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# Tagging of Herring in British Columbia during the 1979-80 Herring Season.

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TAGGING OF HERRING IN BRITISH COLUMBIA DURING THE  
1979-80 HERRING SEASON

by

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PREFACE

The herring tagging program is a joint Federal-Provincial research project that has been largely funded by the Marine Resources Branch, Ministry of Environment, Government of British Columbia and directed from the Pacific Biological Station, Resource Services Branch, Department of Fisheries and Oceans, Canada. The rationale for funding by the Province of British Columbia is that with additional knowledge of the discreteness of stocks and an understanding of the movement of these stocks, the proportion of the total population that can be allocated to catch could be increased and new fisheries and fishing strategies could be developed. This could be done in concert with preserving the resource and hence provide additional employment and economic benefit to the people of British Columbia and Canada for now and in the future.

ABSTRACT

Haegele, C. W. 1981. Tagging of herring in British Columbia during the 1979-80 herring season. Can. Ind. Rep. Fish. Aquat. Sci.125: 46 p.

Herring are being tagged in British Columbia with an anchor tag to distinguish among spawning stocks and determine their migration routes. This report summarizes tagging and tag recovery during the 1979-80 herring season ending June 30, 1980. In the late fall and early winter of 1979, 5,000 herring were tagged in the Strait of Georgia and in Johnstone Strait. During the roe fishing season and spawning period of 1980, 47,000 herring were tagged: 7,700 in the Queen Charlotte Islands; 7,300 in the north coast; 10,000 in the central coast; 2,900 in Johnstone Strait; 8,400 in the Strait of Georgia; and 10,700 on the west coast of Vancouver Island. Samples of herring were taken and processed from 65 of the 70 seine sets to determine the age composition and the maturity of tagged fish. There were 50 tag recoveries during this herring season from a variety of fisheries. Only preliminary conclusions could be drawn from these limited recoveries.

Key words: Pacific herring, stock identification, tagging.

RÉSUMÉ

Haegele, C. W. 1981. Tagging of herring in British Columbia during the 1979-1980 herring season. Can. Ind. Rep. Fish. Aquat. Sci. 125: 46. P.

Des harengs sont marqués en Colombie-Britannique avec une étiquette à ancrage afin de différencier les populations de reproducteurs et de déterminer les routes de migration. Le présent rapport résume le marquage et la récupération d'étiquettes au cours de la saison de pêche du hareng 1979-1980 se terminant le 30 juin 1980. A la fin de l'automne et au début de l'hiver 1979, on a marqué 5 000 harengs dans les détroits de Géorgie et de Johnstone. En 1980, durant la période de fraie et la saison de pêche du hareng plein, on a marqué 47 000 harengs: 7 700 aux îles Reine-Charlotte; 7 300 sur la côte nord; 10 000 sur la côte centrale; 2 900 dans le détroit de Johnstone; 8 400 dans le détroit de Géorgie; et 10 700 sur la côte ouest de l'île Vancouver. Des 70 coups de senne effectués, 65 ont servi à prélever des échantillons de harengs qui ont été ensuite analysés afin de déterminer la répartition des âges et la maturité des poissons marqués. Au cours de la présente saison de pêche, 50 étiquettes, provenant de diverses zones, ont été récupérées. Le nombre de recaptures étant limité, on n'a pu tirer que des conclusions préliminaires.

Mots clés: hareng du Pacifique, identification des stocks, marquage.

## INTRODUCTION

Herring populations were defined for the coast of British Columbia for the reduction fishery from tagging studies extended over 31 yr (1936-1967) and summarized by Stevenson (1954) and Taylor (1964, 1973a, and 1973b). The general conclusions were that there existed 13 major migratory populations and up to 21 minor local populations. Earlier evidence for the existence of some of these populations was demonstrated by Tester (1937, 1949), using vertebral counts. The major populations were considered subject to various degrees of emigration and immigration from adjacent and further removed populations (4.5-45.5%). Over the many years that this tagging data was collected, herring were tagged and recovered in all seasons, but principally herring were tagged at spawning time between February and April and recovered during the reduction fishery in subsequent years between November and March. For the management of the present roe and other fisheries, this stock definition is inadequate<sup>1</sup>.

In British Columbia, herring are now fished for roe in March and April near their spawning grounds. There is also a food and bait fishery in November to January along major migratory routes between summer feeding and winter-spring spawning grounds. In addition, herring are fished for food, bait and spawn-on-kelp by permit. Any of these fisheries may intercept local and/or migratory stocks.

The potential for increasing the proportion of the total population that can be allocated to catch while simultaneously preserving the resource is feasible if stocks can be defined and assessed and their movements delineated in time and space. Based upon this rationale, a new tagging program was conceived to provide suitable stock definition.

There is currently no direct evidence that individual herring return to spawn on the same grounds year after year. This can be determined by tagging fish at spawning time and recovering tagged fish in subsequent roe fisheries on the spawning grounds. Furthermore, it should be determined which fish are caught in non-roe fisheries so that the same stocks are not heavily exploited in several fisheries while other stocks may not be fished at all. This can be accomplished by tagging during non-roe fisheries and from other major aggregations as they are found to occur and subsequently recovering tags in all fisheries.

With a large proportion of the herring catch (roe fishery) being processed manually and some of the other catch also being handled by sorting for size, filleting, etc., a highly visible external body tag was investigated for recovery during processing (Hay et al. 1979; Hay and Mitchell 1979) and found suitable. A study to determine tag retention and survival of live captive fish was also initiated and there appears to be no

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<sup>1</sup>A. S. Hourston is currently re-compiling and re-analyzing the 1936-1967 tagging data in an attempt to extract additional information (pers. comm.).

major tag loss or difference in survival between tagged and control fish over 1.5 yr (D. E. Hay, pers. comm.).

Tagging of herring in the field began in November, 1979 and this report summarizes tagging and tag recovery for the 1979-80 herring season ending June 30, 1980.

## METHODS

Herring were tagged with an external plastic tube anchored in the flesh of the fish with a toggle<sup>2</sup>. The orange coloured portion of the tag bearing the printed legend and tag number was 42 mm long. The monofilament portion of the tag connecting this tube to the toggle was 15 mm long and the toggle was 10 mm long and perpendicular to the main portion of the tag. These dimensions changed slightly as a result of quality control in the manufacture of the tags. The tags were inserted with a gun equipped with a hollow needle of 2.5 mm in O.D. and 30 mm long and a plunger that pushed the tag into the flesh of the fish. The fish were grasped around the anterior body with one hand, the needle was inserted below the posterior margin of the dorsal fin at a 30° angle to the dorso-ventral plane. This resulted in the toggle being implanted just above and on the opposing side of the vertebral column with generally less than 5 mm of the monofilament portion exposed.

Herring were obtained for tagging by seine. Large catches were adjusted by releasing fish before the seine was closed up to retain no more than 5 t. The seine was dried up to the point where fish were swimming around freely but were sufficiently confined that they could be dipnetted. The corkline of the seine was kept away from the side of the vessel by suspension from a boom swung over the side of the vessel or by a brace from the side of the vessel. The seine vessel was kept in such a position that in prevailing winds and current the body of the seine would stream away from the hull. Fish were dipnetted from the seine with a rectangular, shallow dipnet constructed of marquisette webbing and transferred into a shallow plastic tub partially filled with seawater and located on the deck of the vessel. Generally, no more than 10 fish were dipnetted at a time. Using this procedure, panic behaviour (flipping) by the herring was virtually eliminated and scale loss and other injury was minimal. The fish were then taken individually from the tub and tagged using the procedure described above. Tagged fish were immediately placed into a floating holding pond constructed of marquisette webbing (1.0 m x 1.8 m x 1.7 m deep) attached to the port side of the vessel (the opposite side to the seine). At the completion of tagging, the tagged fish were released from the pond in synchrony with the remaining fish in the seine. This procedure was followed

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<sup>2</sup>Anchor tag type 68A as manufactured by Floy Tag and Manufacturing Inc., Seattle, Wash., U.S.A.



to maximize the likelihood that the tagged fish would school up with the fish from the set from which they were taken and to minimize predation.

The rationale for the location and number of tag insertions during the roe fishing and spawning season was based on present fishing patterns, current estimates of stock size, and traditional or anticipated exploitation rates. Herring were to be tagged during the roe fishery at all fishing locations and on major spawning grounds. The number of insertions was determined to provide sufficient returns in the subsequent roe fishery for analysis but without hindering processing in plants. Exploitation rates of 0 to 30% and 100% fidelity in returning to management units of origin were assumed. Fish were to be tagged in management units with no anticipated roe fisheries (0% exploitation rate) to determine the occurrence and frequency of non-fidelity in these stocks and for potential returns in non-roe fisheries. Other assumptions were: (1) 50% natural mortality, including predation, (2) 50% tag loss (including tagging mortality) for each year at large, and (3) 70% plant efficiency in tag recovery for roe processing plants (Hay and Mitchell 1979). On this basis, it was planned to tag 50,000 fish on the coast (Table 1).

These tags were to be distributed over as many individual fish schools as possible. Theoretically, each seine set would sample a different school and the target was for 500 tagged fish per seine set. As the availability of fish and fishing opportunities decreased, the number of tags per seine set were to be increased to achieve the overall target tagging for individual management units.

Herring were also to be tagged during food fisheries throughout the coast, with the Strait of Georgia receiving first priority. The number of tag insertions for this fishery was also to reflect approximately the size of the stocks and target recoveries.

## RESULTS AND DISCUSSION

### TAGGING

A summary of all tagging is provided by location in Table 2 and by tag numbers in Table 3. Locality codes for place names are from Hourston and Hamer 1979. Map reference (map ref.) numbers are also provided for each entry and these correspond to tagging locations indicated in Fig. 2-8. Fig. 1 is a key to these maps.

### Food fishery

Between November 8, 1979 and January 30, 1980, 4,438 herring were tagged from 9 seine sets (map ref. G1 to G9 in Fig. 2) in the Strait of Georgia. Location G1 was fished from the KETA and the other locations from

the CALIGUS, both of which are Government of Canada vessels. The net fished from these vessels was a small seine that fished only to depths of 22 m, while the tops of most herring schools were below that depth. Hence, catches were generally small and biological samples were obtained from only 4 sets. These showed differences in age composition between sets (Table 4). In 2 sets (map ref. G2 and G8 in Fig. 2), 76% and 61% of the fish were 5 yr old or older and in 2 sets (map ref. G1 and G6 in Fig. 2) 79% and 52% of the fish were 3 yr old or younger.

The food fishery in the Strait of Georgia took place November 20 and 21, 1979 when 1,971 t were landed and on November 25 and 26, 1979 when 1,482 t were landed. If the fish tagged formed part of the 60,000 t of herring that have been estimated to occupy the lower east coast of Vancouver Island at that time of year, then 62 of these tags should be recovered during the 1980 roe fishery and 27 tags during the 1980 food fishery (Table 5). These estimates are based on:

1. 50% tagging mortality and tag loss;
2. 20% natural mortality, including predation, for the 1980 roe fishery and 50% natural mortality for the 1980 food fishery;
3. 20% exploitation rate for the roe fishery and 10% exploitation rate for the food fishery;
4. 30% plant efficiency in recovering tags during the processing of food herring (Hay et al. 1979) and 70% plant efficiency for recovering tags during the processing of roe herring (Hay and Mitchell 1979).

In fact, there was only a limited 1980 roe fishery in Lambert Channel, with no catches in the lower east coast of Vancouver Island while the 1980 food fishery took the predicted 6,000 t.

In Johnstone Strait, 541 herring were tagged on January 17, 1980 from one seine set made by the WINDWARD STAR fishing commercially for bait (map ref. Da in Fig. 6). No biological sample of fish was obtained but an estimate of 70% 3 yr old, with the remainder older, was made. The commercial food and bait fishery took 750 t between December 9 and 14, 1979 and 1,550 t between January 9 and 18, 1980 in Johnstone Strait.

There were no herring tagged in 1979 in conjunction with food fisheries on the north coast and west coast of Vancouver Island because of the unavailability of vessels and opportunities.

### Roe fishery

Between March 3 and April 13, 1980, 46,951 herring were tagged throughout the British Columbia coast from charter seine vessels. Predictions are that 1,711 of these will be recovered during the 1981 roe fishery (Table 1). However, the management of individual fisheries will greatly influence the actual returns. In addition, in the lower east coast of Vancouver Island food fishery of 1980, 23 tags from taggings on the east coast of Vancouver Island between Northwest Bay and Beaver Point (5,154 tags) made during the 1980 spawning season should be recovered (Table 5). Recoveries of tags in other food and bait fisheries cannot be predicted

because of the limited knowledge about the movement of stocks and the uncertainty about possible catches and fishing locations.

