table 085-3. Herring statistical spawn summary for section 085.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	3	121641	10292	0	5.7	87.3	3.67	90.5	80	91	2	3
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	1	2163	183	0	3.0	77.0	0.00	77.0	77	77	1	1
1940	1	19017	1609	0	3.0	90.0	0.00	90.0	90	90	1	1
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	2	88371	7477	6	6.0	83.0	0.00	83.6	83	83	1	2
1943	1	47536	4022	9	5.0	85.0	0.00	85.0	85	85	1	1
1944	1	9502	804	5	1.0	56.0	0.00	56.0	56	56	1	1
1945	1	37809	3199	9	5.0	85.0	0.00	85.0	85	85	1	1
1946	1	16204	1371	4	3.0	78.0	0.00	78.0	78	78	1	1
1947	1	97223	8226	5	7.0	77.0	0.00	77.0	77	77	1	1
1948	3	110189	9323	6	3.7	93.0	1.00	94.1	92	95	2	3
1949	1	102624	8683	6	5.0	76.0	0.00	76.0	76	76	1	1
1950	1	5401	457	3	5.0	92.0	0.00	92.0	92	92	1	1
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	1	28082	2376	2	3.0	96.0	0.00	96.0	96	96	1	1
1953	1	5401	457	2	3.0	92.0	0.00	92.0	92	92	1	1
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	1	5401	457	5	7.0	87.0	0.00	87.0	87	87	1	1
1956	3	32408	2742	4	4.3	109.0	4.00	109.0	105	117	2	2
1957	2	27006	2285	5	4.0	84.0	0.00	84.0	84	84	1	1
1958	6	106938	9048	6	5.2	89.8	4.00	85.7	79	105	3	2
1959	7	70205	5940	4	3.6	89.0	1.11	90.1	85	93	3	4
1960	6	115483	9771	12	6.0	94.0	1.29	93.2	89	96	3	3
1961	2	129631	10968	6	4.0	86.0	0.00	86.0	86	86	1	1
1962	6	120979	10236	9	5.0	93.3	0.33	93.1	93	95	2	2
1963	7	118840	10055	6	4.0	88.0	2.20	89.0	79	99	4	3
1964	1	16204	1371	3	5.0	88.0	0.00	88.0	88	88	1	1
1965	2	80204	6786	6	4.0	92.0	1.00	92.5	91	93	2	2
1966	2	15128	1280	8	6.0	90.0	0.00	90.0	90	90	1	1
1967	2	38022	3217	4	5.0	91.0	0.00	91.0	91	91	1	1
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	1	57038	4826	32	4.0	93.0	0.00	93.0	93	93	1	1
1971	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1972	2	39097	3308	3	5.0	92.0	0.00	92.0	92	92	1	2
1973	9	132727	11230	14	4.2	101.1	1.22	98.0	92	103	3	4
1974	27	217150	18373	7	4.0	87.6	2.24	90.9	70	95	2	5
1975	23	200911	16999	12	4.1	95.6	0.81	96.4	84	99	3	5
1976	28	169189	14315	17	4.5	100.5	0.10	100.8	100	101	2	4
1977	32	76954	6511	30	3.2	93.1	0.09	93.1	93	96	2	6
1978	17	112741	9539	19	3.8	94.4	0.23	94.9	93	95	2	3
1979	30	146674	12410	18	2.7	84.2	0.73	82.9	82	93	3	5
1980	47	155349	13144	34	3.8	86.9	0.76	86.5	83	98	6	6
1981	64	154262	13052	20	0.0	85.1	0.65	83.6	77	89	5	8
1982	22	105449	8922	22	0.0	92.0	0.73	91.7	86	94	3	4
1983	45	164343	13905	19	0.0	79.1	0.07	79.1	78	81	4	8
1984	35	130364	11030	15	0.0	81.5	0.69	80.7	79	90	4	5
1985	33	101714	8606	11	0.0	87.8	0.29	88.3	82	90	5	6
1986	22	166530	14090	5	0.0	93.6	0.56	93.6	88	97	4	4
All	503	3698107	312895	17	3.9	88.5	0.34	89.2	56	117	31	13

Table 085-4. Spawn summary for section 085 from 1937 to 1986.

A. GENERAL:

There are two main spawning areas in this section:

- (i) Kwakshua Passage-Keith Anchorage and
- (ii) Kwakume Inlet-Fish Egg Inlet

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to the Namu cannery/fish reduction plant and fishing base.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1938, 1941, 1951, 1954, 1968-69 and 1971.

D. MAGNITUDE OF SPAWNINGS: MEDIUM

- | | |
|---|-------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 43/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 43/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 312.9 Km. |
| 4. CUMULATIVE SPAWN AREA | = 369.8 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|-------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = March 30 (88.5) |
| 2. MEAN WEIGHTED DATE (DOY) | = March 30 (89.2) |

F. COMMENTS:

Kwakshua Channel has a nearly continuous record of spawnings since 1933, although the incidence of spawnings is markedly higher from 1974 to 1986. The mean spawning date of March 30 is not appreciably different than those of the two adjacent spawning centers to the north so the status of Kwakshua as a separate stock is uncertain. Instead, it might represent the southern spawning range of a large central British Columbia spawning stock extending from Kitasu to Kwakshua, and perhaps even to Rivers Inlet. There is evidence of winter distributions of herring in the vicinity of the Goose Island Banks, although it is not well documented. Such a winter distribution would probably serve all of the potential spawning stocks on the central coast.

G. ROE FISHERIES:

- | | |
|---|------------------|
| 1. NUMBER OF SEINE FISHERY YEARS/15 YEARS | = 4/15 (1972-86) |
| 2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS | = 4/15 (1972-86) |
| 3. MEAN SEINE CATCH/YEAR | = 956 tons |
| 4. MEAN GILLNET CATCH/YEAR | = 90 tons |

Table 085-5. History of roe fishery catches by gear type in Kwakshua Channel.

SECT. 085	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE YEAR OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	04/03- 25/03	480	525	Kwakshua Pass & Fishegg Inlet	-	-	-	-
1973	26/03- 28/03	48	1300	Kwakshua Pass	/03	-	20	Kwakshua Pass
1974	25/03- 26/03	28	500	Kwakshua Pass	25/03- 26/03	28	250	Kwakshua Pass
1975	25/03- 28/03	72	1500	Kwakshua Pass	-	-	-	-
1976	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	19/03- 20/03	24	0	Kwakshua Pass
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	31/03 & 01/04	17	(2262)	Kwakshua Ch. & sect. 67, 71, 72 & 74
1986	-	-	-	-	-	-	-	-

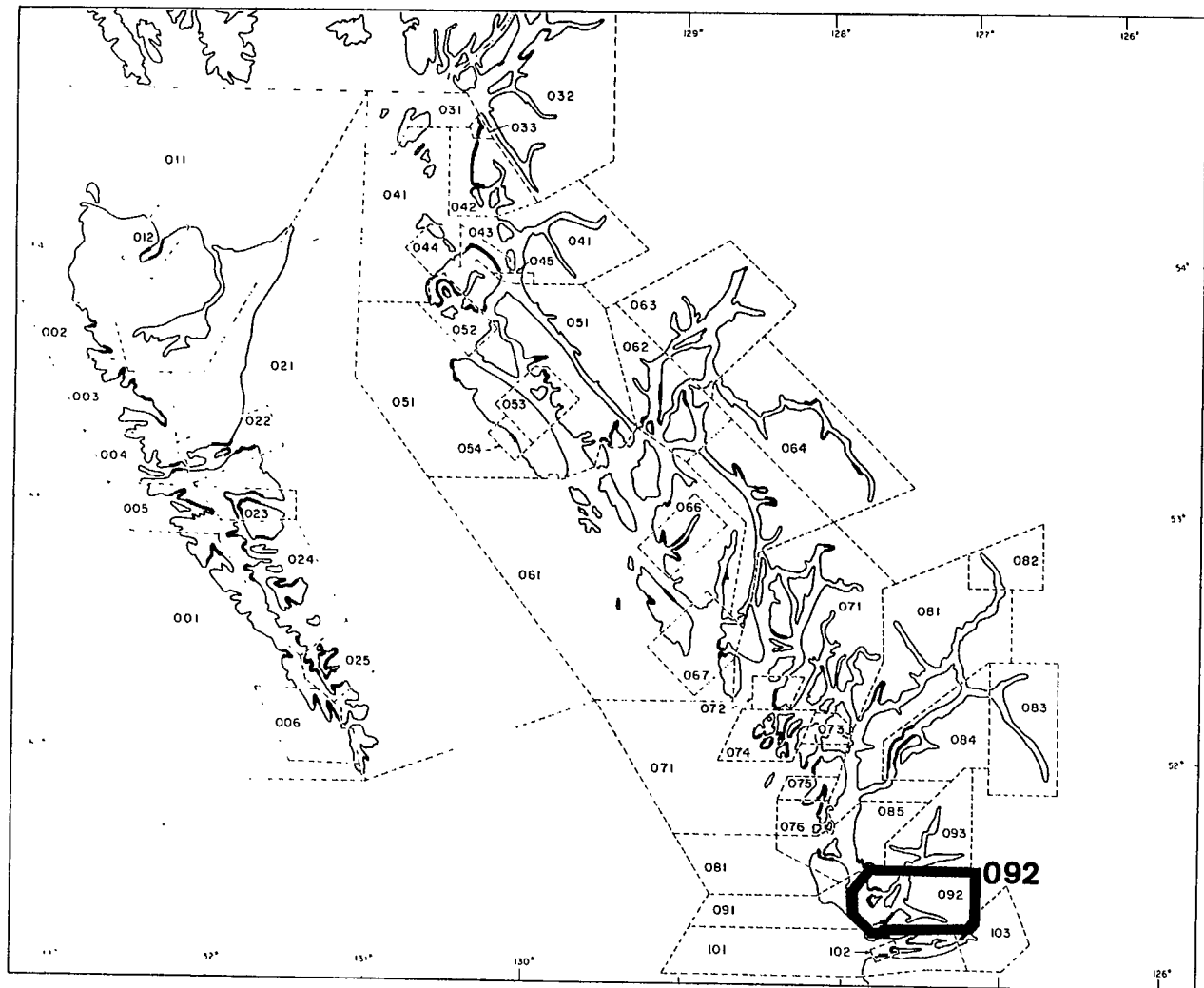


Fig. 092-1. Overview map showing location of section 092, Rivers Inlet Mouth.

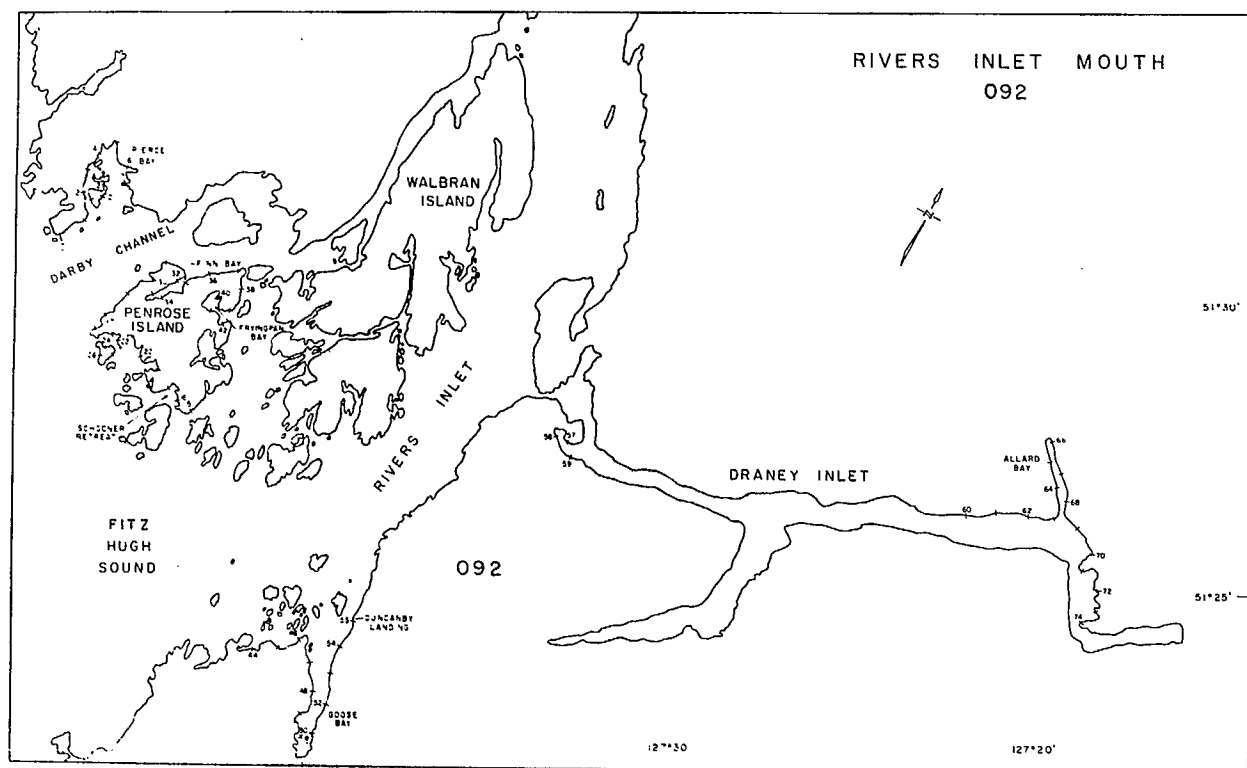


Fig. 092-2. Detailed map of section 092, Rivers Inlet Mouth.

Table 092-1. Section 092 - spawn position by year.

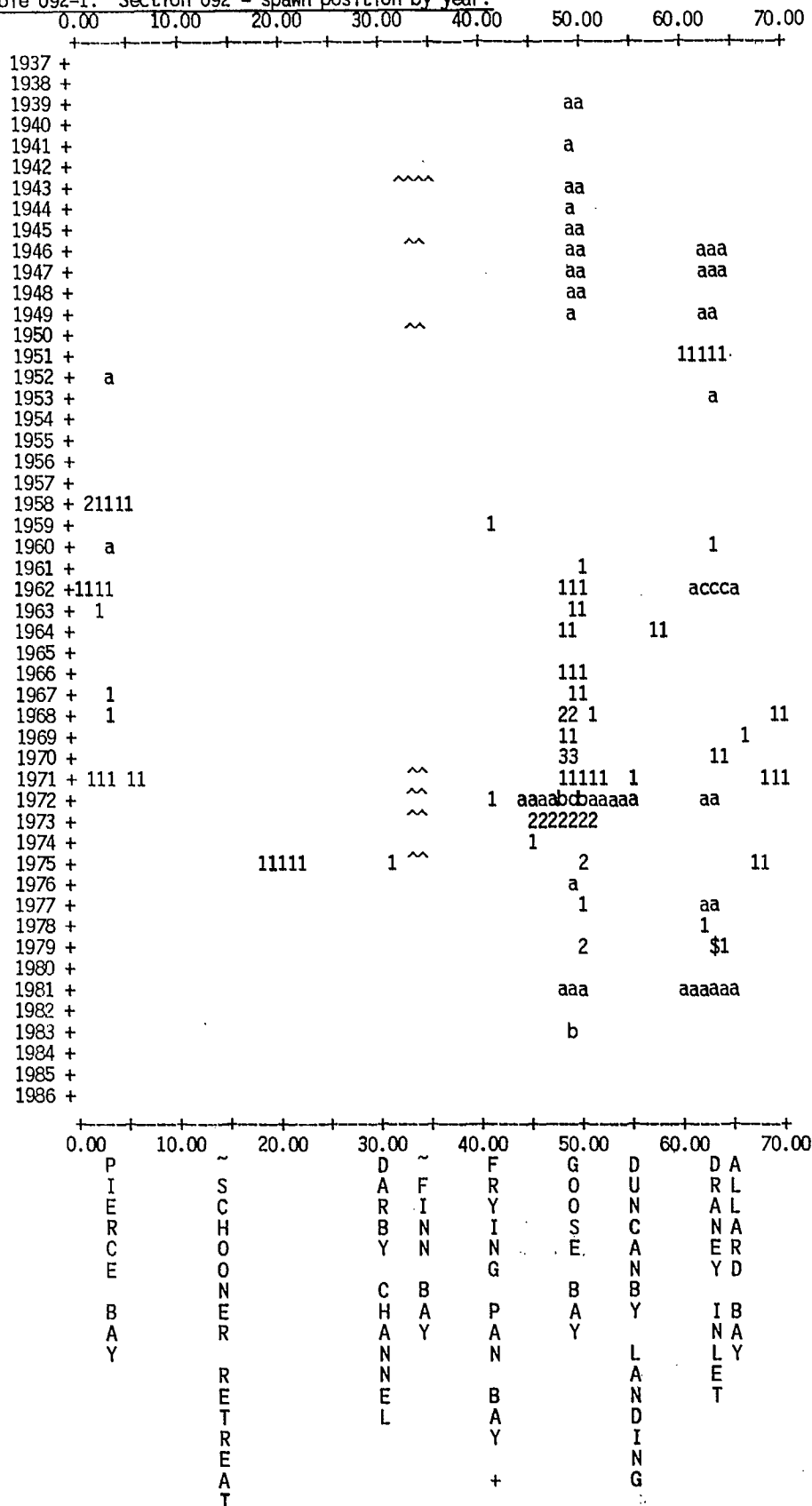


Table 092-2. Section 092 - histogram of cumulative spawn frequency over distance

		position(km)																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
PIERCE BAY	0.00	+	*															1	0	0	1
	1.00	+	*	*	*	*												4	0	0	4
	2.00	+	*	*	*	*	*											4	0	0	4
	3.00	+	*	*	*	*	*	0	0									5	2	0	7
	4.00	+	*															1	0	0	1
	5.00	+	*	*	*													2	0	0	2
	6.00	+	*															1	0	0	1
	7.00	+																0	0	0	0
	8.00	+																0	0	0	0
	9.00	+																0	0	0	0
SCHOONER RETREAT	10.00	+																0	0	0	0
	11.00	+																0	0	0	0
	12.00	+																0	0	0	0
	13.00	+																0	0	0	0
	14.00	+																0	0	0	0
	15.00	+																0	0	0	0
	16.00	+																0	0	0	0
	17.00	+																0	0	0	0
	18.00	+	*															1	0	0	1
	19.00	+	*															1	0	0	1
DARBY CHANNEL	20.00	+	*															1	0	0	1
	21.00	+	*															1	0	0	1
	22.00	+	*															1	0	0	1
	23.00	+																0	0	0	0
	24.00	+																0	0	0	0
	25.00	+																0	0	0	0
	26.00	+																0	0	0	0
	27.00	+																0	0	0	0
	28.00	+																0	0	0	0
	29.00	+																0	0	0	0
DARBY CHANNEL	30.00	+																0	0	0	0
	31.00	+	*															1	0	0	1
	32.00	+	1															0	0	1	1
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 092-2 (cont'd.)

	position(km)	vara	varb	varc	all
	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75				
FINN BAY	33.00 +	0	0	7	7
	34.00 +	0	0	7	7
	35.00 +	0	0	1	1
	36.00 +	0	0	0	0
	37.00 +	0	0	0	0
	38.00 +	0	0	0	0
	39.00 +	0	0	0	0
FRYING PAN BAY +	40.00 +	0	0	0	0
	41.00 +**	2	0	0	2
	42.00 +	0	0	0	0
	43.00 +	0	0	0	0
	44.00 +0	0	1	0	1
	45.00 +***0	3	1	0	4
	46.00 +**0	2	1	0	3
	47.00 +**0	2	1	0	3
GOOSE BAY	48.00 +*****000	12	3	0	15
	49.00 +*****0000000000000000	14	17	0	31
	50.00 +*****000000000	13	9	0	22
	51.00 +****0	4	1	0	5
	52.00 +*0	1	1	0	2
	53.00 +0	0	1	0	1
DUNCANBY LANDING	54.00 +0	0	1	0	1
	55.00 +*0	1	1	0	2
	56.00 +	0	0	0	0
	57.00 +*	1	0	0	1
	58.00 +*	1	0	0	1
	59.00 +	0	0	0	0
	60.00 +*0	1	1	0	2
	61.00 +*00	1	2	0	3
	62.00 +**000000000	2	9	0	11
DRANEY INLET	63.00 +*****000000000000000000	5	19	0	24
	64.00 +***000000	3	6	0	9
ALLARD BAY	65.00 +00	0	2	0	2
	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75				

Table 092-2 (cont'd.)

position(km)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
66.00	+	*															1	0	0	1
67.00	+	*															1	0	0	1
68.00	+	*	*	*													2	0	0	2
69.00	+	*	*	*													2	0	0	2
70.00	+	*	*	*													2	0	0	2
71.00	+																0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 092-3. Herring statistical spawn summary for section 092.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	1	17297	804	0	3.0	91.0	0.00	91.0	91	91	1	1
1940	1	0	0	0	5.0	74.0	0.00	0.0	74	74	1	1
1941	1	8649	402	0	3.0	73.0	0.00	73.0	73	73	1	1
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	2	69211	3217	6	3.0	80.5	3.50	82.3	77	84	2	2
1944	1	8649	402	5	1.0	70.0	0.00	70.0	70	70	1	1
1945	1	17297	804	5	1.0	71.0	0.00	71.0	71	71	1	1
1946	3	63703	2961	6	3.7	86.3	4.67	86.7	77	91	2	3
1947	2	58991	2742	5	4.0	81.5	2.50	82.3	79	84	2	2
1948	1	19664	914	8	3.0	78.0	0.00	78.0	78	78	1	1
1949	2	39328	1828	7	4.0	86.5	9.50	91.3	77	96	2	2
1950	1	990	46	32	5.0	107.0	0.00	107.0	107	107	1	1
1951	1	88487	4113	5	3.0	105.0	0.00	105.0	105	105	1	1
1952	1	7874	366	3	5.0	101.0	0.00	101.0	101	101	1	1
1953	1	5895	274	5	3.0	93.0	0.00	93.0	93	93	1	1
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	2	89003	4137	7	6.0	86.0	0.00	86.0	86	86	1	1
1959	1	3937	183	3	3.0	90.0	0.00	90.0	90	90	1	1
1960	2	8864	412	5	3.0	111.0	5.00	114.9	106	116	2	2
1961	1	990	46	23	1.0	94.0	0.00	94.0	94	94	1	1
1962	5	261546	12157	24	3.8	90.0	1.48	89.9	86	95	4	3
1963	2	13769	640	48	3.0	90.0	2.00	89.7	88	92	2	2
1964	2	47202	2194	26	4.0	82.5	2.50	82.9	80	85	2	2
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	2	26548	1234	23	4.0	93.0	0.00	93.0	93	93	1	1
1967	2	9832	457	24	6.0	97.5	1.50	96.6	96	99	2	2
1968	5	68823	3199	38	4.6	101.6	2.40	100.6	92	104	2	3
1969	2	21643	1006	20	2.0	96.0	9.00	101.7	87	105	2	2
1970	4	55076	2560	186	4.5	77.0	4.64	77.1	69	86	3	2
1971	7	188764	8774	5	4.7	97.4	3.85	98.2	79	109	5	5
1972	7	326604	15181	3	3.3	95.3	4.34	94.4	85	119	6	4
1973	9	122888	5712	185	3.2	103.3	2.72	104.5	88	111	4	2
1974	1	1958	91	1	5.0	110.0	0.00	110.0	110	110	1	1
1975	6	144961	6738	3	4.8	96.3	3.59	97.8	83	109	4	4
1976	1	7874	366	137	3.0	100.0	0.00	100.0	100	100	1	1
1977	2	16716	777	2	3.0	103.0	0.00	103.0	103	103	1	2
1978	1	5895	274	3	4.0	109.0	0.00	109.0	109	109	1	1
1979	14	43093	2003	8	5.3	100.0	0.00	100.0	100	100	1	3
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	2	161247	7495	2	0.0	81.5	6.50	79.8	75	88	2	2
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	2	15598	725	143	0.0	92.0	0.00	92.0	92	92	1	1
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	101	2048864	95234	39	4.0	94.2	1.09	92.2	69	119	38	9

Table 092-4. Spawn summary for section 092 from 1937 to 1986.

A. GENERAL:

There are three main spawning areas at the entrance to Rivers Inlet:

- (i) Pierce Bay
- (ii) Goose Bay and
- (iii) Draney Inlet

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably accurate and complete considering proximity to several canneries and fishing establishments (Goose Bay, Duncanby Landing, Wadhams, Good Hope and Finn Bay).

C. SPAWNING CONSISTENCY OVER TIME: FREQUENT

There have been two main spawning episodes, 1939-53 and 1958-1983.

D. MAGNITUDE OF SPAWNINGS: MEDIUM

- | | |
|---|-------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 36/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 36/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 95.2 Km. |
| 4. CUMULATIVE SPAWN AREA | = 204.9 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = April 4 (94.2) |
| 2. MEAN WEIGHTED DATE (DOY) | = April 2 (92.2) |

F. COMMENTS:

Sections 092 and 093 are situated close to each other as well as to Kwakshua to the north and have a nearly continuous record of spawnings from the mid-1930's. Section 092 has a total of 107 spawn records with a mean time of April 4, about one week later than section 093. This approximate similarity of spawning times and close geographic proximity to section 093 suggests that they belong to the same stock.

G. ROE FISHERIES:

No major roe fisheries are documented.

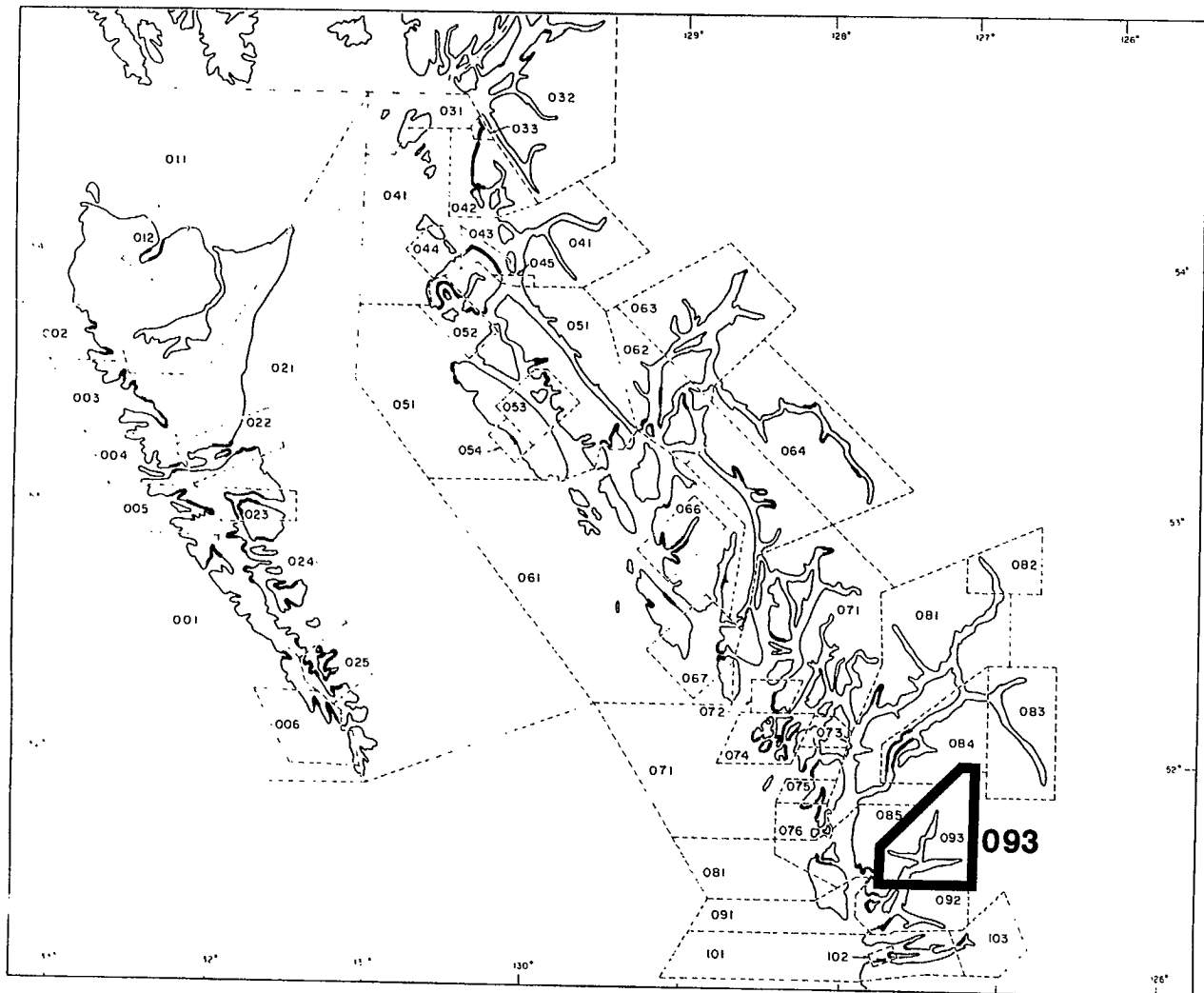


Fig. 093-1. Overview map showing location of section 093, Rivers Inlet Head.

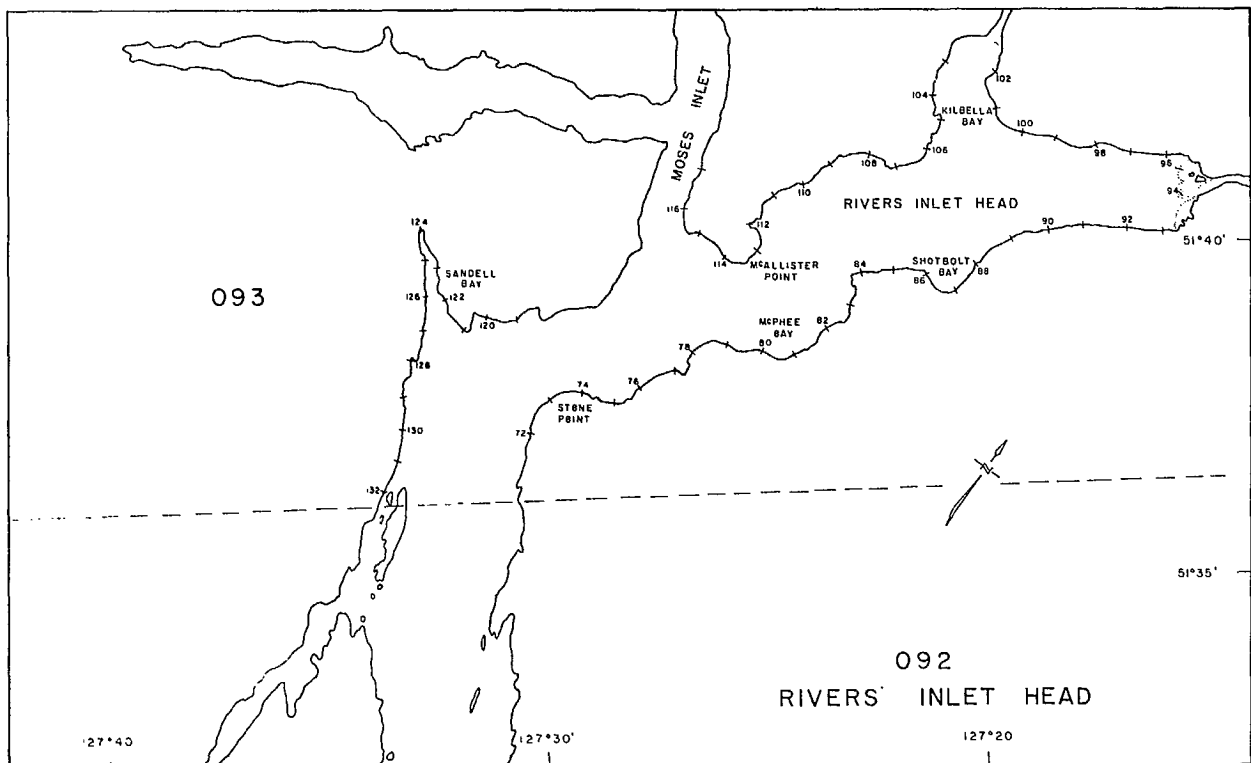


Fig. 093-2. Detailed map of section 093, Rivers Inlet Head.

Table 093-1. Section 093 - spawn position by year.

	71.00	81.00	91.00	101.00	111.00	121.00
1937 +			a	a		
1938 +			aa	aa		
1939 +			bb			
1940 +				aaa		
1941 +				aaaaaaaaa		
1942 +			a			
1943 +			aaa	aaaaa		
1944 +			aaa			
1945 +			aa	aaabaaa		
1946 +			aa	aaaaaaa		
1947 +			aa	aaaaaaa		
1948 +			abba	aa		
1949 +			a	a		
1950 +						
1951 +			aa			
1952 +			11			
1953 +			1	aaaa\$aa		
1954 +			a			
1955 +			11	1		
1956 +			111			
1957 +			a			
1958 +					1 11	
1959 +			22111			
1960 +			11	1111		
1961 +				11		
1962 +			121111111			
1963 +			2			
1964 +			22222222	2211		
1965 +			aaaa	1 111		
1966 +			11111	1111		
1967 +			1 22222221	1		
1968 +			111111	111		
1969 +			31	1111		
1970 +			111111	addca	22221	
1971 +			1111121112221	111 1111		111111
1972 +				1111121112224321111111		
1973 +			111121111112221	2222 222221111		111
1974 +				1111 111111		11112111
1975 +			111	a\$cccaaa cdc	11111	111
1976 +		11 11aba		aadhcaa aacca		1121111
1977 +		1\$cb		berphca dfda		ia
1978 +	111 11	111	111122111 11	11111 211		23122
1979 +				11		
1980 +		1111	11111211111	122211		
1981 +		aaaaa	abba			
1982 +			111233211111			
1983 +						
1984 +			bccca	aaaa		
1985 +		aa	aacaa	aabba		
1986 +		aaaa	bdcba	aa		
	71.00	81.00	91.00	101.00	111.00	121.00
	STONE	MCPH	SHOT	RIVER	KILL	SAND
	POINT	HEE	BOLT	S	ILLISTER	DELL
		BAY	BAY	INLET	POINT	BAY
				HEAD		

Table 093-2. Section 093 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
STONE POINT	70.00	+																0	0	0	0
	71.00	+																0	0	0	0
	72.00	+																1	0	0	1
	73.00	+																1	0	0	1
	74.00	+																1	0	0	1
	75.00	+																0	0	0	0
	76.00	+																0	0	0	0
	77.00	+																0	0	0	0
	78.00	+																0	0	0	0
	79.00	+																1	0	0	1
MCPHEE BAY	80.00	+																2	0	0	2
	81.00	+																3	0	0	3
	82.00	+																2	0	0	2
	83.00	+																2	0	0	2
	84.00	+																2	0	0	2
	85.00	+																4	1	0	5
SHOTBOLT BAY	86.00	+																5	4	0	9
	87.00	+																6	8	0	14
	88.00	+																6	6	0	12
	89.00	+																5	2	0	7
	90.00	+																3	0	0	3
	91.00	+																8	0	0	8
	92.00	+																6	0	0	6
	93.00	+																7	1	0	8
	94.00	+																10	4	0	14
	95.00	+																18	16	0	34
RIVERS INLET-HEAD	96.00	+																25	46	0	71
	97.00	+																21	60	0	81
	98.00	+																18	28	0	46
	99.00	+																15	10	0	25
	100.00	+																9	4	0	13
	101.00	+																15	6	0	21
	102.00	+																11	8	0	19
	103.00	+																7	17	0	24
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 093-2 (cont'd.)

[illegible]

Table 093-3. Herring statistical spawn summary for section 093.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	3	10920	1407	0	4.3	74.3	3.18	75.0	68	78	3	3
1938	2	12480	1608	0	3.0	70.5	6.50	70.5	64	77	2	2
1939	2	12480	1608	0	5.0	67.5	1.50	67.5	66	69	2	1
1940	2	15607	2011	0	4.0	77.0	0.00	77.0	77	77	1	2
1941	2	74909	9652	0	3.0	73.0	6.00	67.0	67	79	2	2
1942	1	3547	457	4	3.0	73.0	0.00	73.0	73	73	1	1
1943	4	62429	8044	8	4.5	80.3	2.81	76.8	74	85	3	3
1944	2	76329	9835	6	5.0	73.0	0.00	73.0	73	73	1	2
1945	3	71502	9213	5	3.7	77.3	5.90	72.0	70	89	3	2
1946	2	49655	6398	5	4.0	91.0	0.00	91.0	91	91	1	2
1947	3	56748	7312	5	3.7	86.0	1.00	87.0	84	87	2	2
1948	3	35468	4570	76	5.0	81.7	5.67	86.2	76	93	2	2
1949	2	5324	686	7	2.0	83.0	9.00	86.0	74	92	2	2
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	1	7094	914	3	3.0	98.0	0.00	98.0	98	98	1	1
1952	1	7094	914	14	5.0	83.0	0.00	83.0	83	83	1	1
1953	3	52495	6764	9	4.3	86.0	4.04	80.7	79	93	3	2
1954	2	7094	914	5	3.0	95.0	0.00	95.0	95	95	1	2
1955	2	10640	1371	5	7.0	89.5	3.50	90.7	86	93	2	2
1956	1	14187	1828	4	5.0	85.0	0.00	85.0	85	85	1	1
1957	1	1420	183	5	3.0	97.0	0.00	97.0	97	97	1	1
1958	2	5107	658	11	4.0	84.0	0.00	84.0	84	84	1	1
1959	2	39015	5027	8	4.0	81.0	0.00	81.0	81	81	1	1
1960	2	28374	3656	3	4.0	96.0	0.00	96.0	96	96	1	1
1961	1	7094	914	23	1.0	94.0	0.00	94.0	94	94	1	1
1962	3	48235	6215	32	4.3	84.7	0.67	84.1	84	86	2	2
1963	2	2833	365	32	3.0	97.0	5.00	94.5	92	102	2	1
1964	7	120722	15555	5	4.0	80.0	0.00	80.0	80	80	1	2
1965	3	51075	6581	2	5.0	93.0	0.00	93.0	93	93	1	2
1966	3	56034	7220	11	4.3	86.0	0.00	86.0	86	86	1	2
1967	5	103563	13344	12	4.2	88.6	2.46	87.6	83	94	3	2
1968	3	58735	7568	3	4.3	83.0	3.00	83.3	80	89	2	2
1969	4	38308	4936	13	4.3	92.5	3.50	88.2	82	96	2	2
1970	7	161017	20747	9	4.4	86.7	4.12	87.5	71	94	3	3
1971	6	197913	25501	4	3.3	88.0	2.41	88.4	85	100	3	4
1972	7	242601	31259	2	3.3	93.0	0.44	93.0	91	95	3	3
1973	10	300770	38754	3	2.9	98.2	3.75	99.0	80	110	5	5
1974	4	124137	15995	25	4.5	85.0	1.15	84.8	83	87	2	3
1975	12	219279	28254	12	4.3	91.3	1.44	91.5	84	104	4	5
1976	19	214219	27602	7	3.4	89.7	2.42	88.0	83	111	3	5
1977	35	370130	47691	8	3.6	76.4	1.60	73.1	69	90	3	4
1978	21	170796	22007	16	2.9	87.1	2.37	79.6	69	94	4	7
1979	1	7800	1005	3	3.0	100.0	0.00	100.0	100	100	1	1
1980	7	138332	17824	18	2.9	85.3	2.22	86.2	79	90	2	3
1981	4	64556	8318	2	0.0	75.5	0.50	75.1	75	77	2	3
1982	7	78619	10130	86	0.0	69.0	0.00	69.0	69	69	1	2
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	4	94684	12200	2	0.0	74.0	0.00	74.0	74	74	1	2
1985	6	83043	10700	13	0.0	73.8	1.22	74.7	68	76	4	3
1986	6	93598	12060	69	0.0	80.0	0.00	80.0	80	80	1	3
All	235	3708012	477775	14	3.7	84.0	0.68	84.0	64	111	38	8

Table 093-4. Spawn summary for section 093 from 1937 to 1986.

