

SOUTHEAST ALASKA/YAKUTAT
ANNUAL HERRING RESEARCH REPORT, 1994



By

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ABSTRACT

The pacific herring, *clupea pallasii*, supports a number of commercial fisheries and is an important food fish in Southeast Alaska. The 1994 winter bait fisheries occurred in Craig, Hobart Bay/Port Houghton, Necker Bay, Whale Bay, and a test fishery in Sitka Sound. The spring gillnet sac roe harvest from Cat Island and Seymour Canal totaled 1,131 tons, while the seine sac roe harvest from Sitka totaled 4,753 tons. Spawn-on-kelp fisheries occurred in Hoonah Sound and Craig. The total exvessel value of the region's herring fisheries was estimated at \$6,382,550. Approximately 7,000 herring were sampled for age and growth analysis from the major stocks. The 1990 year class remained dominant throughout most of the region with good recruitment of younger fish in most stocks, with the exception of Sitka, where 6-year-olds dominated the population and recruitment was minimal. Spawn deposition surveys to compute spawning biomass were conducted on eight spawning stocks for a total escapement estimate of 38,857 tons. A series of aerial and skiff spawning ground surveys conducted on those, and smaller stocks, documented a total of 140 nautical miles of beach receiving spawn in Southeast Alaska, and an additional 0.3 nautical miles in Yakutat. Eighty-seven paired herring spawn-on-kelp samples were collected by department divers from the spawning ground egg deposition surveys for analysis in the laboratory to calibrate individual diver visual estimates. Substrate-specific visual estimate correction factors for individual divers used in 1994 ranged from 0.77 to 1.35.

INTRODUCTION

The Alaska Department of Fish and Game's herring research project was initiated in 1971 in response to greater demands on the resource by the commercial bait and developing sac roe fisheries. The goal of this project is to provide the biological data necessary for the scientific management of the region's herring stocks. Current program project objectives are monitoring spawning populations through age and growth analysis and spawn deposition studies on an annual basis. Project personnel conduct aerial and skiff surveys throughout the region to document spawning activities and assist in the inseason management of the commercial fisheries. Summaries of all herring commercial fisheries and stock assessment activities in Southeast Alaska for 1994 are included.

COMMERCIAL FISHERIES

Methods and Procedures

Age Structured Analysis

Beginning in 1994, the department modified the primary method of forecasting herring abundance for major spawning stocks in Southeast Alaska. Age Structured Analysis (ASA), which relies on a time series of herring population assessment data, was used to forecast herring biomass for those spawning stocks with sufficient historical data. ASA applies estimates of recruitment, growth, maturation, natural mortality, weight-at-age and spawning escapement to forecast herring stock abundance. The 1994 spawning biomass forecast return for Cat Island, Craig, Sitka, and Seymour Canal was based on site-specific age composition, maturity, and mortality estimates applied to the 1993 spawn deposition escapement estimate.

Test Fisheries

A test fishery was conducted in early spring in the Sitka Sound area. The purpose of this test fishery was to improve the current ASA biomass forecast with updated information on age composition and weight-at-age for the Sitka herring population. Samples from the fishery indicated that there had been a general increase in the estimated weights of most age classes. A total of 100 tons of herring was harvested. Approximately 78% of the herring captured during this fishery were age 6.

A test fishery was conducted in April on herring spawning in the Hobart Bay/Port Houghton area. The test fishery was designed to obtain funds to be used for management and research of stocks located throughout the Petersburg-Wrangell management area. A total of 24.5 tons of herring were harvested for sac roe.

A test fishery was conducted in West Behm Canal near Ketchikan. The primary purpose of this test fishery program is to obtain data on age-structure, spawn-timing, and abundance of the herring spawning population in the West Behm Canal area. Revenues generated from this test fish program will be used to defray costs for managing and assessing herring populations in the Ketchikan area. A total of 12 tons of herring were harvested for sac roe.

A test fishery to develop information on the feasibility of open pounds was initiated in Hoonah Sound in 1994. A bid request was announced on February 24. Three respondents were awarded contracts. Two of the three were present on the grounds and fished open pounds; however, no product was produced.

Sac Roe Fisheries

Commercial sac roe fisheries were conducted at Cat Island, Sitka and Seymour Canal during the 1994 season. Harvest in the commercial gillnet areas included 749 tons from the Cat Island area and 382 tons from Seymour Canal. A commercial seine harvest occurred in the Sitka Sound area where 4,753 tons of herring were harvested for sac roe (Table 1).

Winter Bait Fisheries

Winter food and bait fisheries were conducted in Craig, Hobart Bay/Port Houghton, and the Necker Bay/Whale Bay areas. Quality, size and concentration of stocks were limiting factors during the 1994 season. None of the areas open for commercial harvest achieved their guideline harvest limits.

Spawn-on-kelp Pound Fisheries

Spawn-on-kelp pound fisheries were conducted in Craig and Hoonah Sound. In Craig, 15% of the established biomass was allocated to the commercial spawn-on-kelp fisheries, and 85% was allocated to the commercial bait harvest. For the Hoonah Sound spawn-on-kelp fishery, the Board of Fisheries established a 150-ton herring (12 tons of spawn on kelp) harvest guideline.

Results and Discussion

Sac Roe Fisheries

Sitka Sound. Aerial spawning ground surveys commenced on March 16 and continued through April 17. Hydroacoustic surveys for herring distribution began with the arrival of the R/V Sundance on March 24. Initial spawning documentation occurred on March 26 in Leesofskaia Bay. At this time, several large schools were observed in the shallows throughout Aleutkina Bay. No activity had been observed in the traditional spawning areas north of Sitka. On March 26, 1994 it was announced that the Sitka Sound sac roe fishery would be placed on 2-hour notice effective 8:00 a.m., March 28. On March 28, a major shift in distribution was noted on the north end of Sitka Sound. With the advent of a major spawning occurring in the northern area on March 29, it was announced that fishing would begin at 1:30 p.m. on March 29. With catches reported as smaller than originally anticipated and the presence of "spawn-outs", the original area was expanded to include all waters of Katlian Bay. Initial catches were good in Katlian Bay. With the advent of darkness, it was announced that the fishery would close at 6:05 p.m. Approximately 3,300 tons of herring was already harvested, leaving approximately 1,100 tons to fill the quota. The remainder of the quota was small enough to raise concerns about the possibility of a second opening exceeding the quota and, at the same time, be large enough to be of value to the industry. After meeting with industry personnel it was decided to continue fishing in an area where the department could monitor the catches and not exceed the guideline harvest level of 4,432 tons. Aerial surveys conducted on the morning of March 31 revealed good concentrations of herring at the head of Nakwasina Pass. With concern over exceeding the quota it was decided to open the outer portions of Nakwasina Sound where smaller concentrations had been observed. The fishery opened at 1:30 p.m. Catches were reported as very slow, with only 50 tons harvested in one hour. Aerial surveys revealed fish previously reported to be concentrated at the head of Nakwasina were now spreading to the center of the sound and were extending along the shorelines into somewhat shallower water, making them less vulnerable to commercial gear. At 3:00 p.m. the original area was expanded to include the head of Nakwasina Sound. The fishery remained open for 40 minutes and at 3:40 p.m. was announced closed. Approximately 1,050 tons of herring were harvested from the last opening. Final harvest statistics revealed 4,753 tons of herring harvested. Overall, quality was very good with approximately 11% roe maturity and a 130-gram average weight. Ten companies and 51 fishing boats participated in the fishery. Fishermen were advanced \$500/ton for 10% roe and \$50 per ton for each percentage point over 10%, producing an exvessel value for the 1994 Sitka Sound sac roe fishery of approximately \$2,614,150.

Kah Shakes/Cat Island. Spawning activities during the spring of 1994 occurred in the Cat Island area; there was no observed activity spawning in the traditional Kah Shakes area. The quota for the Kah Shakes/Cat Island area was originally established at 1,032 tons. The Metlakatla Indian Community (MIC) requested that the State of Alaska halt the 1994 fishery until stock verification could be determined for the Cat Island area. Due to the intent of MIC to harvest herring within the reservation boundaries, the department voluntarily reduced the established Guideline Harvest Level (GHL) by 150 tons, establishing

a new GHL of 880 tons. The Kah Shakes/Cat Island area was placed on 12-hour notice on April 8, 1994 at 8:30 p.m., and opened for commercial harvest at 8:30 a.m. on April 9. Catches remained good throughout the day with preliminary catch figures approaching the GHL. The fishery was closed at 8:30 p.m. on April 9, 1994. On April 10, 1994, harvest statistics revealed that 725 tons of herring had been harvested by 118 boats, leaving 155 tons remaining on the quota. Department personnel continued to monitor spawning activities in the Cat Island area. Due to weather conditions in the area, it was decided that the Cat Island area would not reopen on April 10. On April 11 at 9:00 a.m., the area was reopened to commercial harvest. As fishing progressed it had become apparent that catches were extremely small and spawning in the Cat Island area had subsided. With conservation goals in mind, and to minimize the harvest of spawned-out herring, the fishery was closed at 2:00 p.m. on April 11, 1994. Final catch figures revealed that 749 tons of herring were harvested from the Cat Island area, 131 tons below the established GHL. Roe percentages varied from 10% to 21%, with an overall average of 14.97%. Processors paid an adjusted price of \$1,600 per ton, giving the fishery an exvessel value of approximately \$1,224,135.