Biological samples of herring were obtained and processed from 58 of the 61 tagging seine sets. The age composition for each sample was determined (Table 6) and should roughly reflect the year-classes tagged from each set, although there was some selection for larger (older) fish during tagging. The gonads of all fish sampled were weighed and the gonosomatic index (G.I.) was calculated as the ratio of gonad weight to total body weight. The proportion of fish, by sex, which were either maturing or immature/spent was determined. The lower limit for maturing fish was a G.I. of 0.10. This was based on results from Hay and Outram (1981) who found that the range in the G.I. of herring near spawning was 0.13-0.21 for males and 0.14-0.25 for females. The av G.I. for herring with a G.I. above 0.10 was determined to give an indication of how close to spawning the tagged fish were (Table 6). Samples were classified for this purpose on the basis of the above information and observations at the time of tagging as follows:

Code	Description
IY	mostly immature, young (2-yr-old fish
MY	large proportion of young (2- and 3-yr-old) fully mature fish
NM	nearly mature fish that are two or more weeks from spawning
FM	fully mature fish that will spawn within two weeks
SP	spawning fish
ST	spent fish

Herring in categories IY, NM, and ST may or may not spawn or have spawned at the tagging location while herring in categories MY, FM, and SP will probably spawn or are spawning near or at the tagging location. Dates of observed spawning from Fishery Officer reports and the timing of the roe fishery (Chalmers 1981) for each tagging location are also given (Table 6).

Tagging is summarized below by the six major divisions of the coast.

Queen Charlotte Islands: Although a target of 1,000 tags had been set for Naden Harbour, no herring were tagged there because a vessel could not be committed to the area. Neither were there any herring tagged in Skidegate Inlet because only 1-yr and 2-yr-old fish could be found and these

were considered to be too small to be tagged with the tags being used. On the west coast of the Charlottes, weather precluded extensive scouting for herring but one school was found and tagged in Rennell Sound (map ref. A1 in Fig. 3). These were mostly fully mature 3-yr-old fish. Near the southern tip of Moresby Island, spawning herring were tagged in Louscoone Inlet (map ref. A2 in Fig. 3) and fully mature fish in Flamingo Inlet (map ref. A3 in Fig. 3). In both locations fish were mostly 3-yr-old. On the east coast of the Queen Charlotte Islands, spent and spawning herring, again mostly 3-yr-old and some 6-yr-old fish, were tagged in Cumshewa Inlet (map ref. A4 and A5 in Fig. 3) from two sets. However, no spawnings were recorded by Fishery Officers in Cumshewa Inlet although there were unofficial reports of spawning near Conglomerate Point on March 26, 1980. Herring were tagged from 3 sets in Skincuttle Inlet (map ref. A6, A7 and A8 in Fig. 3), all containing 90% fully mature 3-yr-old fish. There were 7,719 herring tagged in the Queen Charlotte Islands, exceeding the number of target tags by 1,719 tags.

North coast: Fully mature fish were tagged from 3 sets in Chatham Sound (map ref. B1, B2, and B3 in Fig. 4). The most prominent year-class (approximately 60%) were 3-yr-old fish with the other major year-classes contributing about 10% each. One further tagging (map ref. B4 in Fig. 4) was made from herring in a spawn-on-kelp pond operated by the Port Simpson Indian Band. These fish had been captured on March 29 and they were spawning at the time of tagging. No biological sample of fish was obtained. The last two taggings of the season were made in Malacca Passage (map ref. B5 and B6 in Fig. 4). Although biological fish samples were taken from these two sets, they were mislaid and were not processed. Observations at the time of tagging and spawn records for the area would indicate that these fish were fully mature and that they spawned a week after tagging between Island Point and Hunt Inlet. In the upper portion of Kitkatla Inlet, fish were tagged from 3 sets near Gurd Island. Fish in 2 of the sets (map ref. B7 and B8 in Fig. 4) were 70% fully mature 3-yr-old fish, with the remainder mostly 2-yr-old fish. Herring in the other set (map ref. B9 in Fig. 4) were 68% immature 2-yr-old fish with the remainder mature 3-yr-olds. In the lower portion of Kitkatla Inlet, fish from a set composed almost entirely of fully mature 3-yr-old fish were tagged (map ref. B10 in Fig. 4). There was no spawn recorded in the lower part of Kitkatla Inlet until 3 wk after this tagging, so these herring may also have spawned near the upper portion of the Inlet. There were 7,278 herring tagged in the north coast, 3,278 above target.

Central coast: Taggings were made in the central coast in most target areas. No herring were tagged at the entrance to Rivers Inlet, in Kildidt Sound or in Burke Channel because no herring were found in these waters by the tagging vessels while they operated in this division between March 18 and 28, 1980. Herring were tagged from one set in Weeteeam Bay (map ref. C1 in Fig. 5) and 2 sets in Kitasu Bay (map ref. C2 and C3 in Fig. 5) at the conclusion of the fisheries in this area. Fish from the 3 sets were 85% fully mature 3-yr-olds. Herring were tagged from 4 sets in Thompson Bay. Three of these (map ref. C5, C6, and C7 in Fig. 5) contained fully mature herring that were 60% 3-yr-old with the other age groups contributing about 10% each. The other set (map ref. C4 in Fig. 5) was composed of mature fish

that were 57% 2-yr-olds and 41% 3-yr-olds. In the McNaughton Group (map ref. C8 in Fig. 5), fully mature fish that were 73% 3-yr-old were tagged. Fully mature young fish that were up to 42% 2-yr-old were tagged in Keith Anchorage from 2 sets (map ref. C9 and C10 in Fig. 5). In Rivers Inlet fish were tagged from one set near the head (map ref. C11 in Fig. 5) and these were mostly immature young fish. In Area 10, mature 2-yr-old herring were tagged in Margaret Bay (map ref. C12 in Fig. 5) and mature 3-yr-olds in Anchor Bight (map ref. C13 in Fig. 5). There were 10,009 fish tagged in the central coast, 911 short of target.

Johnstone Strait: Only a moderate effort was made to tag herring in Johnstone Strait because of the historical absence of a roe fishery. Fish were tagged from 2 sets in Kingcome Inlet, one of which was on fully mature fish between 2- and 4-yr-old (map ref. D1 in Fig. 6) and one of which was 53% immature 2-yr-olds (map ref. D2 in Fig. 6). Fish were tagged from one set in Knight Inlet (map ref. D3 in Fig. 6) and they were 75% 2- and 3-yr-old mature fish. Fish tagged in Deepwater Bay (map ref. D4 in Fig. 6) were 94% 4-yr-old and older fish that were nearly mature while herring tagged in adjacent Kanish Bay (map ref. D5 in Fig. 6) were 92% 2- and 3-yr-old fish that were fully mature. The Deepwater Bay fish were probably a part of late spawning resident stocks while the Kanish Bay fish probably were from migratory stocks. Only 2,916 herring were tagged in the Johnstone Strait division, 27% below target, and few recoveries from roe fisheries are expected from this division.

Strait of Georgia: In the eastern part of the Strait of Georgia, fish were tagged from two sets containing mostly 3-, 4-, and 5-yr-old fish. One set was on spawning fish (map ref. E7 in Fig. 7), the other on fully mature fish (map ref. E6 in Fig. 7). In Lambert Channel, spent fish that were 80% 3- and 4-yr-old were tagged from 2 sets (map ref. E1 and E2 in Fig. 7). A mixture of spawning and spent fish that were 80% 2- and 3-yr-old were tagged from 3 sets near Northwest Bay (map ref. E3, E4, and E5 in Fig. 7). Although no spawnings were recorded in the Nanoose Bay section prior to March 23, 1980, spawning fish were tagged at Lantzville (map ref. E8 in Fig. 7) on March 13, 1980. These were 84% 3-, 4-, and 5-yr-old. At Yellow Point, fish were tagged from 2 sets made at the same time and in close proximity. Both sets contained spawning fish, but one was 77% 2- and 3-yr-olds (map ref. E9 in Fig. 7) while the other was 58% 4-yr-old and older fish (map ref. E10 in Fig. 7). Herring tagged in Area 18 were 84% and 99% 4-yr-old and older fish that were not fully mature. As in Deepwater Bay, these may have been fish from late-spawning resident stocks. The target number of 9,000 tags for the Strait of Georgia was nearly met.

West coast of Vancouver Island: Spawning was late in Barkley Sound by nearly 2 wk, but fully mature herring were tagged from 3 sets in the western portion of Barkley Sound. Two of the sets were approximately 80% 2- and 3-yr-old fish (map ref. F1 and F2 in Fig. 8) and one set was 75% 3-, 5-, and 6-yr-old fish (map ref. F3 in Fig. 8). There was no herring spawn recorded on the Bamfield side of Barkley Sound and no fish were tagged there. Spawning and spent herring were tagged in Clayoquot Sound near Tofino from 3 sets (map ref. F4, F5, and F7 in Fig. 8) and all year-classes were well

represented. There was one tagging of herring of a similar age composition and in spawning condition in Hesquiat Harbour (map ref. F7 in Fig. 8). No herring were found for tagging in the Sidney Inlet portion of Clayoquot Sound, nor were any fish tagged in Nootka Sound for the same reason. In the outer part of Nuchatlitz, fish were tagged from 2 sets on spawning fish (map ref. F9 and F10 in Fig. 8) that were 68% 3-yr-old. Fish tagged from one set in Clanninick Cove (map ref. F11 in Fig. 8) were also spawning and 69% 3-yr-old. Fish tagged in Area 27 from 3 sets on spawning fish were 80% 3-yr-old (map ref. F11, F12, and F13 in Fig. 8). The target of 16,000 tags for the west coast of Vancouver Island was only 67% achieved mainly because no herring were located for tagging in some of the locations (east side of Barkley Sound, Sidney Inlet, Nootka Sound and Bajo Reef).

#### TAG RECOVERY

There were 50 tag recoveries up to June 30, 1980. These are tabulated by tagging set and division in Table 7 and by place of recapture and division in Table 8. Recaptures are listed by fishing gear and type of fishery in Table 9.

The bulk of the tag recoveries (22 tags) were immediate recaptures (0-23 days at large) in the lower east coast November food fishery of tags from 2 tagging sets (map ref. G1 and G2 in Fig. 2). Five tags were recovered by spring seine bait fisheries in the Lund area, where fish tagged in March (map ref. E6 and E7 in Fig. 7) were captured after 41-70 days at large. A further 2 tags were recovered from similar fisheries in Johnstone Strait, where fish tagged in Knight Inlet (map ref. D3 in Fig. 6) were recovered after 46 and 62 days at large. These fish may be a part of resident stocks that are found in the waters of Johnstone Strait and in the Lund area throughout the year, although it is possible that they were migrating stocks that had not initiated their offshore migration by late April to late May. Three tags were recovered from permit fisheries. Two of these were caught in Area 17 on Dec. 8, 1979 after 8 days at large from fish tagged in Porlier Pass (map ref. G7 in Fig. 2). The other was caught in Trincomali Channel in January, 1980 after 49 days at large after being tagged near Secretary Islands (map ref. G2 in Fig. 2). There were 2 tagged herring recovered by jig in Porlier Pass in May and June, 1980 after 151 and 198 days at large after being tagged at Hall Island (map ref. G4 and G6 in Fig. 2). Hence, these fish, tagged in November, were probably also part of resident stocks. There were 8 tag recoveries in April fishing for spawn-on-kelp operations. Seven of these were recovered in Kanish and Granite bays in April. Of these, 3 were from fish tagged one month earlier in Knight Inlet (map ref. D3 in Fig. 6) and 3 in Kanish Bay (map ref. D5 in Fig. 6), and the remaining one from fish tagged 88 days earlier in Deepwater Bay (map ref. Da in Fig. 6). The eighth tag was recovered in Lund Harbour from fish released 28 days earlier at Dinner Rock (map ref. E6 in Fig. 7). There were three 1980 roe fishery recoveries. One of these was an immediate gillnet recapture in Skincuttle Inlet. The other two were taken during the Washington roe fishery by seine in May 1980. One of these was tagged in Porlier Pass in November (map ref. G7 in Fig. 2) and the other at Beaver Point in early March (map ref. E12 in Fig. 7).

Five tags were recovered from the gut of predator fish. Little is known about the residence time of these tags in the gut of fishes, but if they are voided at the same rate as food, then these recoveries can be treated as are other recoveries. One tag was recovered from a cod gut in June 1980 in the close proximity of release of fish tagged in Lund Harbour in March (map ref. E7 in Fig. 7), reinforcing the conclusion from the 4 bait fishery recoveries in April and May that these fish were part of a resident stock. The other 4 gut recoveries were from salmon captured in June. The tag recovery near Bonilla Island was from a fish tagged in Otter Anchorage (map ref. B3 in Fig. 3) in March and would indicate that fish spawning in the upper part of Area 4 migrate south to feed in Hecate Strait. The tag from a fish released in Thompson Bay (map ref. C7 in Fig. 5) in March was recovered in the stomach of a salmon caught outside of Kildidit Sound, indicating that these fish also migrate south to feed in Queen Charlotte Strait. The third salmon stomach recovery was in Lambert Channel from a tagged fish released there in March (map ref. E2 in Fig. 7). The fourth tag was recovered in Porlier Pass and originated from a fish tagged in Northwest Bay in March (map ref. E3 in Fig. 7). These last 2 recoveries would indicate that herring spawning in Area 14 may partially be composed of resident stocks.

In summary, some perfunctory conclusions can be drawn from tag returns to date, but many more tagged fish will have to be released and tags recovered before any firm conclusions can be drawn.

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Table 1. Level of tagging and projected tag returns from subsequent roe fisheries for 1980 spawning-fishing ground taggings.