A. GENERAL:

There is one main spawning area centered at the Head of Rivers Inlet.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Rivers Inlet canneries and Dawsons Landing.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1950 and 1983.

D. MAGNITUDE OF SPAWNINGS: MEDIUM

1. NUMBER OF SPAWN YEARS/50 YEARS	= 48/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 48/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 477.8 Km.
4. CUMULATIVE SPAWN AREA	= 370.8 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 25 (84.0)
2. MEAN WEIGHTED DATE (DOY)	= March 25 (84.0)

F. COMMENTS:

Sections 092 and 093 are situated close to each other as well as to Kwakshua to the north and have a nearly continuous record of spawnings from the mid-1930's. A total of 107 spawns with a mean time of April 4 are recorded from the mouth of Rivers Inlet; 240 spawns with a mean time of March 25 have been recorded from Rivers Inlet Head. Spawnings from these sections may be part of a major central coast spawning stock, but until shown otherwise, they should be considered as separate groups.

G. RUE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 4/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 5/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 782 tons
4. MEAN GILLNET CATCH/YEAR	= 115 tons

Table 093-5. History of roe fishery catches by gear type in Rivers Inlet.

SECT. 093	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	04/03- 25/03	480	430	all area 9	-	-	-	-
1973	15/03- 19/03	96	1800	Rivers Inlet (head)	-	-	-	-
1974	25/03- 26/03	28	800	Rivers Inlet (head)	24/03- 28/03	28	100	Rivers Inlet (head)
1975	-	-	-	-	06/03- 01/04	624	107	Rivers Inlet (head)
1976	22/03- 23/03	24	100	Rivers Inlet (head)	18/03- 23/03	120	340	Rivers Inlet (head)
1977	-	-	-	-	06/03- 25/03	360	29	Rivers Inlet (head)
1978	-	-	-	-	19/03- 20/03	24	0	Rivers Inlet (head)
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

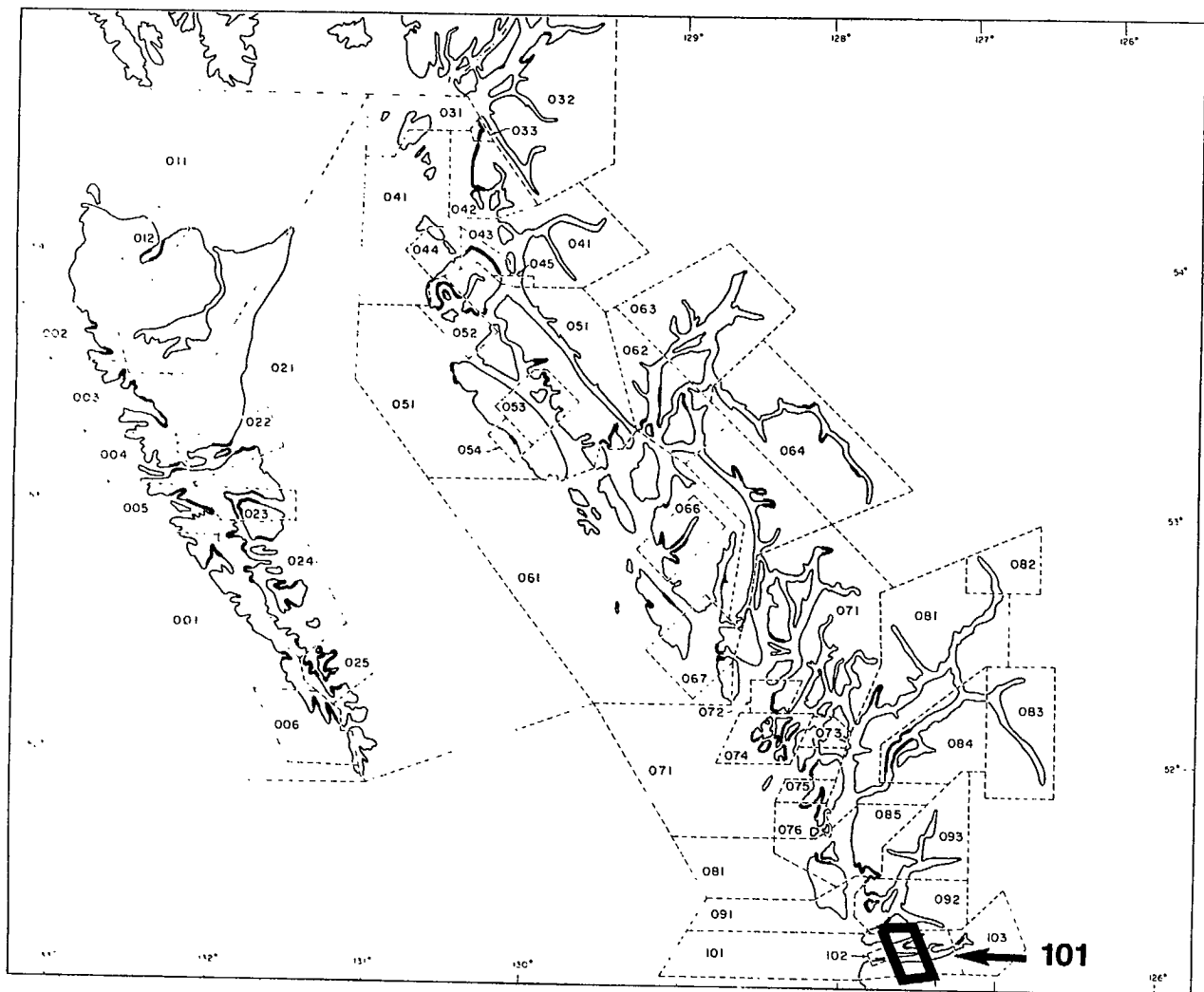


Fig. 101-1. Overview map showing location of section 101, Other Area 10.

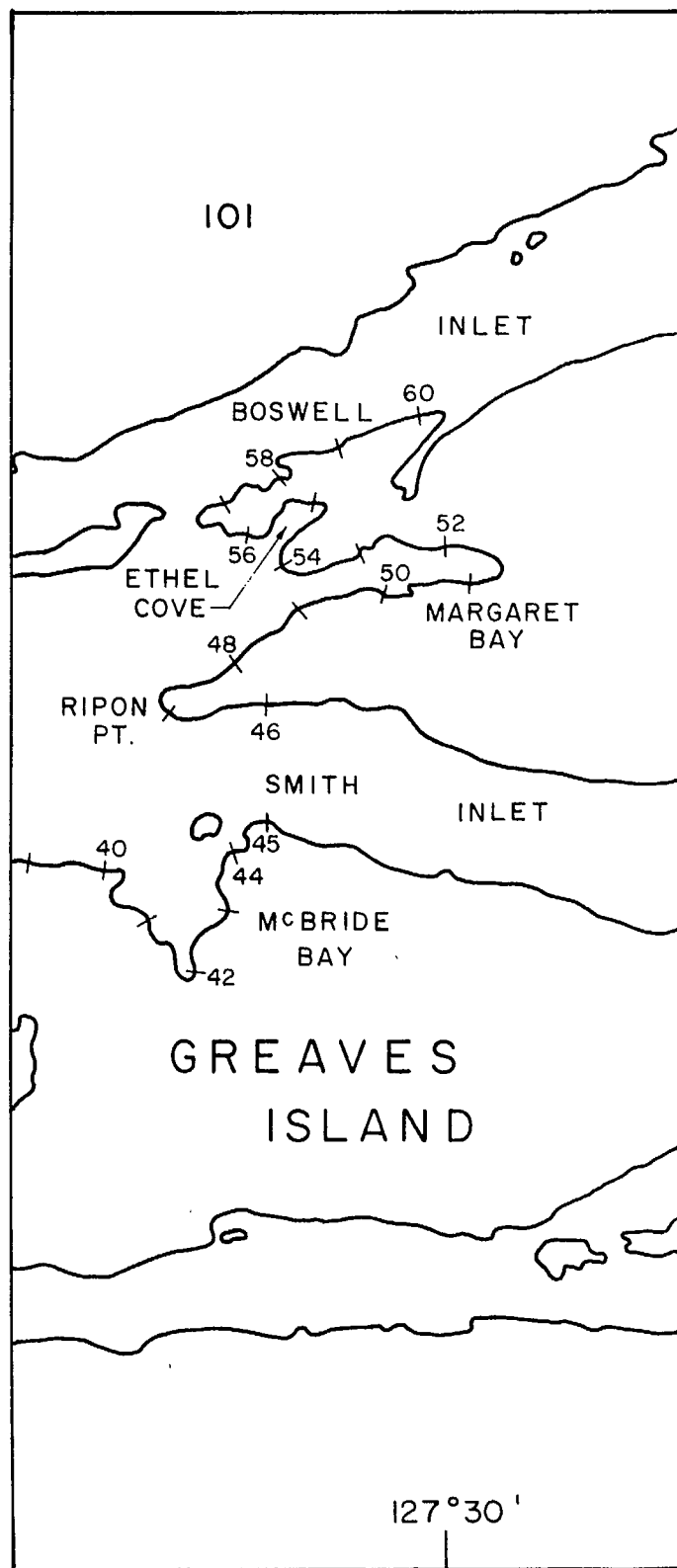


Fig. 101-2. Detailed map of section 101, Other Area 10.

Table 101-1. Section 101 - spawn position by year.

	38.00	48.00	58.00
1937 +		~~~~~	^
1938 +		~~~~~	
1939 +		~~~~~	^
1940 +			
1941 +			
1942 + aaaaa		^^	^
1943 + aaaaa		^^	
1944 +			
1945 +			
1946 +			
1947 +			
1948 +			
1949 +		^^	
1950 +			bc
1951 + 11			^
1952 +		11 ~~~~~	
1953 + 111			
1954 + aa			aa
1955 +			
1956 + abba			
1957 +			
1958 +		1	1
1959 +			c
1960 + ab			
1961 +			
1962 + 1			
1963 +			
1964 +			
1965 +			
1966 +			
1967 +			
1968 +			
1969 +			
1970 +			
1971 +			
1972 +			
1973 +			
1974 +			
1975 +			
1976 +			
1977 +			
1978 + 4211 11			
1979 +			
1980 +			
1981 +			a
1982 +			
1983 + ad			
1984 + aa			
1985 +			
1986 +			

38.00	48.00	58.00
M	R	S
C	I	M
B	P	E
R	O	T
I	N	H
D	A	E
E	R	L
	P	I
B	O	N
A	I	C
Y	N	O
	T	V
	B	E
	A	T
	Y	

Table 101-2. Section 101 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
MCBRIDE BAY	37.00	+																0	0	0	0
	38.00	+																0	0	0	0
	39.00	*****000																4	3	0	7
	40.00	*****00000000																5	8	0	13
	41.00	***0000000000000																3	12	0	15
	42.00	**000																2	3	0	5
	43.00	+00																0	2	0	2
	44.00	+																1	0	0	1
RIPON POINT	45.00	+																1	0	0	1
	46.00	+																0	0	0	0
	47.00	++																2	0	0	2
	48.00	+																1	0	0	1
MARGARET BAY	49.00	+																0	0	4	4
	50.00	+																0	0	7	7
	51.00	+																0	0	7	7
	52.00	+																0	0	4	4
ETHEL COVE	53.00	+																0	0	0	0
	54.00	+																0	0	1	1
	55.00	+																0	0	1	1
	56.00	+																0	0	0	0
SMITH INLET	57.00	+000																0	3	0	3
	58.00	+*00000000																1	8	0	9
	59.00	+																0	0	6	6
BOSWELL INLET	60.00	+																0	0	6	6
	61.00	+																0	0	0	0
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 101-3. Herring statistical spawn summary for section 101.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	3	24986	3619	0	5.0	89.0	9.50	82.4	79	108	3	2
1938	1	16659	2413	0	3.0	89.0	0.00	89.0	89	89	1	1
1939	2	27768	4022	0	3.0	93.0	0.00	93.0	93	93	1	2
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	1	0	0	0	3.0	66.0	0.00	0.0	66	66	1	1
1942	2	27768	4022	18	5.0	85.0	0.00	85.0	85	85	1	2
1943	4	50606	7330	5	4.0	87.5	5.30	80.9	72	96	3	4
1944	1	1388	201	7	1.0	80.0	0.00	80.0	80	80	1	1
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	1	12621	1828	6	5.0	84.0	0.00	84.0	84	84	1	1
1950	3	10729	1554	8	5.0	84.0	0.00	84.0	84	84	1	1
1951	1	10094	1462	9	7.0	80.0	0.00	80.0	80	80	1	1
1952	3	20822	3016	4	5.7	84.7	0.67	84.5	84	86	2	2
1953	3	47327	6855	8	7.7	83.0	0.00	83.0	83	83	1	3
1954	2	12621	1828	5	6.0	73.0	0.00	73.0	73	73	1	2
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	2	25241	3656	5	4.0	86.0	0.00	86.0	86	86	1	1
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	2	3155	457	6	3.0	78.5	4.50	75.8	74	83	2	2
1959	3	4419	640	4	3.7	77.0	0.00	77.0	77	77	1	1
1960	2	6310	914	15	4.0	85.0	5.00	88.0	80	90	2	1
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	1	318	46	3	3.0	97.0	0.00	97.0	97	97	1	1
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1971	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1972	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1973	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1974	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1975	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1976	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1977	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1978	9	7767	1125	3	3.4	89.0	0.00	89.0	89	89	1	1
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	1	1892	274	2	0.0	106.0	0.00	106.0	106	106	1	1
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	4	7802	1130	9	0.0	105.0	0.00	105.0	105	105	1	1
1984	1	3452	500	8	0.0	107.0	0.00	107.0	107	107	1	1
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	52	323742	46892	6	4.3	87.2	1.34	84.9	66	108	21	7

Table 101-4. Spawn summary for section 101 from 1937 to 1986.

A. GENERAL:

There is one main spawning area in this section of Smith Inlet centered in the Margaret Bay-McBride Bay vicinity.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Boswell, a former cannery and fishing base.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There have been three main spawning episodes, 1937-44, 1949-62 and 1978-1984.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 21/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 21/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 46.9 Km.
4. CUMULATIVE SPAWN AREA	= 32.4 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 28 (87.2)
2. MEAN WEIGHTED DATE (DOY)	= March 26 (84.9)

F. COMMENTS:

Margaret and McBride Bays have an inconsistent history of spawns. A total of 54 spawns have been recorded with a mean time of March 28. Nearby, Takush Harbour (section 102) has a virtually continuous history of spawning since 1937: a total of 238 spawns with a mean time of March 30 has been recorded. The head of Smith Inlet (section 103) which is adjacent to Takush harbour, has an intermittent record of spawns: 36 recorded since 1937 with a mean time of April 13. Section 101 spawns could therefore represent a mixture of early and late spawners of the same stock.

G. ROE FISHERIES:

No major roe fisheries are documented.

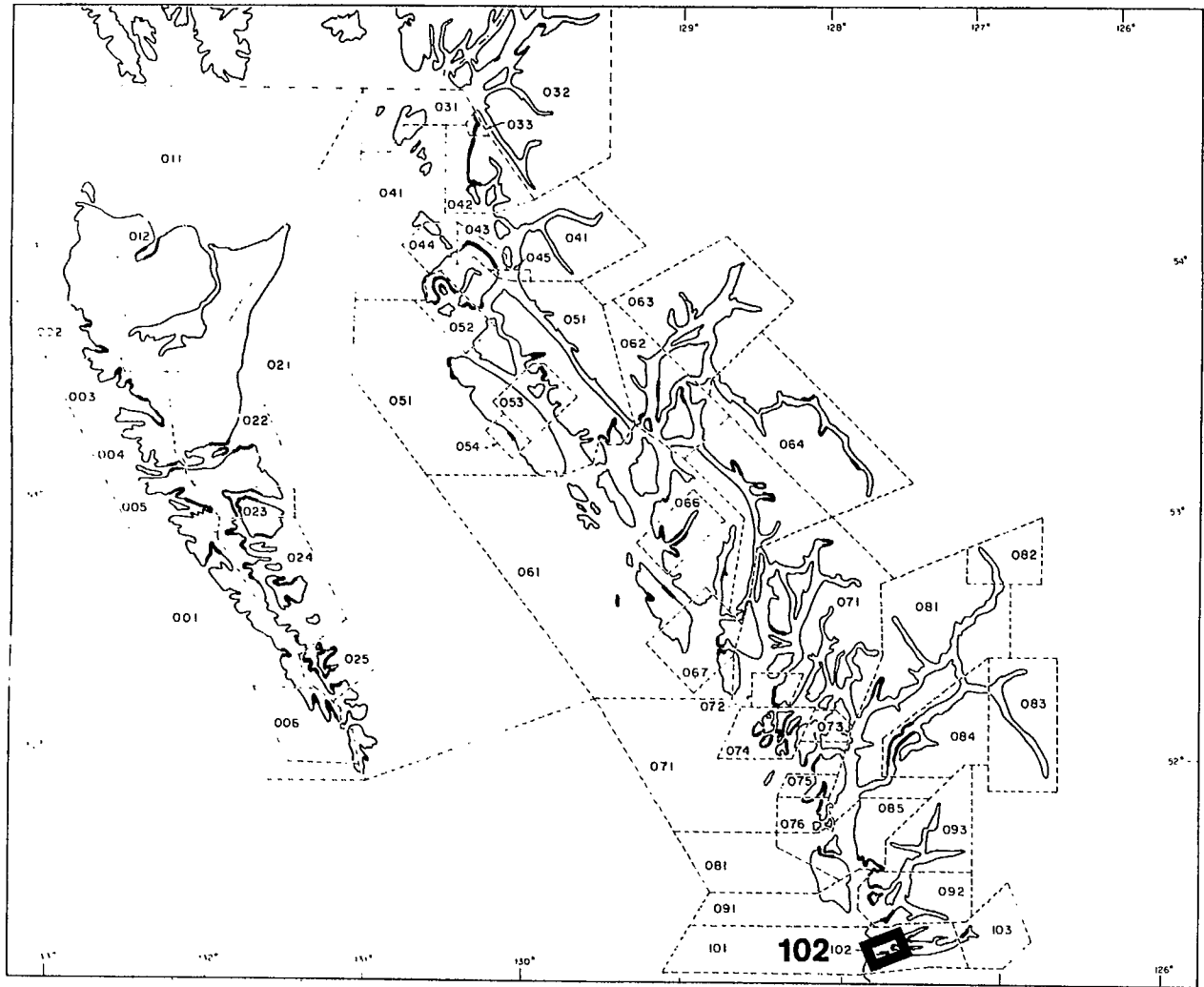


Fig. 102-1. Overview map showing location of section 102, Takush Harbour.

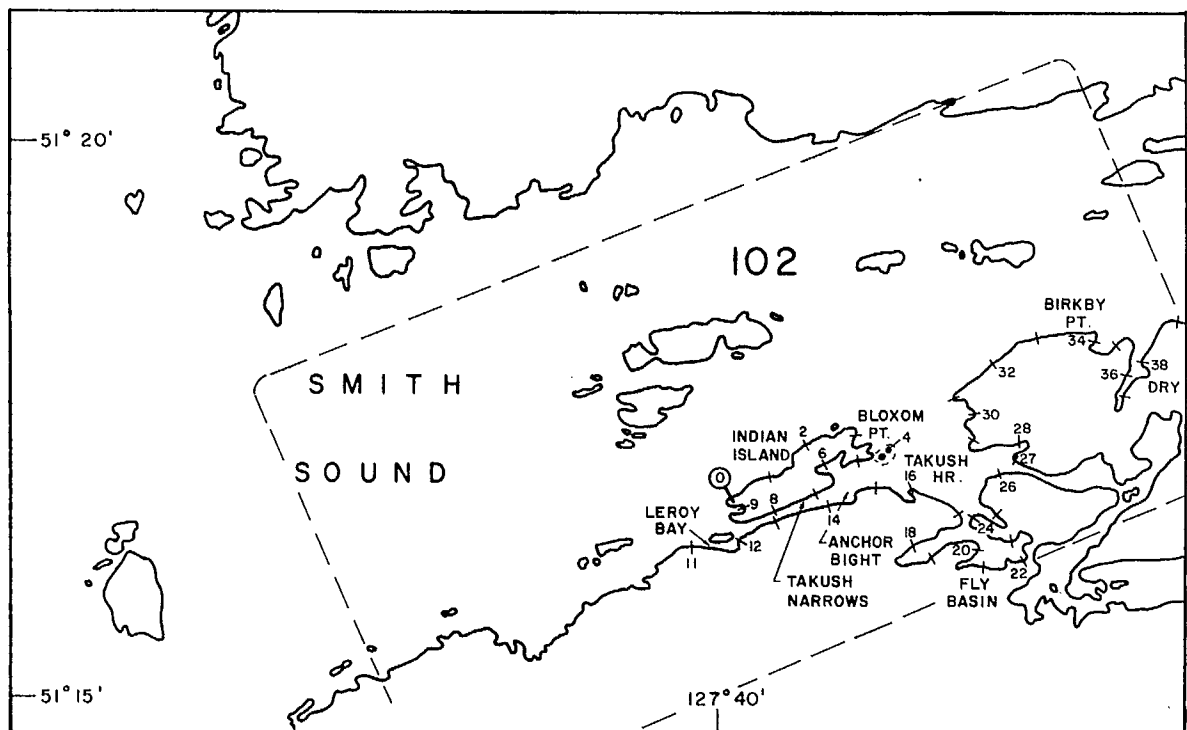


Fig. 102-2. Detailed map of section 102, Takush Harbour.



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Table 102-1. Section 102 - spawn position by year.

	1.00	11.00	21.00	31.00	41.00	51.00	61.00	71.00
1937 +				a				
1938 +				a				
1939 +				b				
1940 +								
1941 +			aa					
1942 +								
1943 +			aaaa		aa			
1944 +			aa					
1945 +		aaaaa						
1946 +		aaaaa						
1947 +		bbbb			aaa			
1948 +		aaa			aaaa			
1949 +		aaaa						
1950 +		cb						
1951 +				11	111			
1952 +					111			
1953 +		2			11111			
1954 +				111		11		
1955 +			11	1	1			
1956 +				ba				11
1957 +		a\$1		111				
1958 +		1		111111111				
1959 +		abb		dd				
1960 +				ca		ab		
1961 +			dc	c	111			
1962 +	11				11			
1963 +	121	1			11 1			
1964 +	122		1		11			
1965 +	1111	1	1211 1					
1966 +	11 11		1 1					
1967 +	11111							
1968 +	221	1						
1969 +	abba							
1970 +	11111			11 1 1121				
1971 +			111	abcb	12121			
1972 +	abba			111123321				
1973 +	1			111212221111	11			
1974 +	abba			11				
1975 +	cf							
1976 +	fj							
1977 +	dd							
1978 +		1		344	1625	4		
1979 +		21		33				
1980 +	11211 1	\$21 1			11			
1981 +				da	e1			
1982 +	121 1 11				11221			
1983 +	bc				bd			
1984 +	aa	a		eb	a			
1985 +	dd	b						
1986 +		a						
	1.00	11.00	21.00	31.00	41.00	51.00	61.00	71.00
	B	I	T A F	T	GD	B		
	L	N	A N L	A	RR	I		
	O	D	K C Y	K	EY	R		
	X	I	U H	U	A	K		
	O	A	S O B	S	VC	B		
	M	N	H R A	H	ER	Y		
			S		SE			
	P	I	N B I	H	E	P		
	O	S	A I N	A	IK	O		
	I	L	R G	R	S	I		
	N	A	R H	B	L	N		
	T	N	O T	O	A	T		
		D	/	U	N			
				R	D			

Table 102-2. Section 102 - histogram of cumulative spawn frequency over distance

[illegible]

Table 102-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
GREAVES ISLAND DRY CREEK	33.00	*****0																19	1	0	20
	34.00	*****000000000000																15	12	0	27
	35.00	*****0000000000000000																14	18	0	32
	36.00	*****00																5	2	0	7
	37.00	+																1	0	0	1
BIRKBY POINT	38.00	*****																6	0	0	6
	39.00	***																2	0	0	2
	40.00	+																0	0	0	0
	41.00	+																0	0	0	0
	42.00	+																0	0	0	0
	43.00	+																0	0	0	0
	44.00	+																0	0	0	0
	45.00	+																0	0	0	0
	46.00	+																0	0	0	0
	47.00	+																0	0	0	0
	48.00	+																0	0	0	0
	49.00	+																0	0	0	0
	50.00	+																0	0	0	0
	51.00	+																0	0	0	0
	52.00	+																0	0	0	0
	53.00	+																0	0	0	0
	54.00	+																0	0	0	0
	55.00	+																0	0	0	0
	56.00	+																0	0	0	0
	57.00	+																0	0	0	0
	58.00	+																0	0	0	0
	59.00	+																0	0	0	0
	60.00	+																0	0	0	0
	61.00	+																0	0	0	0
	62.00	+																0	0	0	0
	63.00	+																0	0	0	0
	64.00	+																0	0	0	0
	65.00	+																0	0	0	0
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 102-2 (cont'd.)

position(km)																vara	varb	varc	all
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
66.00 +																0	0	0	0
67.00 +																0	0	0	0
68.00 +																0	0	0	0
69.00 +																0	0	0	0
70.00 +																0	0	0	0
71.00 +																0	0	0	0
72.00 +																0	0	0	0
73.00 +																0	0	0	0
74.00 +																0	0	0	0
75.00 +																0	0	0	0
76.00 +																0	0	0	0
77.00 +*																1	0	0	1
78.00 +*																1	0	0	1
79.00 +*																1	0	0	1
80.00 +																0	0	0	0

Table 102-3. Herring statistical spawn summary for section 102.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	1	1464	201	0	5.0	78.0	0.00	78.0	78	78	1	1
1938	1	1464	201	0	3.0	69.0	0.00	69.0	69	69	1	1
1939	2	5857	804	0	5.0	76.0	8.00	76.0	68	84	2	1
1940	1	0	0	0	3.0	76.0	0.00	0.0	76	76	1	1
1941	1	2929	402	0	5.0	66.0	0.00	66.0	66	66	1	1
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	2	35157	4826	8	5.0	73.0	1.00	73.3	72	74	2	2
1944	1	2929	402	7	1.0	80.0	0.00	80.0	80	80	1	1
1945	1	29963	4113	7	5.0	76.0	0.00	76.0	76	76	1	1
1946	1	29963	4113	5	5.0	74.0	0.00	74.0	74	74	1	1
1947	3	58105	7976	5	7.0	77.0	0.00	77.0	77	77	1	2
1948	2	29963	4113	20	4.0	79.0	0.00	79.0	79	79	1	2
1949	1	19975	2742	27	3.0	79.0	0.00	79.0	79	79	1	1
1950	3	9988	1371	6	5.0	79.0	0.00	79.0	79	79	1	1
1951	2	23305	3199	9	4.0	91.5	11.50	83.3	80	103	2	2
1952	1	11984	1645	3	3.0	79.0	0.00	79.0	79	79	1	1
1953	3	39951	5484	21	4.3	83.0	0.00	83.0	83	83	1	3
1954	2	33292	4570	5	6.0	73.0	0.00	73.0	73	73	1	2
1955	3	19975	2742	5	5.0	67.0	0.00	67.0	67	67	1	3
1956	3	23305	3199	5	7.0	99.3	13.33	108.9	86	126	2	2
1957	3	23305	3199	5	4.3	79.0	0.00	79.0	79	79	1	2
1958	4	51935	7129	8	6.0	75.5	0.87	74.8	74	77	2	2
1959	6	46609	6398	6	3.3	76.7	1.38	76.2	74	81	3	2
1960	5	24638	3382	5	3.8	84.6	4.11	82.2	80	101	3	2
1961	9	40614	5575	30	3.3	74.6	1.92	76.9	71	89	4	2
1962	3	12654	1737	17	6.0	82.7	0.67	82.8	82	84	2	2
1963	6	18970	2604	7	3.0	87.5	2.99	86.4	83	101	4	2
1964	4	28295	3884	5	4.0	78.5	3.75	77.8	72	85	2	2
1965	8	29970	4114	2	4.3	89.8	3.36	92.6	79	103	6	3
1966	5	25636	3519	3	4.6	92.0	0.00	92.0	92	92	1	2
1967	1	26634	3656	2	5.0	93.0	0.00	93.0	93	93	1	1
1968	3	21972	3016	4	5.0	100.0	6.00	97.3	88	106	2	1
1969	2	22970	3153	15	4.0	93.0	0.00	93.0	93	93	1	1
1970	5	67918	9323	20	4.2	95.0	1.00	95.5	91	96	2	3
1971	8	96009	13179	38	4.6	100.4	0.38	100.1	100	103	2	4
1972	5	115190	15812	2	3.0	86.8	4.55	86.2	82	105	3	4
1973	7	82568	11334	3	4.6	100.4	1.43	99.3	99	109	2	4
1974	3	39281	5392	18	3.7	90.0	9.00	86.9	81	108	2	2
1975	6	14978	2056	6	3.5	87.0	0.00	87.0	87	87	1	1
1976	10	23152	3178	5	4.2	92.7	0.30	92.1	90	93	2	1
1977	4	24303	3336	4	2.5	125.0	0.00	125.0	125	125	1	1
1978	29	38763	5321	9	4.4	89.5	0.15	89.6	89	93	3	3
1979	6	20646	2834	18	3.3	102.3	4.64	102.5	95	117	2	3
1980	12	49436	6786	4	3.9	89.2	0.55	89.3	85	91	6	5
1981	13	43943	6032	9	0.0	98.6	3.21	97.9	80	106	4	2
1982	7	45917	6303	24	0.0	84.9	0.55	84.2	83	87	4	5
1983	7	16646	2285	89	0.0	88.6	1.62	87.3	84	92	2	2
1984	8	28557	3920	31	0.0	93.9	2.66	91.4	89	107	5	4
1985	6	28412	3900	16	0.0	90.7	0.95	91.4	89	95	3	2
1986	7	13732	1885	53	0.0	93.7	0.18	93.7	93	94	2	4
All	236	1503224	206345	15	4.2	88.9	0.72	87.3	66	126	43	13

Table 102-4. Spawn summary for section 102 from 1937 to 1986.

A. GENERAL:

There is one main spawning area in Smith Sound centered in the Takush Harbour vicinity.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Boswell, a former cannery and fishing base.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1940 and 1942.

D. MAGNITUDE OF SPAWNINGS: SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 48/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 48/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 206.4 Km.
4. CUMULATIVE SPAWN AREA	= 150.3 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 30 (88.9)
2. MEAN WEIGHTED DATE (DOY)	= March 28 (87.3)

F. COMMENTS:

Takush Harbour has a virtually continuous history of spawning since 1937: a total of 238 spawns with a mean time of March 30 has been recorded. The head of Smith Inlet (section 103) which is adjacent to Takush Harbour, has an intermittent record of spawns: 36 recorded since 1937 with a mean time of April 13. The difference between the spawning times in Takush and the Head of the inlet is about 14 days; this could represent the difference between the earlier spawnings of older fish and later waves of spawners of younger recruit fish. It is possible that the Takush and Smith Inlet fish are part of a larger spawning stock with spawning sites widely distributed throughout the central British Columbia coast.

G. ROE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 1/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 4/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 1300 tons (area 10)
4. MEAN GILLNET CATCH/YEAR	= 460 tons (area 10)

Table 102-5. History of roe fishery catches by gear type in Takush Harbour.

SECT. 102	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	11/03- 08/04	672	(1300)	all area 10	11/03- 08/04	672	(1300)	all area 10
1973	-	-	-	-	-	-	-	-
1974	-	-	-	-	17/03- 28/03	264	(200)	all area 10
1975	-	-	-	-	02/03- 01/04	720	(223)	all area 10
1976	-	-	-	-	26/03- 31/03	72	(115)	all area 10
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

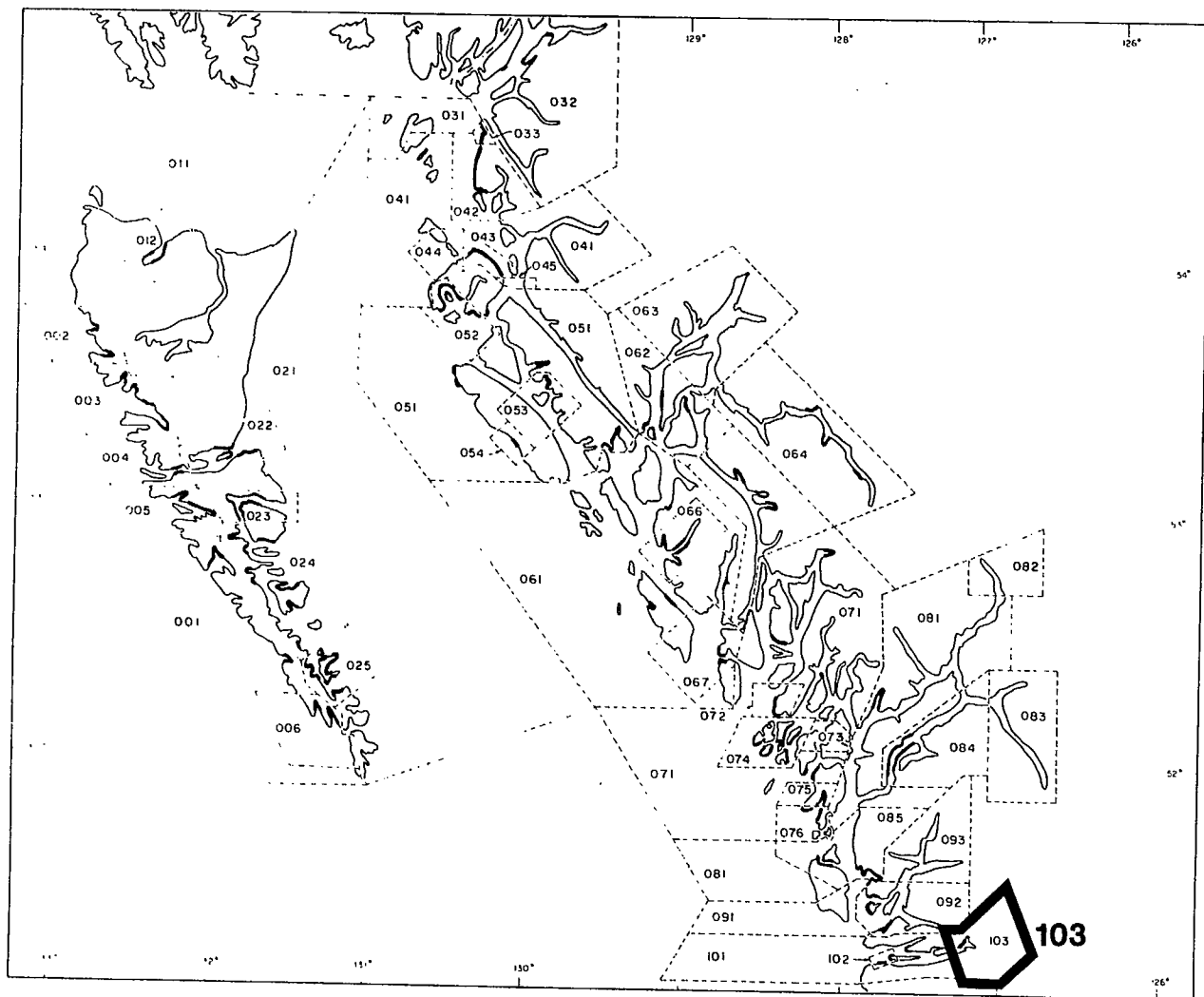


Fig. 103-1. Overview map showing location of section 103, Smith Inlet Head.