Seymour Canal. A 1994 guideline harvest of 368 tons was established for the 1994 Seymour Canal sac roe fishery. Aerial surveys commenced on April 21 and continued on a regular basis through May 19. The department vessel, RV Illiaska, arrived on the fishing grounds April 26 to lend management support and conduct surveys. Spawning in the Seymour Canal area was first observed on April 27. Approximately one nautical mile was recorded just south of Sore Finger Cove. On April 27, 1994, it was announced that the Seymour Canal sac roe fishery would be placed on 2-hour notice effective 8:00 a.m., April 28. Gillnet samples taken on herring observed in the active spawn of April 27, and on schools observed leading the beach on April 28, revealed roe percentages ranging from 12% to 15% with little immature roe. Aerial surveys conducted on April 29 revealed herring leading the beach in the Black Jack area, with several reports of spot spawns occurring throughout the area. The fishery was opened at 11:30 a.m. on April 29. Fishing occurred at a steady rate and was closed at 1:30 p.m. that afternoon. The Seymour Canal fishery had 95 permit holders present, and six companies were represented with 10 tenders present. Approximately 382 tons of herring were harvested, with an average roe maturity of 12.8%, representing an exvessel value of approximately \$630,300.

Winter Bait Fisheries

Craig/Klawock. The Craig/Klawock winter food and bait fishery was opened at 8:00 a.m., Wednesday, December 8, 1993, with a guideline harvest level of 760 tons. Although a large biomass of herring had been located in the fishery area, the herring remained deep and fishermen and processors were unhappy with the small size of the fish. Seven vessels eventually harvested 636 tons of herring from the area, 124 tons short of the established quota. The fishery was closed at 8:00 a.m. on January 9, 1994. Processors paid approximately \$380 a ton, for a total exvessel value of \$187,578.

Hobart Bay/Port Houghton. The Hobart Bay/Port Houghton area was opened to commercial harvest at noon on October 17, 1993, and remained open through February 28, 1994 with a guideline harvest level

of 230 tons. The fishery was opened in October in an attempt to make the fish more accessible. No herring were landed from this area during the past two seasons. No fishing was conducted in the area prior to the end of January when the harvest of 140 tons occurred. In the outer bay a number of sets were released due to inadequate size. The department closed the fishery on February 28, 1994. The fishery produced an exvessel value of approximately \$41,300. This was the first successful harvest of herring on the Port Houghton-Hobart Bay stock since 1978.

Necker Bay/Whale Bay. Necker and Whale Bay were opened for the commercial harvest of bait at 12:00 noon on December 8, 1993. A combined quota of 200 tons was established for both areas. As a result of aerial and hydroacoustic surveys, a harvest limit of 50 tons was established for the Necker Bay area where fishing occurred from January 6-7 with a total harvest of 67 tons. Necker Bay was closed by emergency order on January 12, 1994. Harvest in Whale Bay occurred on January 6, 1994; 36 tons of herring were taken by one vessel. Due to the depth range and small size of fish in the Whale Bay area, this was the only harvest to occur. Whale Bay was closed by emergency order on February 8, 1994. A total of 103 tons of herring were delivered, with an exvessel value of \$30,385.

Spawn-on-kelp Pound Fisheries

Craig/Klawock. The Alaska Board of Fisheries established the Craig/Klawock herring spawn-on-kelp pound fishery in 1992. This fishery is allocated 15% of the guideline harvest level (GHL) for the Craig herring stock, which allowed a GHL of 135 tons of herring, or 10.8 tons of spawn on kelp, for the 1994 fishery. On December 23, 1993, Craig/Klawock herring pound application forms became available in the Ketchikan office with a January 31, 1994 deadline. Of the 257 applications received, 147 permits were issued. Allocations of 233 blades of *Macrocystis* kelp and 1.0 tons of herring were given to each permit holder. On April 5, 1994, the department opened seining for the introduction of herring into the pounds. Seining continued until Monday, April 18. Harvesting began on April 9, with 83 individuals harvesting spawn on kelp. There were 33,109 lbs, or 16.5 tons of product harvested. Three companies bought product at an average price of \$11.00/lb, giving the fishery an estimated exvessel value of \$364,199. All pounds were required to be removed from the water by June 15, 1994. There were 2.9 tons of *Macrocystis* kelp harvested for the fishery. This was the third consecutive year for the Craig/Klawock pound fishery. The final product quality was greatly improved over previous years.

Hoonah Sound. In 1990, the Alaska Board of Fisheries established a fixed harvest quota of 12 tons for the Hoonah Sound herring spawn-on-kelp fishery. Permit applications became available in the Sitka office for the Hoonah Sound pound fishery on December 21, 1993, with a January 31, 1994 deadline. Of the 195 applications received, 123 permits were issued and 120 herring pounds were actually present on the grounds. Allocations of 140 blades of kelp were issued per pound on April 5, 1994. The Hoonah Sound herring grounds were open to seining for herring on April 6 with seining actually occurring from April 21-24. Harvesting in the pounds occurred from April 25-27. An estimated 65,400 lbs (32.7 tons) of high quality product was harvested from this year's fishery, far exceeding the 24,000 lbs (12 ton) quota. A

preliminary estimate of the fishery's exvessel value is \$1,224,631, based on an estimated price of \$18.73/lb. The fishery was closed by emergency order at 8:00 p.m. on April 25, 1994. This was the fifth consecutive year for the Hoonah Sound herring spawn-on-kelp fishery.

AGE AND GROWTH ANALYSIS

Methods and Procedures

Herring samples were collected during research surveys, aerial surveys, and the commercial fisheries from stocks located throughout Southeast Alaska (Figure 1). Collection gear varied with location, but included purse seines, cast nets, and gillnets. Cast nets were used when fish were in shallow water during spawning. Sampling was conducted on the spawning grounds and in prespawning areas. Herring sampled from the commercial fisheries were collected from individual fishermen or tenders on the fishing grounds. The times and geographic locations of collection were recorded. A target collection goal is at least 420 fish from each commercial fishery and each spawning location. All samples were either processed fresh or frozen for examination and collection of scales in the laboratory.

After thawing in the laboratory, the standard length (mm) of each fish, (tip of snout to posterior margin of the hypural plate) was measured on a caliper measuring board. Fish were weighed on an electronic balance to the nearest whole gram.

A scale was removed from each fish for age analysis. The preferred location is on the left side, two rows above the lateral line, anterior to the dorsal fin or beneath the left pectoral fin. Scales were cleaned and dipped in a solution of 10% mucilage glue and water and placed unsculptured side down on glass slides. Aging was conducted using a dissecting microscope, varying the light source for optimum image of the annuli. Scale reading results were spot-checked by a second reader for age verification. The fish were assigned an anniversary date for each completed growing season. All samples were collected before growth resumed in the spring. For example, if a herring hatched in the spring of 1991 and was collected in the fall of 1992, two growing seasons had occurred (age 2). If the herring had been collected in the spring of 1993 before growth had resumed, it was also recorded as age 2.

In order to provide real-time age frequency analysis either prior to or during a commercial fishery, some sampling was conducted onboard department research vessels. This enabled department personnel to provide the commercial fishing fleet and processors with timely age, length, and weight information.

Results and Discussion

A total of 6,868 fish were aged, sexed, weighed and measured for length. Samples were taken from Cat Island, West Behm Canal, Kasaan, Vixen Inlet, Port Houghton/Hobart Bay, Craig, Sitka, Whale and Necker Bay, Hoonah Sound, Seymour Canal, Juneau and Yakutat (Figure 2). Spawning populations in Sitka, Seymour Canal, and the Port Houghton/Hobart Bay areas had a dominant 6-year-old age class, while populations in Cat Island, Craig and West Behm were comprised mostly of 4- and 5-year-old fish. Recruitment of age 2-, 3- and 4-year-old fish was strong throughout most of Southeast Alaska with the exception of Sitka, where 6-year-old fish compromised approximately 70% of the population. Summaries of age, size and sex herring samples completed in 1994 are included in Appendix A.