Management Unit	1979 <sup>a</sup>		1978 <sup>b</sup>		1977 <sup>c</sup>		Target tags	Actual tags (1980)	Pred. exploit. rate(%)	No. of recov. <sup>d</sup>		
	Pop. (10 <sup>3</sup> t)	Exploit. rate(%)	Pop. (10 <sup>3</sup> t)	Exploit. rate(%)	Pop. (10 <sup>3</sup> t)	Exploit. rate(%)				1st yr	2nd yr	3rd yr
North coast Q.C.I.	1.6	6.6	6.7	2.5	?	0.0	1000	0	10	0	0	0
West coast Q.C.I.	3.4	19.2	(2.3)	(14.1)	?	0.0	1000	969	10	17	4	1
Louscoone Inlet	2.3	0.0	3.2	77.8	7.0	49.3	1000	1889	30	99	13	3
Cumshewa Inlet	3.0	0.0	4.6	0.0	2.7	0.0	1000	1908	10	33	8	2
Skincuttle Inlet	8.7	62.7	21.7	48.1	17.3	61.9	1000	2943	30	155	27	5
Other east coast Q.C.I.	1.7	4.6	(2.3)	(14.1)	?	0.0	1000	0	10	0	0	0
QUEEN CHARLOTTE ISLANDS	26.0	39.6	41.0	33.6	40.2	35.6	6000	7719		304	52	11
Chatham Sound	9.4	0.0	5.0	74.2	18.0	23.5	1000	2432	20	85	17	3
Porcher Island	29.8	9.2	11.5	16.2	22.4	9.8	3000	4846	20	170	34	7
NORTH COAST	39.2	7.0	16.7	33.5	42.3	16.0	4000	7278		255	51	10
Kitasu Bay	1.7	0.0	5.9	42.2	3.3	36.8	2000	2474	30	130	23	4
Milbanke Sound	7.0	0.0	14.5	67.7	22.3	45.4	2000	2941	30	154	27	5
Queens Sound	3.8	0.0	7.6	40.8	6.1	16.5	2000	676	20	24	5	1
Kwakshua Channel	0.9	0.0	2.4	1.5	2.5	0.0	2000	1949	10	34	8	2
Burke Channel	1.0	0.0	?	0.0	2.8	0.0	1000	0	0	0	0	0
Rivers Inlet	0.7	0.0	1.2	0.0	1.9	2.0	2000	987	0	0	0	0
Smith Inlet	0.5	0.0	0.8	0.0	0.1	2.8	0	982	0	0	0	0
Other Central Coast	0.5	0.0	0.3	27.0	1.8	20.0	0	0	0	0	0	0
CENTRAL COAST	16.2	0.0	32.6	47.5	40.9	30.5	11000	10009		342	63	12

Table 1 (cont'd)

Management Unit	1979 <sup>a</sup>		1978 <sup>b</sup>		1977 <sup>c</sup>		Target tags	Actual tags (1980)	Pred. exploit. rate %	No. of recov. <sup>d</sup>		
	Pop. (10 <sup>3</sup> t)	Exploit. rate(%)	Pop. (10 <sup>3</sup> t)	Exploit. rate(%)	Pop. (10 <sup>3</sup> t)	Exploit. rate(%)				1st yr	2nd yr	3rd yr
Upper Johnstone Strait	0.1	0.0	1.5	28.4	4.4	1.9	1000	950	0	0	0	0
Knight Inlet	0.2	0.0	1.5	28.4	4.4	1.9	1000	929	0	0	0	0
Other Johnstone Strait	3.0	0.0	0.6	0.0	1.6	0.0	2000	1037	0	0	0	0
JOHNSTONE STRAIT	3.4	0.0	3.2	20.0	10.6	1.6	4000	2916		0	0	0
Powell River	32.3	0.0	17.4	0.0	22.6	0.0	3000	1676	10	168	7	1
Nanaimo - Comox	(113.0)	(6.7)	83.1	13.4	55.8	21.4	4000	3971	20	139	28	6
Yellow Point	11.6	0.0	22.6	0.0	5.8	0.0	1000	1913	20	67	13	3
Ganges - Plumper	1.5	0.0	1.7	55.9	2.1	37.9	1000	782	0	0	0	0
STRAIT OF GEORGIA	(159.3)	(4.7)	126.9	9.5	86.3	14.7	9000	8342		374	48	10
West Barkley Sound	22.4	38.4	16.3	63.8	45.1	34.0	2000	2913	30	153	27	5
Other Area 23	0.3	0.0	?	0.0	?	?	1000	0	0	0	0	0
South Clayoquot Sound	33.7	6.0	37.9	19.1	34.7	32.2	4000	2364	20	83	16	3
Other Area 24	1.1	16.3	3.9	0.0	4.2	80.0	2000	969	20	34	7	1
Nootka Sound	20.9	25.7	0.6	100.0	5.5	36.0	3000	0	20	0	0	0
Nuchatlitz Inlet	19.0	22.8	19.7	18.1	8.2	24.0	2000	1357	30	91	14	2
Quatsino Sound	9.7	7.8	11.0	0.1	?	?	1000	1956	20	68	14	3
Other Upper W.C.V.I.	1.3	0.0	?	0.0	?	?	1000	948	10	17	4	1
WEST COAST VANCOUVER	107.3	19.8	99.0	24.2	116.3	29.8	16000	10687		436	82	15
COAST	351.5	11.7	328.8	21.2	338.4	23.4	50000	46951		1711	296	58

<sup>a</sup>from Hourston 1979b<sup>b</sup>from Hourston 1979a<sup>c</sup>from Hourston and Humphreys 1978<sup>d</sup>based on 100% return to management unit of tagging

Table 2. Herring tags inserted in British Columbia during the 1979-80 herring season by geographical location and seine set.

(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)	Tag series	No. of tags	Tons in set
<u>QUEEN CHARLOTTE ISLAND DIVISION</u>								
(003)	Rennell Sound	(0097)	Seal Inlet	(A1)	02/04/80	H133,001 to H134,000	969	100
(006)	Louscoone Inlet	(1408)	Tuga Point	(A2)	23/03/80	H116,501 to H117,000	476	1
		(1409)	Sperm Bay	(A3)	23/03/80	H118,001 to H118,500	479	
(023)	Cumshewa Inlet	(1371)	Nedden Island	(A4)	07/04/80	H118,501 to H119,500	934	NK
		(1371)	Nedden Island	(A5)	07/04/80	H100,001 to H100,500	460	NK
		(1371)	Nedden Island	(A5)	08/04/80	H100,501 to H102,000	1448	NK
(025)	Skincuttle Inlet	(0166)	Burnaby Strait	(A6)	25/03/80	A 08,001 to A 09,000	984	15
		(0167)	Huston Inlet	(A7)	28/03/80	A 09,001 to A 09,999	990	NK
		(1410)	Smith Point	(A8)	28/03/80	H109,001 to H110,000	979	NK
Total for Division			8 sets				7719	
<u>NORTH COAST DIVISION</u>								
(033)	Port Simpson	(1591)	Bath Point	(B1)	27/03/80	H105,501 to H106,000	483	NK
		(0216)	Village Island	(B2)	27/03/80	A 07,001 to A 07,500	481	NK
(042)	Big Bay	(1598)	Otter Anchorage	(B3)	29/03/80	A 07,501 to A 08,000	490	NK
		(0266)	Pearl Harbour	(B4)	03/04/80	H131,001 to H131,500	489	
(043)	Malacca Passage	(1451)	Mason Point	(B5)	12/04/80	H130,501 to H131,000	489	Pond
		(1451)	Mason Point	(B5)	12/04/80	H135,001 to H136,500	1421	2
		(1451)	Mason Point	(B6)	13/04/80	H136,501 to H138,000	1448	4
(052)	Kitkatla Channel	(1416)	Gurd Point	(B7)	02/04/80	H131,501 to H132,000	490	NK
		(0354)	Gurd Island	(B8)	02/04/80	H131,501 to H132,000	490	NK
		(0354)	Gurd Island	(B8)	02/04/80	H108,001 to H108,500	497	NK
		(0354)	Gurd Island	(B9)	02/04/80	H108,501 to H109,000	494	NK
		(1524)	Billy Bay	(B10)	02/04/80	H130,001 to H130,500	496	NK
Total for Division			10 sets				7278	

Table 2 (cont'd)

(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)	Tag series	No. of tags	Tons in set
<u>CENTRAL COAST DIVISION</u>								
(067)	Kitasu Bay	(1456)	Weeteam Bay	(C1)	24/03/80	A 06,001 to A 07,000	989	150
						H129,501 to H130,000	493	
		(0430)	Marvin Islands	(C2)	28/03/80	H132,001 to H132,500	493	5
		(0430)	Marvin Islands	(C3)	28/03/80	H132,501 to H133,000	495	3
(074)	Thompson Bay	(1600)	Kimlock Point	(C4)	18/03/80	H115,501 to H116,000	493	0.2
		(0482)	Dundivan Inlet	(C5)	19/03/80	H116,001 to H116,500	493	10
		(0545)	Joassa Channel	(C6)	20/03/80	H117,001 to H118,000	975	5
		(0546)	Houghton Islands	(C7)	23/03/80	A 05,001 to A 06,000	980	NK
(075)	McNaughton Group	(1424)	Hoffman Bay	(C8)	22/03/80	A 00,300 to A 01,000	676	20
(085)	Kwakshua Channel	(0604)	Keith Anchorage	(C9)	20/03/80	A 03,001 to A 04,000	986	2
		(0604)	Keith Anchorage	(C10)	20/03/80	A 04,001 to A 05,000	963	1.5
(093)	Rivers Inlet - Head	(0632)	Shotbolt Bay	(C11)	26/03/80	H128,501 to H129,500	987	1
(101)	Other Area 10	(0645)	Margaret Bay	(C12)	24/03/80	H128,001 to H128,500	471	10
(102)	Takush Harbour	(1435)	Anchor Bight	(C13)	23/03/80	H127,476 to H128,000	511	Pond
Total for Division			13 Sets				10,009	
<u>JOHNSTONE STRAIT DIVISION</u>								
(126)	Kingcome Inlet	(0757)	Wakeman Sound	(D1)	22/03/80	H126,501 to H127,000	480	10
		(1557)	Moore Bay	(D2)	22/03/80	H127,001 to H127,475	470	10
(127)	Knight Inlet	(1611)	Axe Point	(D3)	20/03/80	H125,001 to H125,100	97	50
						H125,601 to H126,500	832	
(132)	Kanish Bay	(0766)	Deepwater Bay	(Da)	17/01/80	B 01,451 to B 02,000	541	NK
		(0766)	Deepwater Bay	(D4)	18/03/80	H124,401 to H125,000	575	5
		(0800)	Kanish Bay	(D5)	18/03/80	H125,101 to H125,600	462	15
Total for Division			6 Sets				3,457	

Table 2 (cont'd)

(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)	Tag series	No. of tags	Tons in set
<u>STRAIT OF GEORGIA DIVISION</u>								
(142)	Baynes Sound	(0838)	Shingle Spit	(E1)	11/03/80	H120,801 to H121,800	965	30
		(1499)	Buckley Bay	(E2)	12/03/80	H121,801 to H122,400	547	NK
(144)	French Creek	(0823)	Northwest Bay	(E3)	13/03/80	H103,001 to H104,000	976	50
		(0823)	Northwest Bay	(E4)	13/03/80	H104,001 to H104,500	496	10
		(1500)	Cottam Point	(E5)	15/03/80	H123,901 to H124,400	490	5
(152)	Lund	(0861)	Dinner Rock	(E6)	09/03/80	H120,001 to H120,800	753	10
		(0856)	Lund Harbour	(E7)	12/03/80	H102,001 to H103,000	923	5
(171)	Other Area 17	(0990)	Parker Island	(G1)	08/11/79	B 02,001 to B 02,625	525	0.3
						B 02,701 to B 02,725	25	
						B 02,976 to B 03,000	25	
		(0991)	Secretary Islands	(G2)	20/11/79	B 00,301 to B 01,000	689	1
		(0991)	Secretary Islands	(G3)	28/11/79	B 02,626 to B 02,650	24	NK
						B 02,674 to B 02,675	2	
		(0946)	Hall Island	(G4)	28/11/79	B 02,676 to B 02,700	22	NK
						B 02,651 to B 02,673	23	
						B 02,726 to B 02,975	246	
						B 03,001 to B 03,300	300	
		(0991)	Secretary Islands	(G5)	29/11/79	B 03,301 to B 03,400	100	NK
		(0946)	Hall Island	(G6)	29/11/79	B 03,401 to B 04,000	586	NK
		(0942)	Porlier Pass	(G7)	30/11/79	B 04,001 to B 05,000	987	NK
		(1474)	Shingle Point	(G8)	08/01/80	B 01,001 to B 01,450	437	NK
(172)	Nanoose Bay	(0998)	Lantzville	(E8)	13/03/80	H104,501 to H105,000	497	20
(173)	Yellow Point	(0941)	Yellow Point	(E9)	14/03/80	H122,401 to H123,900	1432	NK
		(0941)	Yellow Point	(E10)	14/03/80	H105,001 to H105,500	481	20
(181)	Other Area 18	(1555)	James Point	(E11)	04/03/80	B 06,501 to B 06,875	327	0.5
(183)	Plumper Sound	(1565)	Hope Bay	(G9)	30/01/80	B 05,001 to B 05,475	447	0.1
(184)	Fulford Harbour	(1015)	Beaver Point	(E12)	03/03/80	B 06,001 to B 06,500	455	2
Total for Division			21 Sets				12,780	

Table 2 (cont'd)

(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)	Tag series	No. of tags	Tons in set
<u>WEST COAST VANCOUVER ISLAND DIVISION</u>								
(232)	Macoah Passage	(1143)	Toquart Bay	(F1)	15/03/80	B 09,001 to B 09,999	953	10
(233)	Mayne Bay	(1158)	Lyall Point	(F2)	17/03/80	A 01,001 to A 02,000	974	100
		(1141)	Mayne Bay	(F3)	17/03/80	A 02,001 to A 03,000	986	20
(242)	Hesquiat Harbour	(1605)	Leclaire Point	(F4)	11/03/80	H112,501 to H113,500	969	5
(245)	Meares Island	(1226)	Maurus Channel	(F5)	12/03/80	B 05,476 to B 06,000	480	0.5
		(1226)	Maurus Channel	(F6)	13/03/80	B 08,001 to B 09,000	933	1
		(1228)	Robert Point	(F7)	13/03/80	H113,501 to H114,000	469	1
						H114,501 to H115,000	482	
(253)	Nuchatlitz Inlet	(1268)	Outer Nuchatlitz	(F8)	06/03/80	B 06,876 to B 08,000	1,049	3
		(1268)	Outer Nuchatlitz	(F9)	06/03/80	H110,001 to H110,500	488	4
(262)	Clanninick Cove	(1292)	Nicolaye Channel	(F10)	07/03/80	H110,501 to H111,500	948	25
(272)	Brooks Bay	(1313)	McDougal Island	(F11)	08/03/80	H111,501 to H112,000	483	5
(273)	Winter Harbour	(1329)	Mathews Island	(F12)	09/03/80	H112,001 to H112,500	496	NK
		(1330)	Greenwood Point	(F13)	16/03/80	H114,001 to H114,500	486	0.2
						H115,001 to H115,500	491	
Total for Division			13 Sets				10,687	
Total for Coast			71 Sets				51,930	

Table 3. Herring tags inserted in British Columbia during the 1979-80 herring season - by tag number series.