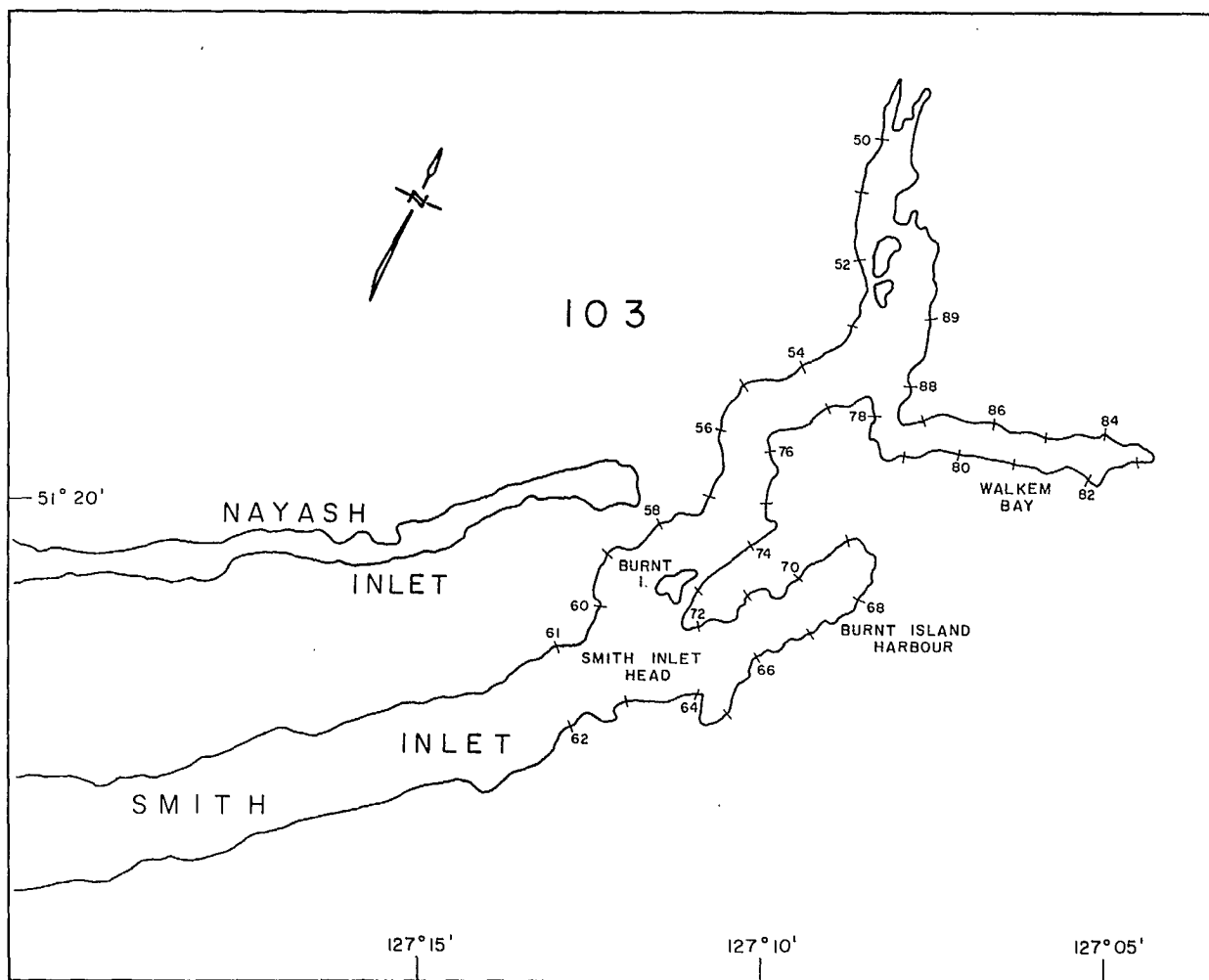


Fig. 103-2. Detailed map of section 103, Smith Inlet Head.

Table 103-1. Section 103 - spawn position by year.

	49.00	59.00	69.00	79.00	89.00
1937 +					
1938 +					
1939 +					
1940 +					
1941 +					
1942 +					
1943 +	aaaaa				
1944 +					
1945 +					
1946 +					
1947 +					
1948 +					
1949 +					
1950 +					
1951 +					
1952 +					
1953 +					
1954 +			111		
1955 +		a			
1956 +					
1957 +					
1958 +					
1959 +					
1960 +					
1961 +					
1962 +					
1963 +					
1964 +					
1965 +					
1966 +					
1967 +					
1968 +					
1969 +					
1970 +	11111				
1971 +	1111				
1972 +					
1973 +	11				
1974 +	111				
1975 +	1111		11		
1976 +	11111				
1977 +	12	a	111		
1978 +	1111111		221221		
1979 +	11				
1980 +	113111		11111		
1981 +					
1982 +	11		11		11
1983 +					
1984 +	aa				
1985 +					
1986 +					
	49.00	59.00	69.00	79.00	89.00
	B	S	B		
	U	M	U		
	R	I	R		
	N	T	N		
	T	H	T		
	I	I	I		
	S	N	S		
	L	L	L		
	A	E	A		
	N	T	N		
	D	(	D		
		H	H		
		E	A		
		A	R		
		D	B		
		)	O		
			U		
			R		

Table 103-2. Section 103 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
BURNT ISLAND	48.00	+																0	0	0	0
	49.00	+																0	0	0	0
	50.00	+	*															1	0	0	1
	51.00	+	*	*	0													2	1	0	3
	52.00	+	*	*	*	*	0											4	1	0	5
	53.00	+	*	*	*	*	*	*	0	0								9	2	0	11
	54.00	+	*	*	*	*	*	*	*	0	0							10	2	0	12
	55.00	+	*	*	*	*	*	*	*	0								9	1	0	10
	56.00	+	*	*	*	*	*	*	*									5	0	0	5
	57.00	+	*	*	*	*	*	*	*									3	0	0	3
	58.00	+	*	*	*	*	*	*	*									2	0	0	2
	59.00	+																0	0	0	0
	60.00	+																0	0	0	0
SMITH INLET (HEAD)	61.00	+																0	0	0	0
	62.00	+	0															0	1	0	1
	63.00	+																0	0	0	0
	64.00	+																0	0	0	0
BURNT ISLAND HARBOUR	65.00	+	0															0	1	0	1
	66.00	+																0	0	0	0
	67.00	+																0	0	0	0
	68.00	+	*															1	0	0	1
	69.00	+	*															1	0	0	1
	70.00	+	*	*														2	0	0	2
	71.00	+	*	*														1	0	0	1
	72.00	+	*	*	*													3	0	0	3
	73.00	+	*	*	*	*												4	0	0	4
	74.00	+	*	*	*	*	*											3	0	0	3
	75.00	+	*	*	*	*	*											3	0	0	3
	76.00	+	*	*	*	*	*	*										4	0	0	4
	77.00	+	*	*	*	*	*	*										3	0	0	3
	78.00	+																0	0	0	0
	79.00	+																0	0	0	0
	80.00	+																0	0	0	0
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 103-2 (cont'd.)

position(km)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
81.00	+																0	0	0	0
82.00	+																0	0	0	0
83.00	+																0	0	0	0
84.00	+																0	0	0	0
85.00	+																0	0	0	0
86.00	+																0	0	0	0
87.00	+																0	0	0	0
88.00	+	*															1	0	0	1
89.00	+	*															1	0	0	1
90.00	+																0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 103-3. Herring statistical spawn summary for section 103.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	1	9407	4022	7	5.0	96.0	0.00	96.0	96	96	1	1
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	1	4276	1828	4	5.0	92.0	0.00	92.0	92	92	1	1
1955	1	748	320	5	7.0	101.0	0.00	101.0	101	101	1	1
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	1	8551	3656	1	5.0	91.0	0.00	91.0	91	91	1	1
1971	1	8123	3473	3	4.0	105.0	0.00	105.0	105	105	1	1
1972	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1973	1	3848	1645	3	4.0	110.0	0.00	110.0	110	110	1	1
1974	1	4704	2011	2	2.0	111.0	0.00	111.0	111	111	1	1
1975	2	11758	5027	3	2.5	91.5	6.50	88.5	85	98	2	2
1976	1	8551	3656	2	3.0	99.0	0.00	99.0	99	99	1	1
1977	4	9195	3931	3	2.0	134.5	1.50	134.3	130	136	2	1
1978	15	8869	3792	2	4.1	101.0	0.00	101.0	101	101	1	1
1979	2	426	182	5	3.0	95.0	0.00	95.0	95	95	1	1
1980	4	22588	9657	5	4.5	96.0	0.00	96.0	96	96	1	1
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	3	3272	1399	3	0.0	94.3	1.67	95.3	91	96	2	1
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	1	1871	800	4	0.0	103.0	0.00	103.0	103	103	1	1
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	39	106188	45399	3	3.8	102.6	1.91	100.6	85	136	14	3

Table 103-4. Spawn summary for section 103 from 1937 to 1986.

A. GENERAL:

There is one main spawning area at the head of Smith Inlet centered in the Burnt Island vicinity.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to the former Smith Inlet cannery.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There have been three main spawning episodes, 1943, 1954-55 and 1970-1984.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 15/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 15/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 45.4 Km.
4. CUMULATIVE SPAWN AREA	= 10.6 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= April 13 (102.6)
2. MEAN WEIGHTED DATE (DOY)	= April 11 (100.6)

F. COMMENTS:

The head of Smith Inlet has an intermittent record of spawns: 36 spawns recorded since 1937 with a mean spawn time of April 13. Takush Harbour, at the entrance to Smith Inlet has a virtually continuous history of spawning since 1937: a total of 238 spawns with a mean spawn date of March 30. The difference between the spawning times in Takush and the head of the Inlet is about 14 days; this could represent the difference between the earlier spawnings of older fish and later waves of spawners of younger recruit fish. It is possible that the Takush and Smith Inlet are part of a larger spawning stock with spawning sites widely distributed throughout the Central British Columbia coast.

G. ROE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 1/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 4/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 1300 tons (area 10)
4. MEAN GILLNET CATCH/YEAR	= 460 tons (area 10)

Table 103-5. History of roe fishery catches by gear type in Smith Inlet.

SECT. 103	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	11/03- 08/04	672	(1300)	all area 10	11/03- 08/04	672	(1300)	all area 10
1973	-	-	-	-	-	-	-	-
1974	-	-	-	-	17/03- 28/03	264	(200)	all area 10
1975	-	-	-	-	02/03- 01/04	720	(223)	all area 10
1976	-	-	-	-	26/03- 31/03	72	(115)	all area 10
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

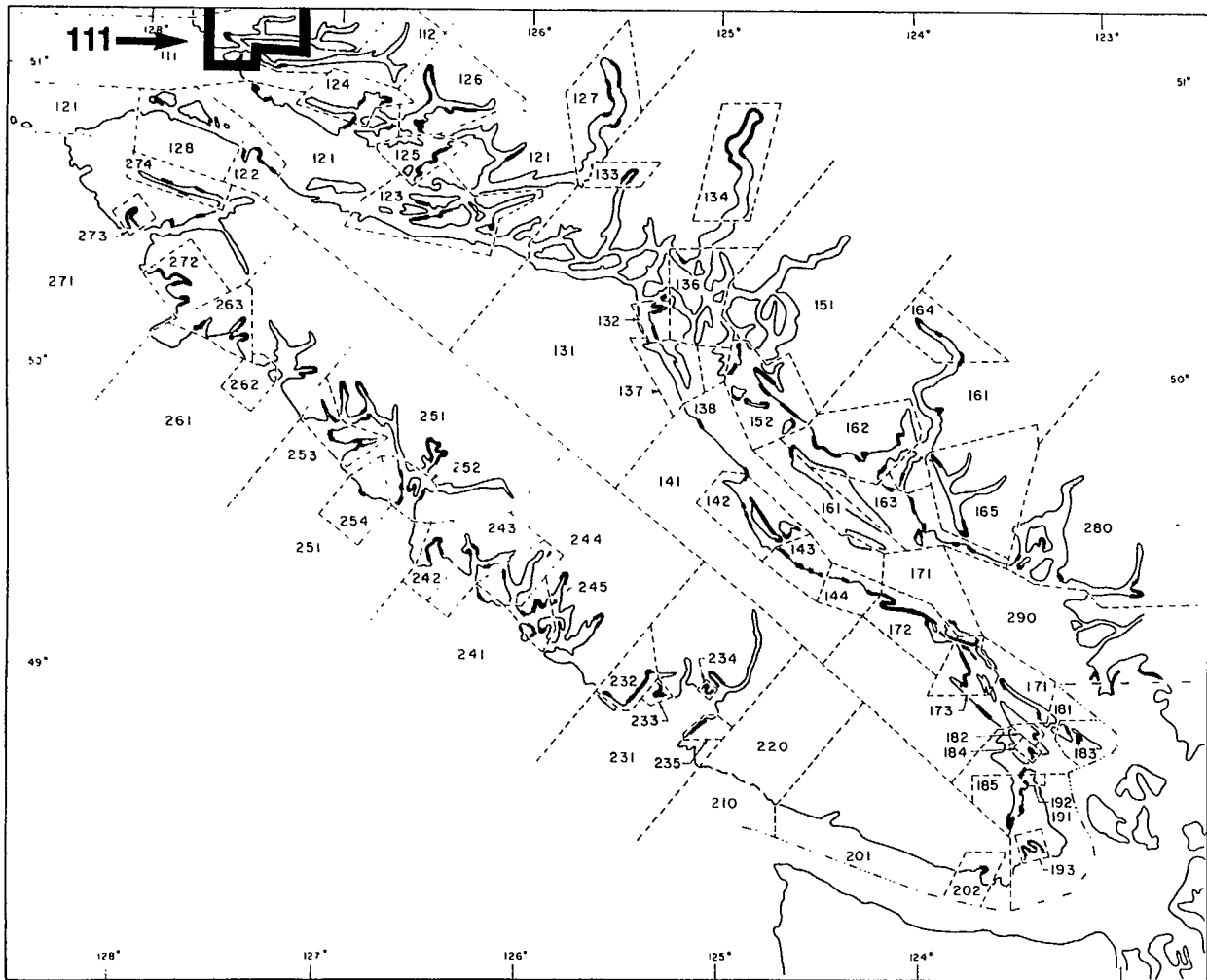


Fig. 111-1. Overview map showing location of section 111, Other Area 11.

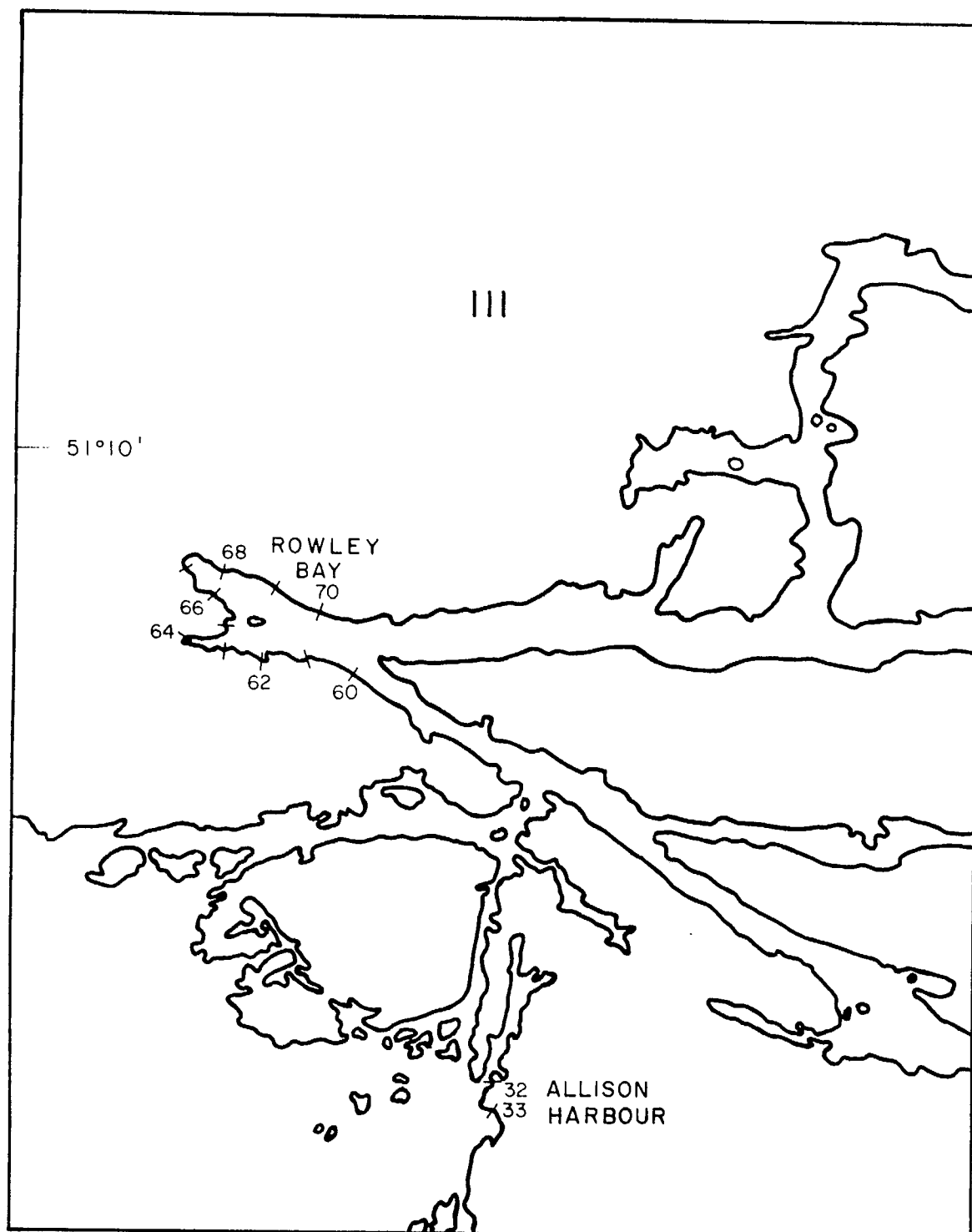


Fig. 111-2. Detailed map of section 111, Other Area 11.

Table 111-1. Section 111 - spawn position by year.

31.00
+-
1937 +
1938 +
1939 +
1940 +
1941 +
1942 +
1943 +
1944 +
1945 +
1946 +
1947 +
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Table 111-2. Section 111 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
ALLISON HARBOUR	30.00	+																0	0	0	0
	31.00	+																0	0	0	0
	32.00	***																2	0	0	2
	33.00	+																0	0	0	0
	34.00	+																0	0	0	0
	35.00	+																0	0	0	0
	36.00	+																0	0	0	0
	37.00	+																0	0	0	0
	38.00	+																0	0	0	0
	39.00	+																0	0	0	0
	40.00	+																0	0	0	0
	41.00	+																0	0	0	0
	42.00	+																0	0	0	0
	43.00	+																0	0	0	0
	44.00	+																0	0	0	0
	45.00	+																0	0	0	0
	46.00	+																0	0	0	0
	47.00	+																0	0	0	0
	48.00	+																0	0	0	0
	49.00	+																0	0	0	0
	50.00	+																0	0	0	0
	51.00	+																0	0	0	0
	52.00	+																0	0	0	0
	53.00	+																0	0	0	0
54.00	+																0	0	0	0	
55.00	+																0	0	0	0	
56.00	+																0	0	0	0	
57.00	+																0	0	0	0	
58.00	+																0	0	0	0	
59.00	+																0	0	0	0	
60.00	+																0	0	0	0	
61.00	+																0	0	0	0	
62.00	+																0	0	0	0	
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 111-2(cont'd.)

ROWLEY BAY

position(km)																	vara	varb	varc	all
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75					
63.00	+																0	0	0	0
64.00	+1																0	0	1	1
65.00	+1																0	0	1	1
66.00	+																0	0	0	0
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all	

Table 111-3. Herring statistical spawn summary for section 111.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	1	298	46	2	7.0	92.0	0.00	92.0	92	92	1	1
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	1	1186	183	4	5.0	113.0	0.00	113.0	113	113	1	1
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	1	4737	731	3	5.0	97.0	0.00	97.0	97	97	1	1
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1971	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1972	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1973	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1974	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1975	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1976	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1977	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	1	590	91	23	4.0	96.0	0.00	96.0	96	96	1	1
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	4	6810	1051	8	5.3	99.5	4.63	99.5	92	113	4	3

Table 111-4. Spawn summary for section 111 from 1937 to 1986.

A. GENERAL:

There is one spawning area in this section centered in the Allison Harbour vicinity.

B. COMPLETENESS OF RECORDS:

The completeness of records is uncertain.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There have been only four recorded spawnings, 1954, 1958, 1964 and 1980.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 4/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 4/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 1.1 Km.
4. CUMULATIVE SPAWN AREA	= 0.7 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= April 10 (99.5)
2. MEAN WEIGHTED DATE (DOY)	= April 10 (99.5)

F. COMMENTS:

Only four spawns have been recorded in the Allison Harbour area with a mean spawning time of April 10 which is close to the spawn date of the inside spawning areas of Nugent Sound (section 112, April 6) which has a total of 94 spawnings recorded. Most of the spawning activity has been concentrated well within Nugent Sound making it geographically distant from the adjacent spawning areas to the north and south.

G. ROE FISHERIES:

No major roe fisheries are documented.

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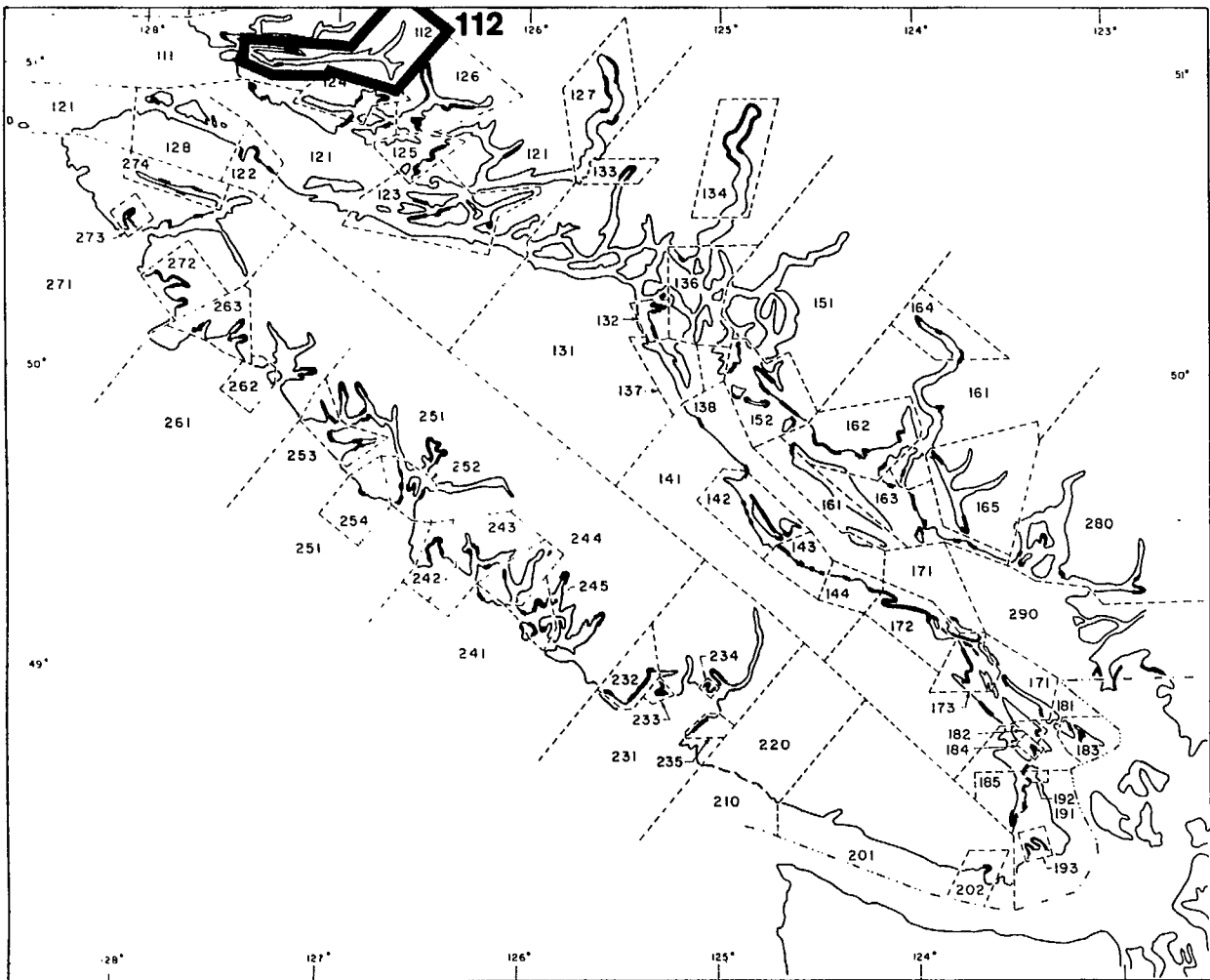


Fig. 112-1. Overview map showing location of section 112, Nugent Sound.

1. The first part of the report deals with the general situation of the country and the position of the various groups of the population. It is a very interesting and valuable contribution to the knowledge of the country and its people. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is well written and is a valuable contribution to the knowledge of the country and its people.

2. The second part of the report deals with the economic situation of the country. It is a very interesting and valuable contribution to the knowledge of the country and its people. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is well written and is a valuable contribution to the knowledge of the country and its people.

3. The third part of the report deals with the social situation of the country. It is a very interesting and valuable contribution to the knowledge of the country and its people. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is well written and is a valuable contribution to the knowledge of the country and its people.

4. The fourth part of the report deals with the political situation of the country. It is a very interesting and valuable contribution to the knowledge of the country and its people. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is well written and is a valuable contribution to the knowledge of the country and its people.

5. The fifth part of the report deals with the cultural situation of the country. It is a very interesting and valuable contribution to the knowledge of the country and its people. The author has done a great deal of research and has gathered a wealth of material which is presented in a clear and concise manner. The report is well written and is a valuable contribution to the knowledge of the country and its people.

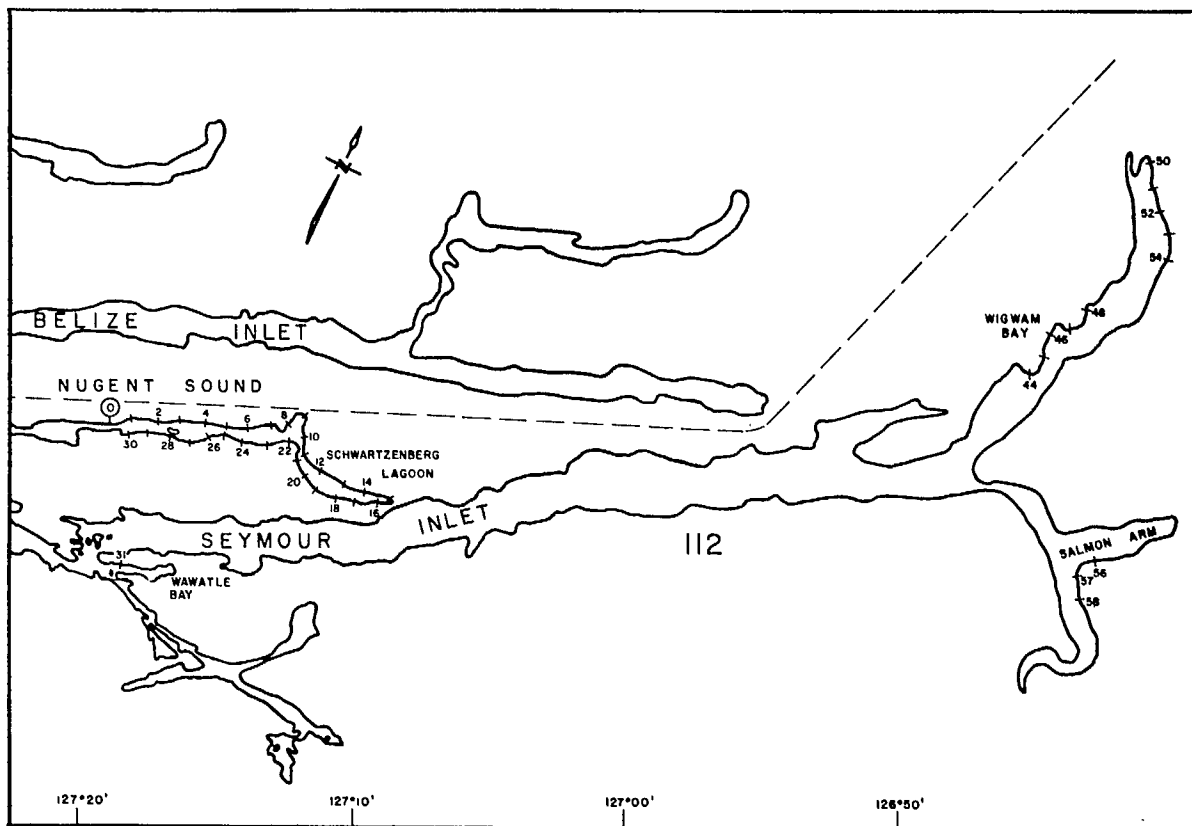


Fig. 112-2. Detailed map of section 112, Nugent Sound.

Table 112-1. Section 112 - spawn position by year.

	6.00	16.00	26.00	36.00	46.00
1937 +					
1938 +					
1939 +					
1940 +					
1941 +					
1942 +					
1943 +					
1944 +					
1945 +					
1946 +					
1947 +					
1948 +					
1949 +					
1950 +		abba			
1951 +		aa			
1952 +	1				
1953 +					
1954 +	1				a
1955 +					
1956 +					
1957 +		bb			
1958 +		11			
1959 +		111	111111		
1960 +		1111111111	11		
1961 +		abbbbbaaaaa			
1962 +		11111			aa
1963 +					
1964 +		1111111	aa	1111	
1965 +					
1966 +					
1967 +		111		11	
1968 +	1	11	1		
1969 +		11			
1970 +		1211			
1971 +		21111			
1972 +		agga			
1973 +		1111	11		
1974 +		111	11		
1975 +		bb	acca		
1976 +		hh		^^	
1977 +		adda			
1978 +			2221		
1979 +		aa			addb
1980 +		111			11 11
1981 +		111	11		bb
1982 +					
1983 +		aa			aaaaa
1984 +					cja
1985 +					
1986 +		dd aa			
	6.00	16.00	26.00	36.00	46.00
		N	S		S
		U	C		E
		G	H		Y
		E	W		M
		N	A		O
		T	R		U
			T		R
		S	Z		
		O	E		I
		U	N		N
		N	B		L
		D	E		E
			R		T
			G		
			L		
			A		
			G		
			O		
			O		
			N		

Table 112-2. Section 112 - histogram of cumulative spawn frequency over distance

[illegible]

Table 112-2 (cont'd.)

position(km)		+-----+																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
	38.00 +																	0	0	0	0
	39.00 +																	0	0	0	0
	40.00 +																	0	0	0	0
	41.00 +																	0	0	0	0
	42.00 +																	0	0	0	0
	43.00 +																	0	0	0	0
	44.00 +																	0	0	0	0
	45.00 +																	0	0	0	0
	46.00 +*																	1	0	0	1
	47.00 +*00																	1	2	0	3
	48.00 +000000000000																	0	11	0	11
SEYMOUR INLET	49.00 +00000000000000000000																	0	19	0	19
	50.00 +*0000																	1	4	0	5
	51.00 +*0																	1	1	0	2
	52.00 +*																	1	0	0	1
	53.00 +																	0	0	0	0
		+-----+																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				

Table 112-3. Herring statistical spawn summary for section 112.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	2	7759	3619	5	5.0	93.0	0.00	93.0	93	93	1	1
1951	1	431	201	2	3.0	103.0	0.00	103.0	103	103	1	1
1952	1	785	366	3	5.0	106.0	0.00	106.0	106	106	1	1
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	2	783	365	2	6.0	67.0	32.00	51.0	35	99	2	2
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	2	3919	1828	2	4.0	101.0	0.00	101.0	101	101	1	1
1958	1	1960	914	4	5.0	100.0	0.00	100.0	100	100	1	1
1959	2	16657	7769	5	4.0	96.0	0.00	96.0	96	96	1	1
1960	3	22156	10334	4	5.7	112.7	0.67	112.8	112	114	2	2
1961	3	28414	13253	5	5.0	107.0	0.00	107.0	107	107	1	2
1962	2	7838	3656	3	3.0	92.0	0.00	92.0	92	92	1	2
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	3	20578	9598	3	3.0	97.0	0.00	97.0	97	97	1	2
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	2	6859	3199	3	6.0	96.0	2.00	95.1	94	98	2	1
1968	4	1762	822	2	5.0	82.5	1.44	82.5	80	85	2	1
1969	1	3724	1737	3	5.0	80.0	0.00	80.0	80	80	1	1
1970	2	6027	2811	4	3.5	91.5	13.50	104.3	78	105	2	1
1971	2	7838	3656	4	4.0	114.0	0.00	114.0	114	114	1	1
1972	7	16462	7678	1	3.6	95.4	2.63	93.0	88	101	2	1
1973	2	8623	4022	1	3.0	112.5	10.50	118.7	102	123	2	2
1974	3	4899	2285	1	3.0	90.0	5.00	85.6	85	100	2	2
1975	5	13689	6385	1	5.0	92.0	0.00	92.0	92	92	1	2
1976	9	17735	8272	1	3.0	90.2	3.25	93.3	80	99	3	2
1977	4	9476	4420	1	4.0	86.8	5.11	91.0	74	95	3	1
1978	2	11758	5484	1	3.0	87.5	4.50	87.9	83	92	2	1
1979	5	16852	7860	5	4.4	100.2	5.84	103.8	89	119	4	2
1980	3	7350	3428	1	2.3	101.3	7.84	95.0	93	117	3	2
1981	4	8036	3748	1	0.0	91.5	2.60	91.4	87	96	2	2
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	2	12221	5700	1	0.0	94.5	14.50	100.4	80	109	2	2
1984	10	9262	4320	1	0.0	103.0	0.00	103.0	103	103	1	1
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	5	4931	2300	6	0.0	96.4	0.98	95.9	94	98	2	2
All	94	278784	130030	2	4.0	95.7	1.21	98.9	35	123	31	4

Table 112-4. Spawn summary for section 112 from 1937 to 1986.

A. GENERAL:

There are two main spawning areas in this section of Nugent Sound:
(i) Schwartzenberg Lagoon and
(ii) Wawatle Bay

B. COMPLETENESS OF RECORDS:

Probably all spawning records prior to 1950 are incomplete.

C. SPAWNING CONSISTENCY OVER TIME: FREQUENT

There have been two main spawning episodes, 1957-62 and 1967-81 with intermittent spawnings in other years.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 29/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 29/37 (1950-86)
3. CUMULATIVE SPAWN LENGTH	= 130.0 Km.
4. CUMULATIVE SPAWN AREA	= 27.9 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= April 6 (95.7)
2. MEAN WEIGHTED DATE (DOY)	= April 9 (98.9)

F. COMMENTS:

A total of 94 spawnings with a mean spawn time of April 6 are documented for Nugent Sound between 1950 and 1986. Only four spawns have been recorded in the surrounding (outside) waters so that most of the spawning activity has been concentrated well within the Sound making it geographically distant from the adjacent spawning areas to the north and south. Herring in this area could represent a small discrete stock.

G. ROE FISHERIES:

No major roe fisheries are documented.

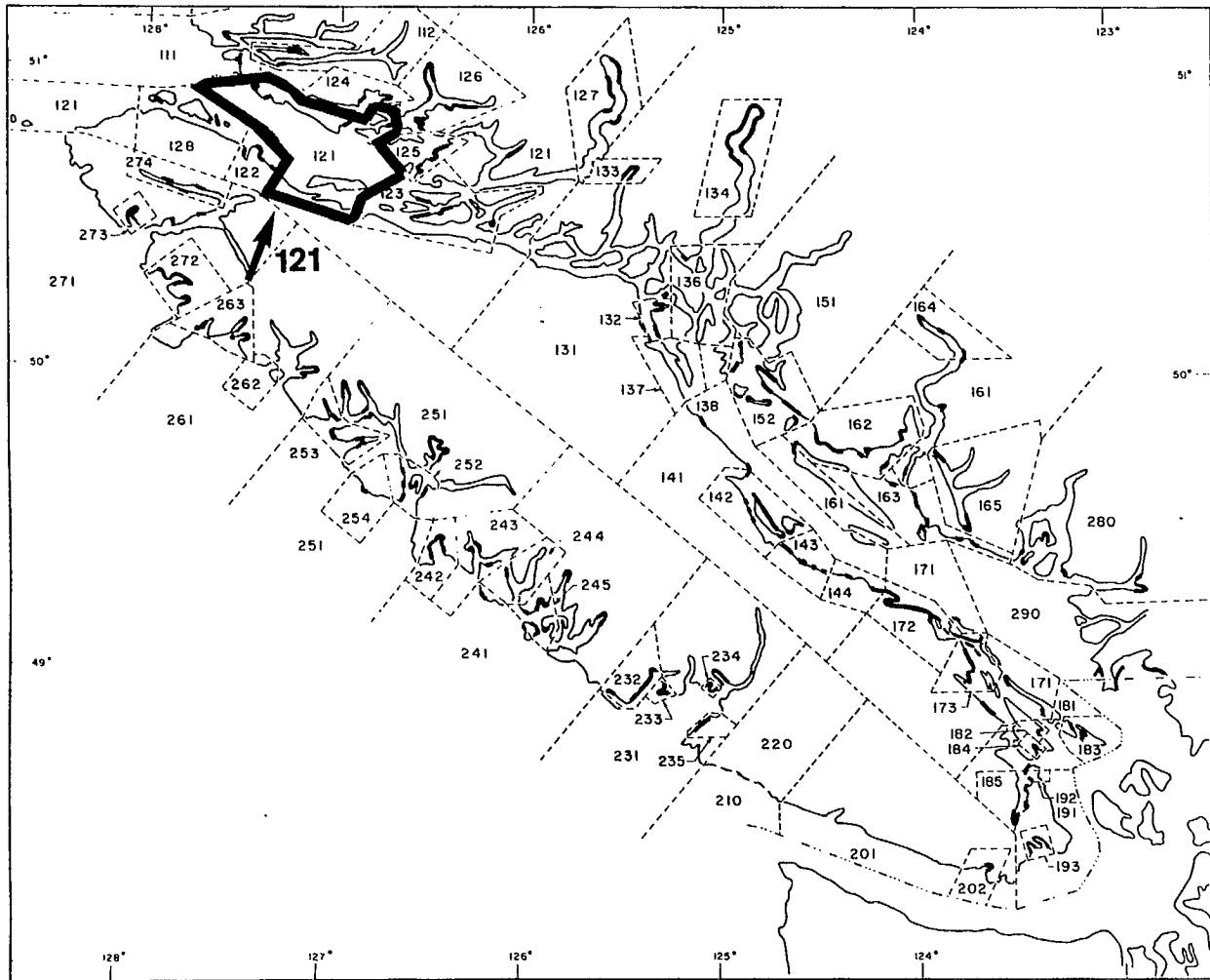


Fig. 121-1. Overview map showing location of section 121, Other Area 12.