SPAWN DEPOSITION SURVEYS

Methods and Procedures

The spawn deposition survey technique for estimating numbers of herring eggs by spawning area has been used in Southeast Alaska since 1976. It has become the most common method of estimating herring escapements in recent years. The goal of the spawn deposition survey is to compute the total number of eggs within a defined spawning area. This estimate of total egg numbers can then be converted into a spawning population biomass estimate.

A series of aerial and vessel surveys are conducted to document the occurrence of spawning activities at sites during the spring spawning period to document spawn timing and to provide an index of abundance in terms of the nautical miles of beach that received herring spawn. The presence of eggs on intertidal kelp, milt present in the water, herring schools, and bird and sea mammal activity are all important indicators of herring and spawn abundance.

The basic field sampling procedure entails 2-person SCUBA teams swimming along line transects and recording visual estimates of the number of eggs within a square, 0.10 m² sampling frame placed on the bottom at 5-meter intervals along the transects. Because the frames (i.e., samples) are spaced equidistantly along transects, the record of the number of frames along a transect is also used to compute transect length. Along each transect, Diver 1 swims the specified inter-frame distance and places the frame on the bottom in a haphazard fashion to minimize bias. Diver 2 then visually estimates the number of eggs within the frame boundary and records the number of eggs within the frame on a preprinted data form carried by Diver 2. Diver 2 records the sequential number of the sample along with data on depth,

substrate, and temperature. If time and conditions allow, Diver 1 also estimates the number of eggs for comparison with Diver 2's estimates and as a training exercise for Diver 1.

Starting points for transects in the control area are located randomly along the shore in areas where aerial or skiff surveys indicated probable spawn deposition. Transects are oriented perpendicular to the shoreline. Transects extend from the intertidal to either 15 meters of depth or until no further egg deposition is observed. The transect is extended above the waterline as far as egg deposition occurs. Dives are limited to 15 meters because deeper dives severely limit total bottom time for SCUBA divers and pose safety risks when done repetitively over several days. In addition, little if any herring egg deposition normally occurs deeper than 15 meters. The number of transects for any spawning site is estimated from previous surveys to achieve a statistical objective of producing an estimate of mean egg density with a standard error within +/- 20% of the mean. Practical considerations due to weather or vessel scheduling often result in a fewer number of transects.

The distribution of herring eggs within the spawning area, the substrate type, and egg densities are determined by divers using SCUBA (Self Contained Underwater Breathing Apparatus). This information is used to document the spawn and compute a total number of eggs present within the survey area. Knowing the total number of eggs present enables us to back-calculate the spawning biomass as a whole, or by cohort analysis by applying age composition and size-at-age data from the age and growth analysis.

Visual Estimate Correction

Since visual estimates, rather than complete counts, of eggs within the 0.10 m² sampling frames are recorded, measurement error occurs. To minimize the influence of this measurement error on final estimates of total egg deposition, diver-specific correction coefficients (c_i) are used to adjust estimates of egg density. Correction coefficients are estimated by visually estimating the number of eggs within a sampling frame and then collecting all of the eggs within the frame for later enumeration. To collect the eggs, divers either remove them from the substrate (e.g., rock) or collect the substrate (e.g., kelp) for later removal of the eggs.

Given the visual estimates and actual counts of eggs, the diver-specific correction factors are estimated as:

$$c_i = \frac{k_i}{v_i}$$

- where: c_i = estimated correction factor for diver i.
k_i = mean laboratory count of egg numbers for diver i
v_i = mean visual estimate of egg numbers for diver i

Estimates of Total Egg Deposition

For each spawning area, total egg deposition is estimated as:

$$t=ad$$

- where: t = estimated total deposition of eggs for spawning area.
a = estimated total area (m²) on which eggs have been deposited at spawning area.
d = estimated mean density of eggs (eggs/m²) at spawning area.

The total area on which eggs have been deposited is estimated as:

$$a=lw$$

- where: l = total meters of shoreline receiving spawn (determined from aerial/skiff surveys) at a spawning area.
w = mean length of transects conducted at a spawning area.

The mean density of eggs is estimated as:

$$d = \frac{\sum v_i c_i}{\sum n_i}$$

- where: n_i = number of quadrants visually estimated by diver i.

Spawning Biomass Estimation

The total number of eggs per spawning area is the primary estimate used in forecasting herring spawning biomass. The estimate is used either with additional information such as age composition and growth information to calculate future returns, or in a simpler model which assumes that growth and recruitment are exactly balanced by natural mortality. A 1994 spawning biomass for the survey areas was directly estimated from the number of eggs as:

$$b = \frac{t}{L * 100,000,000}$$

where: b = estimated total spawning biomass. (100,000,000 is the standard eggs to spawning biomass conversion).

L = egg loss correction factor (=0.9) that accounts for an estimated 10% egg mortality between the time eggs are deposited and spawn deposition surveys are conducted.

Results and Discussion

Comprehensive spawning ground surveys utilizing SCUBA were conducted in the Cat Island, Craig, West Behm Canal, Ernest Sound, Seymour Canal, Sitka, Hoonah Sound and Lisianski areas in 1994. Length and width of spawn, egg density and resultant escapement are summarized for these areas in Table 2. The first survey was initiated in Sitka on April 8 and the last was completed in Seymour Canal on May 21. The surveys documented a total escapement for these areas of 38,857 tons. Maps of the spawning area, transect locations, and individual transect data are presented in Appendix B. The series of periodic aerial and skiff surveys conducted between early March and late May to document spawning in each of these major spawning areas, as well as maps of spawn occurring in some smaller stocks, is presented in Appendix C. The total spawn for Southeast Alaska was 140.0 nautical miles, with an additional 0.3 nautical mile in Yakutat.

Cat Island

The 12.6 nautical miles of beach receiving herring spawn in the Cat Island area occurred April 4-11. All spawning occurred in the Mary Island, Cat Island and Duke Island areas, and none on the Kah Shakes shore. An additional 2.9 nautical miles occurred on the east side of Annette Island in the traditional spawning area between Kwain Bay and Cascade Inlet. The active spawn was described as spotty and discontinuous with noticeably less intensity than in previous years.

The Cat Island spawn survey was initiated April 15, 1994. Twenty-five transects were selected at random in 1994 for a transect density of two per nautical mile of spawn. The spawn deposition survey for east Annette Island, coordinated by the MIC biologist, was initiated in the morning, and their three divers accompanied our divers for three transects of Cat Island. Department biologists also observed the MIC dive survey techniques for two transects north of Crab Bay. Dive operations were completed at noon with the RV Sundance departing for Craig immediately. The average transect length (25 transects) was 155.2 meters, with an average egg density of 109,659 egg/m². The escapement was 4,413 tons, the third lowest ever recorded.

West Behm Canal

Due to the timing of the spawn in Hoonah Sound and Lisianski, the RV Sundance traveled to West Behm Canal after completing the spawn deposition survey in Lisianski Inlet, arriving in West Behm at 2:15 a.m. on May 4. Spawning had occurred in West Behm Canal from April 23-26, with 1.6 n miles occurring on the west side of the canal between Caamano Point and Smugglers Cove, 2.7 n miles in the Tatoosh Islands, 3.05 n miles on Betton Island, and 0.35 n mile on the shore of Revillagigedo Island just south of Lunch Creek, for a total of 7.7 n miles of beach receiving spawn. Twelve of the 15 randomly selected transects were completed on May 4, with the remaining three transects completed on May 5. Transects with the greatest number of eggs occurred in the Tatoosh Islands area. The average transect length was 88 meters, with an average egg density of 186,419 eggs/m². The escapement estimate was 2,609 tons.

Craig

Upon completing the spawn deposition survey for the Cat Island area, the RV Sundance arrived in Craig on April 18. Spawning was first documented on March 23 with major spawning from April 4-12. Department staff reported no large concentrations of herring prior to spawning. The weather was fair but visibility in the water was poor. Weather deteriorated the next day to southeasterly winds to 20 mph and rain, however, visibility in the water improved. As in previous years, it appeared that many of the *Macrocystis* plants around Fish Egg Island with good spawn coverage had been harvested in the subsistence and personal use spawn-on-kelp fishery. Most of the *Macrocystis* plants north of Fish Egg Island had no spawn. Very few sea lions and a smaller number of birds were observed than in past years. A total of 8.0 miles of spawn were observed in 1994 in the Craig area. The average transect length (16 transects) was 115 meters, with an average density of 228,428 eggs/m². The escapement estimate was 4,325 tons.