Tag Series	No. of tags	(Code)	Division	(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)
A 00,300 to A 01,000	676	(3)	Central Coast	(075)	McNaughton Group	(1424)	Hoffman Bay	(C8)	22/03/80
A 01,001 to A 02,000	974	(6)	West Coast V.I.	(233)	Mayne Bay	(1158)	Lyall Point	(F2)	17/03/80
A 02,001 to A 03,000	986	(6)	West Coast V.I.	(233)	Mayne Bay	(1141)	Mayne Bay	(F3)	17/03/80
A 03,001 to A 04,000	986	(3)	Central Coast	(085)	Kwakshua Channel	(0604)	Keith Anchorage	(C9)	20/03/80
A 04,001 to A 05,000	963	(3)	Central Coast	(085)	Kwakshua Channel	(0604)	Keith Anchorage	(C10)	20/03/80
A 05,001 to A 06,000	980	(3)	Central Coast	(074)	Thompson Bay	(0546)	Houghton Islands	(C7)	23/03/80
A 06,001 to A 07,000	989	(3)	Central Coast	(067)	Kitasu Bay	(1456)	Weeteam Bay	(C1)	24/03/80
A 07,001 to A 07,500	481	(2)	North Coast	(033)	Port Simpson	(0216)	Village Island	(B2)	27/03/80
A 07,501 to A 08,000	490	(2)	North Coast	(042)	Big Bay	(1598)	Otter Anchorage	(B3)	29/03/80
A 08,001 to A 09,000	984	(1)	Queen Charlottes	(025)	Skincuttle Inlet	(0166)	Burnaby Strait	(A6)	25/03/80
A 09,001 to A 09,999	990	(1)	Queen Charlottes	(025)	Skincuttle Inlet	(0167)	Huston Inlet	(A7)	28/03/80
B 00,301 to B 01,000	689	(5)	Strait of Georgia	(171)	Other Area 17	(0991)	Secretary Islands	(G2)	20/11/79
B 01,001 to B 01,450	437	(5)	Strait of Georgia	(171)	Other Area 17	(1474)	Shingle Point	(G8)	08/01/80
B 01,451 to B 02,000	541	(4)	Johnstone Strait	(132)	Kanish Bay	(0766)	Deepwater Bay	(Da)	17/01/80
B 02,001 to B 02,625	525	(5)	Strait of Georgia	(171)	Other Area 17	(0990)	Parker Island	(G1)	08/11/79
B 02,626 to B 02,650	24	(5)	Strait of Georgia	(171)	Other Area 17	(0991)	Secretary Islands	(G3)	28/11/79
B 02,651 to B 02,673	23	(5)	Strait of Georgia	(171)	Other Area 17	(0946)	Hall Island	(G4)	28/11/79
B 02,674 to B 02,675	2	(5)	Strait of Georgia	(171)	Other Area 17	(0991)	Secretary Islands	(G3)	28/11/79
B 02,676 to B 02,700	22	(5)	Strait of Georgia	(171)	Other Area 17	(0946)	Hall Island	(G4)	28/11/79
B 02,701 to B 02,725	25	(5)	Strait of Georgia	(171)	Other Area 17	(0990)	Parker Island	(G1)	08/11/79
B 02,726 to B 02,975	246	(5)	Strait of Georgia	(171)	Other Area 17	(0946)	Hall Island	(G4)	28/11/79
B 02,976 to B 03,000	25	(5)	Strait of Georgia	(171)	Other Area 17	(0990)	Parker Island	(G1)	08/11/79
B 03,001 to B 03,300	300	(5)	Strait of Georgia	(171)	Other Area 17	(0946)	Hall Island	(G4)	28/11/79
B 03,301 to B 03,400	100	(5)	Strait of Georgia	(171)	Other Area 17	(0991)	Secretary Islands	(G5)	29/11/79
B 03,401 to B 04,000	586	(5)	Strait of Georgia	(171)	Other Area 17	(0946)	Hall Island	(G6)	29/11/79
B 04,001 to B 05,000	987	(5)	Strait of Georgia	(171)	Other Area 17	(0942)	Porlier Pass	(G7)	30/11/79
B 05,001 to B 05,475	447	(5)	Strait of Georgia	(183)	Plumper Sound	(1565)	Hope Bay	(G9)	30/01/80
B 05,476 to B 06,000	480	(6)	West Coast V.I.	(245)	Meares Island	(1226)	Maurus Channel	(F5)	12/03/80
B 06,001 to B 06,500	455	(5)	Strait of Georgia	(184)	Fulford Harbour	(1015)	Beaver Point	(E12)	03/03/80
B 06,501 to B 06,875	327	(5)	Strait of Georgia	(181)	Other Area 18	(1555)	James Point	(E11)	04/03/80
B 06,876 to B 08,000	1049	(6)	West Coast V.I.	(253)	Nuchatlitz Inlet	(1268)	Outer Nuchatlitz	(F8)	06/03/80
B 08,001 to B 09,000	933	(6)	West Coast V.I.	(245)	Meares Island	(1226)	Maurus Channel	(F6)	13/03/80
B 09,001 to B 09,999	953	(6)	West Coast V.I.	(232)	Macoah Passage	(1143)	Toquart Bay	(F1)	15/03/80

Table 3 (cont'd)

Tag Series	No. of tags	(Code)	Division	(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)
H100,001 to H100,500	460	(1)	Queen Charlottes	(023)	Cumshewa Inlet	(1371)	Nedden Island	(A4)	07/04/80
H100,501 to H102,000	1448	(1)	Queen Charlottes	(023)	Cumshewa Inlet	(1371)	Nedden Island	(A5)	08/04/80
H102,001 to H103,000	923	(5)	Strait of Georgia	(152)	Lund	(0856)	Lund Harbour	(E7)	12/03/80
H103,001 to H104,000	976	(5)	Strait of Georgia	(144)	French Creek	(0823)	Northwest Bay	(E3)	13/03/80
H104,001 to H104,500	496	(5)	Strait of Georgia	(144)	French Creek	(0823)	Northwest Bay	(E4)	13/03/80
H104,501 to H105,000	497	(5)	Strait of Georgia	(172)	Nanoose Bay	(0998)	Lantzville	(E8)	13/03/80
H105,001 to H105,500	481	(5)	Strait of Georgia	(173)	Yellow Point	(0941)	Yellow Point	(E10)	14/03/80
H105,501 to H106,000	483	(2)	North Coast	(033)	Port Simpson	(1591)	Bath Point	(B1)	27/03/80
H108,001 to H108,500	497	(2)	North Coast	(052)	Kitkatla Channel	(0354)	Gurd Island	(B8)	02/04/80
H108,501 to H109,000	494	(2)	North Coast	(052)	Kitkatla Channel	(0354)	Gurd Island	(B9)	02/04/80
H109,001 to H110,000	979	(1)	Queen Charlottes	(025)	Skincuttle Inlet	(1410)	Smithe Point	(A8)	28/03/80
H110,001 to H110,500	488	(6)	West Coast V.I.	(253)	Nuchatlitz Inlet	(1268)	Outer Nuchatlitz	(F9)	06/03/80
H110,501 to H111,500	948	(6)	West Coast V.I.	(262)	Clanninick Cove	(1292)	Nicolaye Channel	(F10)	07/03/80
H111,501 to H112,000	483	(6)	West Coast V.I.	(272)	Brooks Bay	(1313)	McDougal Island	(F11)	08/03/80
H112,001 to H112,500	496	(6)	West Coast V.I.	(273)	Winter Harbour	(1329)	Mathews Island	(F12)	09/03/80
H112,501 to H113,500	969	(6)	West Coast V.I.	(242)	Hesquiat Harbour	(1605)	Leclair Point	(F4)	11/03/80
H113,501 to H114,000	469	(6)	West Coast V.I.	(245)	Meares Island	(1228)	Robert Point	(F7)	13/03/80
H114,001 to H114,500	486	(6)	West Coast V.I.	(273)	Winter Harbour	(1330)	Greenwood Point	(F13)	16/03/80
H114,501 to H115,000	482	(6)	West Coast V.I.	(245)	Meares Island	(1228)	Robert Point	(F7)	13/03/80
H115,001 to H115,500	491	(6)	West Coast V.I.	(273)	Winter Harbour	(1330)	Greenwood Point	(F13)	16/03/80
H115,501 to H116,000	493	(3)	Central Coast	(074)	Thompson Bay	(1600)	Kimlock Point	(C4)	18/03/80
H116,001 to H116,500	493	(3)	Central Coast	(074)	Thompson Bay	(0482)	Dundivan Inlet	(C5)	19/03/80
H116,501 to H117,000	476	(1)	Queen Charlottes	(006)	Louscoone Inlet	(1408)	Tuga Point	(A2)	23/03/80
H117,001 to H118,000	975	(3)	Central Coast	(074)	Thompson Bay	(0545)	Joassa Channel	(C6)	20/03/80
H118,001 to H118,500	479	(1)	Queen Charlottes	(006)	Louscoone Inlet	(1408)	Tuga Point	(A2)	23/03/80
H118,501 to H119,500	934	(1)	Queen Charlottes	(006)	Louscoone Inlet	(1409)	Sperm Bay	(A3)	23/03/80



Table 3 (cont'd)

Tag Series	No. of tags	(Code)	Division	(Code)	Section	(Code)	Locality	(Map ref.)	Date (D/M/Y)
H120,001 to H120,800	753	(5)	Strait of Georgia	(152)	Lund	(0861)	Dinner Rock	(E6)	09/03/80
H120,801 to H121,800	965	(5)	Strait of Georgia	(142)	Baynes Sound	(0838)	Shingle Spit	(E1)	11/03/80
H121,801 to H122,400	547	(5)	Strait of Georgia	(142)	Baynes Sound	(1499)	Buckley Bay	(E2)	12/03/80
H122,401 to H123,900	1432	(5)	Strait of Georgia	(173)	Yellow Point	(0941)	Yellow Point	(E9)	14/03/80
H123,901 to H124,400	490	(5)	Strait of Georgia	(144)	French Creek	(1500)	Cottam Point	(E5)	15/03/80
H124,401 to H125,000	575	(4)	Johnstone Strait	(132)	Kanish Bay	(0766)	Deepwater Bay	(D4)	18/03/80
H125,001 to H125,100	97	(4)	Johnstone Strait	(127)	Knight Inlet	(1611)	Axe Point	(D3)	20/03/80
H125,101 to H125,600	462	(4)	Johnstone Strait	(132)	Kanish Bay	(0800)	Kanish Bay	(D5)	18/03/80
H125,601 to H126,500	832	(4)	Johnstone Strait	(127)	Knight Inlet	(1611)	Axe Point	(D3)	20/03/80
H126,501 to H127,000	480	(4)	Johnstone Strait	(126)	Kingcome Inlet	(0757)	Wakeman Sound	(D1)	22/03/80
H127,001 to H127,475	470	(4)	Johnstone Strait	(126)	Kingcome Inlet	(1557)	Moore Bay	(D2)	22/03/80
H127,476 to H128,000	511	(3)	Central Coast	(102)	Takush Harbour	(1435)	Anchor Bight	(C13)	23/03/80
H128,001 to H128,500	471	(3)	Central Coast	(101)	Other Area 10	(0645)	Margaret Bay	(C12)	24/03/80
H128,501 to H129,500	987	(3)	Central Coast	(093)	Rivers Inlet - Head	(0632)	Shotbolt Bay	(C11)	26/03/80
H129,501 to H130,000	497	(3)	Central Coast	(067)	Kitasu Bay	(0430)	Marvin Islands	(C2)	28/03/80
H130,001 to H130,500	496	(2)	North Coast	(052)	Kitkatla Channel	(1524)	Billy Bay	(B10)	02/04/80
H130,501 to H131,000	489	(2)	North Coast	(042)	Big Bay	(0266)	Pearl Harbour	(B4)	03/04/80
H131,001 to H131,500	489	(2)	North Coast	(042)	Big Bay	(0266)	Pearl Harbour	(B3)	29/03/80
H131,501 to H132,000	490	(2)	North Coast	(052)	Kitkatla Channel	(1416)	Gurd Point	(B7)	02/04/80
H132,001 to H132,500	493	(3)	Central Coast	(067)	Kitasu Bay	(0430)	Marvin Islands	(C2)	28/03/80
H132,501 to H133,000	495	(3)	Central Coast	(067)	Kitasu Bay	(0430)	Marvin Islands	(C3)	28/03/80
H133,001 to H134,000	969	(1)	Queen Charlottes	(003)	Rennell Sound	(0097)	Seal Inlet	(A1)	02/04/80
H135,001 to H136,500	1421	(2)	North Coast	(043)	Malacca Passage	(1451)	Mason Point	(B5)	12/04/80
H136,501 to H138,000	1448	(2)	North Coast	(043)	Malacca Passage	(1451)	Mason Point	(B6)	13/04/80

Table 4. Age composition of herring in tagging sets made during the 1979 food fishery.