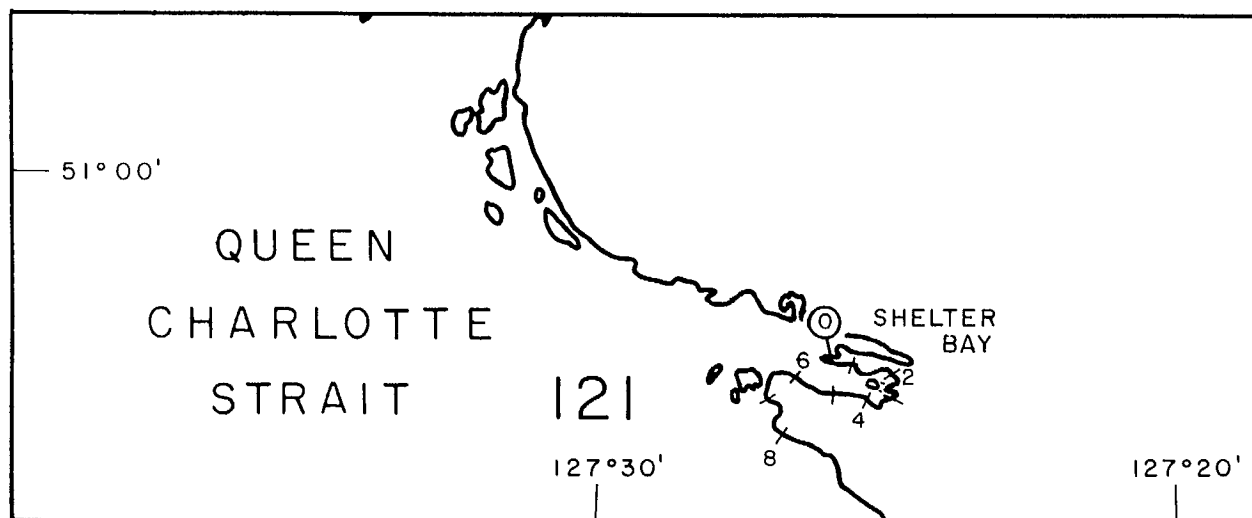
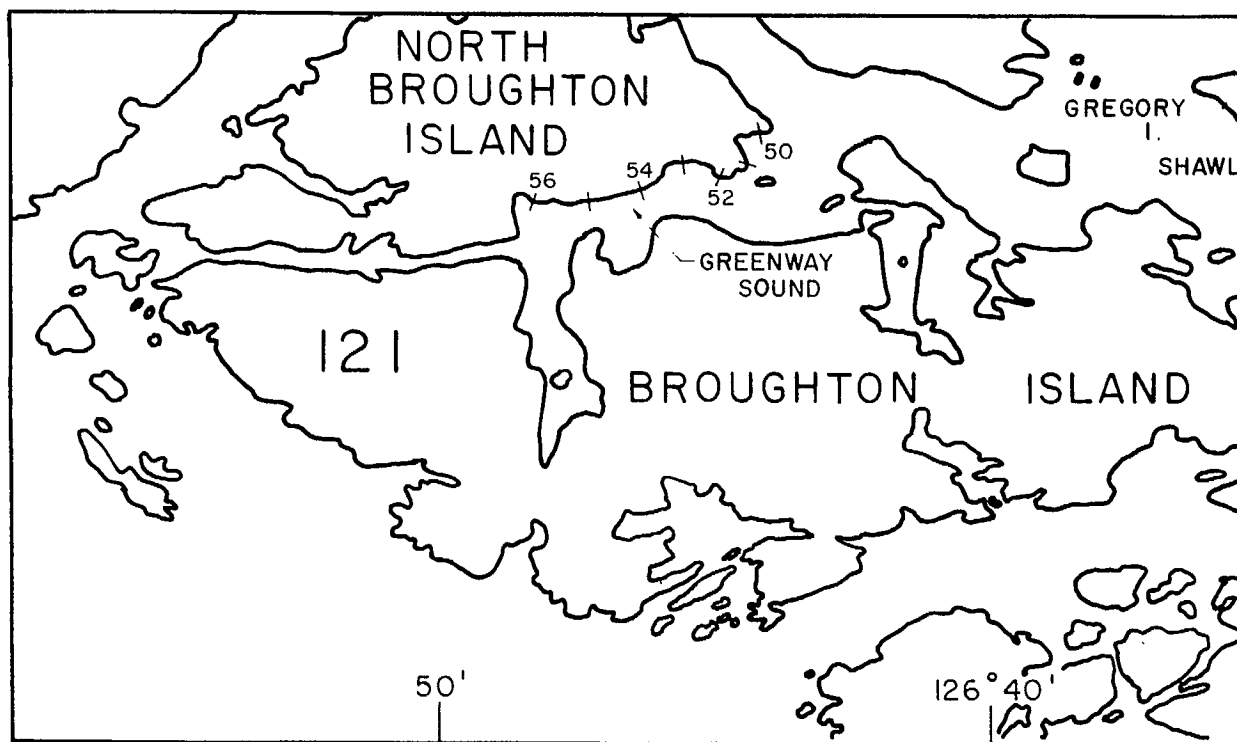


Fig. 121-2. Detailed map of section 121, Other Area 12.

Table 121-2. Section 121 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
SHELTER BAY	2.00	+																0	0	0	0
	3.00	+																0	0	1	1
	4.00	+																0	0	5	5
	5.00	+																0	0	5	5
	6.00	+																0	0	1	1
	7.00	+																0	0	0	0
	8.00	+																0	0	0	0
	9.00	+																0	0	0	0
	10.00	+																0	0	0	0
	11.00	+																0	0	0	0
	12.00	+																0	0	0	0
	13.00	+																0	0	0	0
	14.00	+																0	0	0	0
	15.00	+																0	0	0	0
	16.00	+																0	0	0	0
	17.00	+																0	0	0	0
	18.00	+																0	0	0	0
	19.00	+																0	0	0	0
	20.00	+																0	0	0	0
	21.00	+																0	0	0	0
	22.00	+																0	0	0	0
	23.00	+																0	0	0	0
	24.00	+																0	0	0	0
	25.00	+																0	0	0	0
	26.00	+																0	0	0	0
	27.00	+																0	0	0	0
	28.00	+																0	0	0	0
JULA ISLAND	29.00	+																0	0	1	1
	30.00	+																0	0	1	1
	31.00	+																0	0	0	0
	32.00	+																0	0	0	0
	33.00	+																0	0	0	0
	34.00	+																0	0	0	0
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 121-2 (cont'd.)

position(km)

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
35.00 +																	0	0	0	0
36.00 +																	0	0	0	0
37.00 +																	0	0	0	0
38.00 +																	0	0	0	0
39.00 +																	0	0	0	0
40.00 +																	0	0	0	0
41.00 +																	0	0	0	0
42.00 +																	0	0	0	0
43.00 +																	0	0	0	0
44.00 +																	0	0	0	0
45.00 +																	0	0	0	0
46.00 +																	0	0	0	0
47.00 +																	0	0	0	0
48.00 +																	0	0	0	0
49.00 +																	0	0	0	0
50.00 +																	0	0	0	0
51.00 +																	0	0	0	0
52.00 +I																	0	0	1	1
53.00 +I																	0	0	1	1
54.00 +I																	0	0	1	1
55.00 +I																	0	0	1	1
56.00 +																	0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

GREENWAY SOUND

Table 121-3. Herring statistical spawn summary for section 121.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	1	0	0	0	7.0	56.0	0.00	0.0	56	56	1	1
1939	1	0	0	0	5.0	48.0	0.00	0.0	48	48	1	1
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	1	16181	2742	5	3.0	90.0	0.00	90.0	90	90	1	1
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	1	537	91	3	5.0	113.0	0.00	113.0	113	113	1	1
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	2	26973	4571	18	1.0	111.0	0.00	111.0	111	111	1	1
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1971	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1972	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1973	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1974	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1975	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1976	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1977	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	1	407	69	23	4.0	102.0	0.00	102.0	102	102	1	1
1980	2	2425	411	13	5.0	103.5	7.50	107.7	96	111	2	2
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	9	46523	7884	13	4.0	93.1	8.22	103.5	48	113	7	4

Table 121-4. Spawn summary for section 121 from 1937 to 1986.

A. GENERAL:

There are only two spawning areas in the Queen Charlotte Strait section:

- (i) Shelter Bay and
- (ii) Greenway Sound

B. COMPLETENESS OF RECORDS:

Small spawnings may have gone unrecorded but probably few major spawnings were missed in view of the close proximity of Port Hardy and Alert Bay.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There have been only five years with recorded spawnings: 1948, 1958, 1960, 1979 and 1980.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

- | | |
|---|------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 7/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 5/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 7.9 Km. |
| 4. CUMULATIVE SPAWN AREA | = 4.7 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|--------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = April 3 (93.1) |
| 2. MEAN WEIGHTED DATE (DOY) | = April 14 (103.5) |

F. COMMENTS:

Only nine spawns have been recorded in section 121. It is likely that these belong to the much larger and more frequent spawning stock of sections 123, 124, 125 with a probable epicenter in Kingcome Inlet (section 126).

G. ROE FISHERIES:

No major roe fisheries are documented.

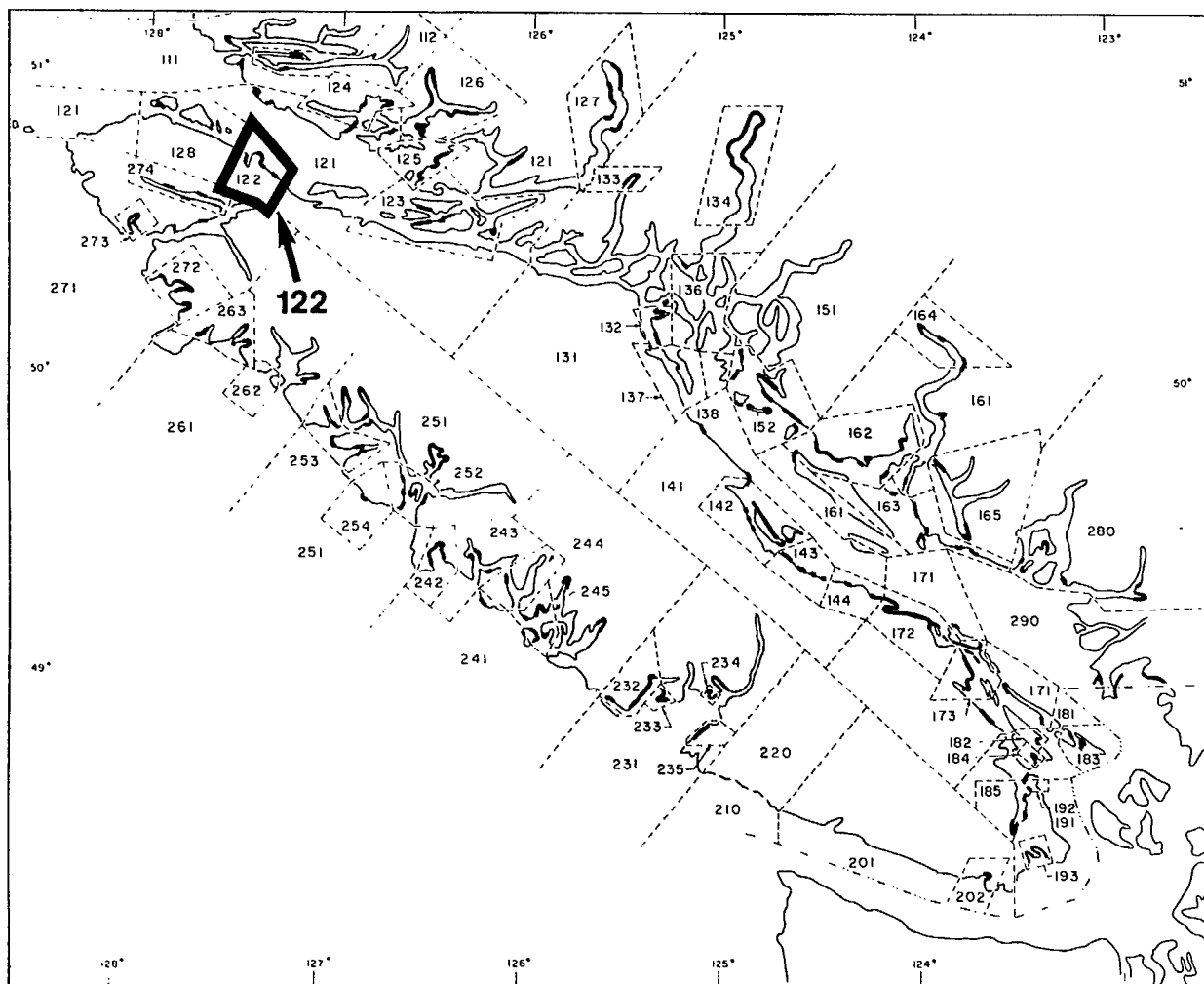


Fig. 122-1. Overview map showing location of section 122, Beaver Harbour.

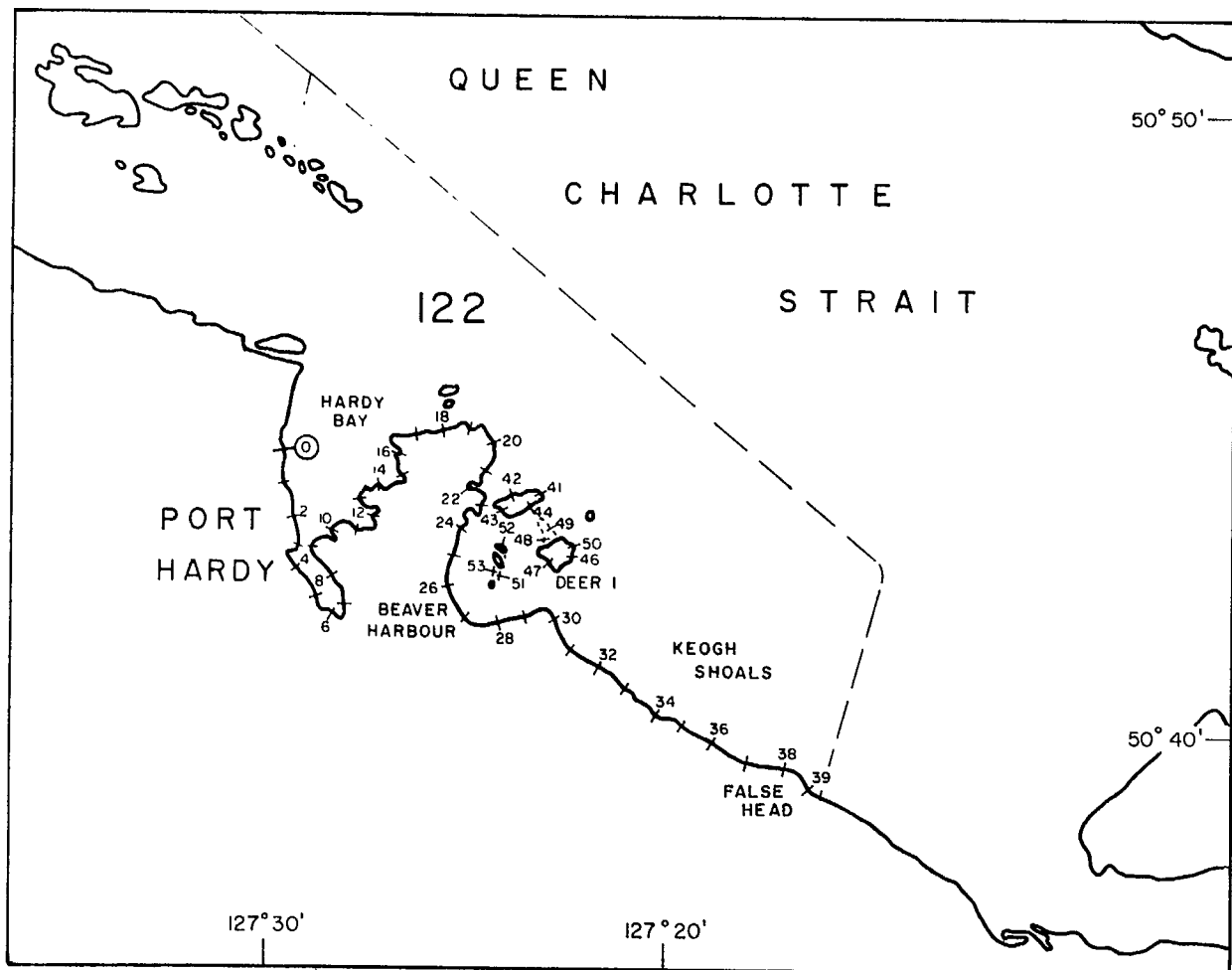


Fig. 122-2. Detailed map of section 122, Beaver Harbour.

Table 122-1. Section 122 - spawn position by year.

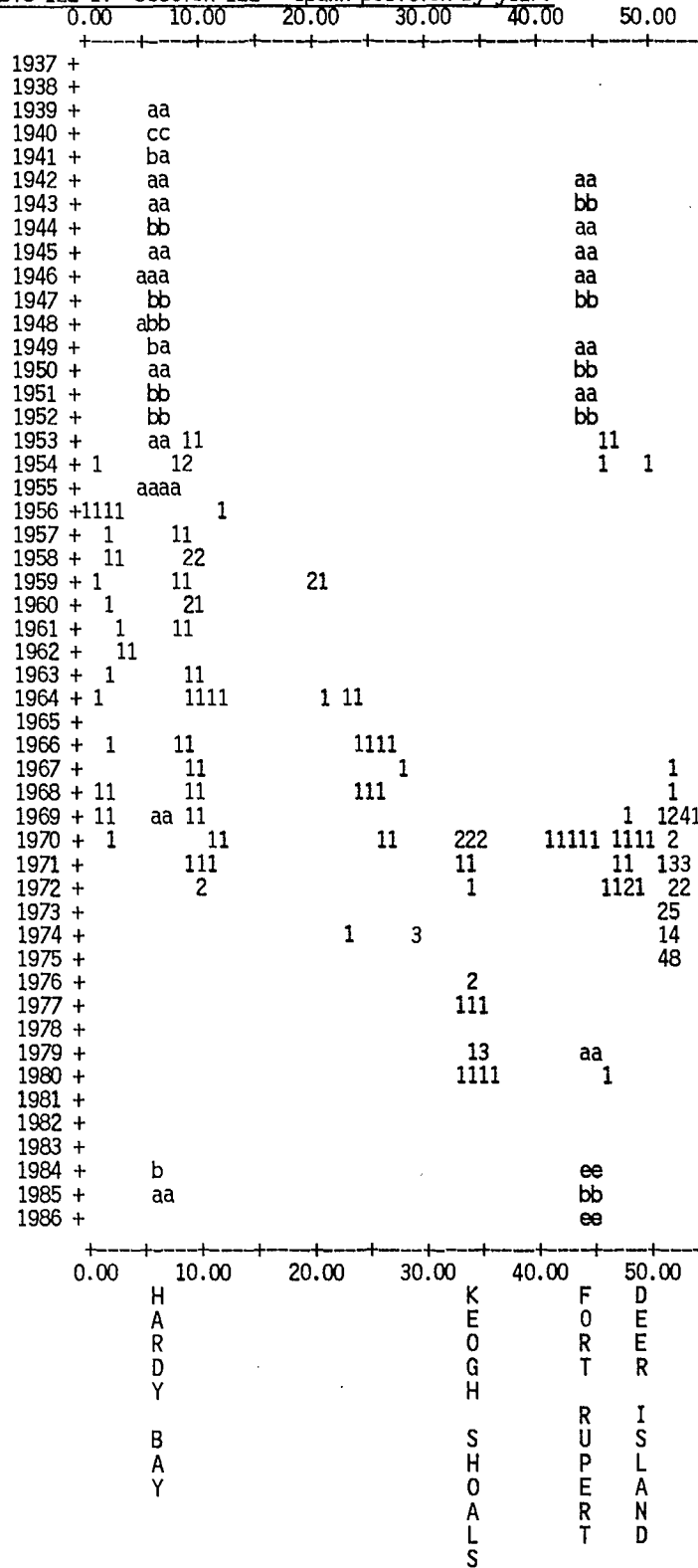


Table 122-2. Section 122 - histogram of cumulative spawn frequency over distance

position(km)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varh	varc	all
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
0.00	+	*															1	0	0	1
1.00	+	*	*	*	*	*	*										6	0	0	6
2.00	+	*	*	*	*	*	*	*	*								9	0	0	9
3.00	+	*	*	*	*	*	*										4	0	0	4
4.00	+	*															1	0	0	1
5.00	+	0	0	0													0	3	0	3
6.00	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	29
7.00	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	25
8.00	+	*	*	*	*	0											5	1	0	6
9.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	17	0	0	17
10.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	12	0	0	12
11.00	+	*	*	*													3	0	0	3
12.00	+	*	*	*													3	0	0	3
13.00	+																0	0	0	0
14.00	+																0	0	0	0
15.00	+																0	0	0	0
16.00	+																0	0	0	0
17.00	+																0	0	0	0
18.00	+																0	0	0	0
19.00	+																0	0	0	0
20.00	+	*	*	*													2	0	0	2
21.00	+	*	*														2	0	0	2
22.00	+																0	0	0	0
23.00	+	*	*	*													2	0	0	2
24.00	+	*	*	*	*												3	0	0	3
25.00	+	*	*	*	*	*											2	0	0	2
26.00	+	*	*	*	*	*	*										3	0	0	3
27.00	+	*	*	*	*	*	*										2	0	0	2
28.00	+	*															1	0	0	1
29.00	+	*	*	*	*												3	0	0	3
30.00	+																0	0	0	0
31.00	+																0	0	0	0
32.00	+																0	0	0	0
	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varh	varc	all

Table 122-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
KEOGH SHOALS	33.00	*****																5	0	0	5
	34.00	*****																9	0	0	9
	35.00	*****																7	0	0	7
	36.00	+																1	0	0	1
	37.00	+																0	0	0	0
	38.00	+																0	0	0	0
	39.00	+																0	0	0	0
	40.00	+																0	0	0	0
	41.00	+																1	0	0	1
	42.00	+																1	0	0	1
FORT RUPERT (BEAVER HR.)	43.00	+																1	0	0	1
	44.00	*****																1	27	0	28
	45.00	*****																1	27	0	28
	46.00	*****																4	0	0	4
	47.00	*****																4	0	0	4
DEER ISLAND	48.00	*****																5	0	0	5
	49.00	***																2	0	0	2
	50.00	***																2	0	0	2
	51.00	*****																9	0	0	9
	52.00	*****																28	0	0	28
	53.00	*****																9	0	0	9
	54.00	+																1	0	0	1
	55.00	+																0	0	0	0
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 122-3. Herring statistical spawn summary for section 122.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	1	12312	804	0	7.0	86.0	0.00	86.0	86	86	1	1
1940	3	49265	3217	0	5.7	91.0	7.94	94.0	76	103	3	1
1941	2	26034	1700	0	5.0	86.0	24.00	107.4	62	110	2	1
1942	2	18469	1206	9	7.0	93.0	16.00	98.3	77	109	2	2
1943	3	17489	1142	11	5.7	88.3	7.31	97.7	77	102	3	2
1944	3	24487	1599	10	7.0	83.7	7.67	82.6	76	99	2	2
1945	2	34992	2285	11	6.0	84.5	15.50	75.2	69	100	2	2
1946	2	32190	2102	4	5.0	92.5	11.50	103.0	81	104	2	2
1947	4	36386	2376	4	4.0	97.3	5.50	101.4	81	104	3	2
1948	2	32190	2102	5	4.0	119.0	0.00	119.0	119	119	1	1
1949	3	28270	1846	46	3.7	103.3	4.84	99.7	98	113	3	2
1950	3	27305	1783	69	2.3	102.0	7.77	105.4	87	113	3	2
1951	3	32190	2102	27	3.0	110.3	2.91	106.6	105	115	3	2
1952	4	18607	1215	22	3.0	98.0	9.08	103.5	72	114	4	2
1953	3	34992	2285	41	5.0	92.7	3.48	90.8	87	99	3	2
1954	5	33170	2166	25	4.6	89.2	7.01	95.6	74	106	4	2
1955	1	49265	3217	25	5.0	94.0	0.00	94.0	94	94	1	1
1956	3	33599	2194	17	4.3	102.7	5.78	103.3	93	113	3	1
1957	3	11899	777	6	4.3	95.7	6.67	103.1	89	109	2	1
1958	3	32190	2102	5	3.0	100.0	11.00	96.2	89	122	2	1
1959	4	26585	1736	8	4.0	87.3	12.43	84.9	72	124	3	2
1960	3	18193	1188	7	5.0	102.0	3.51	103.2	95	106	3	1
1961	2	30796	2011	6	5.0	82.0	2.00	82.2	80	84	2	1
1962	1	13997	914	5	5.0	92.0	0.00	92.0	92	92	1	1
1963	2	10505	686	5	3.0	106.0	2.00	106.1	104	108	2	1
1964	5	51777	3381	5	5.0	108.0	0.00	108.0	108	108	1	2
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	3	68867	4497	13	5.7	102.0	5.00	96.3	92	107	2	2
1967	3	46187	3016	21	5.0	98.3	6.89	101.5	85	108	3	2
1968	4	67887	4433	24	4.5	85.5	8.17	85.4	77	110	3	2
1969	8	93063	6077	61	4.3	96.6	4.36	99.6	88	118	4	2
1970	10	196662	12842	46	3.5	90.3	3.86	85.7	75	109	6	2
1971	7	88454	5776	89	3.4	100.0	3.21	102.4	90	114	4	4
1972	9	62282	4067	64	3.7	89.2	3.62	85.4	82	105	3	4
1973	6	27290	1782	8	4.0	94.0	0.00	94.0	94	94	1	2
1974	8	12251	800	6	2.8	85.0	0.00	85.0	85	85	1	1
1975	12	21654	1414	7	4.4	85.0	0.00	85.0	85	85	1	1
1976	2	8407	549	5	6.0	95.0	0.00	95.0	95	95	1	1
1977	1	27994	1828	5	5.0	94.0	0.00	94.0	94	94	1	1
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	5	10092	659	17	4.0	84.2	3.20	89.9	81	97	2	2
1980	3	26968	1761	33	3.0	98.0	5.00	94.0	93	108	2	2
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	1	12328	805	8	0.0	83.0	0.00	83.0	83	83	1	1
1984	7	66340	4332	12	0.0	82.0	1.29	83.7	77	84	2	2
1985	3	32159	2100	12	0.0	84.7	5.67	83.9	79	96	2	2
1986	5	44257	2890	38	0.0	98.4	5.78	92.7	89	114	3	1
All	169	1650298	107764	26	4.2	93.0	0.96	94.1	62	124	47	5

Table 122-4. Spawn summary for section 122 from 1937 to 1986.

A. GENERAL:

There are two main spawning areas near Port Hardy:

- (i) Hardy Bay and
- (ii) Beaver Harbour

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Port Hardy.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1939 except for the years, 1965, 1978 and 1981-82.

D. MAGNITUDE OF SPAWNINGS: SMALL

- | | |
|---|-------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 44/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 44/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 107.8 Km. |
| 4. CUMULATIVE SPAWN AREA | = 165.0 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = April 3 (93.0) |
| 2. MEAN WEIGHTED DATE (DOY) | = April 4 (94.1) |

F. COMMENTS:

This relatively small spawning location has a nearly continuous record of spawnings beginning in 1939 with a mean spawning date of April 3. Only four years (1965, 1968, 1981-82) have no records of spawning. The surrounding areas in section 121 and 128 have virtually no spawn records indicating a high geographic specificity for herring to spawn in this small area. On this basis, it should be considered as a separate, but small stock. If it is related to stocks in other areas, it would be to the complex of herring spawning generally in northern Johnstone Straits.

G. ROE FISHERIES:

- | | |
|---|-----------------------|
| 1. NUMBER OF SEINE FISHERY YEARS/15 YEARS | = 1/15 (1972-86) |
| 2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS | = 2/15 (1972-86) |
| 3. MEAN SEINE CATCH/YEAR | = 1200 tons (area 12) |
| 4. MEAN GILLNET CATCH/YEAR | = 1050 tons (area 12) |

Table 122-5. History of roe fishery catches by gear type in Beaver Harbour.

SECT. 122	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	-	-	-	-	-	-	-	-
1973	26/02- 05/04	240	(1200)	all area 12	26/02- 05/04	240	(900)	all area 12
1974	-	-	-	-	25/03- 28/03	72	(1200)	Beaver Hbr. & sect. 125, 126
1975	-	-	-	-	-	-	-	-
1976	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

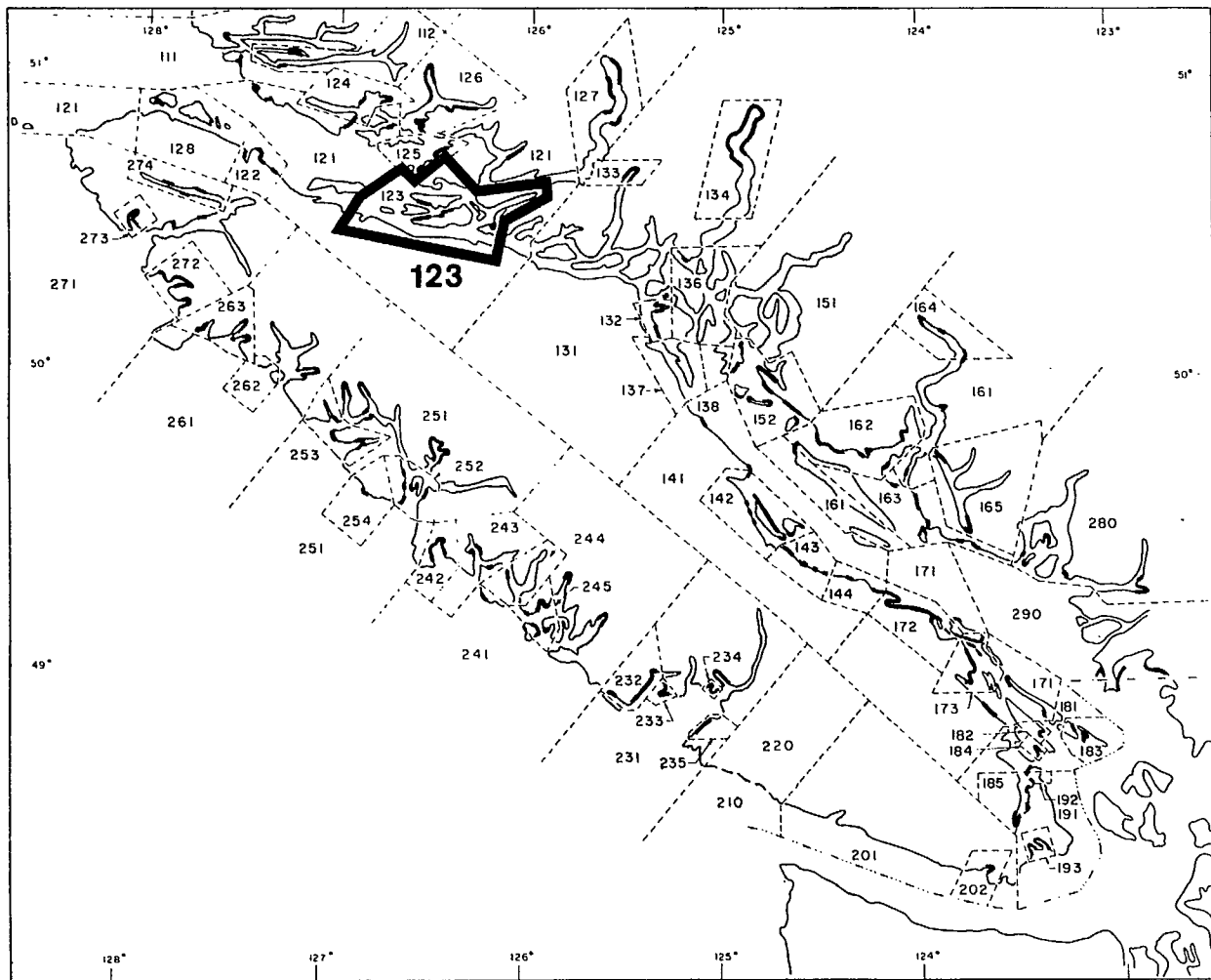


Fig. 123-1. Overview map showing location of section 123, Cracroft Island.

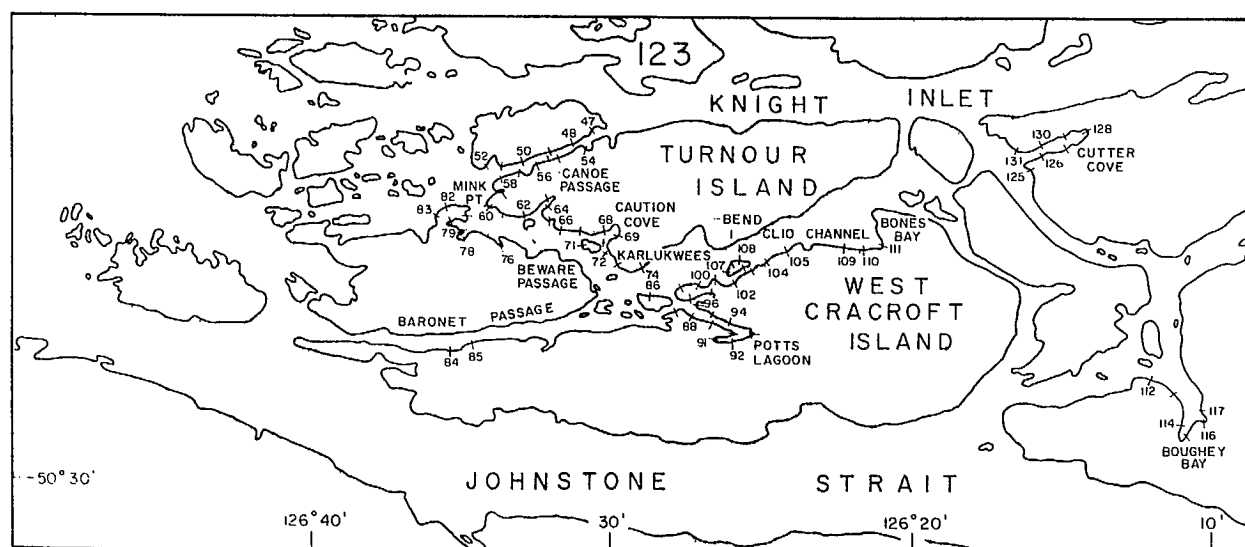


Fig. 123-2. Detailed map of section 123, Cracroft Island.

Table 123-1. Section 123 - spawn position by year.