Ernest Sound (Vixen Inlet/Union Bay)

After completing the West Behm Canal area spawn survey on the morning of May 5, the RV Sundance traveled to Vixen Inlet. The shore was searched by skiff for additional undocumented spawn. The aerial surveys were thorough but little additional spawn was documented. Spawning occurred April 24-27 and was distributed in the traditional areas with 0.2 n miles occurring in Union Bay, 2.2 n miles between Union Point and the head of Vixen Inlet, and 6.0 n miles on the north side of Vixen Inlet, for a total of 8.4 n miles of beach receiving spawn. It was our desire to complete the survey effort in one day and twelve transects were randomly selected. These transects were completed by 3:00 p.m. on May 6 and the RV Sundance departed for Hobart Bay. The average transect length was 108 meters, with an average egg density of 136,365 eggs/m². The escapement estimate was 2,544 tons.

Hobart/Houghton

The RV Sundance arrived in Hobart Bay at 5:45 a.m. on May 7. An early morning skiff survey documented a small amount of additional spawn not observed from the air. The spawn occurred from April 24-30 and was distributed 1.15 n miles from the lagoon to Rocky Point, 1.65 n miles from Hobart Point to the lagoon, and 4.2 n miles along the northern shore of Port Houghton south of Point Hobart, for a total of 7.0 n miles of beach with spawn. Twelve of the 14 transects were completed on May 7 with the other two completed by 7:30 a.m. on May 8. To give the herring in Seymour Canal additional time to spawn, the department vessel returned to Petersburg. The average transect length was 140 meters, with an average egg density of 119,680 eggs/m². The escapement estimate was 2,414 tons.

Seymour Canal

Three days of light spawn was recorded in Seymour Canal on April 27, 28 and 29, all prior to the commercial fishery. An additional 200 yards of active spawn was recorded on May 8 near the district boundary. The anticipated spawn from the fish that contributed to the commercial fishery was not documented as expected and the RV Sundance traveled to Seymour Canal to search the area with skiffs and conduct a spawn deposition survey on May 11. The total beach receiving spawn was 2.2 n miles, primarily inside of Cyprus Rock and near the district boundary. On May 12, this area was surveyed with 11 systematically selected transects. Although the eggs were near hatching and much of the intertidal spawn had been taken by birds, it was obvious that very few fish contributed to this first spawn. The spawn deposition estimate was 50 tons escapement (2.2 n miles, 113 meters transect length, and 9,264 eggs/m²).

Additional spawning occurred on May 12-17 and totaled 8.9 n miles. This was after the fishery which took place on April 29. Most of this spawn occurred between the Slide and Blackjack Cove, 6.0 n miles, with another 2.0 n miles near Point Hugh, and 0.9 n miles inside Mole Harbor. The RV Sundance traveled to Seymour Canal for a second spawn deposition survey on May 19. For the second survey, the average transect length was 129 meters, with an average density of 136,915 eggs/m². The escapement estimate for the second survey was 3,246 tons.

Tenakee Inlet

Little herring spawning activity was recorded in the Tenakee Inlet area. Aerial surveys were flown between April 20-26. Spawning was observed on April 24 but amounted to only 0.25 n miles. No spawn deposition survey was conducted in Tenakee Inlet in 1994.

Sitka

Aerial surveys to document herring activity in the Sitka Sound area were initiated March 16 and terminated April 17. The first active spawning occurred on March 26 with half a mile from Leesofskaia Bay, and ended on April 16 with five spots in the Goddard area. A total of 58.1 n miles of beach received spawn in 1994, slightly more than the 55 miles in 1993. The distribution of spawn was considerably different than what was observed in the past few years, with a number of those miles occurring in narrow bands in Nakwasina Sound, Katlian Bay and Deep Inlet. A department vessel was not available to support the dive survey in 1994. The department entered into a cooperative agreement with the USF&WS for a second year to document spawn within the boundaries of the proposed small boat harbor in Sitka. As part of that agreement, the USF&WS supplied a local vessel to support the survey effort. Two USF&WS divers, assisted with the surveys. The spawn deposition surveys began with the five permanent transects within the proposed small boat harbor area on April 8. Surveys continued north of town on April 9, 10 and 11, with the last 15 transects south of the bridge completed on April 12. A total of 39 randomly selected transects were completed (0.7 per nautical mile of beach) for the 57.1 nautical miles of spawn outside the boat harbor, with an additional five permanent transects inside the boat harbor, for a total of 44 transects completed in 1994. The average transect width in the boat harbor area (5 transects, 1 mile of beach) was 199 meters, with an average density of 167,752 eggs/m². The boat harbor escapement estimate totalled 687 tons. For the area outside the boat harbor (39 transects, 57.1 nautical miles of spawn), the average transect width was 51 meters, with an average density of 232,198 eggs/m². The escapement estimate was 14,026 tons. The total egg-deposition-based biomass estimate for herring spawning in Sitka Sound, including the proposed boat harbor area, was 14,713 tons.

Hoonah Sound

A total of 9.0 nautical miles of herring spawn was recorded in 1994. It occurred April 21-24 in the traditional areas of Emmons Island, Vixen Islands, and the Chichagof shore between Fick Cove and Rodgers Point. A small area of spawn was observed on the north side of Hoonah Sound opposite Emmons Island. The Sitka management staff was on the grounds during and after the main spawning event and verified the extent of spawning. Surveys were conducted on April 29 and 30 in marginal weather. The area with the most intense spawn occurred along the north and west sides of Emmons Island. A total of 18 randomly selected transects (2 per nautical mile) were completed. The average transect length was 124 meters, with a density of 106,535 eggs/m². The escapement estimate was 2,450 tons. Based on the amount of herring observed in 1993, this was a much higher estimate than expected. Observations of adult herring also indicated about twice the return observed in 1993. In addition, herring were captured by a much greater number of fishermen during the spawn-on-kelp pound fishery than in previous years.

Lisianski Inlet

Aerial surveys of Lisianski Inlet and Lisianski Strait were complicated by the spawn timing, which was concurrent with the Hoonah Sound spawn-on-kelp fishery, and hampered by very poor weather. Aerial surveys were flown between April 19 and May 1. These initial surveys indicated that approximately 4.5 nautical miles of spawn occurred in the Lisianski area (3 nautical miles in the Straits and 1.5 nautical miles in the Inlet). Subsequent skiff surveys on May 1 documented an additional 5.4 nautical miles, for a total of 9.9 nm (5.7 nm Straits, 4.2 nm Inlet). Spawn deposition surveys occurred on May 1 and 2 when 19 randomly selected transects were completed. The average length of these transects was 44 meters, with an average density of 232,712 eggs/m². The escapement estimate was 2,096 tons. Local residents indicated that a spawn had also occurred near Soapstone Point. One aspect of the dive survey was to observe the influence of sea otters on the nearshore invertebrate community. Almost no invertebrates of any size or species were observed during the 14 transects in Lisianski Straits. Otters were also present in Lisianski Inlet where most of the scallops and clams were missing, but sea cucumbers and snails remained abundant. This was in striking contrast to the large numbers of invertebrates observed in previous years.

DIVER VISUAL ESTIMATION CALIBRATION

Methods and Procedures

Samples of substrate with eggs were collected during the spawn deposition surveys for enumeration at the laboratory in Ketchikan to verify visual density estimates. The objective of this phase of the project is to determine a diver substrate-specific calibration figure that is used to adjust visual egg density estimates for individual divers each year.

A 0.1 square meter sample with vegetation and eggs is collected in sample bags (approximately 2-liter capacity) during the spawn deposition surveys. These kelp and egg samples were transferred from the diver's bag to 4-liter (1-gallon) water-tight zip lock bags and preserved in Gilson's fluid. Detailed procedures for determining egg densities from collected samples are discussed in the 1993 Annual Report (RIR IJ93-19).

Results and Discussion

A total of 87 visually-estimated and laboratory-enumerated samples of vegetation with eggs were processed in 1994 (Tables 3 and 4). A summary of correction ratios by diver and substrate for all samples

taken since 1982 have total correction ratios that range from 0.77 to 1.35 of the visual estimates (Table 5). The correction ratios are used in the spawn deposition surveys to adjust the total visual estimates of each diver before summing the total eggs in the survey area.

Table 1. Summary of 1993-1994 season herring fisheries.