(Map ref.)	Location	n	% at age				
			2	3	4	5	6+
(Da)	Deepwater Bay	N/S					
(G1)	Parker Island	95	60	19	6	11	4
(G2)	Secretary Islands	90		7	17	33	43
(G3)	Secretary Islands	N/S					
(G4)	Secretary Islands	N/S					
(G5)	Secretary Islands	N/S					
(G6)	Hall Island	81	16	36	16	16	16
(G7)	Porlier Pass	90	3	21	15	35	26
(G8)	Shingle Spit	N/S					

Table 5. Projected lower east coast tag recoveries from food and roe fishery taggings in the 1979-80 herring season.

Tagging	No. of tags	Fishery	Estimated stock size (x10 <sup>3</sup> tons)	Tagging mortality (%)	Natural mortality (%)	Estimated % exploitation rate for intervening fishery	Predicted % exploitation rate	Plant efficiency (%)	No. of recoveries
1979 Food	4,438	1980 roe	60	50	20	20	20	70	62
		1980 food	60	50	50	20	10	30	27
1980 Roe	5,154	1980 food	60	50	30	0	10	30	23

Table 6. Age distribution, percent maturity and av gonosomatic index (G.I.) of herring in seine sets for 1980 fishing - spawning grounds taggings.

(Map ref.)	Location	n	% at age					% mature		Av G.I.		Maturity <sup>a</sup> stage	Date of		
			2	3	4	5	6+	MM	FF	MM	FF		Tagging	Spawning	Fishery
<u>QUEEN CHARLOTTE ISLANDS DIVISION</u>															
(A1)	Seal Inlet	97	1	86	10	1	2	100	100	0.18	0.26	FM	Ap02	Ap20	none
(A2)	Tuga Point	95	10	88		2		30	57	0.14	0.20	SP	M23	M21~24	M19~21
(A3)	Sperm Bay	95	4	78	10	1	7	97	100	0.17	0.25	FM	M23	Ap8	none
(A4)	Nedden Island	92	10	67	2	2	19	10	20	0.18	0.28	ST	Ap7	M27(?)	none
(A5)	Nedden Island	95	18	68		2	12	35	56	0.16	0.25	SP	Ap8	M27(?)	none
(A6)	Burnaby Strait	92	5	89	2		4	96	100	0.18	0.26	FM	M25	M9~Ap19	M23~27
(A7)	Huston Inlet	96	1	89	4	4	2	72	76	0.17	0.24	FM	M28	M9~Ap19	M23~27
(A8)	Smithe Point	92	5	92	2	1		81	71	0.16	0.22	FM	M28	M9~Ap19	M23~27
<u>NORTH COAST DIVISION</u>															
(B1)	Bath Point	85	9	61	11	6	13	95	95	0.17	0.24	FM	M27	M25~31	M28~Ap4 <sup>b</sup>
(B2)	Village Island	91	7	56	14	7	16	84	100	0.18	0.25	FM	M27	M25~31	M28~Ap4 <sup>b</sup>
(B3)	Otter Anchorage	97	8	75	8	4	6	90	100	0.17	0.24	FM	M29	M3~A4	M28~Ap4 <sup>b</sup>
(B4)	Pearl Harbour	N/S											Ap3	M3~A4	M28~Ap4 <sup>b</sup>
(B5)	Mason Point	N/S											Ap12	Ap20~23	none
(B6)	Mason Point	N/S											Ap13	Ap20~23	none
(B7)	Gurd Point	96	14	77	3	4	2	75	70	0.17	0.23	FM	Ap2	Ap1~8	M29~31
(B8)	Gurd Island	95	24	67	4	2	3	64	68	0.18	0.24	FM	Ap2	Ap1~8	M29~31
(B9)	Gurd Island	99	68	29		1	2	54	20	0.15	0.14	IY	Ap2	Ap1~8	M29~31
(B10)	Billy Bay	94	9	88		2	1	100	98	0.17	0.24	FM	Ap2	Ap22	none

Table 6 (cont'd)

(Map ref.)	Location	n	% at age					% mature		Av G.I.		Maturity <sup>a</sup> stage	Date of		
			2	3	4	5	6+	MM	FF	MM	FF		Tagging	Spawning	Fishery
<u>CENTRAL COAST DIVISION</u>															
(C1)	Weeteem Bay	96	7	85	6		2	94	100	0.16	0.24	FM	M24	M24-Ap5	M18-26
(C2)	Marvin Islands	94	4	87	5	1	3	94	100	0.17	0.23	FM	M28	M24-Ap5	M18-26
(C3)	Marvin Islands	90	5	84	9		2	39	64	0.17	0.21	FM	M28	M24-Ap5	M18-26
(C4)	Kimlock Point	91	57	41		1	1	88	72	0.15	0.20	MY	M18	Ap6-10	none
(C5)	Dundivan Inlet	99	3	62	20	7	8	98	98	0.18	0.23	FM	M19	Ap6-10	none
(C6)	Joassa Channel	98	16	74	7	1	2	100	98	0.18	0.24	FM	M20	Ap7-11	none
(C7)	Houghton Islands	88	5	61	6	15	13	93	100	0.20	0.26	FM	M23	M24-30	none
(C8)	Hoffman Bay	92	10	73	7	6	4	98	100	0.17	0.24	FM	M22	M27-Ap4	none
(C9)	Keith Anchorage	93	24	60	6	5	5	98	97	0.16	0.21	MY	M20	M23-Ap9	none
(C10)	Keith Anchorage	94	42	52	4	1	1	96	95	0.15	0.19	MY	M20	M23-Ap9	none
(C11)	Shotbolt Bay	96	62	27	3	6	2	12	27	0.16	0.25	IY	M26	M30-Ap1	none
(C12)	Margaret Bay	96	99	1				82	42	0.13	0.16	MY	M24	M25-Ap1	none
(C13)	Anchor Bight	81	14	14	8	11		100	97	0.17	0.24	FM	M23	M25-Ap1	none
<u>JOHNSTONE STRAIT DIVISION</u>															
(D1)	Wakeman Sound	81	18	45	32	4	1	85	96	0.18	0.24	FM	M22	M28-Ap6	none
(D2)	Moore Bay	75	53	18	23	5	1	58	59	0.15	0.18	IY	M22	M28-Ap6	none
(D3)	Axe Point	86	48	26	19	4	3	73	95	0.15	0.23	MY	M20	M13-M20	none
(D4)	Deepwater Bay	78		6	28	39	27	92	71	0.18	0.14	NM	M18	Ap19-22	none
(D5)	Kanish Bay	96	17	75	5		3	72	77	0.14	0.20	MY	M18	Ap19-22	none

Table 6 (cont'd)

(Map ref.)	Location	n	% at age					% mature		Av G.I.		Maturity <sup>a</sup> stage	Date of		
			2	3	4	5	6+	MM	FF	MM	FF		Tagging	Spawning	Fishery
<u>STRAIT OF GEORGIA DIVISION</u>															
(E1)	Shingle Spit	88	11	52	24	9	4	4	16	0.15	0.17	ST	M11	M4-11	M5-6
(E2)	Buckley Bay	98	11	59	21	6	3	5	25	0.14	0.15	ST	M12	M4-11	M5-6
(E3)	Northwest Bay	87	13	59	14	8	6	20	23	0.13	0.17	SP	M13	M3-13	M9-12
(E4)	Northwest Bay	83	32	54	11	1	2	56	72	0.15	0.20	SP	M13	M3-13	M9-12
(E5)	Cottam Point	92	15	74	9	1	1	21	41	0.13	0.17	SP	M15	M3-13	none
(E6)	Dinner Rock	90	2	18	41	30	9	92	100	0.16	0.26	FM	M9	M11-13	none
(E7)	Lund Harbour	91	15	41	20	15	9	30	51	0.14	0.19	SP	M12	M11-13	none
(E8)	Lantzville	89	7	31	25	28	9	44	59	0.20	0.25	SP	M13	M23-27	none
(E9)	Yellow Point	94	14	63	15	4	4	70	73	0.15	0.22	SP	M14	M10-16	none
(E10)	Yellow Point	87	10	32	27	18	13	83	91	0.19	0.26	SP	M14	M10-16	none
(E11)	James Point	82		2	14	46	38	92	45	0.16	0.15	NM	M4	F21-M27	none
(E12)	Beaver Point	93			1	45	54	86	42	0.15	0.14	NM	M3	F21-M27	none
<u>WEST COAST OF VANCOUVER ISLAND DIVISION</u>															
(F1)	Toquart Bay	83	34	50	9	6	1	95	100	0.16	0.23	FM	M15	M25-28	none
(F2)	Lyall Point	91	42	37	6	6	9	95	88	0.16	0.22	FM	M17	M25-28	none
(F3)	Mayne Bay	82	16	28	8	26	22	100	100	0.18	0.25	FM	M17	M25-28	none
(F4)	Leclaire Point	84	5	33	34	14	14	12	21	0.18	0.25	SP	M11	M8-15	none
(F5)	Maurus Channel	83	24	37	19	13	7	2	3	0.15	0.31	ST	M12	M4-12	M7-8
(F6)	Maurus Channel	88	28	33	18	8	13	43	50	0.16	0.23	SP	M13	M4-12	M7-8
(F7)	Robert Point	88	11	23	19	21	26	81	85	0.17	0.25	SP	M13	M4-12	M7-8
(F8)	Outer Nuchatlitz	87		68	25	6	1	12	57	0.13	0.20	SP	M6	M3-14	M2-5
(F9)	Outer Nuchatlitz	91	2	68	18	10	2	14	45	0.15	0.21	SP	M6	M3-14	M2-5
(F10)	Clanninck Cove	94	12	69	14	2	3	16	61	0.14	0.22	SP	M7	M10-13	none
(F11)	McDougal Island	94	12	80	8			40	82	0.17	0.20	SP	M8	M5-6	none
(F12)	Mathews Island	94	4	77	14	4	1	21	66	0.17	0.25	SP	M9	M3-11	M3-9
(F13)	Greenwood Point	91	6	87	6	1		6	27	0.15	0.25	SP	M16	M3-11	M3-9

<sup>a</sup>See text for definition of codes.

<sup>b</sup>Spawn on kelp fishing (all others - roe fishery).

Table 7. Herring tag recoveries for the 1979-80 herring season - by tagging set.