	47.00	57.00	67.00	77.00	87.00	97.00	107.00
1937 +				~~~~~		aaaaa	^^
1938 +				~~~~~		aaaaa	^^
1939 +				~~~~~		abaaa	^^
1940 +			aba	~~~~~		aab	^^
1941 +			a			a	aa
1942 +			a			a	
1943 +			abcba			a	
1944 +			b			a	
1945 +			aaa			a	
1946 +			a				
1947 +			b				
1948 +			a				
1949 +			b				
1950 +	aa		aaaaa			a	
1951 +			a				
1952 +							^^ aa
1953 +		1111111					
1954 +		11111				1	
1955 +			b				
1956 +		1111					
1957 +			1	1			
1958 +						11	
1959 +		11112					
1960 +							
1961 +				11			
1962 +							
1963 +		1	1				
1964 +	11	11111				111	
1965 +			bcb			aaa	
1966 +		11		1			
1967 +		1		11			1
1968 +			1 1	a			121
1969 +			12			11	1 11
1970 +			11	aaa		1 111	1 1111
1971 +				11		3	1 1
1972 +				d	11	1 1	11
1973 +			11		22	122	
1974 +		1			121		11111 1
1975 +				^	12	11	111
1976 +				^			111
1977 +				11			111
1978 +							
1979 +							
1980 +			a			1212211111	
1981 +						c	aa
1982 +		1 1				e	
1983 +							
1984 +							
1985 +			a				
1986 +							
	47.00	57.00	67.00	77.00	87.00	97.00	107.00
		C M	B ~			P C	~ B
		A I	E N			O L	B O
		N K	W E			T I	O U
		O	A R			T O	N G
		E	E V			S	E H
		P T	A N			C	S E
		P	P A			L H	Y
		A S	A C			A A	B
		S S	S O			G N	A B
		A G	S U			O N	Y A
		E	A V			O E	Y
			E R			N L	

Table 123-2. Section 123 - histogram of cumulative spawn frequency over distance

	position(km)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
	+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																				
	46.00 +																	0	0	0	0
	47.00 +																	0	0	0	0
	48.00 +*																	1	0	0	1
	49.00 +*																	1	0	0	1
	50.00 +																	0	0	0	0
	51.00 +																	0	0	0	0
	52.00 +																	0	0	0	0
	53.00 +																	0	0	0	0
	54.00 +																	0	0	0	0
CANOE PASSAGE	55.00 +0																	0	1	0	1
	56.00 +*0																	1	1	0	2
	57.00 +*																	1	0	0	1
	58.00 +*****																	5	0	0	5
MINK PT.	59.00 +****																	4	0	0	4
	60.00 +*****																	6	0	0	6
	61.00 +*****																	5	0	0	5
	62.00 +*****																	5	0	0	5
	63.00 +***																	3	0	0	3
	64.00 +*****																	5	0	0	5
	65.00 +*****																	5	0	0	5
	66.00 +****																	4	0	0	4
	67.00 +*																	1	0	0	1
	68.00 +00																	0	2	0	2
	69.00 +00000000																	0	8	0	8
BEWARE PASSAGE	70.00 +*000000000000000000000000000000																	1	31	0	32
	71.00 +*00000000																	1	8	0	9
	72.00 +*00																	1	2	0	3
NEW VANCOUVER (KARLUKWE	73.00 +*																	1	0	3	4
	74.00 +*																	1	0	0	1
	75.00 +																	0	0	0	0
	76.00 +																	0	0	0	0
	77.00 +**																	2	0	0	2
	78.00 +*																	1	0	0	1
	+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																				
	0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75																				
		vara	varb	varc	all																

Table 123-2 (cont'd.)

				position(km)																vara	varb	varc	all
				0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
BARONET PASSAGE	79.00	+																		0	0	0	0
	80.00	+	*																	1	0	0	1
	81.00	+	*****																	6	0	0	6
	82.00	+	*****																	7	0	5	12
	83.00	+	*																	1	0	5	6
	84.00	+																		0	0	5	5
	85.00	+	*																	1	0	5	6
	86.00	+	*																	1	0	5	6
	87.00	+	*																	1	0	0	1
	88.00	+	*																	1	0	0	1
	89.00	+																		0	0	0	0
	90.00	+																		0	0	0	0
	91.00	+																		0	0	0	0
	92.00	+																		0	0	0	0
	93.00	+																		0	0	0	0
	94.00	+																		0	0	0	0
POTTS LAGOON	95.00	+	**																	2	0	0	2
	96.00	+	***0000																	3	4	0	7
	97.00	+	***00000000																	3	8	0	11
	98.00	+	***000000000000000000																	4	18	0	22
CLIO CHANNEL	99.00	+	***0000																	2	4	0	6
	100.00	+	*****000																	8	3	0	11
	101.00	+	***																	3	0	0	3
	102.00	+	***																	3	0	0	3
BEND ISLAND	103.00	+	**																	2	0	0	2
	104.00	+	**00																	2	2	0	4
	105.00	+	*****00																	5	2	0	7
	106.00	+	*****																	5	0	0	5
	107.00	+	***																	3	0	0	3
	108.00	+	**																	2	0	0	2
	109.00	+	**																	2	0	6	8
BONES BAY	110.00	+																		0	0	6	6
	111.00	+	*****																	7	0	0	7

Table 123-2 (cont'd.)

	position(km)																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
BOUGHEY BAY	112.00	+++++0															5	1	0	6
	113.00	+++++++0															9	1	0	10
	114.00	+++															3	0	0	3
	115.00	+															1	0	0	1
	116.00	+															1	0	0	1
	117.00	+															0	0	0	0
	118.00	+															0	0	0	0
	119.00	+															0	0	0	0
	120.00	+															0	0	0	0
	121.00	+															0	0	0	0
	122.00	+															0	0	0	0
	123.00	+															0	0	0	0
	124.00	+															0	0	0	0
	125.00	+															0	0	0	0
	126.00	+															0	0	0	0
	127.00	+++++															0	0	11	11
CUTTER COVE	128.00	+++++															0	0	11	11
	129.00	+															0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 123-3. Herring statistical spawn summary for section 123.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	3	151916	8043	0	6.3	66.7	1.45	67.2	64	69	3	3
1938	3	151916	8043	0	5.7	61.3	2.73	62.4	56	65	3	3
1939	4	155373	8226	0	4.5	70.5	7.93	63.9	60	94	4	4
1940	8	179190	9487	0	4.8	77.0	5.76	74.7	48	101	8	6
1941	6	131026	6937	0	5.3	85.7	8.12	98.2	61	118	6	6
1942	3	7669	406	7	5.0	72.0	7.77	71.2	61	87	3	3
1943	5	137939	7303	8	6.2	92.4	5.04	81.3	77	104	5	3
1944	4	25971	1375	50	6.0	78.8	7.20	74.8	68	100	4	3
1945	3	35566	1883	14	6.3	77.0	9.00	62.9	59	86	2	3
1946	2	11654	617	4	5.0	76.0	4.00	74.7	72	80	2	2
1947	3	23818	1261	3	5.0	77.7	8.45	81.9	62	91	3	2
1948	1	17264	914	5	5.0	92.0	0.00	92.0	92	92	1	1
1949	3	23818	1261	41	3.0	89.3	5.33	94.2	84	100	2	2
1950	3	104526	5534	6	4.3	84.3	3.67	87.7	77	88	2	3
1951	1	869	46	3	1.0	79.0	0.00	79.0	79	79	1	1
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	3	123433	6535	48	3.7	84.3	9.82	67.3	65	97	3	3
1954	2	107983	5717	5	4.0	73.0	4.00	70.2	69	77	2	2
1955	2	9066	480	21	5.0	75.5	13.50	87.7	62	89	2	1
1956	1	45577	2413	5	5.0	82.0	0.00	82.0	82	82	1	1
1957	2	774	41	4	3.5	90.5	5.50	89.8	85	96	2	1
1958	3	65598	3473	94	5.7	84.0	3.00	85.3	78	87	2	2
1959	3	58704	3108	6	3.7	84.0	0.00	84.0	84	84	1	2
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	2	13826	732	5	5.0	78.0	0.00	78.0	78	78	1	1
1962	1	510	27	18	3.0	100.0	0.00	100.0	100	100	1	1
1963	2	7253	384	6	4.0	58.5	1.50	59.9	57	60	2	1
1964	5	96688	5119	28	5.2	74.6	4.03	72.3	65	84	4	3
1965	4	96669	5118	17	4.5	72.0	2.12	72.2	69	78	3	2
1966	2	30372	1608	18	6.0	83.0	0.00	83.0	83	83	1	1
1967	5	13656	723	40	1.4	78.4	5.15	72.2	69	91	4	4
1968	6	49203	2605	30	4.7	85.0	1.34	84.5	82	88	2	2
1969	7	65182	3451	19	3.3	81.1	2.95	81.5	66	92	5	3
1970	7	159698	8455	24	3.0	79.1	4.16	74.9	67	96	6	4
1971	6	32960	1745	9	2.5	84.0	5.51	95.0	68	98	4	3
1972	11	104791	5548	5	3.7	84.5	0.72	85.4	82	87	3	3
1973	8	160548	8500	6	5.5	83.0	2.93	83.0	71	92	6	4
1974	5	104186	5516	7	4.6	90.6	9.66	110.3	77	127	4	4
1975	7	105301	5575	32	6.4	88.4	7.29	92.4	77	130	5	5
1976	2	53510	2833	10	5.0	106.5	16.50	100.6	90	123	2	2
1977	3	51791	2742	9	3.7	87.3	1.67	85.7	84	89	2	3
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	6	166139	8796	15	5.3	109.0	3.00	110.7	94	112	2	3
1981	4	20720	1097	27	0.0	98.0	0.00	98.0	98	98	1	2
1982	7	14846	786	8	0.0	93.0	0.00	93.0	93	93	1	2
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	1	4722	250	2	0.0	91.0	0.00	91.0	91	91	1	1
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	169	2922220	154713	18	4.5	83.3	1.06	81.4	48	130	51	13

Table 123-4. Spawn summary for section 123 from 1937 to 1986.

A. GENERAL:

The two main spawning areas in the West Cracroft Island section are:

- (i) Beware Passage and
- (ii) Clio Channel

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Alert Bay and Port Hardy.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1952, 1960, 1978-79, 1983-84 and 1986.

D. MAGNITUDE OF SPAWNINGS: MEDIUM

- | | |
|---|-------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 43/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 43/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 154.7 Km. |
| 4. CUMULATIVE SPAWN AREA | = 292.2 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|-------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = March 24 (83.3) |
| 2. MEAN WEIGHTED DATE (DOY) | = March 21 (81.4) |

F. COMMENTS:

Section 123 has a nearly continuous set of records (169 records recorded since 1937) but in recent years no spawns have been recorded for five of the last nine years. This is evidence that the fish which previously spawned here have spawned elsewhere in recent years. The mean spawning time (March 24) is similar to spawnings in other areas in Northern Johnstone Strait. Therefore it is not clear whether fish spawning in this area are a distinct stock or are a part of a larger stock which also spawns in adjacent locations.

G. ROE FISHERIES:

- | | |
|---|----------------------|
| 1. NUMBER OF SEINE FISHERY YEARS/15 YEARS | = 0/15 (1972-86) |
| 2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS | = 1/15 (1972-86) |
| 3. MEAN SEINE CATCH/YEAR | = 0 tons |
| 4. MEAN GILLNET CATCH/YEAR | = 274 tons (area 12) |

Table 123-5. History of roe fishery catches by gear type in Cracroft Island.

SECT. 123	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	-	-	-	-	-	-	-	-
1973	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-
1975	-	-	-	-	-	-	-	-
1976	-	-	-	-	07/03- 31/03	432	(274)	Karlukwees & sect. 125
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

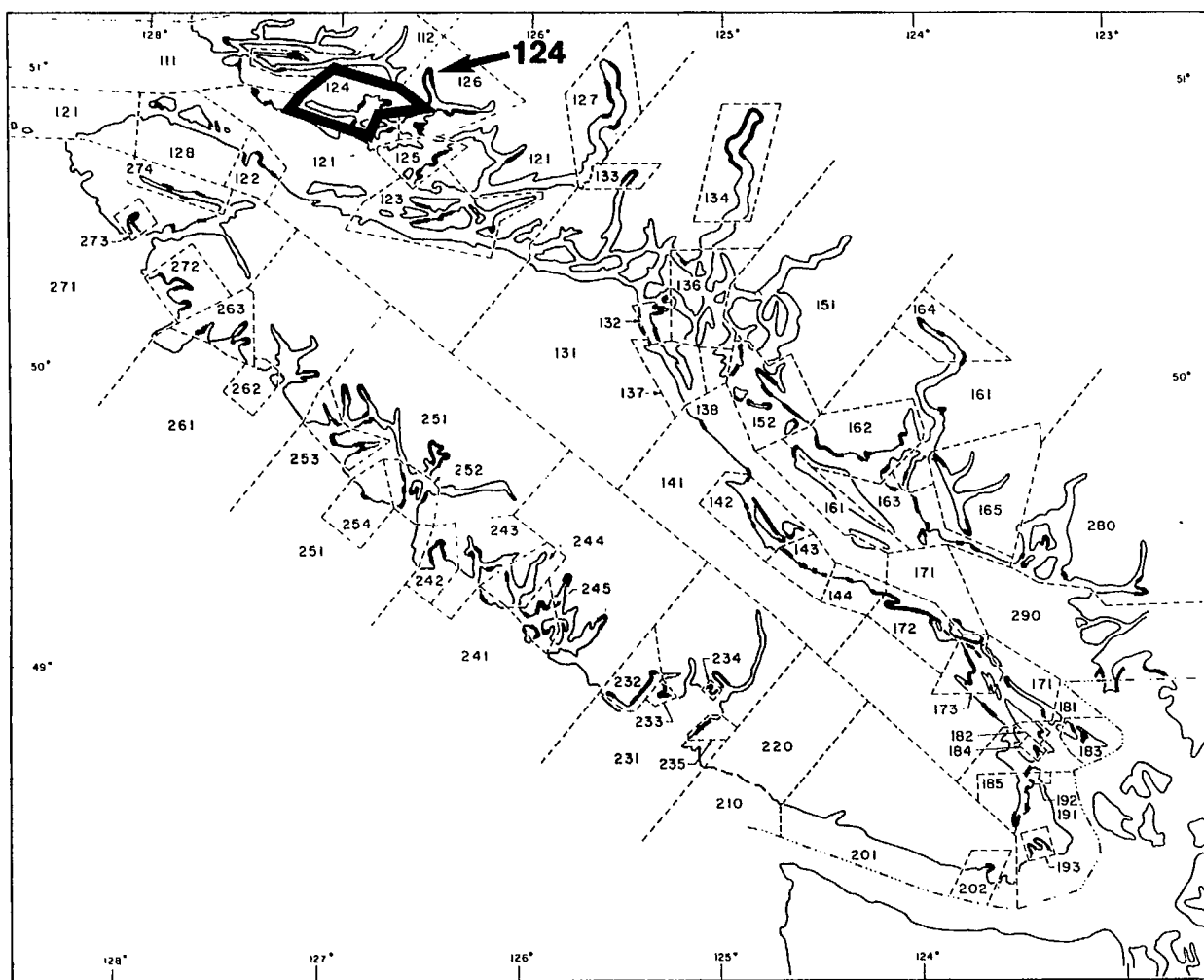


Fig. 124-1. Overview map showing location of section 124, Watson Island.

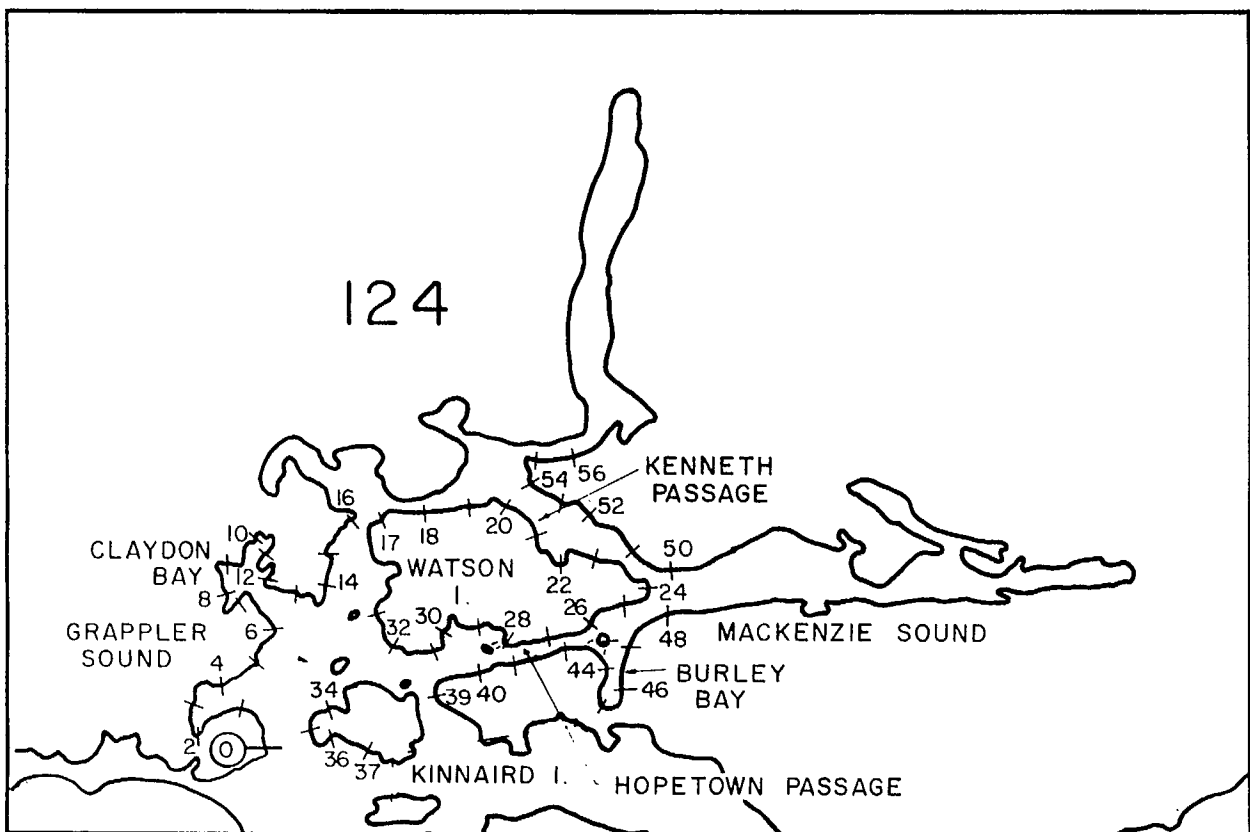


Fig. 124-2. Detailed map of section 124, Watson Island.

Table 124-1. Section 124 - spawn position by year.

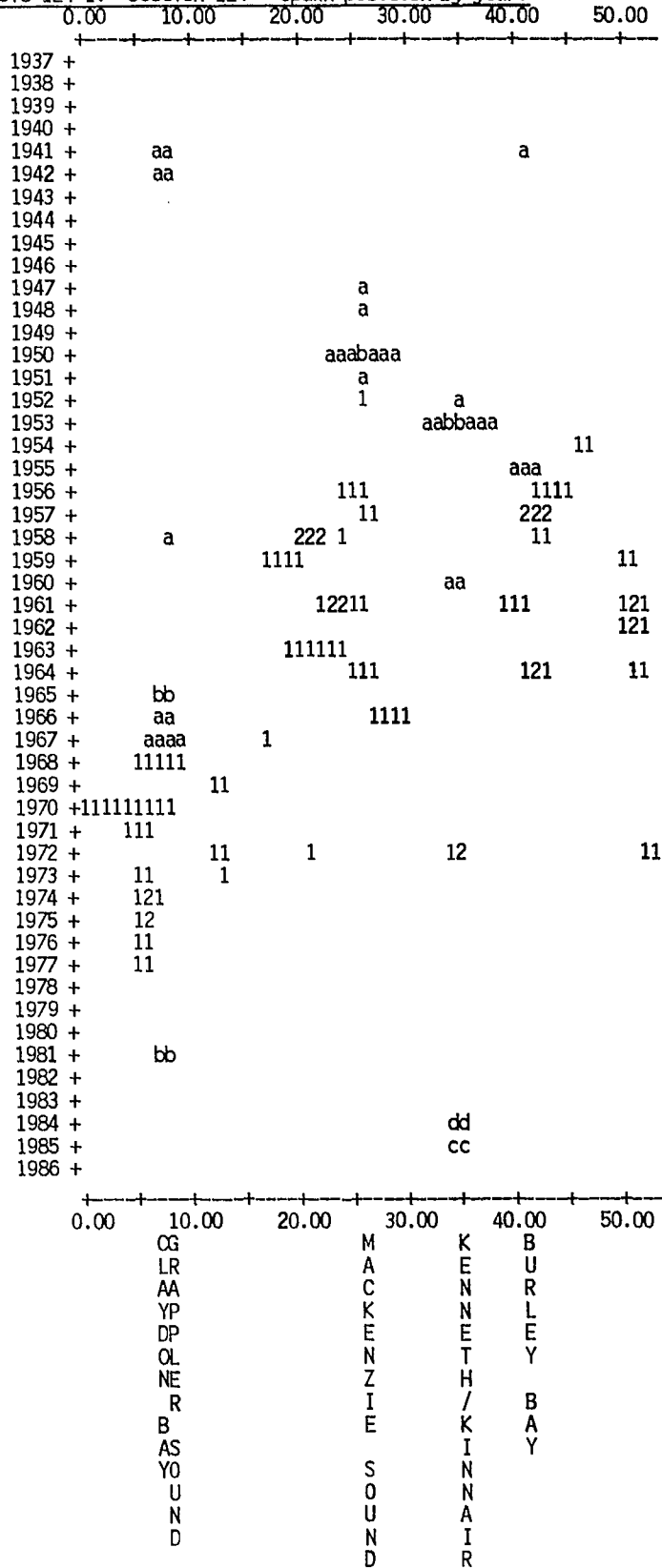


Table 124-2. Section 124 - histogram of cumulative spawn frequency over distance

position(km)		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all	
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																				
CLAYDON BAY GRAPPLER SOUND	0.00	+	*															1	0	0	1	
	1.00	+	*															1	0	0	1	
	2.00	+	*															1	0	0	1	
	3.00	+	*															1	0	0	1	
	4.00	+	*	*														2	0	0	2	
	5.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	8	0	0	8	
	6.00	+	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	10	1	0	11	
	7.00	+	*	*	*	*	0	0	0	0	0	0	0	0	0	0	0	3	8	0	11	
	8.00	+	*	*	*	0	0	0	0	0	0	0	0	0	0	0	0	2	9	0	11	
	9.00	+	*	0														1	1	0	2	
10.00	+																0	0	0	0		
11.00	+																0	0	0	0		
12.00	+	*	*														2	0	0	2		
13.00	+	*	*	*													3	0	0	3		
14.00	+																0	0	0	0		
15.00	+																0	0	0	0		
16.00	+																0	0	0	0		
17.00	+	*	*														2	0	0	2		
18.00	+	*															1	0	0	1		
19.00	+	*	*														2	0	0	2		
20.00	+	*	*	*	*												4	0	0	4		
21.00	+	*	*	*	*	*											4	0	0	4		
22.00	+	*	*	*	*	*											4	0	0	4		
23.00	+	*	*	*	0												3	1	0	4		
24.00	+	*	*	*	*	0											5	1	0	6		
25.00	+	*	*	*	0												3	1	0	4		
MACKENZIE SOUND	26.00	+	*	*	*	*	0	0	0	0	0	0	0	0	0	0	0	5	5	0	10	
	27.00	+	*	*	*	0											3	1	0	4		
	28.00	+	*	0													1	1	0	2		
	29.00	+	*	0													1	1	0	2		
	30.00	+	*														1	0	0	1		
	31.00	+															0	0	0	0		
	32.00	+	0														0	1	0	1		
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all	

Table 124-2 (cont'd.)

		position (km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
KENNETH/KINNAIR/HOPETOW	33.00	+0																0	1	0	1
	34.00	+*0000000000																1	10	0	11
	35.00	+**00000000000																2	11	0	13
	36.00	+0																0	1	0	1
	37.00	+0																0	1	0	1
	38.00	+0																0	1	0	1
	39.00	+*																1	0	0	1
	40.00	+*0																1	1	0	2
BURLEY BAY	41.00	+****00																4	2	0	6
	42.00	+*****0																6	1	0	7
	43.00	+*****																5	0	0	5
	44.00	+*																1	0	0	1
	45.00	+*																1	0	0	1
	46.00	+*																1	0	0	1
	47.00	+*																1	0	0	1
	48.00	+																0	0	0	0
	49.00	+																0	0	0	0
	50.00	+***																3	0	0	3
	51.00	+*****																6	0	0	6
	52.00	+*****																4	0	0	4
	53.00	+*																1	0	0	1
	54.00	+																0	0	0	0

Table 124-3. Herring statistical spawn summary for section 124.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	4	44380	3007	0	6.5	86.5	4.59	89.1	74	96	4	4
1942	1	17799	1206	3	5.0	88.0	0.00	88.0	88	88	1	1
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	1	2022	137	3	7.0	111.0	0.00	111.0	111	111	1	1
1948	1	2701	183	4	5.0	101.0	0.00	101.0	101	101	1	1
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	2	95978	6503	8	4.0	104.5	0.50	105.0	104	105	2	1
1951	1	2701	183	1	1.0	107.0	0.00	107.0	107	107	1	1
1952	2	9446	640	48	7.0	101.0	0.00	101.0	101	101	1	2
1953	2	106840	7239	5	5.0	108.5	14.50	97.2	94	123	2	2
1954	1	17799	1206	5	5.0	90.0	0.00	90.0	90	90	1	1
1955	1	23747	1609	5	7.0	110.0	0.00	110.0	110	110	1	1
1956	2	71227	4826	5	5.0	108.0	0.00	108.0	108	108	1	1
1957	3	75537	5118	11	3.7	106.7	4.67	110.0	102	116	2	2
1958	5	94827	6425	7	6.2	109.0	8.82	108.6	90	137	3	3
1959	3	57250	3879	5	4.3	111.0	3.00	113.2	108	117	2	1
1960	1	13490	914	3	5.0	105.0	0.00	105.0	105	105	1	1
1961	7	113320	7678	4	5.0	117.3	0.18	117.2	117	118	2	3
1962	2	33724	2285	5	3.0	117.0	0.00	117.0	117	117	1	1
1963	1	74193	5027	18	4.0	117.0	0.00	117.0	117	117	1	1
1964	4	67449	4570	5	5.0	113.0	0.00	113.0	113	113	1	2
1965	2	33724	2285	7	4.0	96.0	23.00	85.9	73	119	2	2
1966	2	49915	3382	4	6.0	100.0	11.00	106.8	89	111	2	2
1967	2	54712	3707	2	1.0	124.0	0.00	124.0	124	124	1	2
1968	1	56660	3839	4	5.0	97.0	0.00	97.0	97	97	1	1
1969	1	13490	914	6	5.0	89.0	0.00	89.0	89	89	1	1
1970	1	107918	7312	4	5.0	95.0	0.00	95.0	95	95	1	1
1971	2	11468	777	4	3.5	102.5	7.50	96.8	95	110	2	1
1972	6	27658	1874	34	4.5	101.7	8.47	102.1	82	131	4	3
1973	2	14833	1005	55	5.0	88.0	4.00	91.3	84	92	2	1
1974	2	28323	1919	55	6.0	114.0	0.00	114.0	114	114	1	1
1975	2	16191	1097	30	6.0	89.5	4.50	86.5	85	94	2	1
1976	1	16191	1097	41	5.0	84.0	0.00	84.0	84	84	1	1
1977	1	6745	457	18	5.0	85.0	0.00	85.0	85	85	1	1
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	2	32366	2193	7	0.0	72.0	1.00	72.5	71	73	2	2
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	4	41163	2789	64	0.0	101.0	0.00	101.0	101	101	1	1
1985	3	15940	1080	2	0.0	99.0	0.00	99.0	99	99	1	1
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	78	1451725	98362	16	4.9	103.3	1.61	104.4	71	137	34	9

Table 124-4. Spawn summary for section 124 from 1937 to 1986.

A. GENERAL:

There is one main spawning area centered in the Watson Island vicinity.

B. COMPLETENESS OF RECORDS:

Probably all spawning records prior to 1947 are incomplete.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1947 except for the years, 1949, 1978-80, 1982-83 and 1986.

D. MAGNITUDE OF SPAWNINGS: SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 35/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 33/40 (1947-86)
3. CUMULATIVE SPAWN LENGTH	= 98.4 Km.
4. CUMULATIVE SPAWN AREA	= 145.2 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= April 13 (103.3)
2. MEAN WEIGHTED DATE (DOY)	= April 14 (104.4)

F. COMMENTS:

Section 124 is geographically close to several areas which have continuous or nearly continuous spawning records. Section 124 is defined as having a "constant" record of spawnings but there are frequent gaps of 1-2 years, especially in recent years. It may be a significant part of a larger spawning stock that also spawns in adjacent locations, although its mean spawning time is considerably later than those of adjacent areas.

G. ROE FISHERIES:

No major roe fisheries are documented.

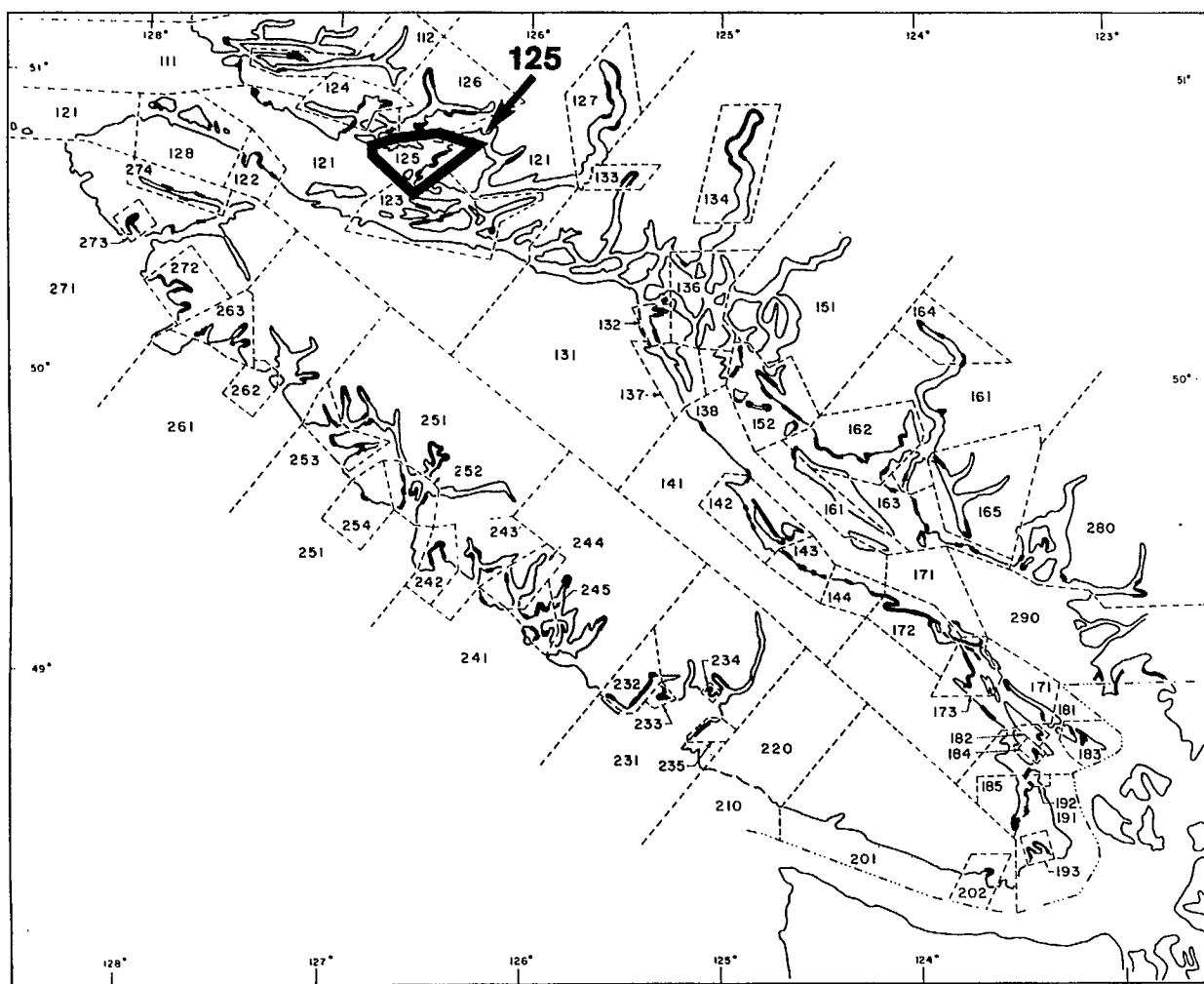


Fig. 125-1. Overview map showing location of section 125, Eden Island.

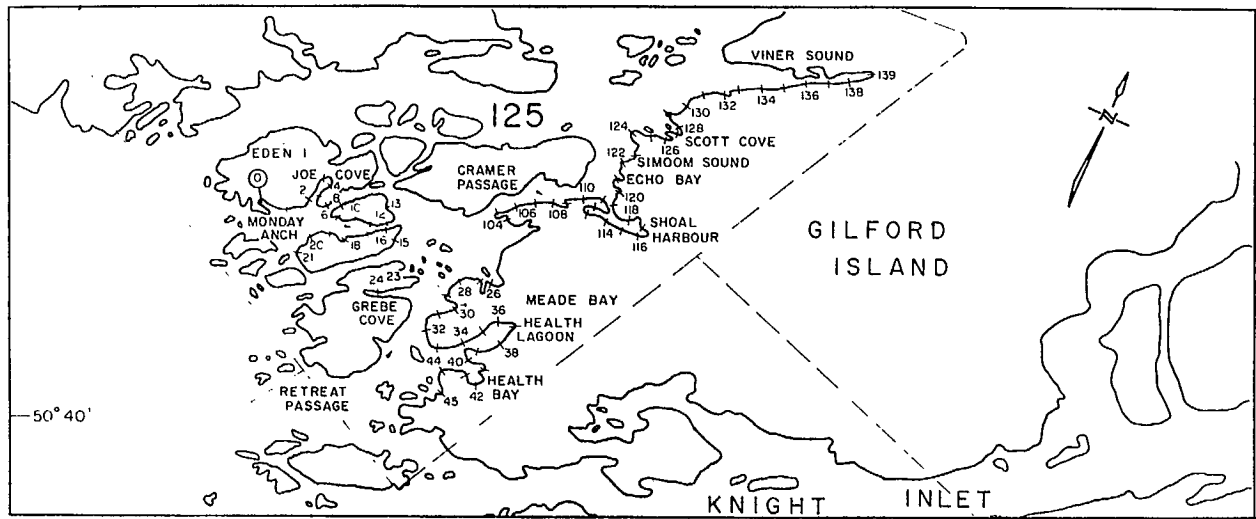


Fig. 125-2. Detailed map of section 125, Eden Island.

Table 125-1. Section 125 - spawn position by year.

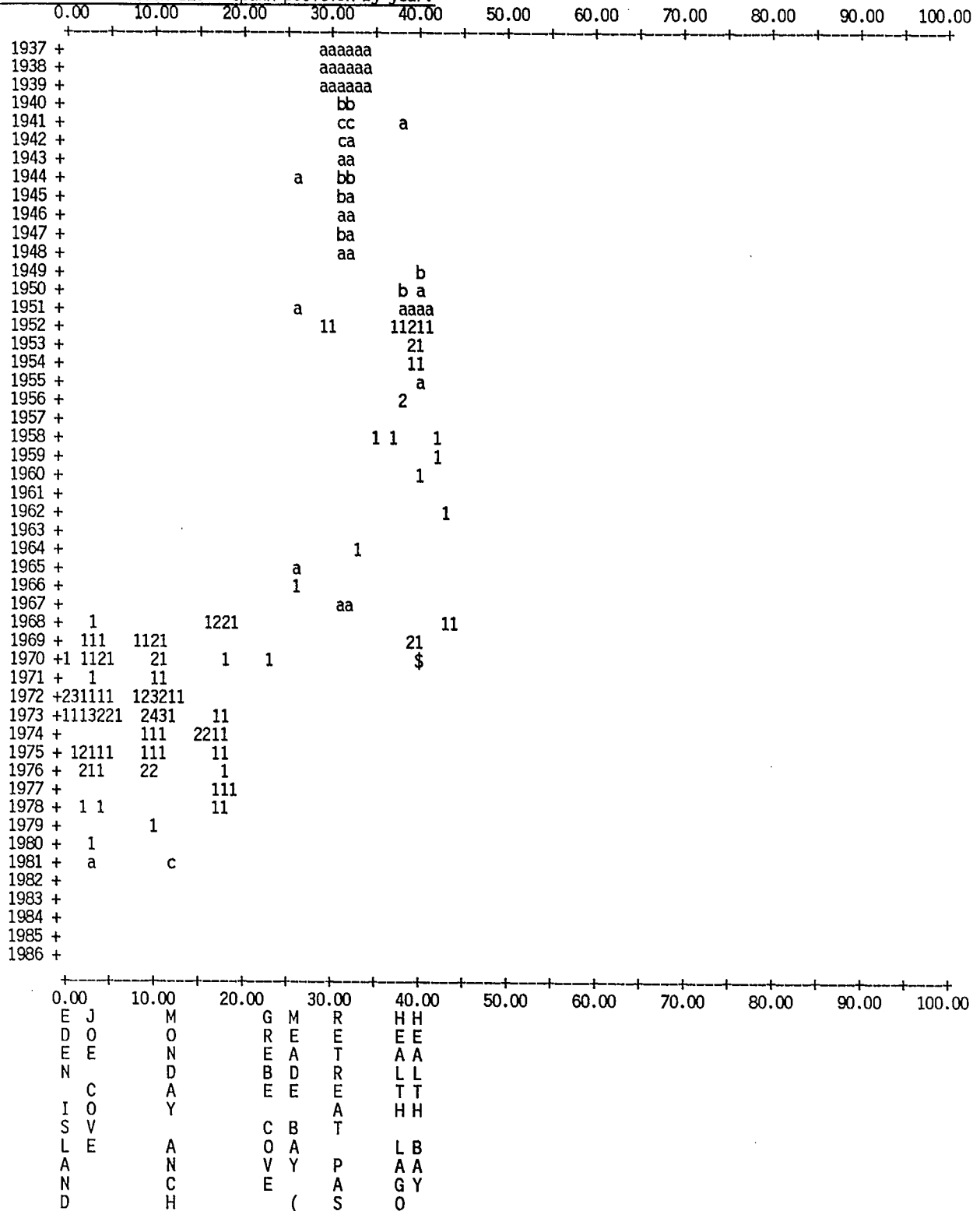


Table 125-1 (cont'd). Section 125 - spawn position by year.