WINTER FOOD AND BAIT FISHERY

Opening	Closing	District	Area	Forecast 1994 (tons)	Quota ^a (tons)	Harvest (tons)	Percent Harvest (Quota)	Exvessel Value
12/08/93	1/09/94	3/4	Bocas de Finas/Meares Pass	7,996	760	636	11.2	\$187,578
10/17/93	2/28/94	10	Hobart Bay/Port Houghton	2,238	230	140	10.2	\$41,300
12/08/93	1/12/94	13B	Necker Bay	2,000 ^d	50	67	10.0	\$19,765
12/08/93	2/08/94	13B	Whale Bay	2,000 ^d	150	36	10.0	\$10,620
01/31/94	2/03/94	13	Sitka Test Fishery			100		\$25,000
Total				14,234	1,190	979	Bait Value	\$284,263

SAC ROE FISHERY

Opening	Closing	District	Area	Gear	Forecast 1994 (tons)	Quota ^a (tons)	Harvest (tons)	Percent Harvest	Roe % (Quota)	Exvessel Value
3/29/94	3/31/94	13	Sitka	Seine	28,439	4,432	4,753	15.6	11.0	\$2,614,150
4/09/94	4/11/94	01	Cat Island	Gillnet	9,300	880 ^c	749	10.5	15.0	\$1,224,135
4/29/94	4/29/94	11	Seymour	Gillnet	3,552	368	382	10.4	12.8	\$630,300
4/24/94	4/26/94	01	West Behm Test Fishery				12		16.2	\$18,835
4/26/94	4/27/94	10	Hobart Bay Test Fishery				24		11.5	\$22,536
Total					41,291	5,680	5,913	Sac Roe Total		\$4,508,958

SPAWN-ON-KELP FISHERY

Opening	Closing	District	Area	Gear	Forecast 1994 (tons)	Herring Quota	Spawn-on-Kelp Harvest (tons)	Exvessel Value	
4/05/94	4/18/94	103-60	Craig	Pound	6,956	135	16.5	\$364,199	
4/06/94	4/21/94	113-55	Hoonah Sound	Pound	2,000	150 ^b	33.0	\$1,224,631	
			Hoonah Sound Test Fishery				0		
Total					8,956	285	47.5	Spawn-on-Kelp	\$1,588,830
								Total Value	\$6,382,051

^a Quota based on previous year's escapement estimate.

^b Pound quota set by Board of Fisheries at 150 tons of herring.

^c Quota reduced by 150 tons to account for possible catch from Annette Island.

^d Necker and Whale Bay combined assessment equals 2,000 tons.

Table 2. Southeast Alaska herring spawn deposition survey results, 1994.

CAT ISLAND AREA

Number of estimates	776	Divers making estimates	TM	TK	RL	PD
		Corrected sum of estimates:	2,440.18	989.87	1,337.46	3,742.00
Total number of eggs/.1meter quadrant (1,000s)	8,509.51					
Average length of transects in meters	155.2	(total samples*5 meters/total [25] transects)				
Lineal meters of shoreline receiving spawn	23,335.20	(12.6 nautical miles of shore* 1852 meters/nmile)				
Area of survey in square meters	3,621,623	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	11	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	109,659	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	397,142,235,504	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	3,971	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	4,413	(adjustment to account for 10% egg loss prior to survey)				

WEST BEHM CANAL

Number of estimates	265	Divers with estimates	TM	PD	RL	WB
		Corrected sum of estimates	1525.74	2453.74	303.48	657.14
Total number of eggs/.1meter quadrant (1,000s)	4940.1					
Average length of transects in meters	88	(total samples*5 meters/total [15] transects)				
Lineal meters of shoreline receiving spawn	14,260	(7.7 nautical miles of shore* 1852 meters/nmile)				
Area of survey in square meters	1,259,669	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	18.64	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	186,419	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	234,826,006,800	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	2,348	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	2,609	(adjustment to account for 10% egg loss prior to survey)				

Craig Area

Number of estimates	368	Divers making estimates	TM	TK	RL	PD
		Corrected sum of estimates:	672.62	4,615.15	291.66	2,826.73
Total number of eggs/.1meter quadrant (1,000s)	8,406.16					
Average length of transects in meters	115	(total samples*5 meters/total [16] transects)				
Lineal meters of shoreline receiving spawn	14,816	(8.0 nautical miles of shore* 1852 meters/nmile)				
Area of survey in square meters	1,703,840	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	23	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	228,428	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	389,205,208,000	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	3,892	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	4,325	(adjustment to account for 10% egg loss prior to survey)				

VIXEN INLET/UNION BAY (ERNEST SOUND)

Number of estimates	259	Divers with estimates	TM	RL	WB
		Corrected sum of estimates	832.88	2191.82	507.15
Total number of eggs/.1meter quadrant (1,000s)	3531.85				
Average length of transects in meters	108	(total samples*5 meters/total [12] transects)			
Lineal meters of shoreline receiving spawn	15,557	(8.4 nautical miles of shore* 1852 meters/nmile)			
Area of survey in square meters	1,678,838	(length of shoreline * average width of transects)			
Average density of quadrant samples (1,000s)	13.64	(total eggs[1,000s] / total number of observations)			
Average density of eggs per square meter	136,365	(average .1 meter quadrant sample*1,000 eggs*10 meters)			
Total number of eggs in survey area	228,934,517,000	(total survey area in meters * total eggs per meter)			
Unadjusted escapement estimate in tons	2,289	(total number of eggs / 100,000,000 eggs per ton of spawners)			
Corrected escapement using 10% egg loss	2,544	(adjustment to account for 10% egg loss prior to survey)			

Table 2. Southeast Alaska herring spawn deposition survey results, 1994 (cont).

HOBART BAY/PORT HOUGHTON AREA

Number of estimates	392	Divers making estimates:	TM	BL	RL	WB
		Corrected sum of estimates:	1301.19	0	638.37	2751.91
Total number of eggs/.1meter quadrant (1,000s)	4691.47					
Average length of transects in meters	140	(total samples*5 meters/total [14] transects)				
Lineal meters of shoreline receiving spawn	12964	(7.0 nautical miles of shore* 1852 meters/nmile)				
Area of survey in square meters	1814960	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	11.96803571	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	119,680	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	217,215,061,000	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	2,172	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	2,414	(adjustment to account for 10% egg loss prior to survey)				

SEYMOUR CANAL AREA, FIRST SURVEY

Number of estimates	249	Divers making estimates:	TM	BL	RL
		Corrected sum of estimates:	106.12	23.36	101.19
Total number of eggs/.1meter quadrant (1,000s)	230.67				
Average length of transects in meters	113	(total samples*5 meters/total [11] transects)			
Lineal meters of shoreline receiving spawn	4,074	(2.2 nautical miles of shore* 1852 meters/nmile)			
Area of survey in square meters	461,148	(length of shoreline * average width of transects)			
Average density of quadrant samples (1,000s)	0.93	(total eggs[1,000s] / total number of observations)			
Average density of eggs per square meter	9,264	(average .1 meter quadrant sample*1,000 eggs*10 meters)			
Total number of eggs in survey area	4,272,008,400	(total survey area in meters * total eggs per meter)			
Unadjusted escapement estimate in tons	43	(total number of eggs / 100,000,000 eggs per ton of spawners)			
Corrected escapement using 10% egg loss	47	(adjustment to account for 10% egg loss prior to survey)			

SEYMOUR CANAL AREA, SECOND SURVEY

Number of estimates	466	Divers with estimates	TM	BD	RL	WB
		Corrected sum of estimates:	671.16	1962.68	2095.24	1651.18
Total number of eggs/.1meter quadrant (1,000s)	6380.26					
Average length of transects in meters	129	(total samples*5 meters/total [18] transects)				
Lineal meters of shoreline receiving spawn	16482.8	(8.9 nautical miles of shore* 1852 meters/nmile)				
Area of survey in square meters	2133607	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	13.69	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	136,915	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	292,123,748,689	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	2,921	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	3,246	(adjustment to account for 10% egg loss prior to survey)				

SEYMOUR CANAL ESCAPEMENT SUMMARY 1994

Spawn deposition estimate from first survey	47
Spawn deposition estimate from second survey	3,246
Total spawn deposition estimate for 1994	3,293

SITKA BOAT HARBOR

Number of estimates	199	Divers with estimates	TM	BDJ	RL
		Corrected sum of estimates	1163.63	560.15	1614.48
Total number of eggs/.1meter quadrant (1,000s)	3338.26				
Average length of transects in meters	199	(total samples*5 meters/total [5] transects)			
Lineal meters of shoreline receiving spawn	1852	(1.0 nautical miles of shore* 1852 meters/nmile)			
Area of survey in square meters	368548	(length of shoreline * average width of transects)			
Average density of quadrant samples (1,000s)	17	(total eggs[1,000s] / total number of observations)			
Average density of eggs per square meter	167,752	(average .1 meter quadrant sample*1,000 eggs*10 meters)			
Total number of eggs in survey area	61,824,575,200	(total survey area in meters * total eggs per meter)			
Unadjusted escapement estimate in tons	618	(total number of eggs / 100,000,000 eggs per ton of spawners)			
Corrected escapement using 10% egg loss	687	(adjustment to account for 10% egg loss prior to survey)			

Table 2. Southeast Alaska herring spawn deposition survey results, 1994 (cont).