Release			Recovery						
(Sec-Loc Code)	Locality	(Map ref.)	Date D/M/Y	(Sec-Loc Code)	Locality	Type <sup>a</sup>	Date D/M/Y	Days at large	No. of tags
<u>QUEEN CHARLOTTE ISLANDS DIVISION</u>									
(025-0166)	Burnaby Strait	(A6)	25/03/80	(025-0170)	Bag Harbour	Gn-Ro	26/03/80	1	1
<u>NORTH COAST DIVISION</u>									
(042-1597)	Otter Anchorage	(B3)	29/03/80	(051-0305)	Bonilla Island	S-gut	22/06/80	85	1
<u>CENTRAL COAST DIVISION</u>									
(074-0546)	Houghton Islands	(C7)	23/03/80	(076-1596)	Gosling Rocks	S-Gut	17/06/80	86	1
<u>JOHNSTONE STRAIT DIVISION</u>									
(127-1611)	Axe Point	(D3)	20/03/80	(132-0800)	Kanish Bay	SonK	14/04/80	25	3
				(123-0691)	Bones Bay	Sn-Bt	05/05/80	46	1
				(123-0693)	Minstrel Island	Sn-Bt	21/05/80	62	1
(132-0766)	Deepwater Bay	(Da)	17/01/80	(132-0800)	Kanish Bay	SonK	14/04/80	88	1
(132-0800)	Kanish Bay	(D5)	18/03/80	(132-0800)	Kanish Bay	SonK	14/04/80	27	1
				(132-0798)	Granite Bay	SonK	26/04/80	41	2
Total for Division									9

Table 7 (cont'd)

Release				Recovery					
(Sec-Loc Code)	Locality	(Map ref.)	Date D/M/Y	(Sec-Loc Code)	Locality	Type <sup>a</sup>	Date D/M/Y	Days at large	No. of tags
<u>STRAIT OF GEORGIA DIVISION</u>									
(142-1499)	Buckley Bay	(E2)	12/03/80	(171-0837)	Komass Bluff	S-gut	25/05/80	68	1
(144-0823)	Northwest Bay	(E3)	13/03/80	(152-0942)	Porlier Pass	S-gut	06/05/80	55	1
(152-0861)	Dinner Rock	(E6)	09/03/80	(152-0856)	Lund Harbour	SonK	06/04/80	28	1
				(152-0856)	Lund Harbour	Sn-Bt	05/05/80	57	1
(152-0856)	Lund Harbour	(E7)	12/03/80	(152-0856)	Lund Harbour	Sn-Bt	22/04/80	41	1
				(152-0856)	Lund Harbour	Sn-Bt	24/04/80	43	1
				(152-0866)	Copeland Islands	Sn-Bt	09/05/80	58	1
				(123-0693)	Minstrel Island	Sn-Bt	21/05/80	70	1
				(152-0866)	Copeland Islands	C-gut	24/06/80	104	1
(171-0990)	Parker Island	(G1)	08/11/79	(171-0942)	Porlier Pass	Sn-F	21/11/79	13	3
				(171-0938)	Trincomali Channel	Sn-Fo	21/11/79	13	1
				(181-1008)	Swanson Channel	Sn-Fo	01/12/79	23	1
(171-0991)	Secretary Islands	(G2)	20/11/79	(171-0942)	Porlier Pass	Sn-Fo	20/11/79	0	7
				(171-0942)	Porlier Pass	Sn-Fo	21/11/79	1	7
				(171-0938)	Trincomali Channel	Sn-Fo	25/11/79	5	1
				(171-0938)	Trincomali Channel	Sn-Fo	26/11/79	6	2
				(171-0938)	Trincomali Channel	Nk-Pt	08/01/80	49	1
(171-0946)	Hall Island	(G4)	28/11/79	(171-0942)	Porlier Pass	jig	13/06/80	198	1
(171-0946)	Hall Island	(G6)	29/11/79	(171-0942)	Porlier Pass	jig	28/04/80	151	1
(171-0942)	Porlier Pass	(G7)	30/11/79	(171-2171)	Unknown Sec. 171	Sn-Pt	08/12/79	8	2
				(USA)	Cherry Point	Sn-Ro	05/05/80	125	1
(184-1015)	Beaver Point	(E12)	03/03/80	(USA)	Point Whitehorn	Sn-Ro	12/05/80	69	1
Total for Division									38
Total for Coast									50

<sup>a</sup>See table 9 for code by gear and fishery



Table 8. Herring tag recoveries for the 1979-80 herring season - by place of recapture.

Recovery			Release						
(Sec-Loc Code)	Locality	Type <sup>a</sup>	Date D/M/Y	(Sec-Loc Code)	Locality	(Map ref.)	Date D/M/Y	Days at large	No. of tags
<u>QUEEN CHARLOTTE ISLANDS DIVISION</u>									
(025-0170)	Bag Harbour	Gn-Ro	26/03/80	(025-0166)	Burnaby Strait	(A6)	25/03/80	1	1
<u>NORTH COAST DIVISION</u>									
(051-0305)	Bonilla Island	S-gut	22/06/80	(042-1597)	Otter Anchorage	(B3)	29/03/80	85	1
<u>CENTRAL COAST DIVISION</u>									
(076-1596)	Gosling Rocks	S-gut	17/06/80	(074-0546)	Houghton Islands	(C7)	23/03/80	86	1
<u>JOHNSTONE STRAIT DIVISION</u>									
(123-0691)	Bones Bay	Sn-Bt	05/05/80	(127-1611)	Axe Point	(D3)	20/03/80	46	1
(123-0693)	Minstrel Island	Sn-Bt	21/05/80	(127-1611)	Axe Point	(D3)	20/03/80	62	1
(123-0693)	Minstrel Island	Sn-Bt	21/05/80	(152-0856)	Lund Harbour	(E7)	12/03/80	70	1
(132-0800)	Kanish Bay	SonK	14/04/80	(127-1611)	Axe Point	(D3)	20/03/80	25	3
(132-0800)	Kanish Bay	SonK	14/04/80	(132-0800)	Kanish Bay	(D5)	18/03/80	27	1
(132-0800)	Kanish Bay	SonK	14/04/80	(132-0766)	Deepwater Bay	(Da)	17/01/80	88	1
(132-0798)	Granite Bay	SonK	28/04/80	(132-0800)	Kanish Bay	(D5)	18/03/80	41	2
Total for Division									10
<u>STRAIT OF GEORGIA DIVISION</u>									
(142-0834)	Komass Bluff	S-gut	23/05/80	(142-1499)	Buckley Bay	(E2)	12/03/80	68	1
(152-0856)	Lund Harbour	SonK	06/04/80	(152-0861)	Dinner Rock	(E6)	09/03/80	28	1
(152-0856)	Lund Harbour	Sn-Bt	22/04/80	(152-0856)	Lund Harbour	(E7)	12/03/80	41	1
(152-0856)	Lund Harbour	Sn-Bt	24/04/80	(152-0856)	Lund Harbour	(E7)	12/03/80	43	1
(152-0856)	Lund Harbour	Sn-Bt	05/05/80	(152-0861)	Dinner Rock	(E6)	09/03/80	57	1
(152-0866)	Copeland Islands	Sn-Bt	09/05/80	(152-0856)	Lund Harbour	(E7)	12/03/80	58	1
(152-0866)	Copeland Islands	C-gut	24/06/80	(152-0856)	Lund Harbour	(E7)	12/03/80	104	1

Table 8 (cont'd)

Recovery				Release					
(Sec-Loc Code)	Locality	Type <sup>a</sup>	Date D/M/Y	(Sec-Loc Code)	Locality	(Map ref.)	Date D/M/Y	Days at large	No. of tags
(171-0942)	Porlier Pass	Sn-Fo	20/11/79	(171-0991)	Secretary Islands	(G2)	20/11/79	0	7
(171-0942)	Porlier Pass	Sn-Fo	21/11/79	(171-0991)	Secretary Islands	(G2)	20/11/79	1	7
(171-0942)	Porlier Pass	Sn-Fo	21/11/79	(171-0990)	Parker Island	(G1)	08/11/79	13	4
(171-0938)	Trincomali Channel	Sn-Fo	25/11/79	(171-0991)	Secretary Islands	(G2)	20/11/79	5	1
(171-0938)	Trincomali Channel	Sn-Fo	26/11/79	(171-0991)	Secretary Islands	(G2)	20/11/79	6	1
(171-0942)	Porlier Pass	Sn-Fo	26/11/79	(171-0991)	Secretary Islands	(G2)	20/11/79	6	1
(171-2171)	Unknown Sec. 171	Sn-Pt	8/12/79	(171-0942)	Porlier Pass	(G7)	30/11/79	8	2
(171-0938)	Trincomali Channel	Nk-Pt	08/01/80	(171-0991)	Secretary Islands	(G2)	20/11/79	49	1
(171-0942)	Porlier Pass	jig	28/04/80	(171-0946)	Hall Island	(G6)	29/11/79	151	1
(171-0942)	Porlier Pass	S-gut	06/05/80	(144-0823)	Northwest Bay	(E3)	13/03/80	55	1
(171-0947)	Porlier Pass	jig	13/06/80	(171-0946)	Hall Island	(G4)	28/11/79	198	1
(181-1008)	Swanson Channel	Sn-Fo	01/12/79	(171-0990)	Parker Island	(G1)	08/11/79	23	1
Total for Division									35
<u>U.S.A. WATERS</u>									
(USA)	Cherry Point	Sn-Ro	05/05/80	(171-0942)	Porlier Pass	(G7)	30/11/79	125	1
(USA)	Point Whitehorn	Sn-Ro	12/05/80	(184-1015)	Beaver Point	(E12)	03/03/80	69	1
Total for Coast									50

<sup>a</sup>See table 9 for code by gear and fishery.

Table 9. Herring tag recoveries for the 1979-80 herring season by type of gear and fishery.

Code <sup>a</sup>	Description	No. of tags
Sn-Bt	Seine for bait	7
Sn-Fo	Seine for food	22
Sn-Ro	Seine for roe	2
Sn-Pt	Seine by permit	2
Gn-Ro	Gillnet for roe	1
SonK	Spawn-on-kelp (by seine)	8
jig	Herring (or other) jig ~ or rake	2
C-gut	Cod gut	1
S-gut	Salmon gut	4
Nk-Pt	Not known ~ by permit	1
Total		50

<sup>a</sup>As used in Tables 7 and 8.



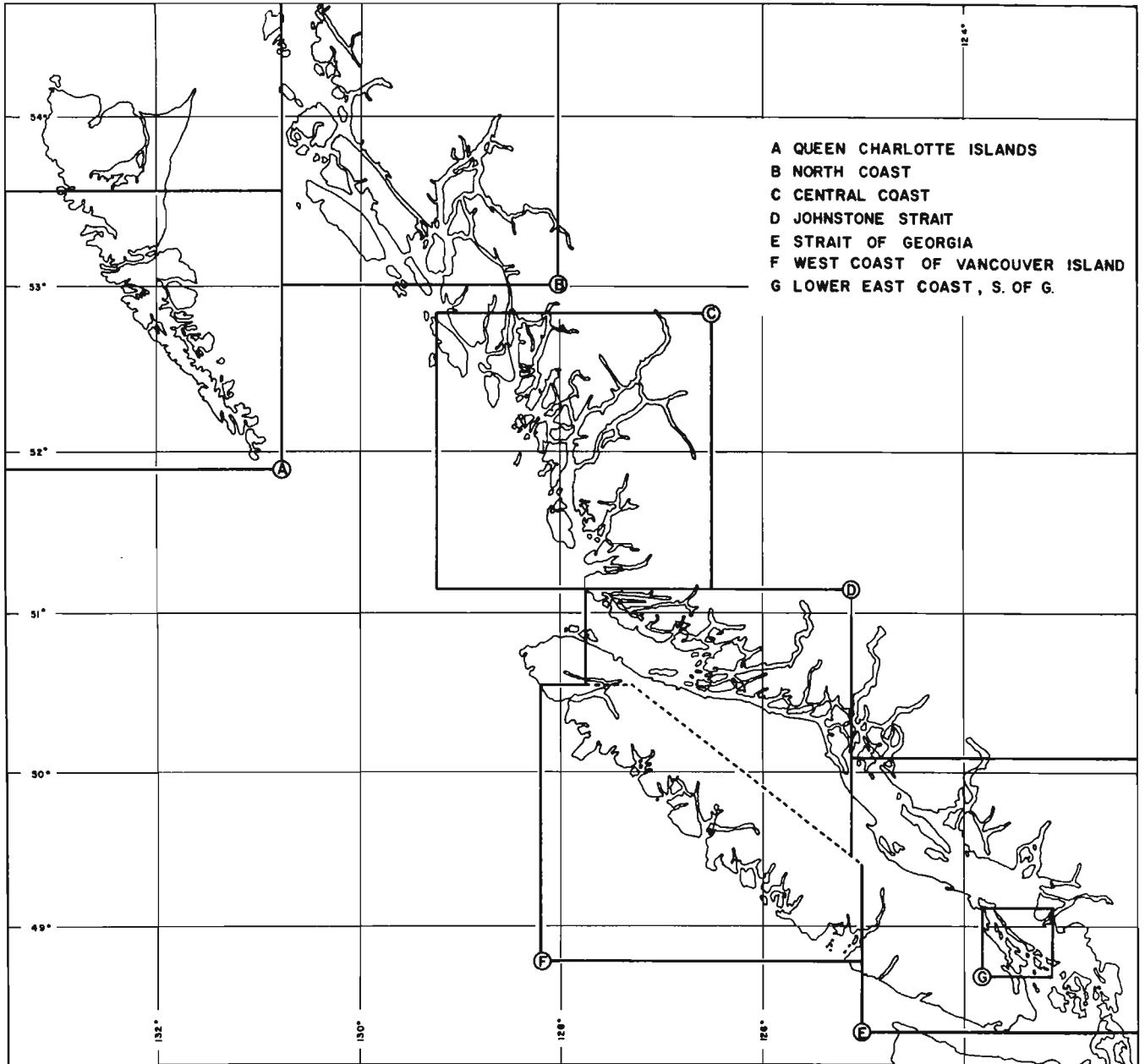


Fig. 1. Key to large scale maps depicting tagging locations (Figs. 2 to 8).