	100.00	110.00	120.00	130.00
1937 +			aaa	aaaaa
1938 +			aaa	aaaaa
1939 +			aaa	aaaaa
1940 +			a	aaa
1941 +			a	aaa
1942 +			b	
1943 +			a	
1944 +			a	
1945 +			a	a
1946 +	~		a	b
1947 +				
1948 +			aaa	a
1949 +	~			a
1950 +	~		a	aaaaa
1951 +				aa
1952 +			1 1	aaaaa
1953 +			1	11
1954 +				
1955 +				
1956 +				
1957 +				
1958 +				
1959 +				
1960 +				
1961 +			1	
1962 +				
1963 +				
1964 +			1	
1965 +				
1966 +				
1967 +				1
1968 +				
1969 +				1
1970 +			11	
1971 +				
1972 +				
1973 +				
1974 +				
1975 +				
1976 +				
1977 +				
1978 +				
1979 +				
1980 +			112	
1981 +				
1982 +				
1983 +				
1984 +				
1985 +				
1986 +				
	100.00	110.00	120.00	130.00
	~		S	V
	C		H	I
	R		O	N
	A		A	E
	M		L	R
	E			
	R		H	S
			A	O
			R	U
			B	N
			O	D
			U	
			/	
			E	
			C	
			H	
			O	

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[illegible]

Table 125-2 (cont'd.)

		position(km).																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
	33.00	+	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	4
	34.00	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
	35.00	+	*															1	0	0	1
	36.00	+																0	0	0	0
	37.00	+	*	*	*													2	0	0	2
HEALTH LAGOON	38.00	+	*	*	*	0	0	0	0									3	4	0	7
	39.00	+	*	*	*	*	*	*	0									7	1	0	8
HEALTH BAY	40.00	+	*	*	*	*	*	*	*	0	0	0	0	0	0			8	6	0	14
	41.00	+	*	0														1	1	0	2
	42.00	+	*	*														2	0	0	2
	43.00	+	*	*														2	0	0	2
	44.00	+	*															1	0	0	1
	45.00	+																0	0	0	0
	46.00	+																0	0	0	0
	47.00	+																0	0	0	0
	48.00	+																0	0	0	0
	49.00	+																0	0	0	0
	50.00	+																0	0	0	0
	51.00	+																0	0	0	0
	52.00	+																0	0	0	0
	53.00	+																0	0	0	0
	54.00	+																0	0	0	0
	55.00	+																0	0	0	0
	56.00	+																0	0	0	0
	57.00	+																0	0	0	0
	58.00	+																0	0	0	0
	59.00	+																0	0	0	0
	60.00	+																0	0	0	0
	61.00	+																0	0	0	0
	62.00	+																0	0	0	0
	63.00	+																0	0	0	0
	64.00	+																0	0	0	0
	65.00	+																0	0	0	0
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				

Table 125-2 (cont'd.)

position(km)																
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	
																vara varb varc all
66.00 +																0 0 0 0
67.00 +																0 0 0 0
68.00 +																0 0 0 0
69.00 +																0 0 0 0
70.00 +																0 0 0 0
71.00 +																0 0 0 0
72.00 +																0 0 0 0
73.00 +																0 0 0 0
74.00 +																0 0 0 0
75.00 +																0 0 0 0
76.00 +																0 0 0 0
77.00 +																0 0 0 0
78.00 +																0 0 0 0
79.00 +																0 0 0 0
80.00 +																0 0 0 0
81.00 +																0 0 0 0
82.00 +																0 0 0 0
83.00 +																0 0 0 0
84.00 +																0 0 0 0
85.00 +																0 0 0 0
86.00 +																0 0 0 0
87.00 +																0 0 0 0
88.00 +																0 0 0 0
89.00 +																0 0 0 0
90.00 +																0 0 0 0
91.00 +																0 0 0 0
92.00 +																0 0 0 0
93.00 +																0 0 0 0
94.00 +																0 0 0 0
95.00 +																0 0 0 0
96.00 +																0 0 0 0
97.00 +																0 0 0 0
98.00 +																0 0 0 0
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara varb varc all

Table 125-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
CRAMER PASSAGE	99.00 +																	0	0	0	0
	100.00 +																	0	0	0	0
	101.00 +																	0	0	0	0
	102.00 +																	0	0	0	0
	103.00 +																	0	0	0	0
	104.00 +																	0	0	0	0
	105.00 +																	0	0	0	0
	106.00 +																	0	0	7	7
	107.00 +																	0	0	7	7
	108.00 +																	0	0	0	0
	109.00 +																	0	0	0	0
	110.00 +																	0	0	0	0
	111.00 +																	0	0	0	0
	112.00 +																	0	0	0	0
	113.00 +																	0	0	0	0
	114.00 +																	0	0	0	0
SHOAL HARBOU/ECHO BAY	115.00 +																	0	0	0	0
	116.00 +																	0	0	0	0
	117.00 +*0000																	1	4	0	5
	118.00 +***00000000000000																	3	13	0	16
	119.00 +0000																	0	4	0	4
	120.00 +*																	1	0	0	1
	121.00 +																	0	0	0	0
	122.00 +																	0	0	0	0
	123.00 +																	0	0	0	0
	124.00 +																	0	0	0	0
SCOTT COVE	125.00 +																	0	0	0	0
	126.00 +**																	0	0	0	0
	127.00 +**0																	2	0	0	2
	128.00 +000																	2	1	0	3
	129.00 +*																	0	3	0	3
	130.00 +*																	1	0	0	1
	131.00 +***000000																	1	0	0	1
																		3	6	0	9
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 125-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
VINER SOUND	132.00	+00000000																0	8	0	8
	133.00	+000000000000																0	12	0	12
	134.00	+00000000																0	8	0	8
	135.00	+ *000000																1	6	0	7
	136.00	+ *																1	0	0	1
	137.00	+																0	0	0	0
	138.00	+																0	0	0	0
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 125-3. Herring statistical spawn summary for section 125.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	3	188697	9652	0	6.3	71.3	1.45	71.7	69	74	3	3
1938	3	188697	9652	0	7.7	63.0	3.79	64.3	56	69	3	3
1939	3	188697	9652	0	6.3	72.7	1.33	72.0	70	74	2	3
1940	4	101523	5193	0	5.5	79.8	1.93	80.2	76	85	4	3
1941	6	115814	5924	0	6.3	87.3	8.42	98.4	69	118	5	4
1942	5	28778	1472	5	5.8	69.6	4.20	72.5	61	84	5	2
1943	2	28582	1462	8	6.0	78.0	0.00	78.0	78	78	1	2
1944	4	36637	1874	50	6.5	71.0	1.08	71.1	69	74	4	3
1945	4	28602	1463	42	6.0	71.5	1.50	71.5	67	73	2	3
1946	8	40234	2058	4	6.3	74.6	1.34	72.7	68	80	8	4
1947	2	12512	640	4	4.0	96.0	3.00	94.7	93	99	2	1
1948	3	67897	3473	5	4.3	85.7	6.77	83.1	77	99	3	3
1949	6	103674	5303	6	5.0	77.2	3.78	81.0	60	84	4	4
1950	8	116401	5954	100	4.8	87.8	4.34	84.2	74	115	5	6
1951	4	107564	5502	98	4.0	81.8	3.12	85.7	78	91	3	4
1952	9	42091	2153	41	3.9	77.4	3.23	81.0	66	95	6	5
1953	4	25298	1294	53	5.0	85.3	12.89	78.5	62	110	4	3
1954	2	4457	228	28	3.0	70.5	6.50	69.2	64	77	2	1
1955	2	5806	297	4	5.0	65.5	3.50	64.7	62	69	2	2
1956	2	723	37	2	3.0	74.0	11.00	71.3	63	85	2	1
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	3	7155	366	14	3.3	72.7	3.33	72.3	66	76	2	2
1959	1	1349	69	5	5.0	65.0	0.00	65.0	65	65	1	1
1960	1	3578	183	3	3.0	59.0	0.00	59.0	59	59	1	1
1961	1	17869	914	5	5.0	110.0	0.00	110.0	110	110	1	1
1962	1	1779	91	4	5.0	69.0	0.00	69.0	69	69	1	1
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	2	11613	594	4	5.0	79.5	2.50	79.7	77	82	2	2
1965	1	8934	457	14	7.0	78.0	0.00	78.0	78	78	1	1
1966	1	4106	210	3	5.0	77.0	0.00	77.0	77	77	1	1
1967	2	33939	1736	10	2.5	81.5	3.50	79.1	78	85	2	2
1968	6	38963	1993	9	4.3	89.8	3.11	84.9	83	98	3	3
1969	8	66666	3410	15	4.4	76.5	3.84	74.5	67	98	4	4
1970	12	128209	6558	20	3.9	76.3	3.78	76.1	58	100	8	5
1971	2	18768	960	115	6.0	74.0	14.00	86.7	60	88	2	2
1972	10	190476	9743	17	5.0	71.6	4.42	77.6	53	88	4	3
1973	12	226936	11608	22	3.6	74.3	4.51	77.4	57	99	8	2
1974	3	112569	5758	2	5.0	78.0	0.00	78.0	78	78	1	1
1975	7	88444	4524	17	5.9	89.6	2.72	89.8	75	95	5	2
1976	8	67917	3474	10	4.8	76.9	4.63	80.0	54	98	5	2
1977	1	53606	2742	9	7.0	89.0	0.00	89.0	89	89	1	1
1978	4	41094	2102	6	5.8	85.8	2.75	86.2	81	91	3	2
1979	1	3578	183	1	1.0	69.0	0.00	69.0	69	69	1	1
1980	3	52218	2671	3	4.7	104.0	7.23	114.3	91	116	3	2
1981	4	8680	444	7	0.0	77.0	0.58	77.1	76	78	2	2
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	1	1955	100	6	0.0	95.0	0.00	95.0	95	95	1	1
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	179	2623082	134173	24	4.9	78.5	0.96	79.3	53	118	48	14

Table 125-4. Spawn summary for section 125 from 1937 to 1986.

A. GENERAL:

There are three main spawning areas in this section:

- (i) Monday Anchorage
- (ii) Retreat Passage-Health Lagoon and
- (iii) Cramer Passage-Viner Sound

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Alert Bay and Port Hardy.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1957, 1963, 1982-84 and 1986.

D. MAGNITUDE OF SPAWNINGS: MEDIUM

- | | |
|---|-------------------|
| 1. NUMBER OF SPAWN YEARS/50 YEARS | = 44/50 (1937-86) |
| 2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS | = 44/50 (1937-86) |
| 3. CUMULATIVE SPAWN LENGTH | = 134.2 Km. |
| 4. CUMULATIVE SPAWN AREA | = 262.3 ha. |

E. SPAWNING TIME:

- | | |
|-------------------------------|-------------------|
| 1. MEAN UNWEIGHTED DATE (DOY) | = March 20 (78.5) |
| 2. MEAN WEIGHTED DATE (DOY) | = March 20 (79.3) |

F. COMMENTS:

Section 125 has a complex spawning history. There was relatively substantial spawnings in the 1940's and early 1950's followed by a decline in the late 1950's and 1960's. The spawn deposition increased in the 1970's but the main location shifted to Monday Anchorage. Spawning decreased again in the 1980's. Probably, herring spawning in Section 125 are part of a larger spawning stock in Area 12.

G. ROE FISHERIES:

- | | |
|---|----------------------|
| 1. NUMBER OF SEINE FISHERY YEARS/15 YEARS | = 0/15 (1972-86) |
| 2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS | = 3/15 (1972-86) |
| 3. MEAN SEINE CATCH/YEAR | = 0 tons |
| 4. MEAN GILLNET CATCH/YEAR | = 791 tons (area 12) |

Table 125-5. History of roe fishery catches by gear type in Eden Island.

SECT. 125	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE YEAR	TIME OPEN (D/Mo)	HAILED OPEN (hrs)	FISHING CATCH (Tons)	DATE YEAR	TIME OPEN (D/Mo)	HAILED OPEN (hrs)	FISHING CATCH (Tons)
1972	-	-	-	-	-	-	-	-
1973	-	-	-	-	26/02- 05/04	240	(900)	all area 12
1974	-	-	-	-	25/03- 28/03	72	(1200)	Monday Anch. & sect. 122, 126
1975	-	-	-	-	-	-	-	-
1976	-	-	-	-	07/03- 31/03	432	(274)	Monday Anch. & sect. 123
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

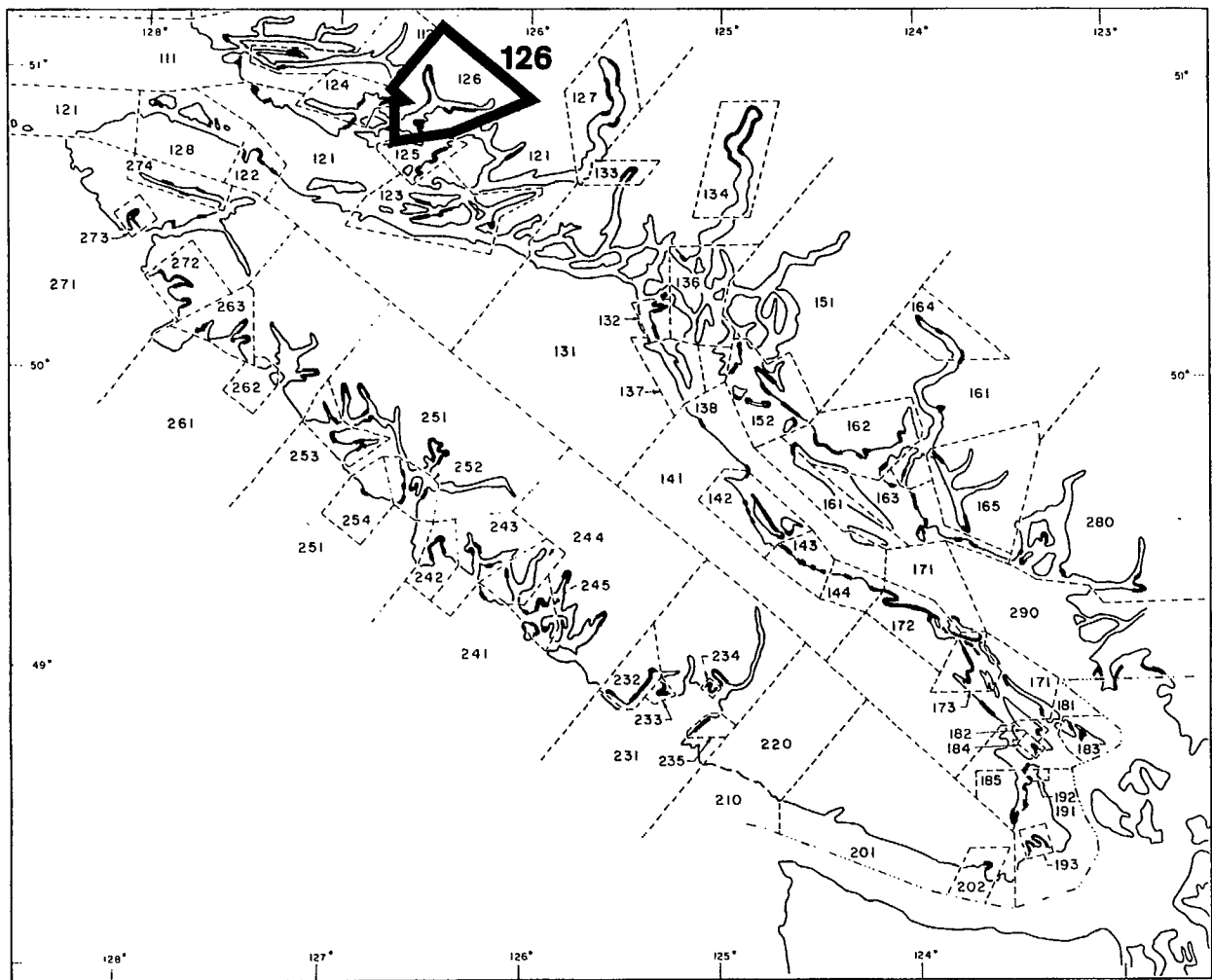


Fig. 126-1. Overview map showing location of section 126, Kingcome Inlet.

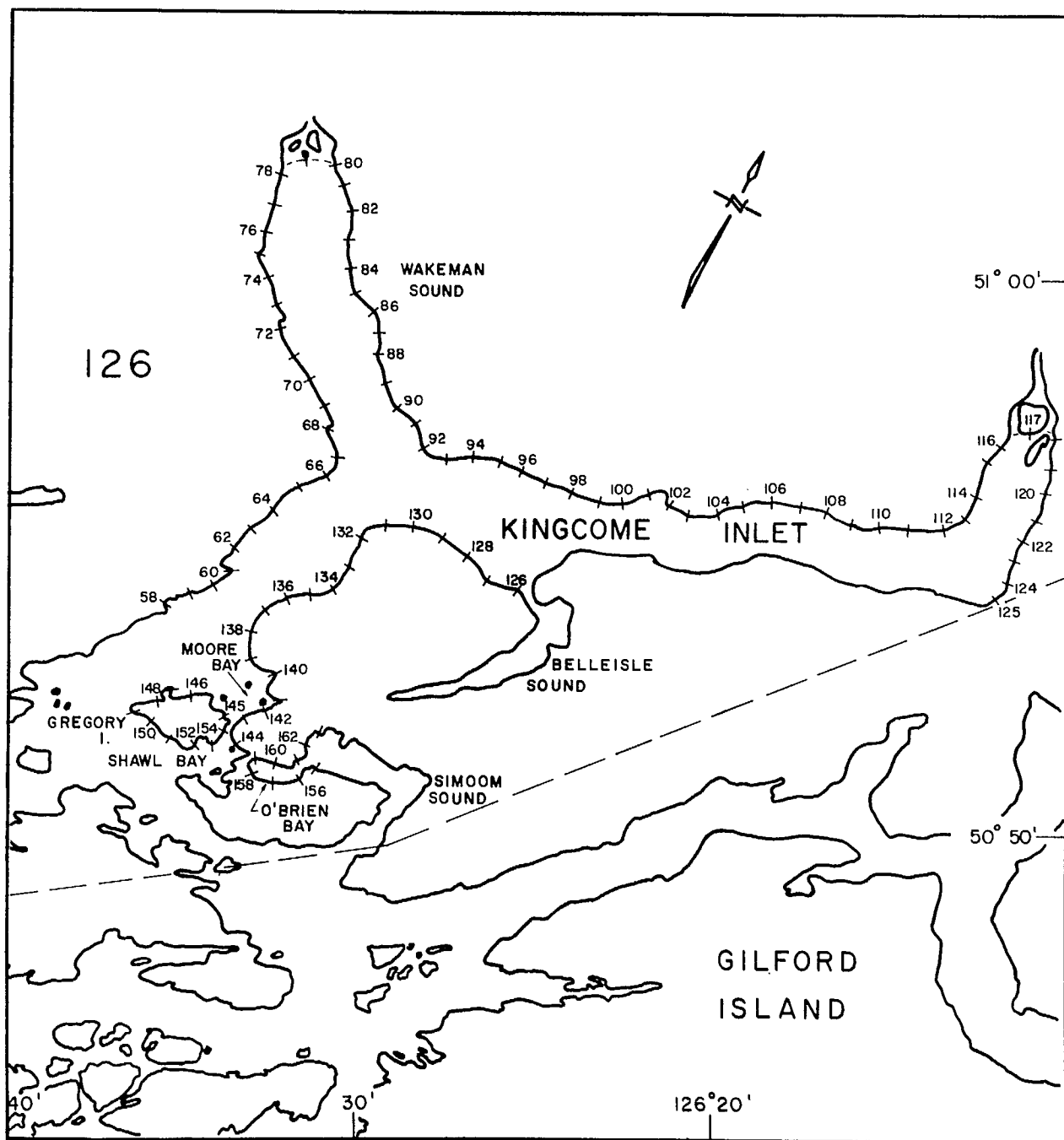


Fig. 126-2. Detailed map of section 126, Kingcome Inlet.

Table 126-1. Section 126 - spawn position by year.

Section 120 - spawn position by year											
	58.00	68.00	78.00	88.00	98.00	108.00	118.00	128.00	138.00	148.00	158.00
1937 +								^^			
1938 +								^^			
1939 +			aaaaaaaa					^^			
1940 +			bbbb					^^			
1941 +			bbbb					^^			
1942 +					b				a		a
1943 +			aaaaa								a
1944 +			aaaaaa								
1945 +			aaa		a						a
1946 +			aa		aa						
1947 +			aaaaa		b						
1948 +			aaaaa		c						
1949 +			aaaaaaaaaaaaa		aaa						
1950 +			aaaaaaaaaaaaa		aba						
1951 +			aaaaaaa		aaaaa						
1952 +	111111										
1953 +	11121111										
1954 +	111111111										
1955 +			a								
1956 +	1111111							1			
1957 +	111111										
1958 +	11 111 11		a							2	
1959 +	11111111111111								aaa		
1960 +	11111122121							1			
1961 +	1							1			
1962 +		111									
1963 +											
1964 +		11111111			11311111						
1965 +											
1966 +		11111								aa	
1967 +		11111				1			aa		
1968 +		111			111						12
1969 +		11111 111111			11		11			111	12
1970 +	12211 1111111111111111				111					2	11
1971 +	11111111111111111111						1	1111			
1972 +	12311111111111111111										
1973 +	11211112212111121111										
1974 +	111 11111112111111										
1975 +	11111 111111 1211111211111111										1 1
1976 +	11111111111 1112111										42
1977 +	11111111111111111111										
1978 +	11111 11111111							1			
1979 +	aaaa1211111 111				1111						
1980 +	1111112111111111				aaal				11 1	211	1 1
1981 +	dogb				ab						
1982 +	1 1 1111 13112121222121										
1983 +	cvg										
1984 +	bbbbbbb				bc						
1985 +	abddcaaa										a
1986 +	acjea										
	58.00	68.00	78.00	88.00	98.00	108.00	118.00	128.00	138.00	148.00	158.00
			W		K				M S	G	O
			A		I			B	O H	R	B
			K		N			E	O A	E	R
			E		G			L	R W	G	I
			M		C			L	E L	O R	E
			A		O			E	B B	Y	N
			N		M			I	A A		B
					E			S	Y Y		A
			S		I			L		I	Y
			O		N			E		S	
			U		L					L	
			N		E			S		A	
			D		T			D		N	

Table 126-1 (cont'd). Section 126 - spawn position by year.

158.00
+---
1937 +
1938 +
1939 +
1940 +
1941 +
1942 +
1943 +
1944 +
1945 +
1946 +
1947 +
1948 +
1949 +
1950 +
1951 +
1952 +
1953 +
1954 + 1
1955 +
1956 +
1957 +
1958 +
1959 +
1960 +
1961 +
1962 +
1963 +
1964 +
1965 +
1966 +
1967 +
1968 +2
1969 +2
1970 +
1971 +
1972 +
1973 +
1974 +
1975 +
1976 +
1977 +
1978 +
1979 +
1980 +11
1981 +
1982 +
1983 +
1984 +
1985 +
1986 +
+---
158.00

WAKEMAN SOUND

WAKEMAN SOUND

Table 126-2 (cont'd.)

	position(km)																vara	varb	varc	all
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
90.00	++++																4	0	0	4
91.00	+++																2	0	0	2
92.00	++																1	0	0	1
93.00	+																1	0	0	1
94.00	+																1	0	0	1
95.00	+																1	0	0	1
96.00	+																0	0	0	0
97.00	+																0	1	0	1
98.00	+00000000																0	8	0	8
99.00	+00000000000000000000																0	19	0	19
100.00	+0000																0	4	0	4
101.00	+*0																1	1	0	2
102.00	+																0	0	0	0
103.00	+																0	0	0	0
104.00	+																0	0	0	0
105.00	+																1	0	0	1
106.00	+																1	0	0	1
107.00	+++																3	0	0	3
108.00	+																1	0	0	1
109.00	+																1	0	0	1
110.00	+																1	0	0	1
111.00	++++																5	0	0	5
112.00	++++																5	0	0	5
113.00	++++																4	0	0	4
114.00	+																1	0	0	1
115.00	+																0	0	0	0
116.00	+																0	0	0	0
117.00	+																0	0	0	0
118.00	+																0	0	0	0
119.00	+																0	0	0	0
120.00	+																0	0	0	0
121.00	+																0	0	0	0
122.00	++																2	0	0	2

Table 126-2 (cont'd.)

		position (km)																		vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75						
BELLEISLE SOUND	123.00	+	*															1	0	0	1		
	124.00	+																0	0	0	0		
	125.00	+																0	0	5	5		
	126.00	+																0	0	5	5		
	127.00	+	*															1	0	0	1		
	128.00	+	*															1	0	0	1		
	129.00	+	*															1	0	0	1		
	130.00	+	*															1	0	0	1		
	131.00	+																0	0	0	0		
	132.00	+																0	0	0	0		
	133.00	+																0	0	0	0		
	134.00	+																0	0	0	0		
	135.00	+																0	0	0	0		
	136.00	+																0	0	0	0		
	137.00	+	*															1	0	0	1		
	138.00	+	*															1	0	0	1		
	139.00	+	*															1	0	0	1		
MOORE BAY	140.00	+	*															1	0	0	1		
	141.00	+	**0															2	1	0	3		
SHAWL BAY	142.00	+	0															0	1	0	1		
	143.00	+	*00															1	2	0	3		
	144.00	+	00															0	2	0	2		
GREGORY ISLAND	145.00	+																0	0	0	0		
	146.00	+																0	0	0	0		
	147.00	+																0	0	0	0		
	148.00	+	***0															3	1	0	4		
	149.00	+	***0															3	1	0	4		
	150.00	+	****															4	0	0	4		
	151.00	+	*															1	0	0	1		
	152.00	+																0	0	0	0		
	153.00	+																0	0	0	0		
	154.00	+																0	0	0	0		
	155.00	+	*															1	0	0	1		

Table 126-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
OBRIEN BAY /SIMOOM SOUND	156.00	*****																6	0	0	6
	157.00	*****0000																6	4	0	10
	158.00	*****																5	0	0	5
	159.00	+																1	0	0	1
	160.00	+																1	0	0	1
	161.00	+																0	0	0	0
	162.00	+																0	0	0	0
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 126-3. Herring statistical spawn summary for section 126.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	1	8544	1609	0	5.0	60.0	0.00	60.0	60	60	1	1
1938	1	8544	1609	0	7.0	59.0	0.00	59.0	59	59	1	1
1939	2	59796	11261	0	7.0	72.5	11.50	80.7	61	84	2	2
1940	3	42708	8043	0	6.3	86.0	1.00	86.4	84	87	2	2
1941	3	42708	8043	0	6.3	99.3	4.33	97.6	95	108	2	2
1942	4	2809	529	3	5.5	87.3	3.47	88.8	77	92	4	3
1943	2	25626	4826	8	5.0	81.5	0.50	81.2	81	82	2	2
1944	1	25626	4826	8	7.0	76.0	0.00	76.0	76	76	1	1
1945	3	12133	2285	8	7.0	92.7	0.33	92.3	92	93	2	3
1946	2	10673	2010	4	6.0	86.0	6.00	84.8	80	92	2	2
1947	3	24946	4698	3	7.0	92.0	0.00	92.0	92	92	1	2
1948	4	22568	4250	4	5.0	99.5	2.84	102.5	91	103	3	2
1949	2	98277	18508	5	5.0	89.0	0.00	89.0	89	89	1	2
1950	3	72264	13609	6	5.0	101.3	8.33	94.4	93	118	2	2
1951	2	51252	9652	6	3.0	87.5	0.50	87.7	87	88	2	2
1952	1	25626	4826	5	5.0	101.0	0.00	101.0	101	101	1	1
1953	2	38439	7239	5	7.0	95.0	0.00	95.0	95	95	1	2
1954	2	44652	8409	4	4.0	91.5	12.50	102.9	79	104	2	2
1955	1	196	37	4	5.0	110.0	0.00	110.0	110	110	1	1
1956	2	34244	6449	5	5.0	108.5	7.50	116.0	101	116	2	1
1957	2	24267	4570	5	4.5	109.0	6.00	111.4	103	115	2	1
1958	7	23290	4386	3	3.9	94.7	2.83	98.4	79	99	4	2
1959	2	85130	16032	4	4.0	101.5	6.50	96.3	95	108	2	2
1960	4	59207	11150	4	5.3	95.0	0.00	95.0	95	95	1	2
1961	2	3398	640	5	4.0	109.5	0.50	109.4	109	110	2	1
1962	1	12133	2285	3	3.0	117.0	0.00	117.0	117	117	1	1
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	4	77653	14624	3	4.8	88.0	4.00	92.0	84	100	2	2
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	2	23783	4479	5	6.0	90.0	4.00	86.8	86	94	2	2
1967	3	27033	5091	2	2.3	100.0	10.69	97.8	86	121	3	3
1968	4	24022	4524	3	5.5	94.5	4.97	90.0	84	103	3	3
1969	7	76395	14387	6	4.3	82.7	0.89	83.6	80	87	3	4
1970	8	144634	27238	3	4.0	89.5	5.66	80.7	78	117	6	4
1971	4	118057	22233	2	3.8	104.5	4.56	92.3	91	110	3	2
1972	5	109195	20564	2	3.4	76.6	5.14	75.1	64	85	2	2
1973	6	100587	18943	4	3.3	83.0	0.63	83.2	81	84	2	1
1974	5	87365	16453	2	4.0	83.0	0.00	83.0	83	83	1	1
1975	7	124488	23444	14	5.3	84.1	3.00	85.3	75	98	7	2
1976	7	96095	18097	12	6.1	91.7	2.60	94.6	80	100	6	3
1977	3	101920	19194	5	5.0	82.7	5.61	87.4	72	91	3	1
1978	3	65037	12248	5	5.7	82.7	8.69	89.2	73	100	3	2
1979	7	82507	15538	2	3.0	81.0	3.41	84.6	75	95	4	2
1980	11	90148	16977	6	4.9	94.0	3.96	91.3	80	121	7	7
1981	17	91959	17318	7	0.0	79.4	1.82	77.3	72	102	5	2
1982	17	85539	16109	3	0.0	79.3	1.77	80.2	75	92	3	1
1983	22	64251	12100	4	0.0	84.2	1.35	86.4	80	96	5	1
1984	5	77600	14614	4	0.0	80.8	5.63	72.5	69	94	3	2
1985	5	83510	15727	4	0.0	77.0	5.14	74.0	67	95	4	2
1986	10	56934	10722	4	0.0	82.4	0.16	82.1	82	83	2	1
All	224	2667770	502405	5	4.8	87.0	0.77	87.2	59	121	48	8

Table 126-4. Spawn summary for section 126 from 1937 to 1986.

A. GENERAL:

There is one major spawning area at the head of Wakeman Sound and secondary locations along Kingcome Inlet.

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Alert Bay and Port Hardy.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1963 and 1965.

D. MAGNITUDE OF SPAWNINGS: MEDIUM

1. NUMBER OF SPAWN YEARS/50 YEARS	= 48/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 48/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 502.4 Km.
4. CUMULATIVE SPAWN AREA	= 266.8 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 28 (87.0)
2. MEAN WEIGHTED DATE (DOY)	= March 28 (87.2)

F. COMMENTS:

Wakeman Sound is the center of spawning activity with only scattered occurrences of spawning elsewhere in Kingcome Inlet. The nearly continuous spawnings over time and the high number of spawning records (224) are sufficient to regard this as a separate stock. However, it also could be the center of spawning for a larger stock that also spawns in adjacent sections.

G. ROE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 5/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 6/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 1135 tons
4. MEAN GILLNET CATCH/YEAR	= 246 tons

Table 126-5. History of roe fishery catches by gear type in Kingcome Inlet.

SECT. 126	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	11/03- 08/04	672	2651	Wakeman Snd.	-	-	-	-
1973	26/02- 05/04	240	(1200)	all area 12	26/02- 05/04	240	(900)	all area 12
1974	-	-	-	-	25/03- 28/03	72	(1200)	Wakeman Snd. & sect. 122, 125
1975	16/03- 06/04	504	643	Kingcome Inlet & Wakeman Snd.	16/03- 11/04	624	763	Kingcome Inlet & Wakeman Snd.
1976	16/03	-	720	Kingcome Inlet & Wakeman Snd.	07/03- 31/03	432	125	Kingcome Inlet & Wakeman Snd.
1977	-	-	-	-	13/03- 25/03	240	46	Kingcome Inlet & Wakeman Snd.
1978	20/03- 22/03	-	525	Kingcome Inlet & Wakeman Snd.	15/03	24	50	Kingcome Inlet & Wakeman Snd.
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

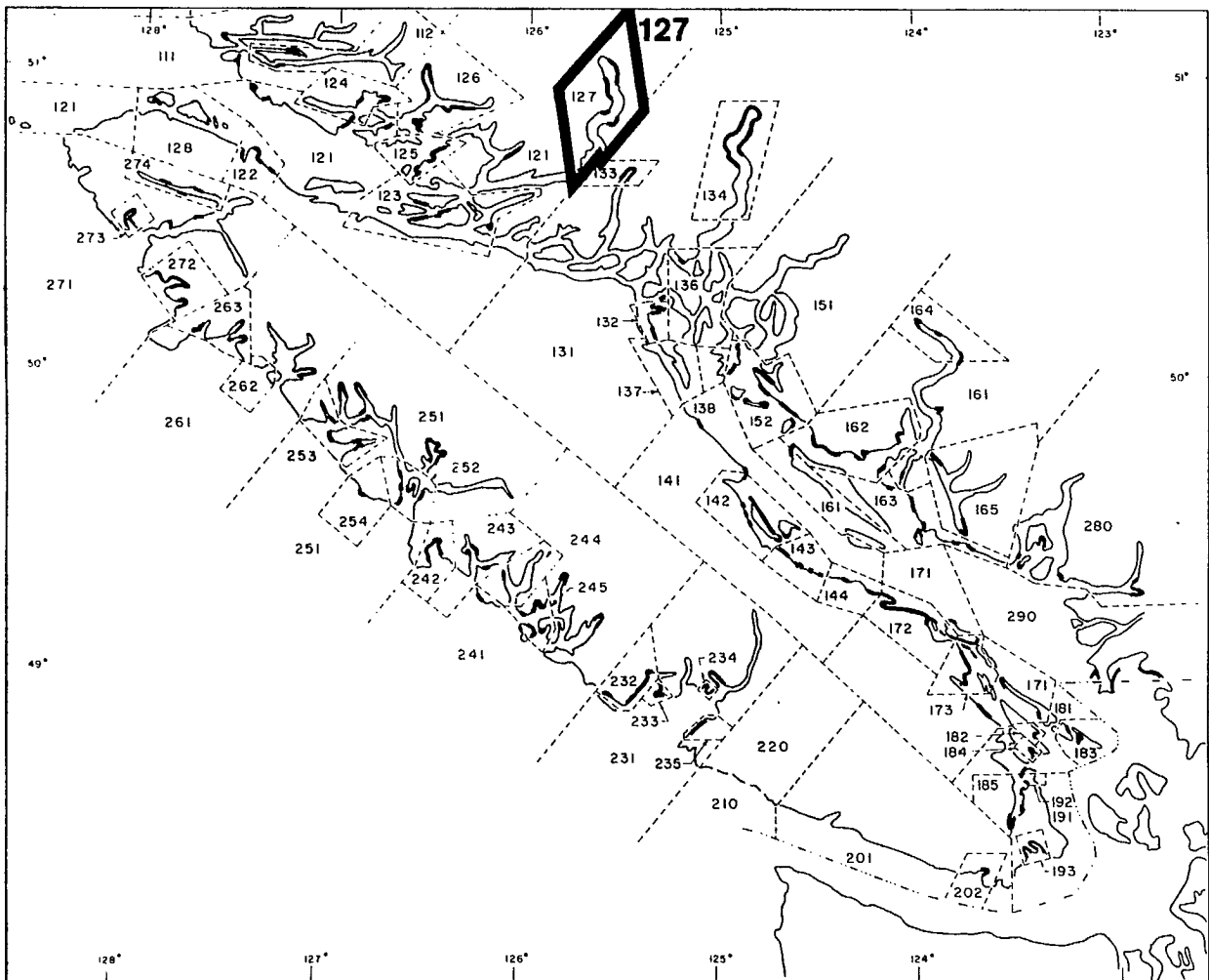


Fig. 127-1. Overview map showing location of section 127, Knight Inlet.