REMAINDER SITKA SOUND

Number of estimates	401	Divers making estimates	TM	BD	BDJ	RL
		Corrected sum of estimates	1616.43	826.56	1592.51	5275.65
Total number of eggs/.1meter quadrant (1,000s)	9,311.15					
Average length of transects in meters	51	(total samples*5 meters/total [39] transects)				
Lineal meters of shoreline receiving spawn	105,749	(57.1 nautical miles of shore* 1852 meters/nmile)				
Area of survey in square meters	5,436,593	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	23	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	232,198	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	1,262,367,517,410	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	12,624	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	14,026	(adjustment to account for 10% egg loss prior to survey)				

SITKA SOUND AND BOAT HARBOR TOTAL

Sitka small boat harbor corrected escapement	687
Remainder Sitka Sound corrected escapement	14,026
Total Sitka Sound herring escapement	14,713

HOONAH SOUND

Number of estimates	447	Divers making estimates:	TM	BD	RL	WB	BDJ
		Corrected sum of estimates:	435.3	46.95	1,353.37	1,947.45	979.04
Total number of eggs/.1meter quadrant (1,000s)	4762.11						
Average length of transects in meters	124	(total samples*5 meters/total [18] transects)					
Lineal meters of shoreline receiving spawn	16,668	(9.0 nautical miles of shore* 1852 meters/nmile)					
Area of survey in square meters	2,069,610	(length of shoreline * average width of transects)					
Average density of quadrant samples (1,000s)	10.65	(total eggs[1,000s] / total number of observations)					
Average density of eggs per square meter	106,535	(average .1 meter quadrant sample*1,000 eggs*10 meters)					
Total number of eggs in survey area	220,485,693,000	(total survey area in meters * total eggs per meter)					
Unadjusted escapement estimate in tons	2,205	(total number of eggs / 100,000,000 eggs per ton of spawners)					
Corrected escapement using 10% egg loss	2,450	(adjustment to account for 10% egg loss prior to survey)					

LISIANSKI INLET AND LISIANSKI STRAIT

Number of estimates	168	Divers with estimates	TM	RL	WB	BDJ
		Corrected sum of estimates	567.75	1938.86	611.79	791.16
Total number of eggs/.1meter quadrant (1,000s)	3909.56					
Average length of transects in meters	44	(total samples*5 meters/total [19] transects)				
Lineal meters of shoreline receiving spawn	18,335	(9.9 nautical miles of shore with spawn* 1852 meters/nmile)				
Area of survey in square meters	810,591	(length of shoreline * average width of transects)				
Average density of quadrant samples (1,000s)	23.27	(total eggs[1,000s] / total number of observations)				
Average density of eggs per square meter	232,712	(average .1 meter quadrant sample*1,000 eggs*10 meters)				
Total number of eggs in survey area	188,634,212,337	(total survey area in meters * total eggs per meter)				
Unadjusted escapement estimate in tons	1,886	(total number of eggs / 100,000,000 eggs per ton of spawners)				
Corrected escapement using 10% egg loss	2,096	(adjustment to account for 10% egg loss prior to survey)				

Table 3 . Individual spawn deposition diver calibration estimates, 1994.

INDIVIDUAL VISUAL AND LAB ESTIMATES BY DIVER AND SUBSTRATE							
Area	Date	Observer	Substrate	Eggs/ml	Visual Est.	Lab Count	lab/visual
Cat Is.	16-Apr-94	BL	fir	295	90,000	175,132	1.9
Cat Is.	16-Apr-94	PD	agm	168	25,000	29,509	1.2
Cat Is.	16-Apr-94	PD	elg	241	60,000	39,283	0.7
Cat Is.	16-Apr-94	PD	fir	323	60,000	75,337	1.3
Cat Is.	16-Apr-94	PD	lbk	84	12,000	6,531	0.5
Cat Is.	16-Apr-94	PD	lbk	125	35,000	47,060	1.3
Cat Is.	16-Apr-94	TM	agm	168	30,000	29,509	1.0
Cat Is.	16-Apr-94	TM	elg	241	20,000	39,283	2.0
Cat Is.	16-Apr-94	TM	fir	323	80,000	75,337	0.9
Cat Is.	16-Apr-94	TM	fir	295	160,000	175,132	1.1
Cat Is.	16-Apr-94	TM	lbk	84	15,000	6,531	0.4
Cat Is.	16-Apr-94	TM	lbk	125	45,000	47,060	1.0
Craig	19-Apr-94	BL	agm	191	40,000	31,299	0.8
Craig	18-Apr-94	BL	elg	316	150,000	133,668	0.9
Craig	18-Apr-94	BL	fir	195	80,000	60,037	0.8
Craig	18-Apr-94	BL	fuc	121	70,000	37,205	0.5
Craig	19-Apr-94	BL	fuc	65	20,000	12,121	0.6
Craig	19-Apr-94	BL	fuc	104	15,000	20,488	1.4
Craig	19-Apr-94	BL	lbk	196	45,000	75,533	1.7
Craig	18-Apr-94	BL	lbk	157	30,000	43,188	1.4
Craig	18-Apr-94	BL	mac	180	30,000	38,491	1.3
Craig	18-Apr-94	PD	elg	241	85,000	94,632	1.1
Craig	18-Apr-94	PD	elg	211	100,000	106,454	1.1
Craig	18-Apr-94	PD	fir	157	50,000	22,860	0.5
Craig	19-Apr-94	TK	agm	191	40,000	31,299	0.8
Craig	18-Apr-94	TK	elg	316	140,000	133,668	1.0
Craig	18-Apr-94	TK	fir	195	60,000	60,037	1.0
Craig	18-Apr-94	TK	fuc	121	90,000	37,205	0.4
Craig	19-Apr-94	TK	fuc	65	20,000	12,121	0.6
Craig	19-Apr-94	TK	fuc	104	8,000	20,488	2.6
Craig	19-Apr-94	TK	lbk	196	65,000	75,533	1.2
Craig	18-Apr-94	TK	lbk	157	40,000	43,188	1.1
Craig	18-Apr-94	TK	mac	180	35,000	38,491	1.1
Craig	18-Apr-94	TM	elg	241	85,000	94,632	1.1
Craig	18-Apr-94	TM	elg	211	110,000	106,454	1.0
Craig	18-Apr-94	TM	fir	157	40,000	22,860	0.6
Hoonah	30-Apr-94	BD	elg	271	90,000	82,386	0.9
Hoonah	30-Apr-94	BD	elg	263	120,000	61,444	0.9
Hoonah	30-Apr-94	BD	red	273	35,000	44,771	1.3
Hoonah	30-Apr-94	WB	elg	271	100,000	82,386	0.8
Hoonah	30-Apr-94	WB	elg	263	110,000	61,444	0.6
Hoonah	30-Apr-94	WB	red	273	20,000	44,771	2.2
Seymour	20-May-94	BD	agm	342	110,000	79,103	0.7
Seymour	20-May-94	BD	agm	282	70,000	80,229	1.1

Table 3 . Individual spawn deposition diver calibration estimates, 1994 (cont).