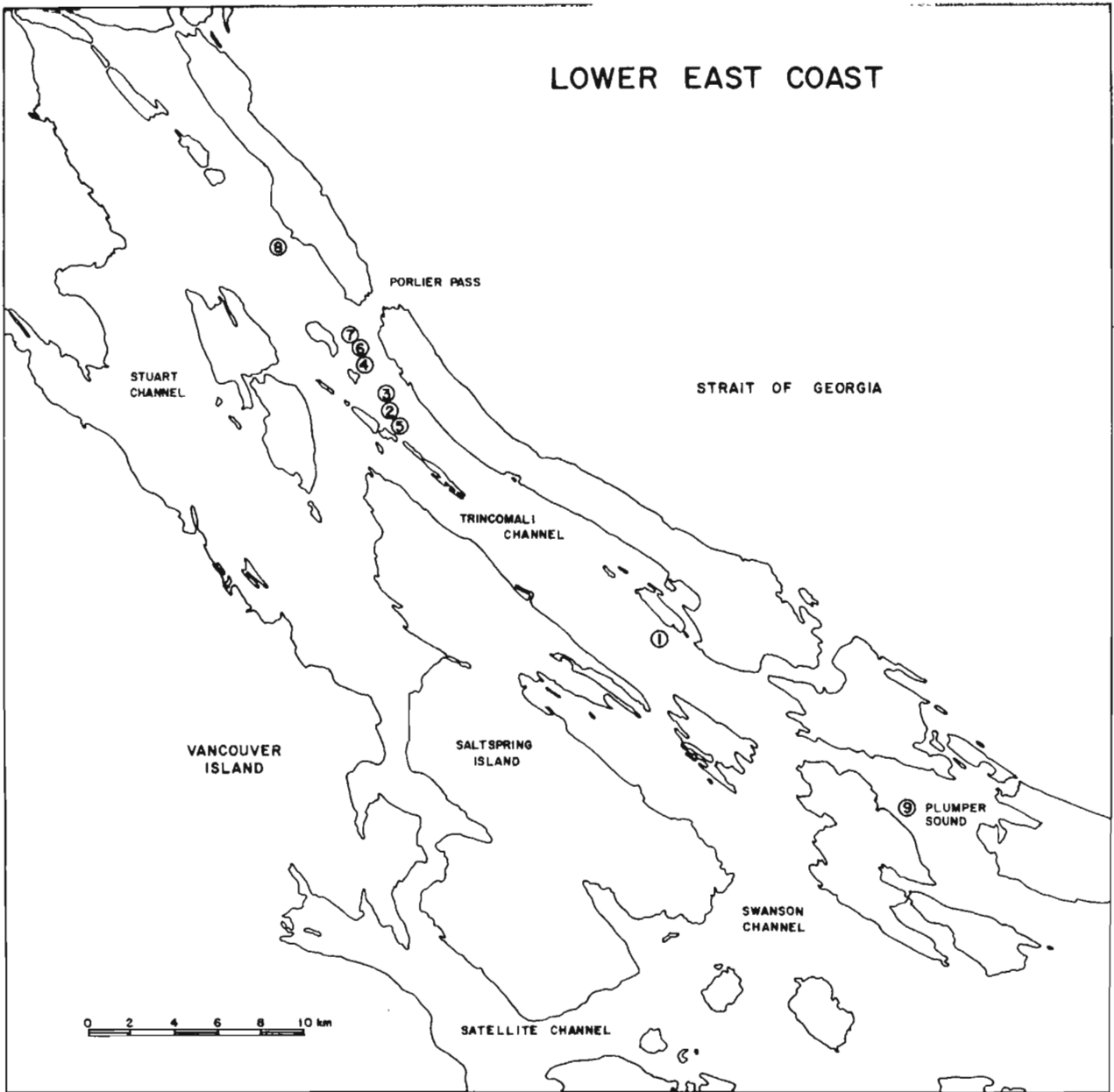


Fig. 2. Map of the lower east coast of Vancouver Island (G) showing 1979-80 food fishery tagging locations.





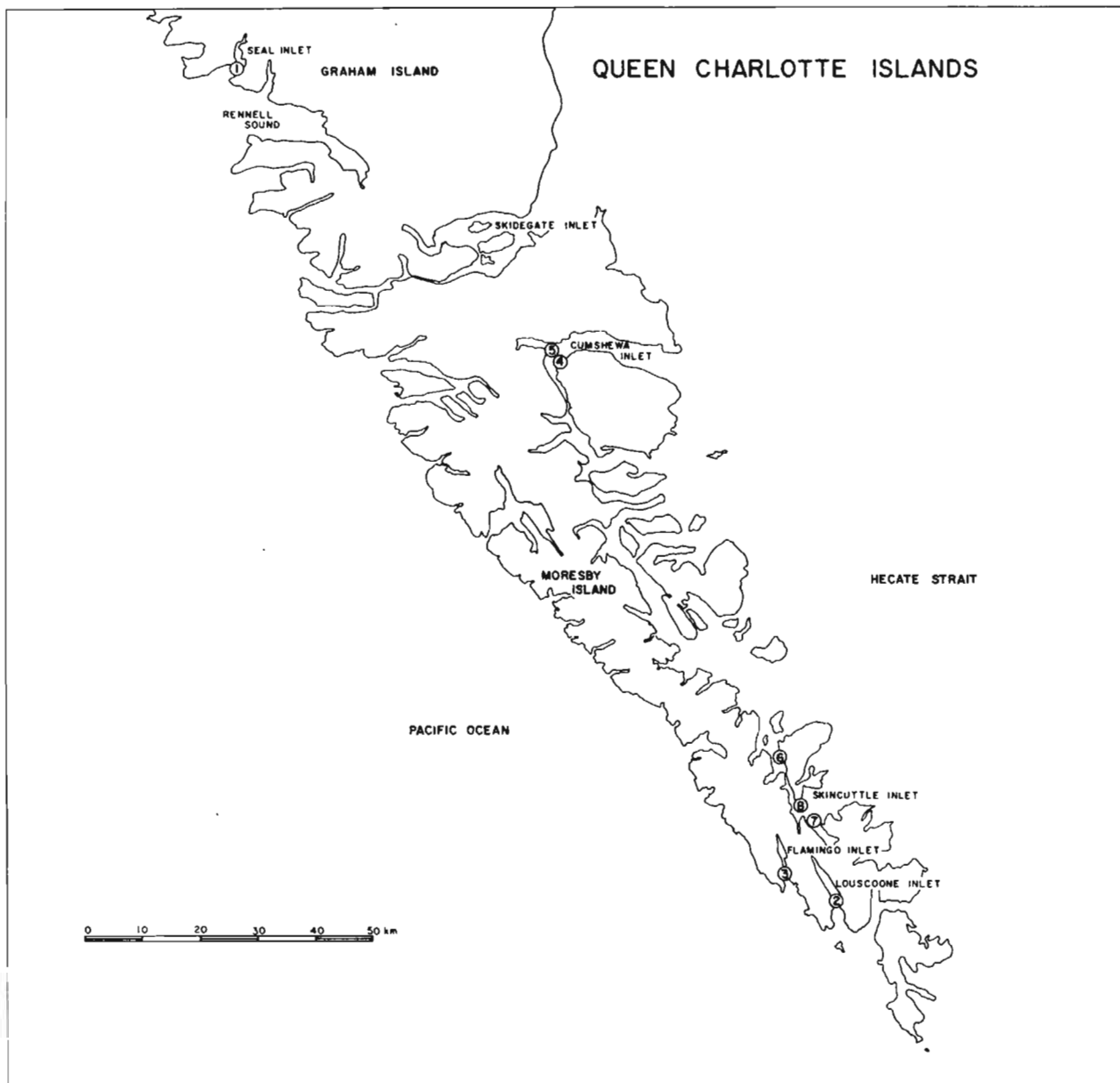


Fig. 3. Map of the Queen Charlotte Island (A) showing 1980 roe fishery and spawning ground tagging locations.



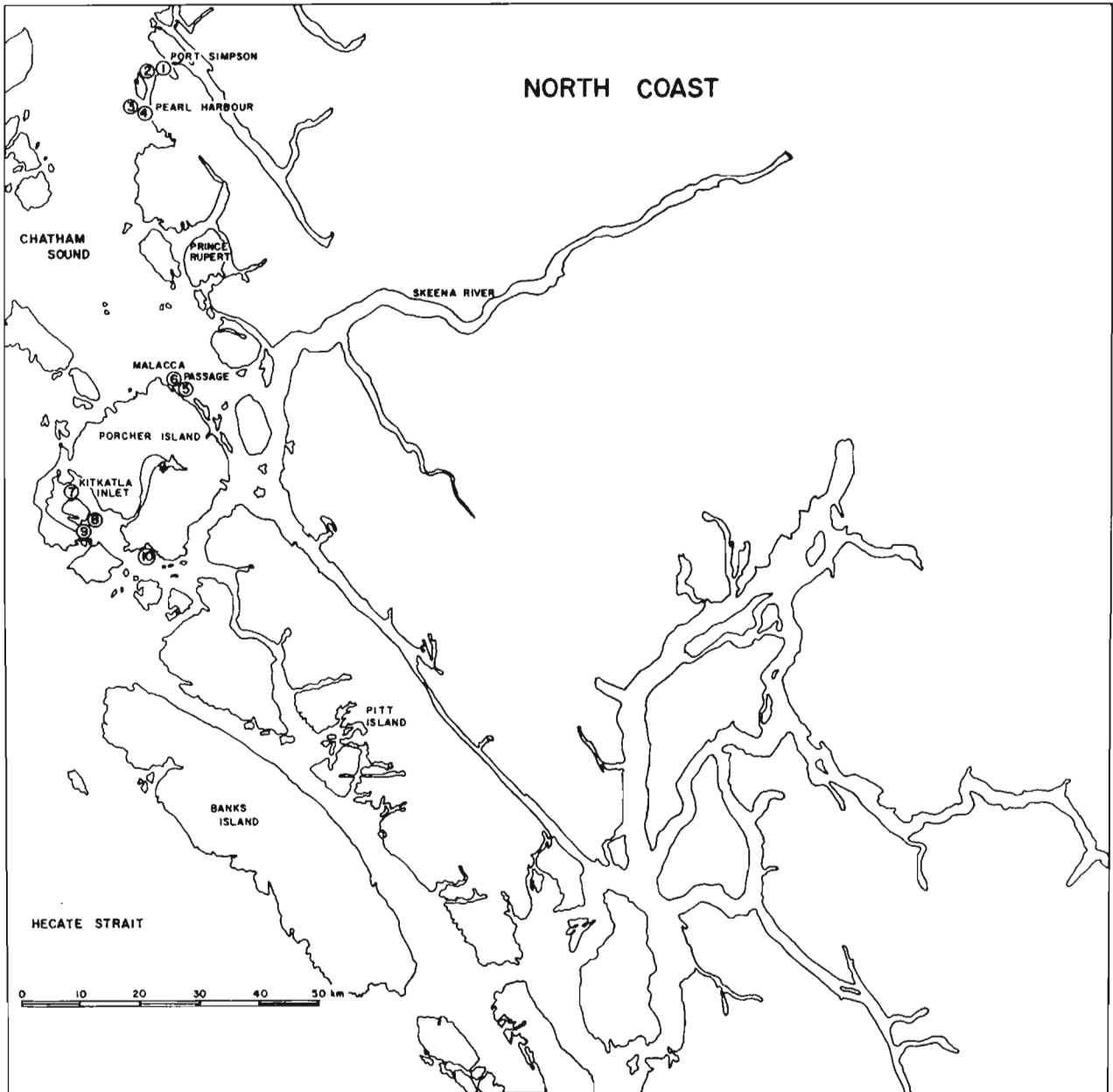


Fig. 4. Map of the north coast of British Columbia (B) showing 1980 roe fishery and spawning ground tagging locations.



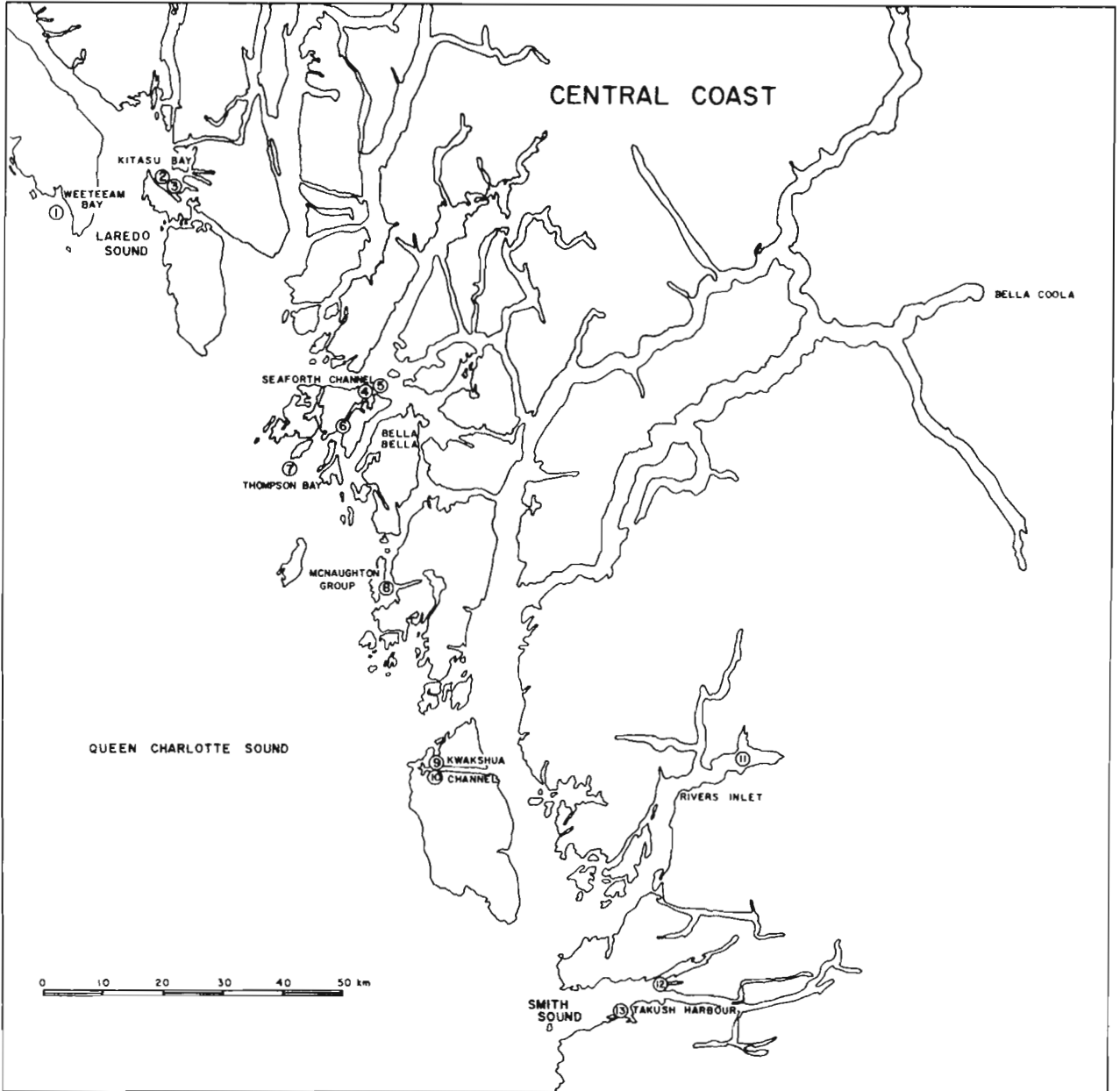


Fig. 5. Map of the central coast of British Columbia (C) showing 1980 roe fishery and spawning ground tagging locations.