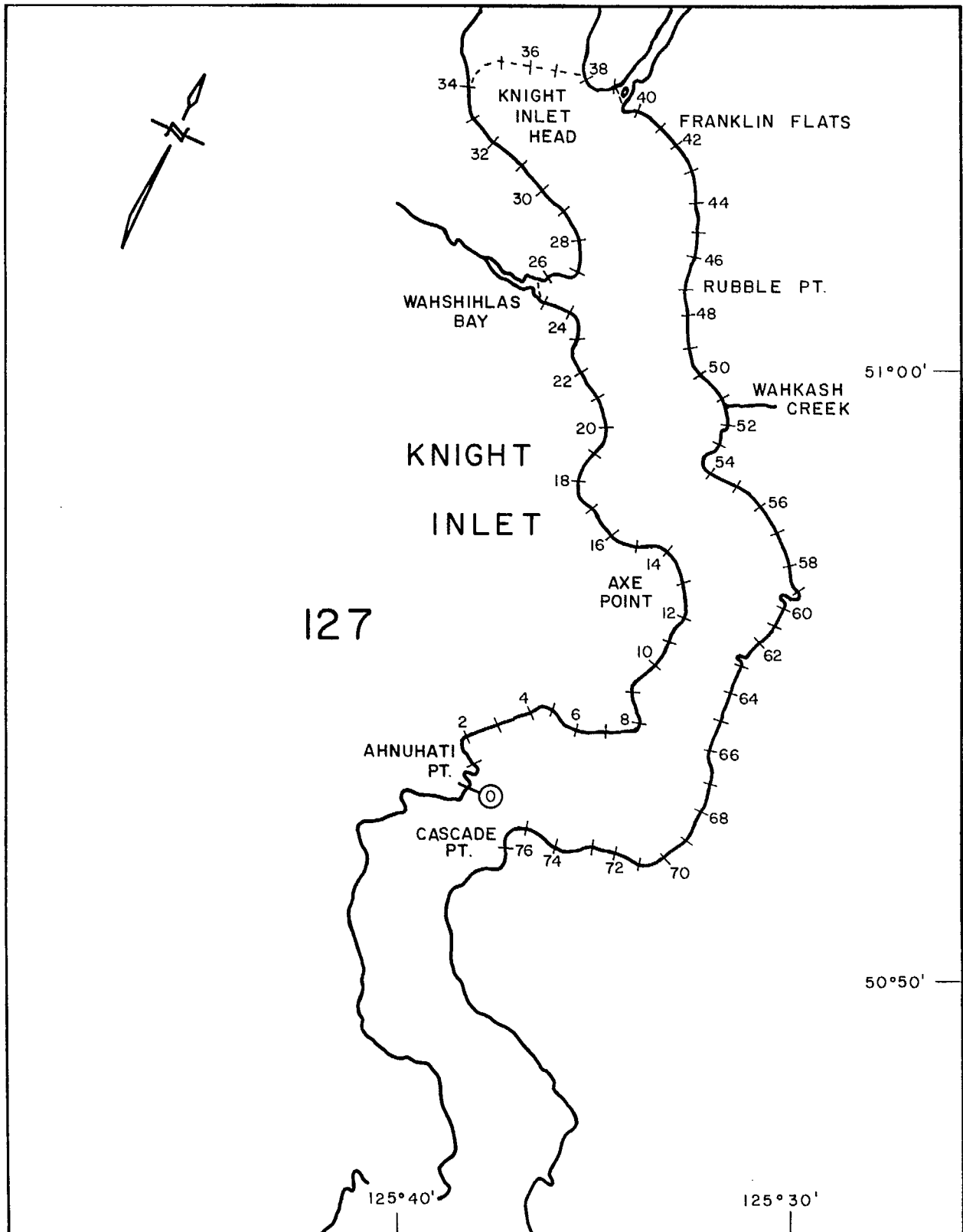
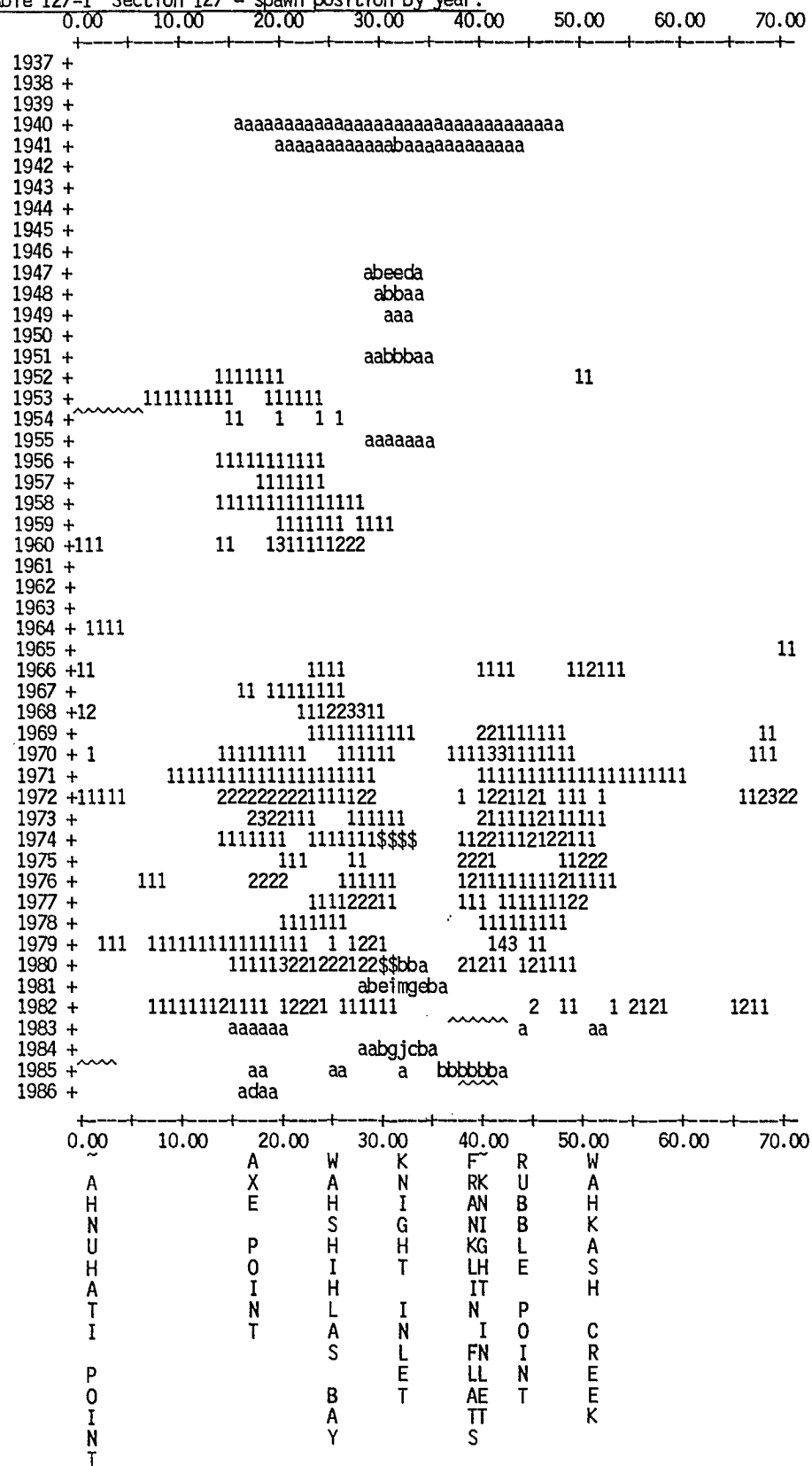


Fig. 127-2. Detailed map of section 127, Knight Inlet.

Table 127-1 Section 127 - spawn position by year.



- 208 -

[illegible]

Table 127-2 (cont'd.)

[illegible]

Table 127-2 (cont'd.)

position(km)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
66.00	***																3	0	0	3
67.00	***																3	0	0	3
68.00	*****																5	0	0	5
69.00	*****																5	0	0	5
70.00	***																3	0	0	3
71.00	***																3	0	0	3
72.00	+																0	0	0	0
73.00	+																0	0	0	0
74.00	+																0	0	1	1
75.00	+																0	0	1	1
76.00	+																0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

CASCADE POINT

Table 127-3. Herring statistical spawn summary for section 127.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	1	8506	804	0	5.0	61.0	0.00	61.0	61	61	1	1
1938	1	17023	1609	0	7.0	57.0	0.00	57.0	57	57	1	1
1939	1	17023	1609	0	5.0	69.0	0.00	69.0	69	69	1	1
1940	2	357414	33782	0	6.0	86.5	0.50	87.0	86	87	2	2
1941	2	257232	24313	0	7.0	83.0	11.00	93.8	72	94	2	1
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	5	127648	12065	3	7.0	78.4	6.91	81.9	64	98	5	1
1948	2	62856	5941	3	6.0	111.5	0.50	111.2	111	112	2	1
1949	1	17023	1609	5	7.0	104.0	0.00	104.0	104	104	1	1
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	2	93612	8848	5	5.0	88.5	0.50	88.3	88	89	2	1
1952	3	71468	6755	11	4.3	97.0	0.00	97.0	97	97	1	1
1953	2	136154	12869	5	5.0	98.0	0.00	98.0	98	98	1	1
1954	5	75827	7167	6	5.0	98.0	1.00	101.5	97	102	2	2
1955	1	68082	6435	5	7.0	90.0	0.00	90.0	90	90	1	1
1956	1	102118	9652	5	5.0	96.0	0.00	96.0	96	96	1	1
1957	1	66337	6270	5	5.0	99.0	0.00	99.0	99	99	1	1
1958	1	153177	14478	2	5.0	89.0	0.00	89.0	89	89	1	1
1959	2	98077	9270	4	4.0	90.0	0.00	90.0	90	90	1	1
1960	7	125712	11882	3	3.7	96.0	2.93	93.0	90	106	3	1
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	1	29010	2742	3	4.0	90.0	0.00	90.0	90	90	1	1
1965	1	17404	1645	3	1.0	88.0	0.00	88.0	88	88	1	1
1966	5	151823	14350	3	3.4	98.8	3.80	96.5	95	114	2	1
1967	2	80260	7586	4	3.0	88.0	4.00	84.5	84	92	2	1
1968	5	134419	12705	6	5.0	82.6	3.43	78.4	77	91	2	1
1969	4	210912	19935	8	3.0	80.3	0.25	80.1	80	81	2	1
1970	7	289628	27375	6	3.9	78.9	2.55	76.0	75	91	3	1
1971	2	428892	40538	1	1.0	91.0	0.00	91.0	91	91	1	1
1972	16	462240	43690	13	2.9	85.8	1.56	84.2	75	91	5	1
1973	8	255295	24130	62	5.3	81.0	0.46	81.5	78	82	3	1
1974	10	312343	29522	41	5.1	79.8	0.70	79.8	79	86	3	1
1975	7	145052	13710	43	5.1	82.6	0.48	82.3	80	84	4	1
1976	12	243689	23033	18	4.5	84.2	0.89	84.6	81	90	4	1
1977	7	234019	22119	29	4.4	81.7	0.71	81.6	80	84	4	1
1978	4	120877	11425	14	4.5	80.5	0.50	80.4	79	81	2	1
1979	11	263051	24863	1	2.1	73.9	1.61	77.1	71	89	4	1
1980	18	378087	35736	6	2.3	78.7	0.50	79.2	73	80	4	6
1981	13	351224	33197	4	0.0	77.1	2.61	77.5	70	92	4	1
1982	14	318225	30078	5	0.0	83.4	1.39	81.9	74	87	4	3
1983	9	277196	26200	5	0.0	75.7	1.14	74.9	72	81	5	7
1984	10	186229	17602	7	0.0	75.9	1.59	72.2	69	81	5	1
1985	13	411689	38912	5	0.0	81.8	2.79	85.1	67	94	5	6
1986	17	163800	15482	8	0.0	78.8	1.00	79.4	76	86	4	3
All	236	7320652	691933	12	4.0	82.6	0.59	84.1	57	114	41	12

Table 127-4. Spawn summary for section 127 from 1937 to 1986.

A. GENERAL:

There is one main spawning area at the head of Knight Inlet.

B. COMPLETENESS OF RECORDS:

Probably all spawning records prior to 1964 are incomplete.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a constant annual record of spawnings since 1964.

D. MAGNITUDE OF SPAWNINGS: LARGE

1. NUMBER OF SPAWN YEARS/50 YEARS	= 41/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 23/23 (1964-86)
3. CUMULATIVE SPAWN LENGTH	= 691.9 Km.
4. CUMULATIVE SPAWN AREA	= 732.1 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 24 (82.6)
2. MEAN WEIGHTED DATE (DOY)	= March 25 (84.1)

F. COMMENTS:

A total of 236 spawnings with a mean time of March 24 have been recorded in Knight Inlet. There has only been one 3-year time gap (1961-62) since 1951, and this could represent incomplete survey information. The spawns are concentrated at the head of Knight Inlet and are therefore geographically distant from the closest neighbouring location in Blackfish Sound. The surrounding area (section 121) has had negligible spawnings so it seems very likely that Knight Inlet supports a separate herring stock, which is probably non-migratory.

G. ROE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 3/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 3/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 1175 tons
4. MEAN GILLNET CATCH/YEAR	= 58 tons

Table 127-5. History of roe fishery catches by gear type in Knight Inlet.

SECT. 127	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE YEAR	TIME OPEN (D/Mo)	HAILED OPEN CATCH (Tons)	FISHING AREA	DATE YEAR	TIME OPEN (D/Mo)	HAILED OPEN CATCH (Tons)	FISHING AREA
1972	-	-	-	-	-	-	-	-
1973	26/02- 05/04	240	(1200)	all area 12	26/02- 05/04	240	(900)	all area 12
1974	17/03- 26/03	216	1800	Knight Inlet	-	-	-	-
1975	-	-	-	-	-	-	-	-
1976	21/03	-	550	Knight Inlet	07/03- 31/03	432	50	Knight Inlet
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	19/03	24	65	Knight Inlet
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

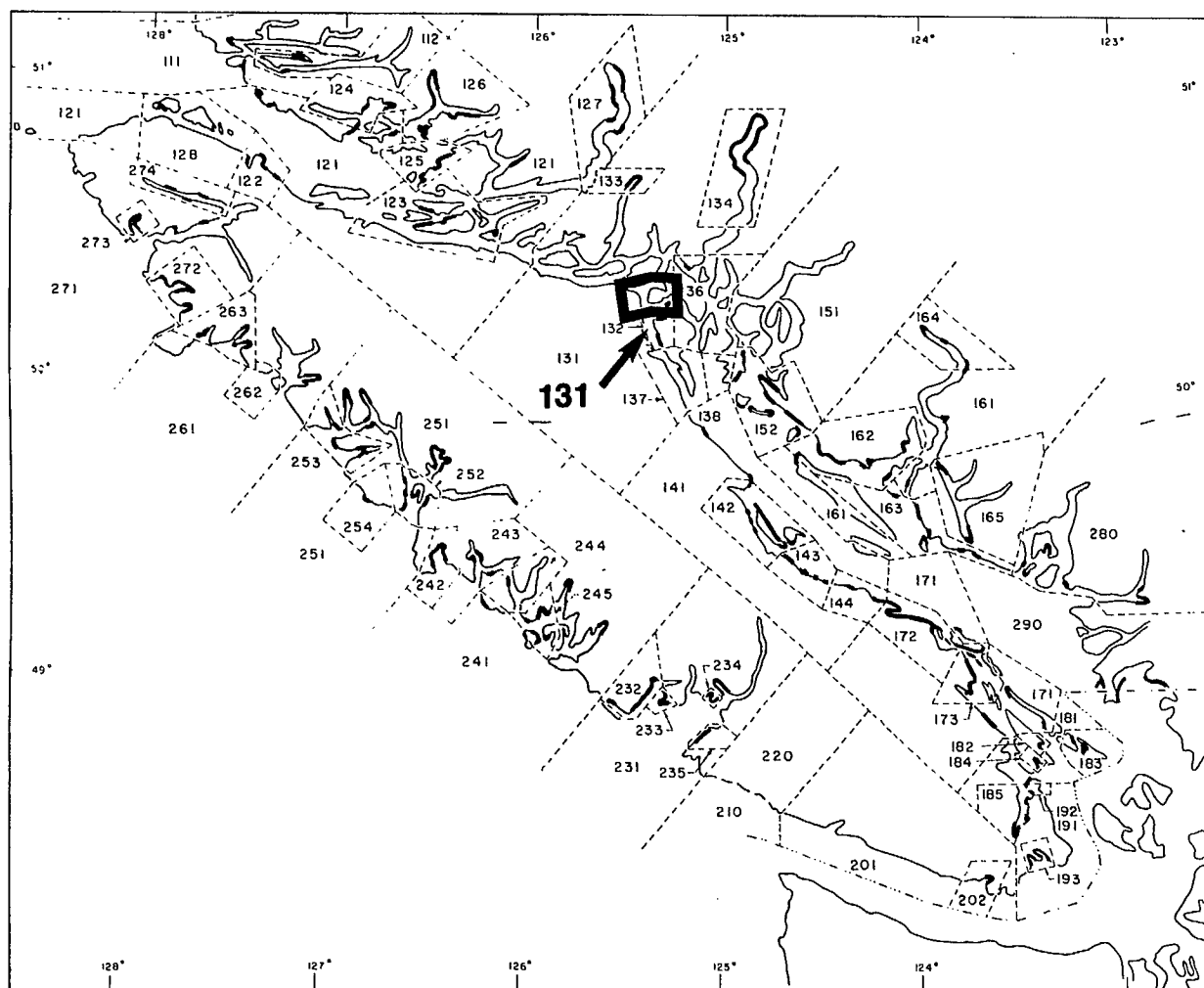


Fig. 131-1. Overview map showing location of section 131, Other Area 13 Strait.

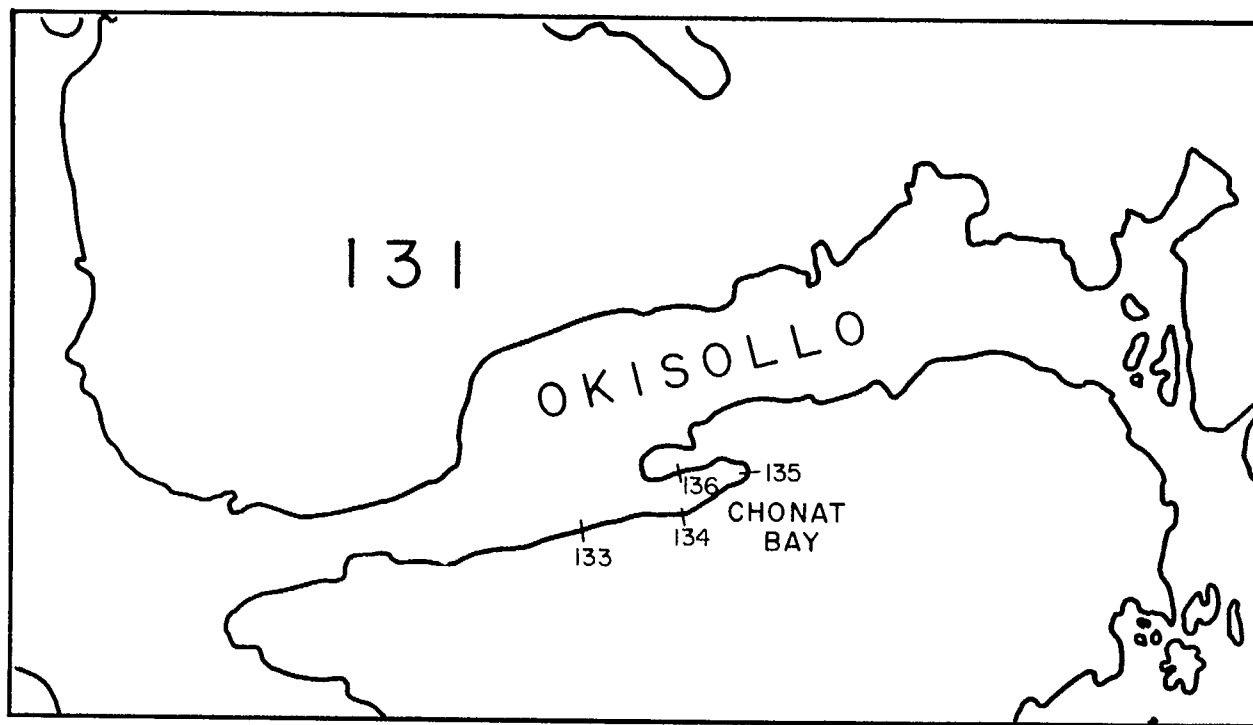


Fig. 131-2. Detailed map of section 131, Other Area 13 Strait.

Table 131-1. Section 131 - spawn position by year.

	54.00	64.00	74.00	84.00	94.00	104.00	114.00	124.00	134.00
1937 +									
1938 +									
1939 +									
1940 +									
1941 +									
1942 +									
1943 +									
1944 +									
1945 +									
1946 +									
1947 +									
1948 +									
1949 +									
1950 +									
1951 +									
1952 +									
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1972 +									
1973 +									
1974 +									
1975 +									
1976 +									
1977 +									
1978 +									
1979 +									
1980 +									
1981 +									
1982 + 1									
1983 +									
1984 +									
1985 +									
1986 +									
	54.00	64.00	74.00	84.00	94.00	104.00	114.00	124.00	134.00
R									C
O									H
C									O
K									N
Y									A
									T
I									B
S									A
L									Y
E									
T									
S									

Table 131-2. Section 131 - histogram of cumulative spawn frequency over distance

	position(km)																vara	varb	varc	all
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
	+-----+																			
ROCKY ISLETS	53.00 +																0	0	0	0
	54.00 +																0	0	0	0
	55.00 +*																1	0	0	1
	56.00 +																0	0	0	0
	57.00 +																0	0	0	0
	58.00 +																0	0	0	0
	59.00 +																0	0	0	0
	60.00 +																0	0	0	0
	61.00 +																0	0	0	0
	62.00 +																0	0	0	0
	63.00 +																0	0	0	0
	64.00 +																0	0	0	0
	65.00 +																0	0	0	0
	66.00 +																0	0	0	0
	67.00 +																0	0	0	0
	68.00 +																0	0	0	0
	69.00 +																0	0	0	0
	70.00 +																0	0	0	0
	71.00 +																0	0	0	0
	72.00 +																0	0	0	0
	73.00 +																0	0	0	0
	74.00 +																0	0	0	0
	75.00 +																0	0	0	0
	76.00 +																0	0	0	0
	77.00 +																0	0	0	0
	78.00 +																0	0	0	0
	79.00 +																0	0	0	0
	80.00 +																0	0	0	0
	81.00 +																0	0	0	0
	82.00 +																0	0	0	0
	83.00 +																0	0	0	0
	84.00 +																0	0	0	0
	85.00 +																0	0	0	0
	+-----+																			
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 131-1 (cont'd.)

position(km)															
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
vara	varb	varc	all												
86.00 +	0	0	0	0											
87.00 +	0	0	0	0											
88.00 +	0	0	0	0											
89.00 +	0	0	0	0											
90.00 +	0	0	0	0											
91.00 +	0	0	0	0											
92.00 +	0	0	0	0											
93.00 +	0	0	0	0											
94.00 +	0	0	0	0											
95.00 +	0	0	0	0											
96.00 +	0	0	0	0											
97.00 +	0	0	0	0											
98.00 +	0	0	0	0											
99.00 +	0	0	0	0											
100.00 +	0	0	0	0											
101.00 +	0	0	0	0											
102.00 +	0	0	0	0											
103.00 +	0	0	0	0											
104.00 +	0	0	0	0											
105.00 +	0	0	0	0											
106.00 +	0	0	0	0											
107.00 +	0	0	0	0											
108.00 +	0	0	0	0											
109.00 +	0	0	0	0											
110.00 +	0	0	0	0											
111.00 +	0	0	0	0											
112.00 +	0	0	0	0											
113.00 +	0	0	0	0											
114.00 +	0	0	0	0											
115.00 +	0	0	0	0											
116.00 +	0	0	0	0											
117.00 +	0	0	0	0											
118.00 +	0	0	0	0											
0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
vara	varb	varc	all												

Table 131-2 (cont'd.)

position(km)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
119.00 +																	0	0	0	0
120.00 +																	0	0	0	0
121.00 +																	0	0	0	0
122.00 +																	0	0	0	0
123.00 +																	0	0	0	0
124.00 +																	0	0	0	0
125.00 +																	0	0	0	0
126.00 +																	0	0	0	0
127.00 +																	0	0	0	0
128.00 +																	0	0	0	0
129.00 +																	0	0	0	0
130.00 +																	0	0	0	0
131.00 +																	0	0	0	0
132.00 +																	0	0	0	0
133.00 +*																	1	0	0	1
134.00 +*																	1	0	0	1
135.00 +																	0	0	0	0
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

CHONAT BAY

Table 131-3. Herring statistical spawn summary for section 131.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	1	1004	55	2	5.0	61.0	0.00	61.0	61	61	1	1
1948	1	840	46	7	5.0	73.0	0.00	73.0	73	73	1	1
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1951	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1952	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1953	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1954	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1955	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1956	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1959	1	3342	183	1	1.0	111.0	0.00	111.0	111	111	1	1
1960	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1963	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1964	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	1	1169	64	64	5.0	67.0	0.00	67.0	67	67	1	1
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1970	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1971	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1972	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1973	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1974	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1975	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1976	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1977	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1978	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1979	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1980	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1981	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1982	1	4566	250	15	0.0	90.0	0.00	90.0	90	90	1	1
1983	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	5	10921	598	18	4.0	80.4	9.05	90.0	61	111	5	4

Table 131-4. Spawn summary for section 131 from 1937 to 1986.

A. GENERAL:

There is one main spawning area at Chonat Bay.

B. COMPLETENESS OF RECORDS:

The 50 year record probably is incomplete although it is unlikely that many large spawnings would have been unreported because of the close proximity of Kelsey Bay and Campbell River.

C. SPAWNING CONSISTENCY OVER TIME: INFREQUENT

There have been only five recorded spawnings, 1947, 1948, 1959, 1967, and 1982.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 5/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 5/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 0.6 Km.
4. CUMULATIVE SPAWN AREA	= 1.1 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 21 (80.4)
2. MEAN WEIGHTED DATE (DOY)	= March 31 (90.0)

F. COMMENTS:

Only five spawns have been recorded in section 131. It is likely that these belong to the much larger and more frequent spawning stock of sections 132, 136, 137 and 138 with an epicenter at Deepwater Bay (section 132).

G. ROE FISHERIES:

No major roe fisheries are documented.

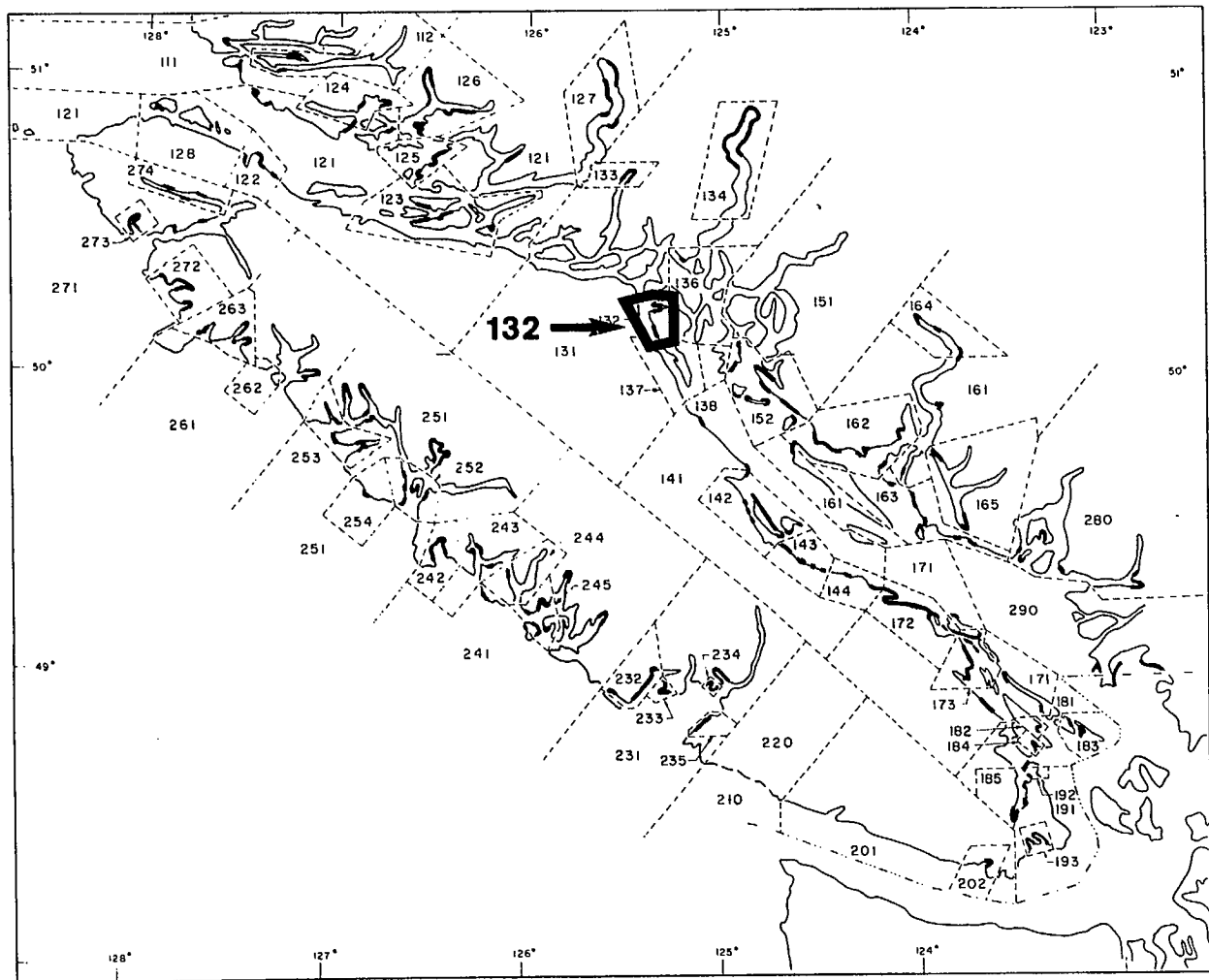


Fig. 132-1. Overview map showing location of section 132, Kanish Bay.

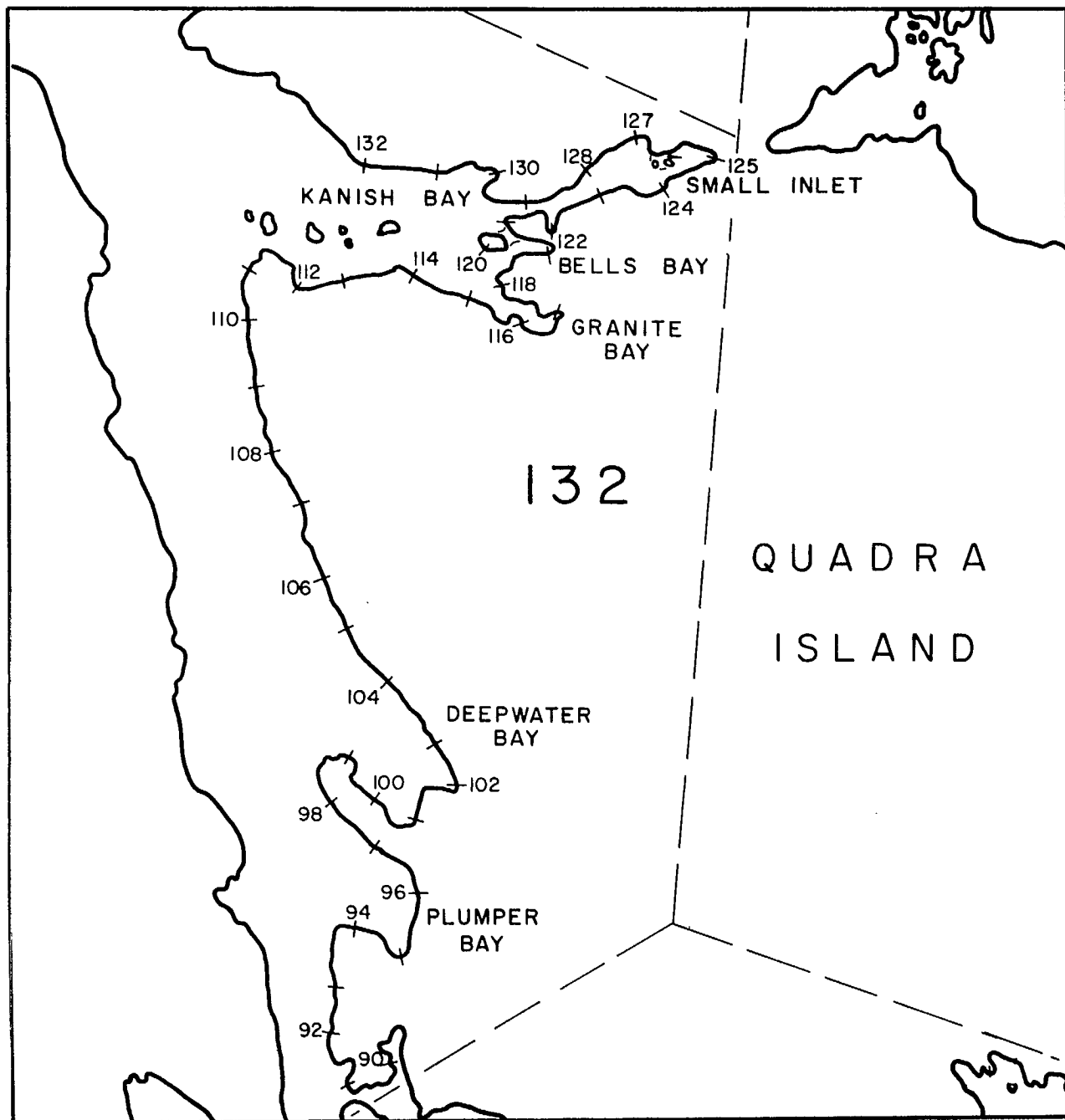


Fig. 132-2. Detailed map of section 132, Kanish Bay.

Table 132-1. Section 132 - spawn position by year.

	93.00	103.00	113.00	123.00
1937 +	b	aa		aa
1938 +				aa
1939 +			aa aa	
1940 +			aa aa	
1941 +			aa aa	
1942 +				
1943 +				aa
1944 +		aaaa		
1945 +		a		aa
1946 +			bb aa	
1947 +	a		aa	
1948 +	a		bb	
1949 +		cb	cc a	
1950 +			aaaaa	
1951 +		a	ff bb	
1952 +			aaaa	
1953 +		a	cb	
1954 +			cc	
1955 +		b	aa	
1956 +	11	1\$1		
1957 +		1		
1958 +	1	11		
1959 +			111	
1960 +			1	
1961 +				
1962 +	111		22	
1963 +		113	111	
1964 +			11	11211
1965 +				
1966 +				1
1967 +				312
1968 +			1	
1969 +				1 1 21
1970 +			1121	
1971 +	11		aa\$sa11 1	
1972 +			1	
1973 +				
1974 +	11	141		
1975 +			11111	
1976 +		2332	1311	
1977 +		2	13 1321	
1978 +			11111	
1979 +			3311	
1980 +			12321	
1981 +			333	
1982 +		321	13	
1983 +		aaa ~		
1984 +		c		
1985 +		aa		
1986 +		b		
	93.00	103.00	113.00	123.00
	P	D	G	S
	L	E	R	B
	U	E	A	E
	M	P	N	M
	P	W	I	A
	E	A	T	L
	R	T	E	I
		R	B	N
	B		A	L
	A		Y	E
	Y	B	Y	T
		A		
		Y		
		P		
		A		
		S		
		S		

Table 132-2. Section 132 - histogram of cumulative spawn frequency over distance

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
PLUMPER BAY	92.00	+																0	0	0	0
	93.00	+																0	0	0	0
	94.00	***																2	0	0	2
	95.00	*****0000																5	4	0	9
	96.00	***																3	0	0	3
	97.00	+																0	0	0	0
	98.00	+																0	0	0	0
DEEPWATER BAY	99.00	+																0	0	0	0
	100.00	*****00																8	2	0	10
	101.00	*****00000000000000000000																10	20	0	30
	102.00	*****000000																15	6	0	21
	103.00	****0																3	1	0	4
DISCOVERY PASS	104.00	+1																0	0	1	1
	105.00	+1																0	0	1	1
	106.00	+																0	0	0	0
	107.00	+																0	0	0	0
	108.00	+																0	0	0	0
	109.00	+																0	0	0	0
	110.00	+																0	0	0	0
	111.00	+																1	0	0	1
	112.00	***																2	0	0	2
	113.00	***																2	0	0	2
GRANITE BAY	114.00	***																2	0	0	2
	115.00	*****0																5	1	0	6
	116.00	***0000000000000000																2	17	0	19
	117.00	*****0000000000000000																4	17	0	21
	118.00	*****00																22	2	0	24
BELLS BAY /KANISH BAY	119.00	*****00000000000000000000																20	21	0	41
	120.00	*****0000000000000000																12	18	0	30
	121.00	*****0																5	1	0	6
	122.00	*****0																5	1	0	6
SMALL INLET	123.00	****0																3	1	0	4
	124.00	*****00																5	2	0	7
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 132-2 (cont'd.)

position(km)		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																							
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75					vara	varb	varc	all
125.00	***0																				2	1	0	3	
126.00	***0																				3	1	0	4	
127.00	***																				2	0	0	2	
128.00	+																				1	0	0	1	
129.00	+																				1	0	0	1	
130.00	+																				1	0	0	1	
131.00	+																				0	0	0	0	
132.00	+																				0	0	0	0	
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																							
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75					vara	varb	varc	all

Table 132-3. Herring statistical spawn summary for section 132.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	4	30968	2010	0	8.5	72.5	21.84	77.0	7	95	3	3
1938	1	6194	402	0	9.0	103.0	0.00	103.0	103	103	1	1
1939	2	37177	2413	0	9.0	117.0	0.00	117.0	117	117	1	2
1940	2	37177	2413	0	7.0	93.0	0.00	93.0	93	93	1	2
1941	2	37177	2413	0	0.0	94.0	3.00	93.0	91	97	2	2
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	1	24790	1609	9	9.0	95.0	0.00	95.0	95	95	1	1
1944	1	49564	3217	0	0.0	91.0	0.00	91.0	91	91	1	1
1945	2	2111	137	4	5.0	100.5	5.50	102.3	95	106	2	2
1946	3	15499	1006	6	7.0	104.0	0.00	104.0	104	104	1	2
1947	2	4930	320	6	8.0	102.0	9.00	103.3	93	111	2	2
1948	3	9290	603	28	7.0	108.0	0.58	107.6	107	109	3	2
1949	7	27116	1760	9	2.7	100.1	0.14	100.0	100	101	2	3
1950	2	35914	2331	6	4.0	118.0	0.00	118.0	118	118	1	2
1951	9	16824	1092	7	4.3	97.9	0.11	97.7	97	98	2	3
1952	1	37177	2413	6	6.0	104.0	0.00	104.0	104	104	1	1
1953	4	27039	1755	10	6.5	100.0	5.05	94.8	94	115	3	3
1954	3	5624	365	4	5.0	105.0	0.00	105.0	105	105	1	1
1955	3	1895	123	9	5.7	98.7	3.67	95.8	95	106	2	2
1956	7	31199	2025	16	2.4	108.6	0.87	106.9	106	111	3	2
1957	1	3867	251	11	5.0	98.0	0.00	98.0	98	98	1	1
1958	3	18304	1188	8	4.0	95.3	0.67	94.9	94	96	2	2
1959	1	28565	1854	5	5.0	101.0	0.00	101.0	101	101	1	1
1960	1	277	18	4	5.0	114.0	0.00	114.0	114	114	1	1
1961	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1962	4	37331	2423	41	5.0	105.0	2.00	101.9	99	107	2	2
1963	5	41245	2677	10	5.0	102.0	0.00	102.0	102	102	1	2
1964	3	74632	4844	4	5.7	103.7	2.33	104.9	99	106	2	2
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	1	5639	366	5	3.0	99.0	0.00	99.0	99	99	1	1
1967	4	35683	2316	33	5.0	109.0	0.00	109.0	109	109	1	1
1968	1	1402	91	2	5.0	111.0	0.00	111.0	111	111	1	1
1969	5	5331	346	33	5.6	111.0	0.00	111.0	111	111	1	1
1970	2	47885	3108	5	7.0	106.0	0.00	106.0	106	106	1	1
1971	8	76049	4936	5	5.1	114.0	2.02	115.9	105	118	3	3
1972	1	277	18	9	7.0	118.0	0.00	118.0	118	118	1	1
1973	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1974	6	32093	2083	14	5.0	102.3	0.76	103.3	100	104	3	2
1975	3	30275	1965	5	7.7	102.3	1.67	103.7	99	104	2	1
1976	12	77605	5037	11	4.5	100.3	2.51	102.1	94	112	3	4
1977	9	62938	4085	12	5.0	104.3	1.17	105.5	99	108	5	4
1978	3	31399	2038	27	4.3	111.3	0.33	111.1	111	112	2	3
1979	7	37531	2436	47	3.7	101.1	1.12	101.3	97	104	4	2
1980	6	39565	2568	30	4.7	110.3	0.71	109.2	109	113	4	2
1981	7	35559	2308	18	0.0	101.7	0.18	101.7	101	102	2	1
1982	8	28503	1850	24	0.0	95.0	1.46	95.4	90	98	2	2
1983	2	28272	1835	15	0.0	99.5	1.50	100.9	98	101	2	2
1984	3	5547	360	36	0.0	107.0	0.00	107.0	107	107	1	1
1985	1	10015	650	1	0.0	97.0	0.00	97.0	97	97	1	1
1986	2	1094	71	8	0.0	114.0	0.00	114.0	114	114	1	1
All	168	1234548	80129	16	5.1	102.9	0.79	103.0	7	118	28	7

Table 132-4. Spawn summary for section 132 from 1937 to 1986.