Area	Date	Observer	Substrate	Eggs/ml	Visual Est.	Lab Count	lab/visual
Seymour	20-May-94	BD	fir	292	240,000	194,180	0.8
Seymour	20-May-94	BD	hir	282	160,000	119,554	0.7
Seymour	20-May-94	BD	hir	358	420,000	852,320	2.0
Seymour	20-May-94	RL	agm	342	100,000	79,103	0.8
Seymour	20-May-94	RL	agm	282	60,000	80,229	1.3
Seymour	20-May-94	RL	fir	292	155,000	194,180	1.3
Seymour	20-May-94	RL	hir	282	135,000	119,554	0.9
Seymour	20-May-94	RL	hir	358	500,000	852,320	1.7
Sitka	11-Apr-94	BD	elg	233	80,000	159,256	2.0
Sitka	11-Apr-94	BD	fuc	124	13,000	18,251	1.4
Sitka	11-Apr-94	BD	lbk	222	65,000	63,285	1.0
Sitka	11-Apr-94	BDJ	elg	233	60,000	159,256	2.7
Sitka	11-Apr-94	BDJ	elg	269	25,000	27,856	1.1
Sitka	11-Apr-94	BDJ	fuc	184	25,000	28,519	1.1
Sitka	11-Apr-94	BDJ	fuc	179	35,000	38,324	1.1
Sitka	11-Apr-94	BDJ	fuc	118	35,000	32,522	0.9
Sitka	11-Apr-94	BDJ	lbk	205	20,000	17,313	0.9
Sitka	11-Apr-94	BDJ	lbk	243	25,000	34,991	1.4
Sitka	11-Apr-94	RL	fuc	123	33,000	36,408	1.1
Sitka	11-Apr-94	RL	fuc	204	35,000	35,559	1.0
Sitka	11-Apr-94	RL	fuc	162	25,000	36,490	1.5
Sitka	11-Apr-94	RL	lbk	196	10,000	15,484	1.5
Sitka	11-Apr-94	RL	lbk	199	75,000	92,336	1.2
Sitka	11-Apr-94	RL	lbk	232	75,000	61,374	0.8
Sitka	11-Apr-94	TM	elg	233	110,000	159,256	1.4
Sitka	11-Apr-94	TM	elg	269	15,000	27,856	1.9
Sitka	11-Apr-94	TM	fuc	184	20,000	28,519	1.4
Sitka	11-Apr-94	TM	fuc	179	40,000	38,324	1.0
Sitka	11-Apr-94	TM	fuc	118	35,000	32,522	0.9
Sitka	11-Apr-94	TM	fuc	124	15,000	18,251	1.2
Sitka	11-Apr-94	TM	lbk	205	20,000	17,313	0.9
Sitka	11-Apr-94	TM	lbk	222	70,000	63,285	0.9
Sitka	11-Apr-94	TM	lbk	243	40,000	34,991	0.9
W. Behm	4-May-94	BL	fir	247	155,000	211,062	1.4
W. Behm	4-May-94	PD	fir	247	100,000	211,062	2.1
W. Behm	4-May-94	SW	fir	247	95,000	205,999	2.2
W. Behm	4-May-94	SW	fir	188	45,000	53,906	1.2
W. Behm	4-May-94	SW	fuc	107	35,000	38,352	1.1
W. Behm	4-May-94	SW	lbk	250	27,000	25,816	1.0
W. Behm	4-May-94	TM	fir	247	200,000	205,999	1.0
W. Behm	4-May-94	TM	fir	188	60,000	53,906	0.9
W. Behm	4-May-94	TM	fuc	107	40,000	38,352	1.0
W. Behm	4-May-94	TM	lbk	250	25,000	25,816	1.0

OBSERVERS: BL=Brian Lynch, PD=Phil Doherty, TM=Tim Minicucci, TK=Tim Koeneman,
 BD=Bill Davidson, WB=William Bergmann, RL=Robert Larson, BDJ=Bob DeJong, SW=Scott Walker

Table 4. Summary of visual and lab estimates by diver, 1994.

DIVER	Number of Estimates	Visual Est.	Lab count	Lab/visual
R. Larson	11	1,203,000	1,603,037	1.33
T. Minicucci	22	1,275,000	1,341,188	1.05
B. Davidson	11	1,403,000	1,754,779	1.25
B. DeJong	7	225,000	338,781	1.51
P. Doherty	9	527,000	632,728	1.20
W. Bergman	3	230,000	188,601	0.82
T. Koenoman	9	498,000	452,030	0.91
B. Lynch	11	725,000	838,224	1.16
S. Walker	4	202,000	324,073	1.60
Total	87	6,288,000	7,473,441	1.19

Table 5. Southeast herring spawn deposition diver calibration factors, 1994.

DIVER	SUBSTRATE				
	Eel Grass	Fucus	Hair Kelp	Large Brown Kelp	Other
B. Davidson	1.05	1.14	1.24	0.85	1.06
B. DeJong	1.01	1.15	1.03	0.95	1.08
B. Lynch	0.84	1.20	0.83	1.35	1.15
P. Doherty	1.36	0.98	1.09	1.07	1.22
R. Larson	1.03	1.02	1.22	1.08	1.06
T. Koeneman	0.77	0.78	0.88	0.95	0.86
T. Minicucci	1.24	1.13	1.03	0.86	1.06
W. Bergmann	0.77	1.23	1.19	0.86	1.00

Note: Estimates based on 1982-88, 1993 and 1994 diver calibration data. Data from each year weighted equally. Some extreme data points excluded from data subsets to minimize bias in correcting future visual estimates based on these calibration factors.

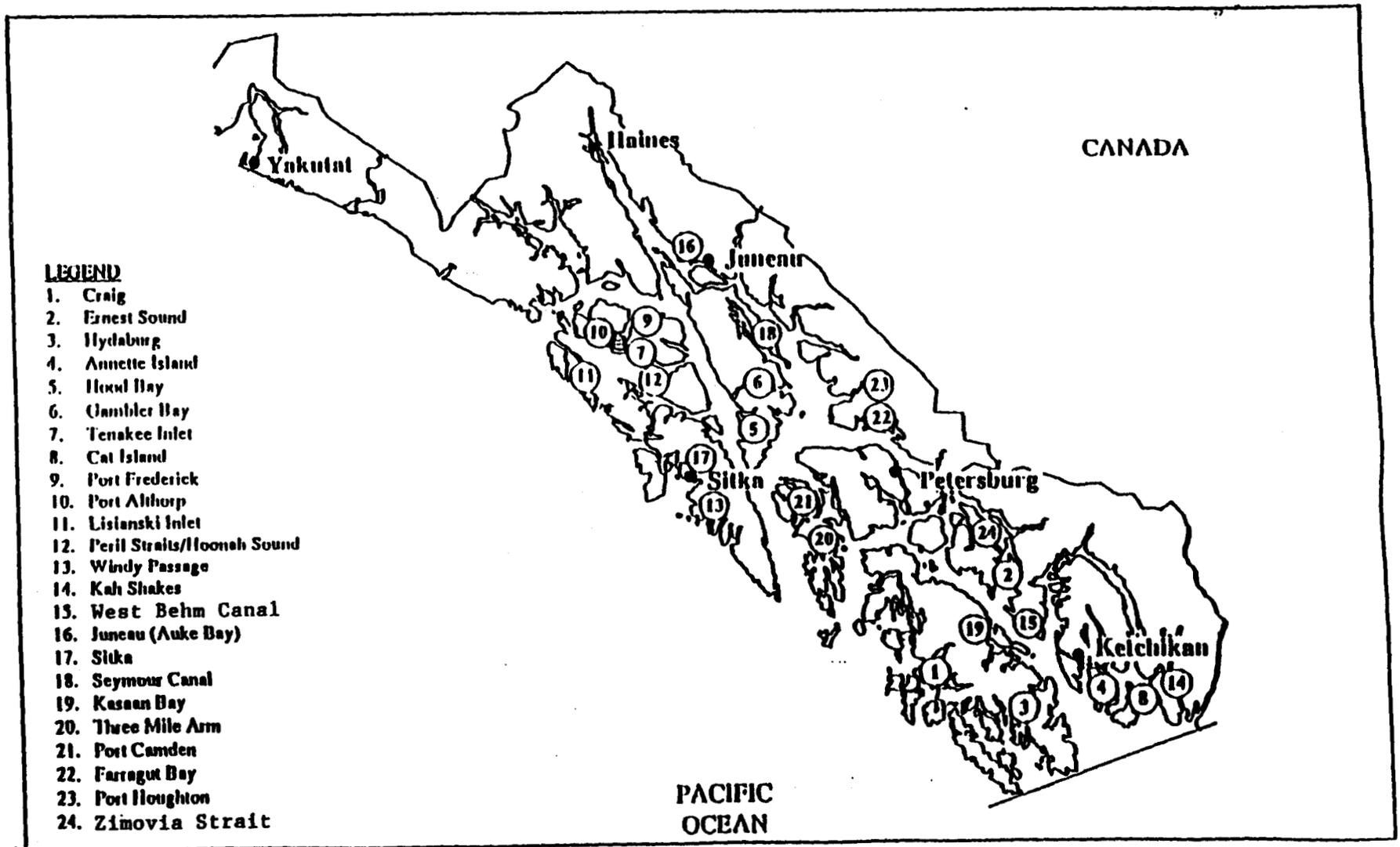
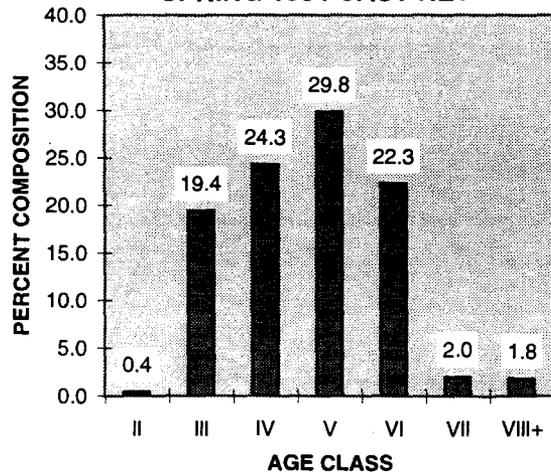
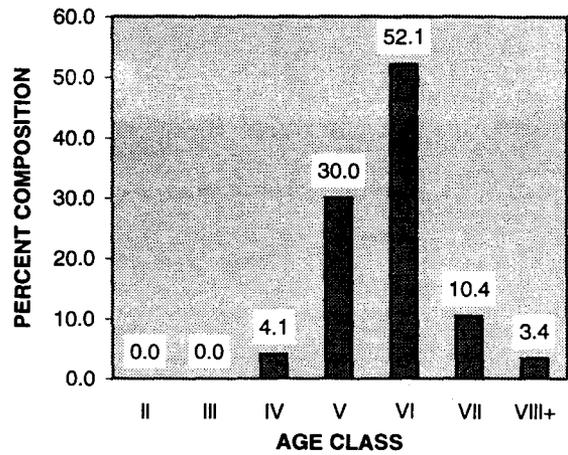


Figure 1. Southeast Alaska herring project study area, 1994.