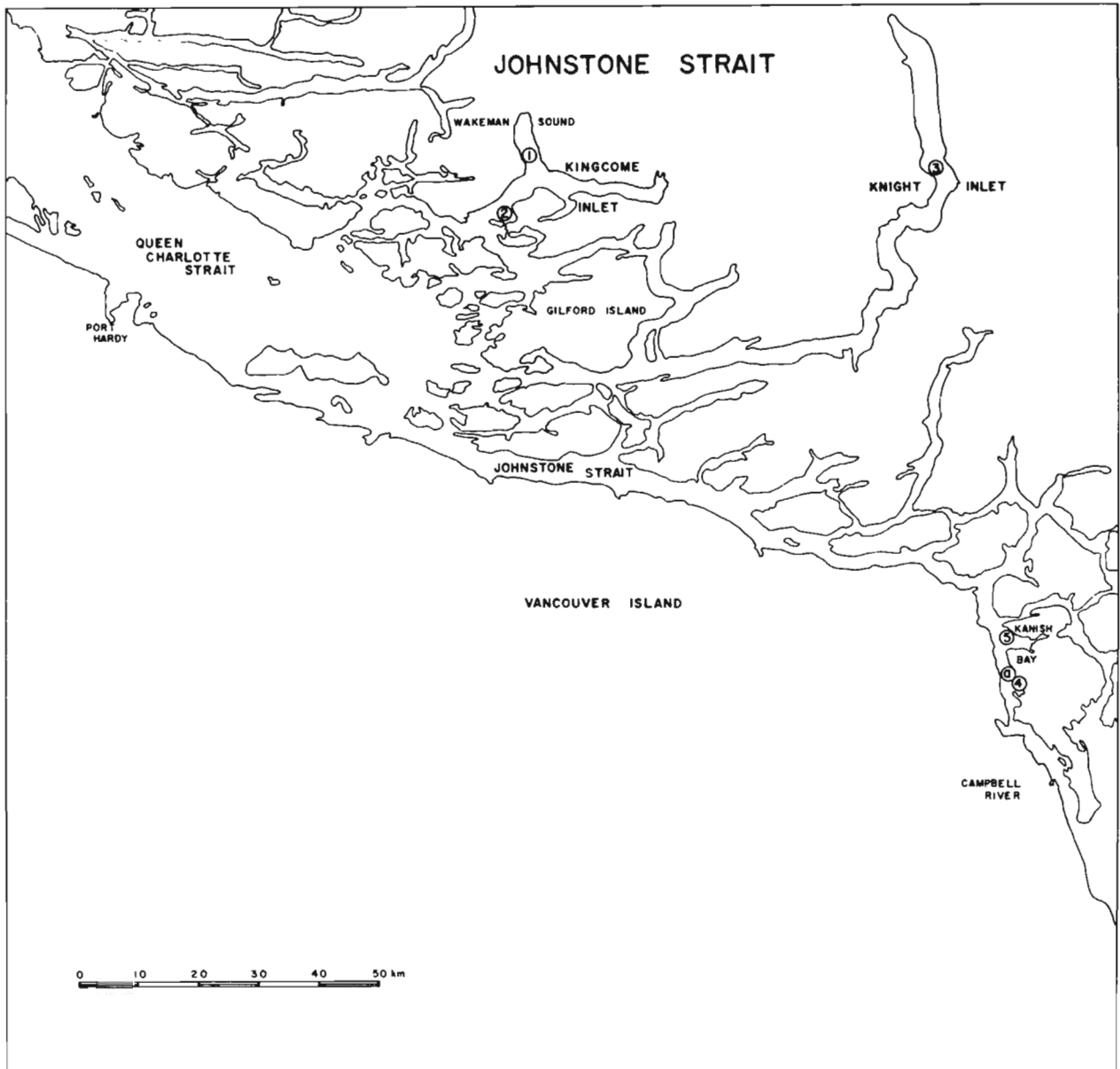


Fig. 6. Map of Johnstone Strait (D) showing 1979 food fishery and spawning ground tagging locations.





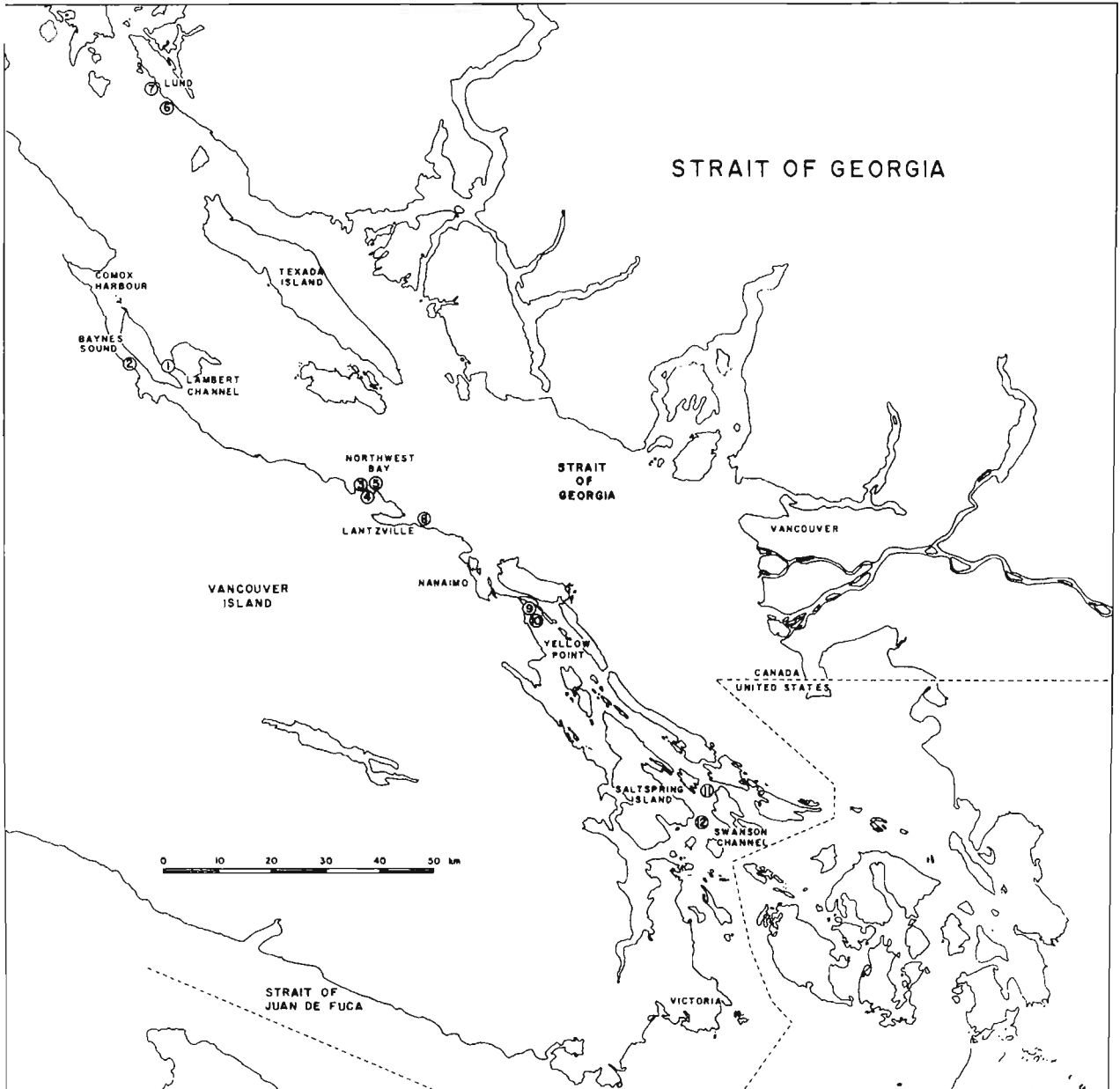


Fig. 7. Map of the Strait of Georgia (E) showing 1980 roe fishery and spawning ground tagging locations.



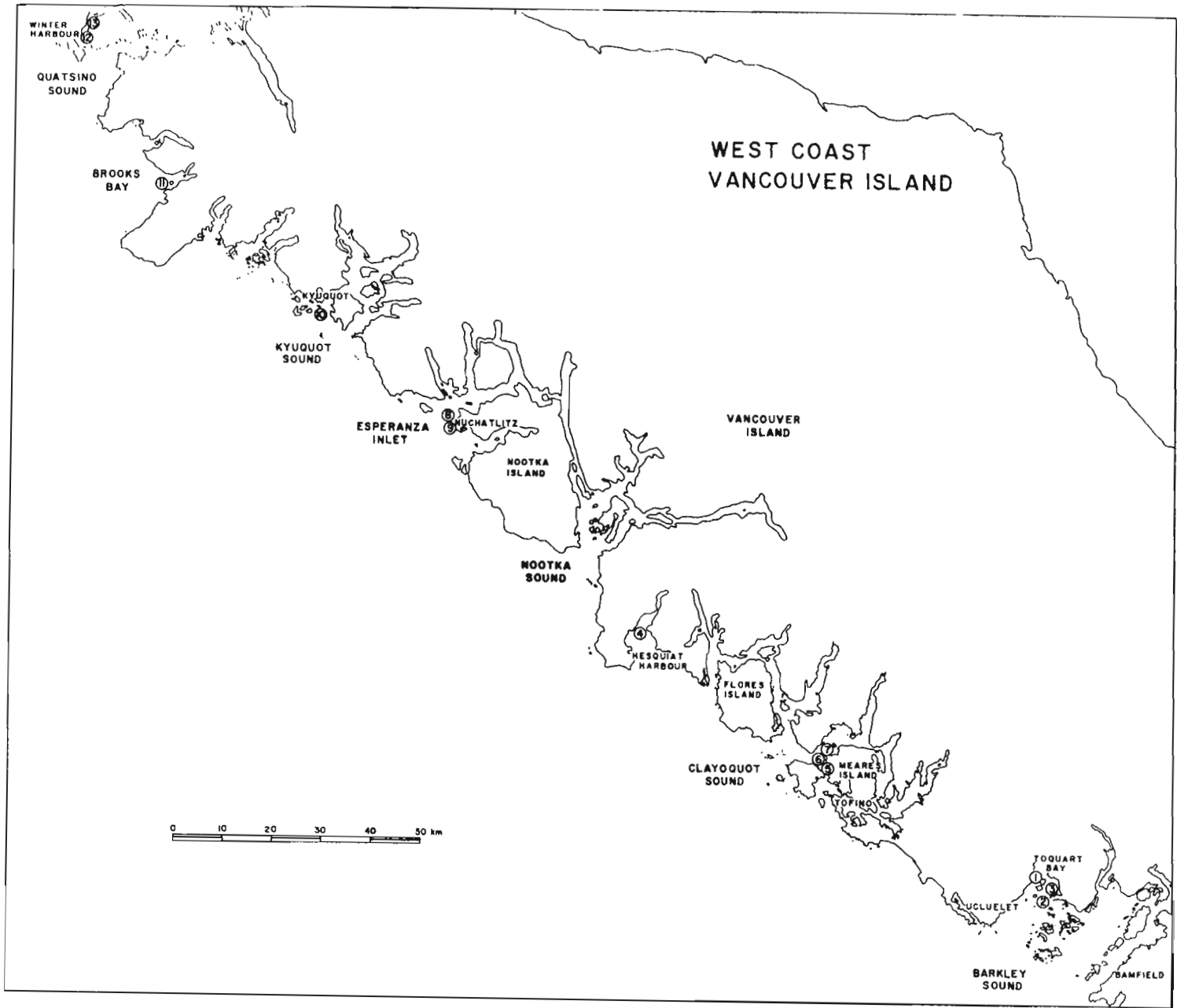


Fig. 8. Map of the west coast of Vancouver Island (F) showing 1980 roe fishery and spawning ground tagging locations.