A. GENERAL:

There are two main spawning areas in this section of Discovery Passage:
(i) Kanish Bay and
(ii) Deepwater Bay

B. COMPLETENESS OF RECORDS:

The 50 year record should be reasonably complete considering proximity to Campbell River.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1937 except for the years, 1942, 1961, 1965 and 1973.

D. MAGNITUDE OF SPAWNINGS: SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 46/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 46/50 (1937-86)
3. CUMULATIVE SPAWN LENGTH	= 80.1 Km.
4. CUMULATIVE SPAWN AREA	= 123.5 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= April 13 (102.9)
2. MEAN WEIGHTED DATE (DOY)	= April 13 (103.0)

F. COMMENTS:

The center of spawning in this area is Deepwater Bay which has records of 176 spawns with a mean time of April 13. To the immediate south, section 137, or Quadra Island has records of 192 spawns with a mean time of March 31. The difference in the spawning times could be indicative of two separate stocks but another explanation is that there is a geographical shift between the earlier waves of spawners in the south and those spawning about two weeks later, on average, to the north. The other two sections included in this group are 136, an extensive area which had 39 spawns between 1930 and 1961, the last year spawn was recorded there. The mean dates for those 39 spawns was March 27, which is similar to those of Quadra Island. Section 138, to the southeast of Cortes Island, has records of only 8 spawns with a mean time of March 13. The grouping of these spawns with those of a presumed 'Southern Johnstone Strait' stock is debatable but the significant point is that such a stock is geographically distinct, both from those to the north in Northern Johnstone Strait and those to the south in Northern Georgia Strait. Sections 131 and 141 are the intermediate areas and collectively there is little spawning in those areas.

G. ROE FISHERIES:

- | | |
|---|----------------------|
| 1. NUMBER OF SEINE FISHERY YEARS/15 YEARS | = 4/15 (1972-86) |
| 2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS | = 1/15 (1972-86) |
| 3. MEAN SEINE CATCH/YEAR | = 355 tons |
| 4. MEAN GILLNET CATCH/YEAR | = 570 tons (area 13) |

Table 132-5. History of roe fishery catches by gear type in Kanish Bay.

SECT. 132	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	11/03- 15/04	840	(4165)	Granite Bay & sect. 162	-	-	-	-
1973	05/04- 13/04	192	(570)	all area 13	05/04- 13/04	192	(570)	all area 13
1974	09/04- 16/04	-	500	Deepwater Bay	-	-	-	-
1975	01/04- 08/04	168	210	Kanish Bay	-	-	-	-
1976	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

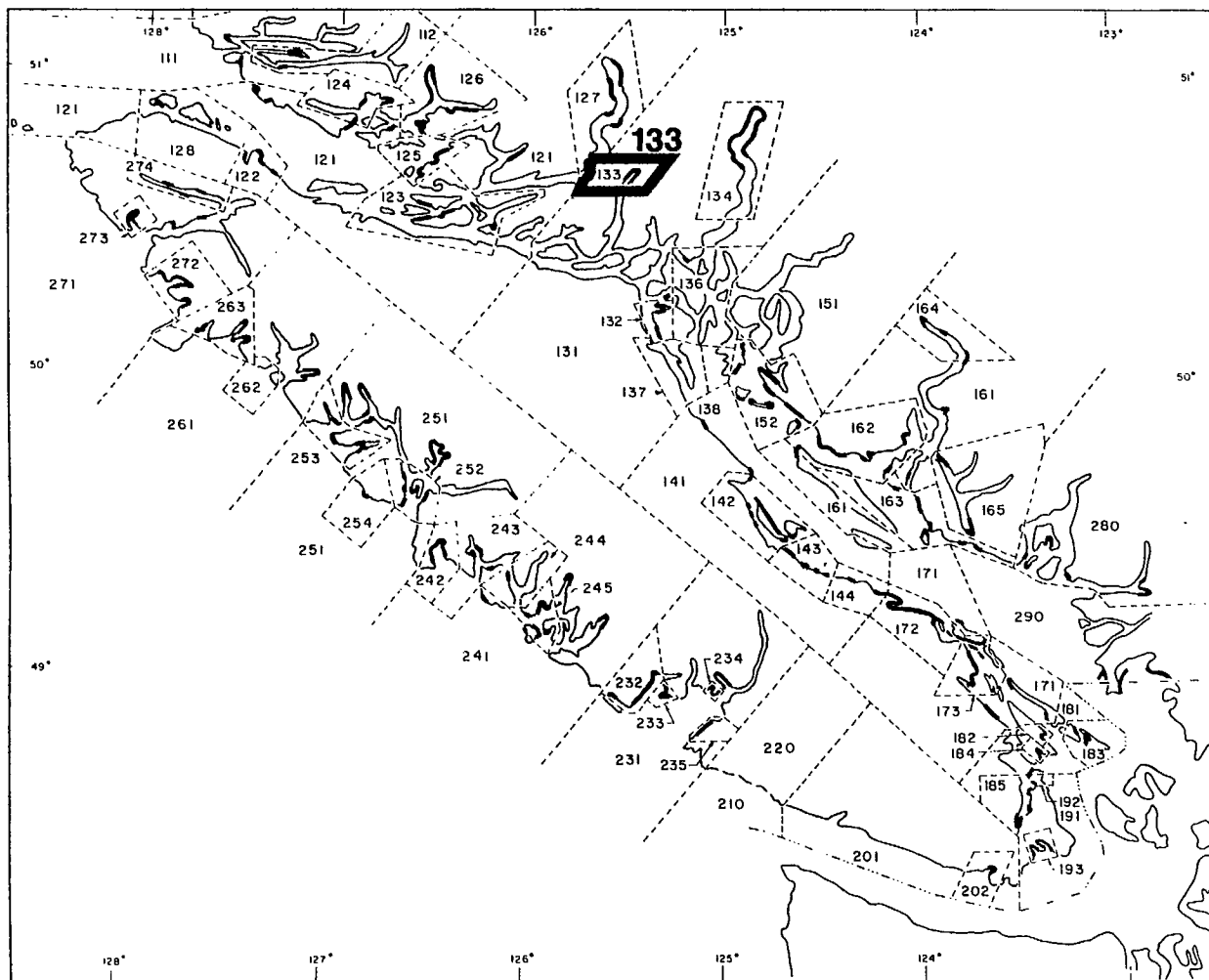


Fig. 133-1. Overview map showing location of section 133, Loughborough Inlet.

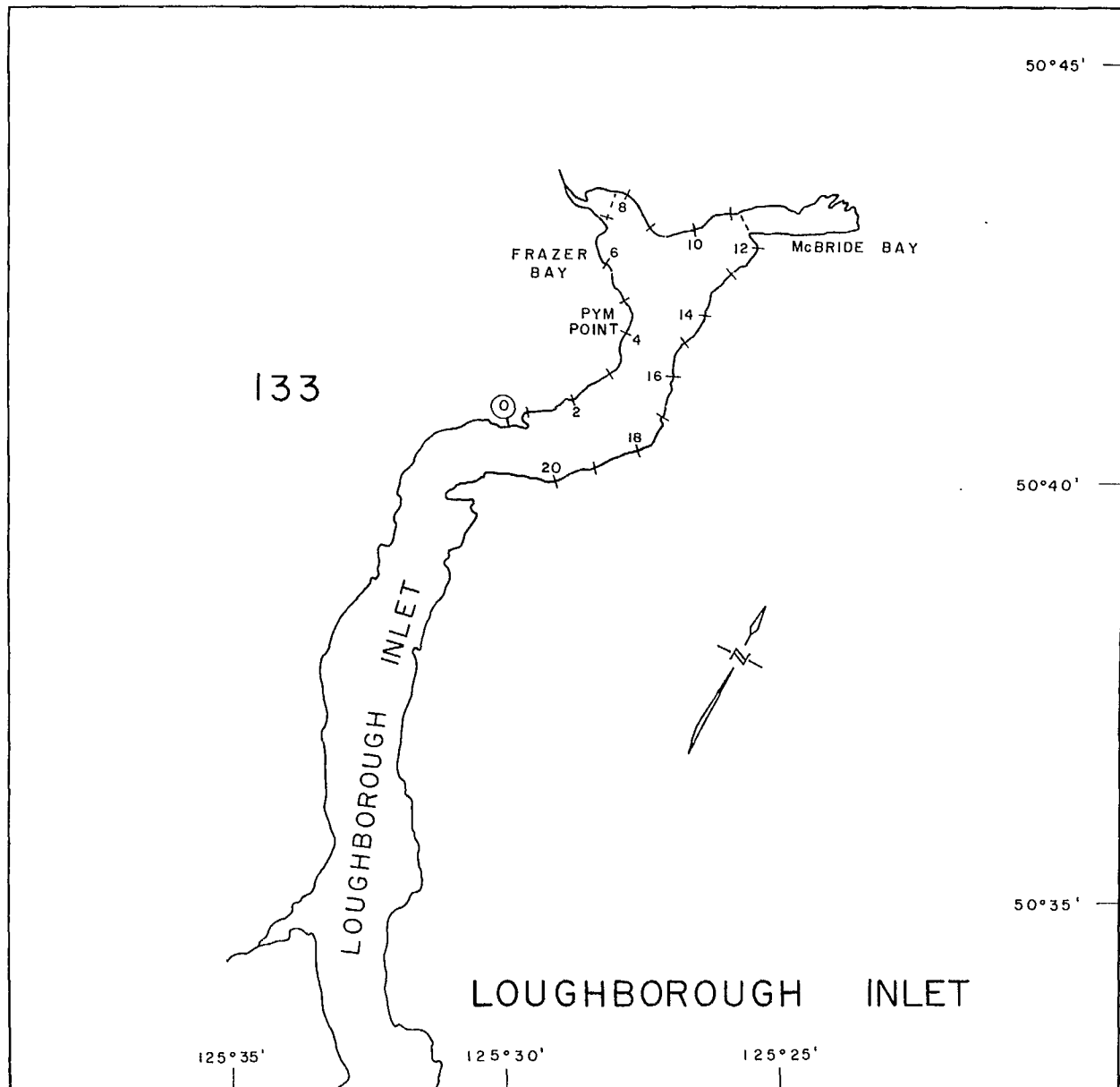


Fig. 133-2. Detailed map of section 133, Loughborough Inlet.

Table 133-1. Section 133 - spawn position by year.

	2.00	12.00
	+	+
1937 +		
1938 +	aaaa	
1939 +		
1940 +		
1941 +		
1942 +		
1943 +		
1944 +		
1945 +		
1946 +		
1947 +		
1948 +		
1949 +	a	
1950 +	a	
1951 +	b	
1952 +	aaaa	
1953 +	cb	
1954 +	cb	
1955 +	da	
1956 +	l	
1957 +		
1958 +	1	
1959 +		
1960 +	1	
1961 +	1	
1962 +	1	
1963 +	1321	
1964 +	11	
1965 +		
1966 +		
1967 +		
1968 +		
1969 +	1111	
1970 +	111111	11
1971 +	13112111	11
1972 +	11 12	
1973 +	111	1
1974 +	11	
1975 +	111	
1976 +	11	
1977 +	1	
1978 +	1211	
1979 +	111	
1980 +	1	
1981 +	1	
1982 +		
1983 +	ca c	
1984 +		
1985 +		
1986 +		

2.00 12.00

P L M
Y O C
M U B
G R
P H I
O B D
I O E
N R
T O B
U A
G Y
H

Table 133-2. Section 133 - histogram of cumulative spawn frequency over distance

	position(km)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
	1.00	+																0	0	0	0
	2.00	+																0	0	0	0
	3.00	***																3	0	0	3
PYM POINT	4.00	*****																13	0	0	13
	5.00	*****00																9	2	0	11
LOUGHBOROUGH/FRASER BAY	6.00	*****000000000000000000000000																11	19	0	30
	7.00	*****00000000																9	8	0	17
	8.00	*****00																9	2	0	11
MCBRIDE BAY	9.00	*****000																6	3	0	9
	10.00	**																2	0	0	2
	11.00	+																0	0	0	0
	12.00	**																2	0	0	2
	13.00	**																2	0	0	2
	14.00	**																2	0	0	2
	15.00	**																2	0	0	2
	16.00	+																0	0	0	0
		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+																			
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all

Table 133-3. Herring statistical spawn summary for section 133.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	1	13981	3217	0	9.0	94.0	0.00	94.0	94	94	1	1
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	1	0	0	0	3.0	76.0	0.00	0.0	76	76	1	1
1941	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1942	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	1	795	183	3	3.0	110.0	0.00	110.0	110	110	1	1
1950	1	795	183	3	3.0	100.0	0.00	100.0	100	100	1	1
1951	2	178	41	7	3.0	105.0	0.00	105.0	105	105	1	1
1952	1	13125	3020	5	3.0	100.0	0.00	100.0	100	100	1	1
1953	3	8279	1905	10	5.0	94.0	0.00	94.0	94	94	1	1
1954	3	7649	1760	6	4.3	98.7	1.33	99.5	96	100	2	1
1955	4	3672	845	9	5.0	98.0	0.00	98.0	98	98	1	2
1956	1	395	91	5	1.0	106.0	0.00	106.0	106	106	1	1
1957	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1958	1	200	46	1	3.0	113.0	0.00	113.0	113	113	1	1
1959	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1960	1	1591	366	3	5.0	117.0	0.00	117.0	117	117	1	1
1961	1	1986	457	18	3.0	111.0	0.00	111.0	111	111	1	1
1962	1	200	46	3	5.0	110.0	0.00	110.0	110	110	1	1
1963	5	10722	2467	21	3.8	100.0	0.00	100.0	100	100	1	1
1964	1	3972	914	3	5.0	85.0	0.00	85.0	85	85	1	1
1965	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1966	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1967	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1968	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1969	1	13507	3108	3	6.0	99.0	0.00	99.0	99	99	1	1
1970	3	33460	7699	3	4.3	104.0	0.00	104.0	104	104	1	1
1971	6	37336	8591	3	4.7	115.0	2.88	120.5	105	121	4	1
1972	3	11921	2743	3	5.0	103.0	0.00	103.0	103	103	1	1
1973	3	1591	366	3	5.0	100.0	0.00	100.0	100	100	1	1
1974	1	3972	914	5	5.0	61.0	0.00	61.0	61	61	1	1
1975	1	7944	1828	4	5.0	104.0	0.00	104.0	104	104	1	1
1976	1	4368	1005	4	5.0	107.0	0.00	107.0	107	107	1	1
1977	1	1191	274	2	3.0	94.0	0.00	94.0	94	94	1	1
1978	3	5159	1187	3	3.7	100.7	7.67	94.8	93	116	2	1
1979	1	7944	1828	5	5.0	84.0	0.00	84.0	84	84	1	1
1980	1	2382	548	2	3.0	96.0	0.00	96.0	96	96	1	1
1981	1	395	91	2	0.0	109.0	0.00	109.0	109	109	1	1
1982	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1983	6	4889	1125	3	0.0	87.8	0.17	87.5	87	88	2	2
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
All	60	203601	46848	6	4.3	99.9	1.38	102.3	61	121	24	4

Table 133-4. Spawn summary for section 133 from 1937 to 1986.

A. GENERAL:

There is one main spawning area in this section centered at the head of Loughborough Inlet.

B. COMPLETENESS OF RECORDS:

Probably all spawning records prior to 1947 are incomplete.

C. SPAWNING CONSISTENCY OVER TIME: FREQUENT

There have been two main spawning episodes, 1949-64 and 1969-83.

D. MAGNITUDE OF SPAWNINGS: VERY SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 30/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 28/40 (1947-86)
3. CUMULATIVE SPAWN LENGTH	= 46.8 Km.
4. CUMULATIVE SPAWN AREA	= 20.4 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= April 10 (99.9)
2. MEAN WEIGHTED DATE (DOY)	= April 12 (103.2)

F. COMMENTS:

Only 60 spawnings with a mean time of April 10 have been documented. The records are nearly complete: 28 of the last 38 years (1949-1986) have records of some spawnings. The area is remote and it is likely that some spawns have not been reported. Therefore, Loughborough Inlet probably supports a separate stock of herring with a fairly precise spawning location at the head of the Inlet. This stock is widely separated geographically from its nearest neighbours.

G. ROE FISHERIES:

No major roe fisheries are documented.

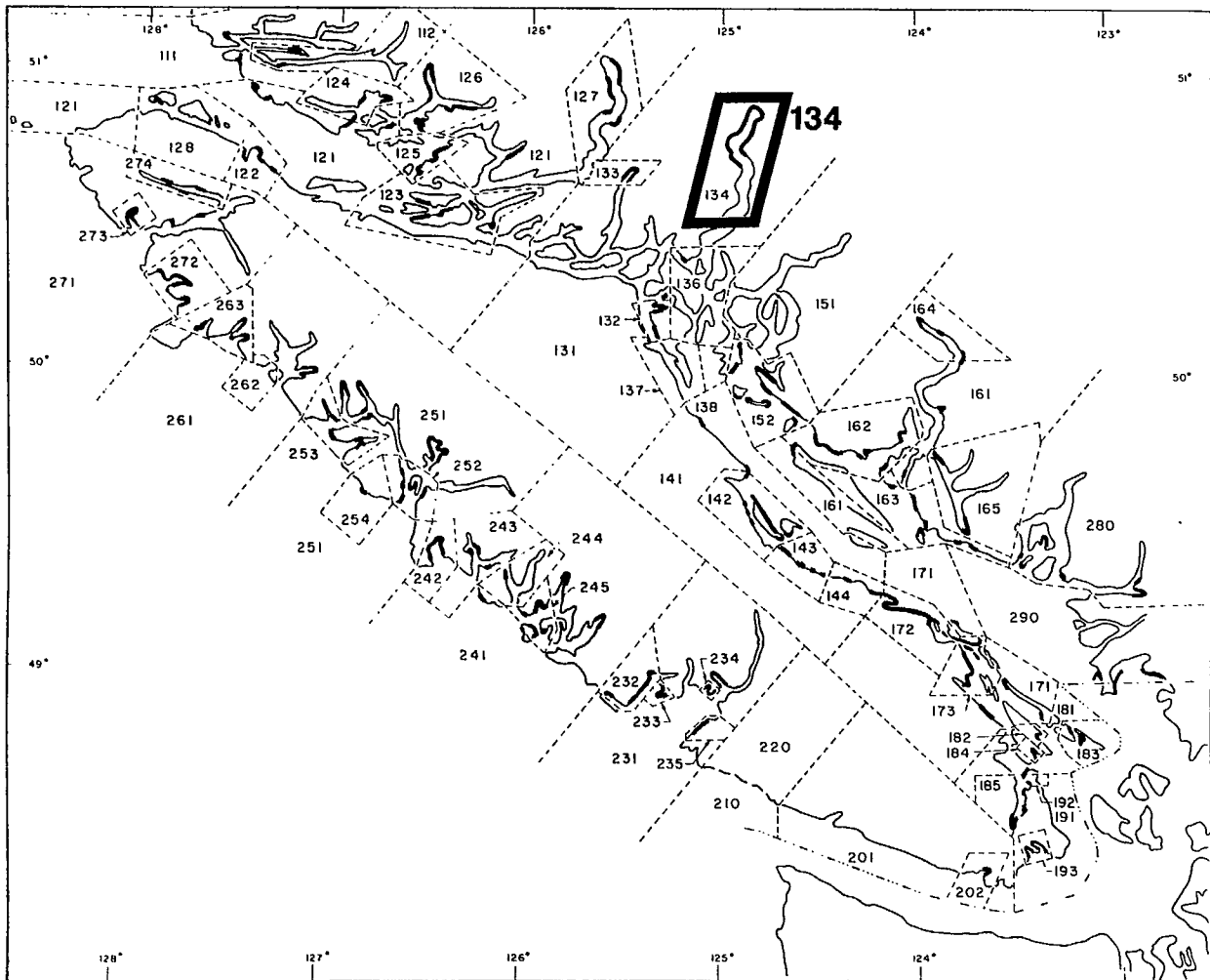


Fig. 134-1. Overview map showing location of section 134, Bute Inlet.

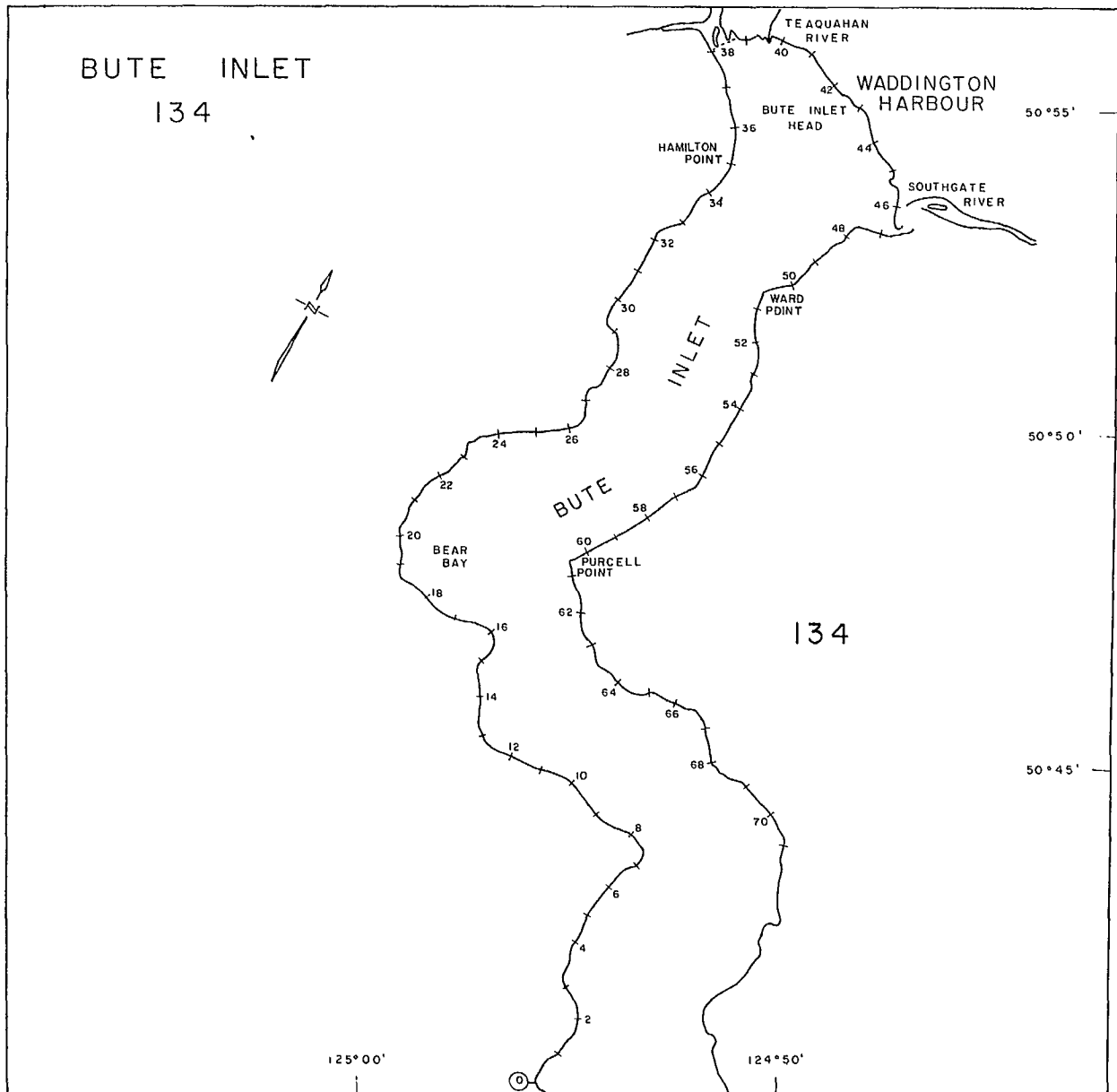
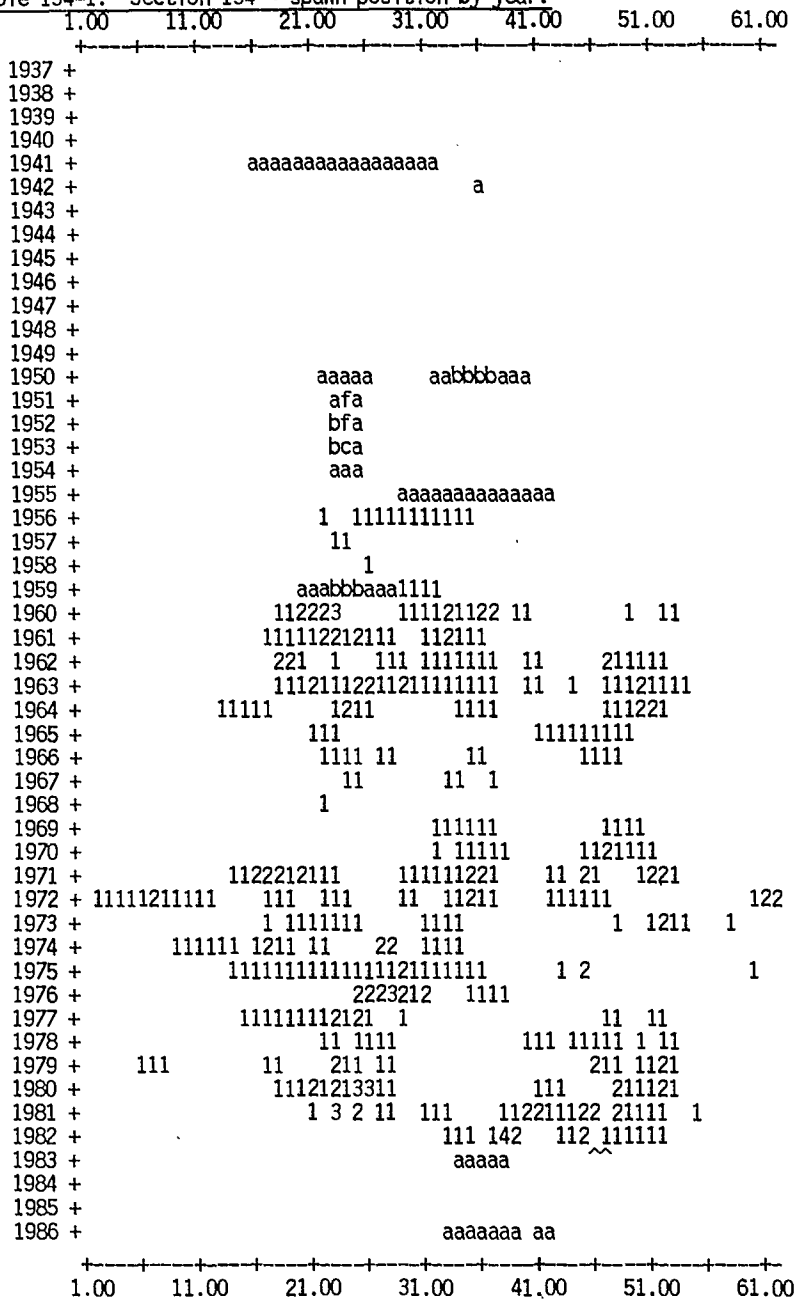


Fig. 134-2. Detailed map of section 134, Bute Inlet.

Table 134-1. Section 134 - spawn position by year.



B	B TB W	~ W
E	U EU A	S A
A	T AT D	O R
R	E QE D	U D
	U I	T
B	I AI N	H P
A	N HN G	G T
Y	L AL T	A .
	E NE O	T
	T TN	E

Table 134-2. Section 134 - histogram of cumulative spawn frequency over distance

position(km)	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	vara	varb	varc	all
0.00 +																	0	0	0	0
1.00 +																	0	0	0	0
2.00 +*																	1	0	0	1
3.00 +*																	1	0	0	1
4.00 +*																	1	0	0	1
5.00 +*																	1	0	0	1
6.00 +**																	2	0	0	2
7.00 +***																	3	0	0	3
8.00 +**																	2	0	0	2
9.00 +**																	2	0	0	2
10.00 +**																	2	0	0	2
11.00 +**																	2	0	0	2
12.00 +**																	2	0	0	2
13.00 +**																	2	0	0	2
14.00 +****																	4	0	0	4
15.00 +****																	4	0	0	4
16.00 +*****0																	6	1	0	7
17.00 +*****0																	11	1	0	12
18.00 +*****0																	13	1	0	14
19.00 +*****0																	12	1	0	13
20.00 +*****00																	11	2	0	13
21.00 +*****00																	14	2	0	16
22.00 +*****000																	17	3	0	20
23.00 +*****000000000																	25	10	0	35
24.00 +*****000000000000000000																	13	20	0	33
25.00 +*****00000000																	21	8	0	29
26.00 +*****000																	14	3	0	17
27.00 +*****00																	14	2	0	16
28.00 +*****00																	15	2	0	17
29.00 +*****00																	13	2	0	15
30.00 +*****00																	8	2	0	10
31.00 +*****00																	13	2	0	15
32.00 +*****000																	13	3	0	16

BEAR BAY

Table 134-2 (cont'd.)

		position(km)																vara	varb	varc	all
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75				
	33.00	*****000																16	3	0	19
	34.00	*****00000																15	5	0	20
	35.00	*****00000																16	5	0	21
BUTE INLET /HAMILTON PT.	36.00	*****000000																14	6	0	20
	37.00	*****00000																12	5	0	17
TEAQUAHAN RIVER	38.00	*****0000																7	4	0	11
BUTE INLET-HEAD	39.00	*****000																4	3	0	7
	40.00	*****00																6	2	0	8
WADDINGTON HARBOUR	41.00	*****00																7	2	0	9
	42.00	*****00																6	2	0	8
	43.00	*****																7	0	0	7
	44.00	*****																6	0	0	6
	45.00	*****																13	0	0	13
	46.00	*****																10	0	1	11
SOUTHGATE RIVER	47.00	*****																14	0	1	15
	48.00	*****																16	0	0	16
	49.00	*****																10	0	0	10
WARD PT.	50.00	*****																13	0	0	13
	51.00	*****																13	0	0	13
	52.00	*****																16	0	0	16
	53.00	*****																7	0	0	7
	54.00	***																2	0	0	2
	55.00	***																1	0	0	1
	56.00	+																0	0	0	0
	57.00	+																0	0	0	0
	58.00	***																1	0	0	1
	59.00	+																0	0	0	0
	60.00	***																2	0	0	2
	61.00	***																2	0	0	2
	62.00	***																2	0	0	2
	63.00	***																1	0	0	1
	64.00	+																0	0	0	0

Table 134-3. Herring statistical spawn summary for section 134.

Year	Total records	Spawn index	Sum length	Av wid	Av int	Av date	SE date	Wt date	Min day	Max day	Ind day	Ind loc
1937	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1938	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1939	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1940	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1941	1	55271	16086	0	7.0	60.0	0.00	60.0	60	60	1	1
1942	1	313	91	0	1.0	81.0	0.00	81.0	81	81	1	1
1943	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1944	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1945	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1946	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1947	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1948	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1949	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1950	3	49743	14477	2	5.0	94.0	0.00	94.0	94	94	1	2
1951	6	12139	3533	5	3.3	83.5	0.22	83.8	83	84	2	1
1952	6	16328	4752	3	4.0	92.0	4.92	83.5	81	103	2	1
1953	3	13503	3930	4	7.0	78.0	0.00	78.0	78	78	1	1
1954	1	8164	2376	3	5.0	86.0	0.00	86.0	86	86	1	1
1955	1	44592	12978	3	5.0	71.0	0.00	71.0	71	71	1	1
1956	3	31800	9255	5	3.7	84.0	2.00	82.0	82	88	2	2
1957	1	6281	1828	11	5.0	87.0	0.00	87.0	87	87	1	1
1958	1	237	69	3	1.0	86.0	0.00	86.0	86	86	1	1
1959	3	42397	12339	7	3.0	82.0	0.00	82.0	82	82	1	1
1960	11	58103	16910	6	4.6	90.2	0.70	89.4	89	96	4	3
1961	7	52918	15401	3	4.4	91.1	3.14	88.1	88	110	2	4
1962	9	54959	15995	4	4.6	82.0	0.00	82.0	82	82	1	2
1963	9	100970	29386	8	3.4	84.3	2.33	82.1	82	103	2	3
1964	7	51502	14989	4	4.4	82.4	4.04	83.2	71	91	2	2
1965	2	31405	9140	6	5.0	87.0	12.00	94.2	75	99	2	2
1966	6	16489	4799	3	2.3	80.0	2.08	78.4	70	84	6	2
1967	4	5649	1644	6	3.0	84.3	5.51	90.3	68	92	4	3
1968	1	313	91	7	5.0	79.0	0.00	79.0	79	79	1	1
1969	2	31405	9140	4	4.0	83.0	0.00	83.0	83	83	1	1
1970	4	32347	9414	3	4.5	80.5	1.44	80.1	78	83	2	1
1971	10	89508	26050	4	4.8	84.3	1.44	86.3	80	89	3	3
1972	11	90288	26277	11	4.6	93.4	1.13	92.3	88	99	5	1
1973	8	42397	12339	4	4.8	81.0	1.77	81.9	77	91	3	1
1974	8	49310	14351	4	5.1	84.5	0.19	84.3	84	85	2	1
1975	6	78578	22869	13	4.7	91.3	1.80	86.2	86	95	3	2
1976	6	40198	11699	4	1.3	82.8	0.48	82.4	81	84	4	2
1977	6	41174	11983	3	3.0	88.5	2.80	80.7	76	93	4	1
1978	10	17269	5026	4	4.0	74.0	1.17	75.5	69	81	8	1
1979	13	25674	7472	7	3.5	80.8	1.00	81.5	75	85	7	1
1980	15	52602	15309	5	4.1	87.3	1.32	87.6	79	97	8	3
1981	21	44768	13029	16	0.0	82.1	0.38	81.5	79	85	7	1
1982	14	40720	11851	21	0.0	79.7	0.73	81.7	75	82	5	5
1983	3	30099	8760	3	0.0	78.3	0.33	78.3	78	79	2	3
1984	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1985	0	0	0	0	0.0	0.0	0.00	0.0	0	0	0	0
1986	2	27007	7860	3	0.0	78.5	2.50	76.9	76	81	2	2
All	225	1386419	403498	7	4.1	84.0	0.46	83.2	60	110	33	10

Table 134-4. Spawn summary for section 134 from 1937 to 1986.

A. GENERAL:

There is one main spawning area in this section centered at the head of Bute Inlet (Waddington Harbour-Bear Bay).

B. COMPLETENESS OF RECORDS:

Probably all spawning records prior to 1950 are incomplete.

C. SPAWNING CONSISTENCY OVER TIME: CONSTANT

If pooled among all localities, there has been a nearly constant annual record of spawnings since 1950 except for the years, 1984-85.

D. MAGNITUDE OF SPAWNINGS: SMALL

1. NUMBER OF SPAWN YEARS/50 YEARS	= 37/50 (1937-86)
2. NUMBER OF SPAWN YEARS/DOCUMENTED YEARS	= 35/37 (1950-86)
3. CUMULATIVE SPAWN LENGTH	= 403.5 Km.
4. CUMULATIVE SPAWN AREA	= 138.6 ha.

E. SPAWNING TIME:

1. MEAN UNWEIGHTED DATE (DOY)	= March 25 (84.0)
2. MEAN WEIGHTED DATE (DOY)	= March 24 (83.2)

F. COMMENTS:

A total of 225 spawns with a mean time of March 25 have been recorded from Bute Inlet, mainly from the extreme head. These spawns are continuous between 1950 and 1983 (no spawn was recorded in 1984 or 1985). Therefore this appears to be a separate stock, with virtually continuous spawning, and geographically separated from its nearest neighbours.

G. ROE FISHERIES:

1. NUMBER OF SEINE FISHERY YEARS/15 YEARS	= 2/15 (1972-86)
2. NUMBER OF GILLNET FISHERY YEARS/15 YEARS	= 1/15 (1972-86)
3. MEAN SEINE CATCH/YEAR	= 79 tons
4. MEAN GILLNET CATCH/YEAR	= 0 tons

Table 134-5. History of roe fishery catches by gear type in Bute Inlet.

SECT. 134	SEINE NET ROE FISHERIES				GILLNET ROE FISHERIES			
	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA	DATE OPEN (D/Mo)	TIME OPEN (hrs)	HAILED CATCH (Tons)	FISHING AREA
1972	-	-	-	-	-	-	-	-
1973	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-
1975	01/04- 08/04	168	157	Bute Inlet (head)	-	-	-	-
1976	14/03- 02/04	360	0	Bute Inlet (head)	14/03- 02/04	360	0	Bute Inlet (head)
1977	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-

DUE DATE

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