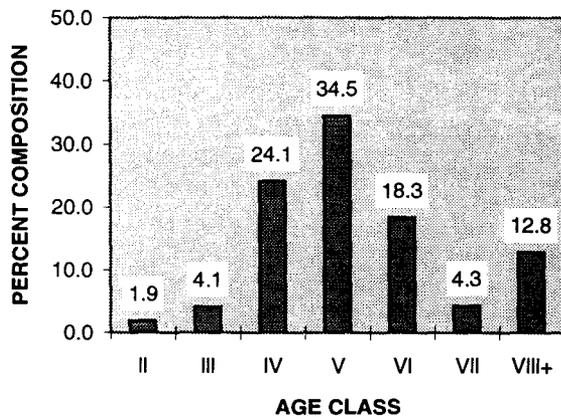
**CAT ISLAND COMBINED SAMPLE
SUMMARY
SPRING 1994 CAST NET**



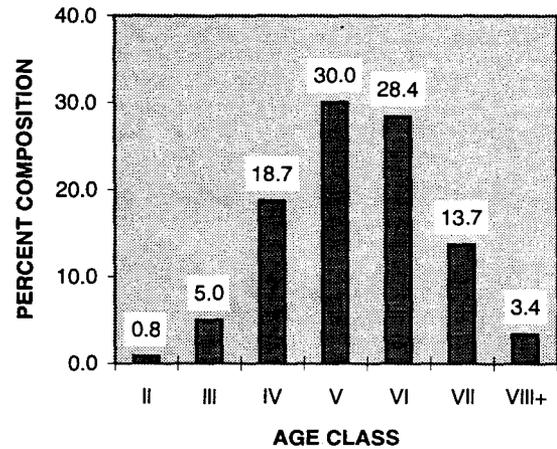
**CAT ISLAND COMBINED SAMPLE
SUMMARY SPRING 1994
COMMERCIAL GILLNET**



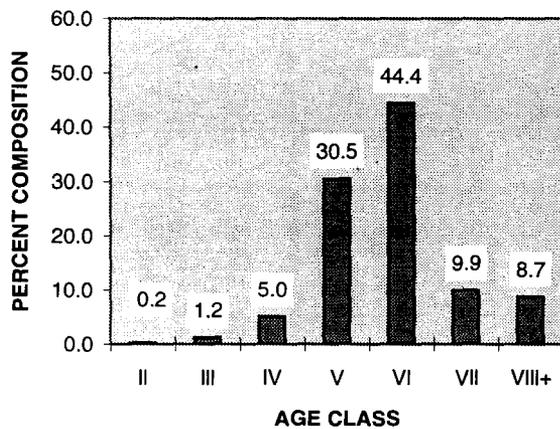
**CRAIG COMBINED SAMPLE
SUMMARY WINTER 1994 BAIT
FISHERY COMMERCIAL SEINE**



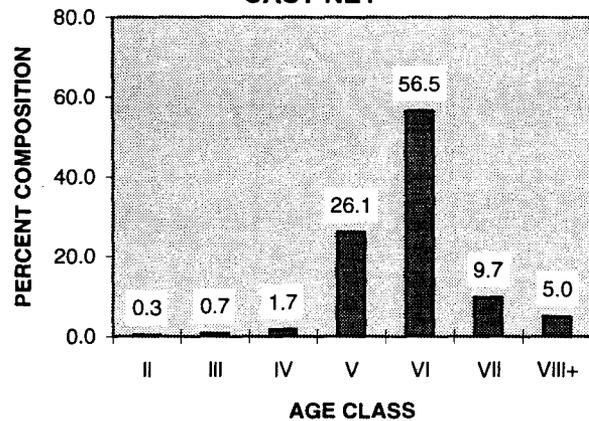
**CRAIG COMBINED SAMPLE SUMMARY
SPRING 1994 CAST NET**



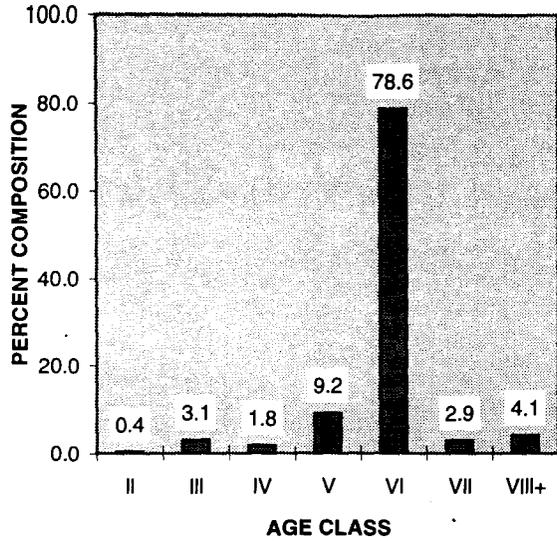
**SEYMOUR COMBINED SAMPLE
SUMMARY SPRING 1994 CAST NET**



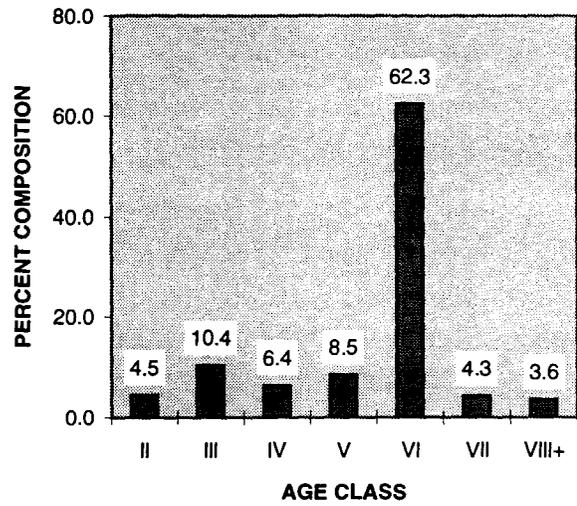
**HOBART/HOUGHTON COMBINED
SAMPLE SUMMARY SPRING 1994
CAST NET**



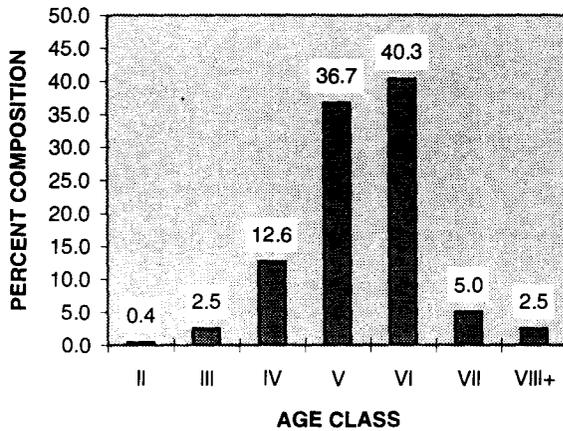
**SITKA COMBINED SAMPLE SUMMARY
SPRING 1994 COMMERCIAL SEINE**



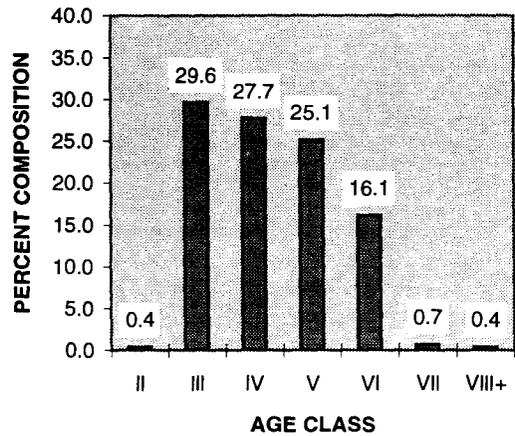
**SITKA COMBINED SAMPLE SUMMARY
SPRING 1994 CAST NET**



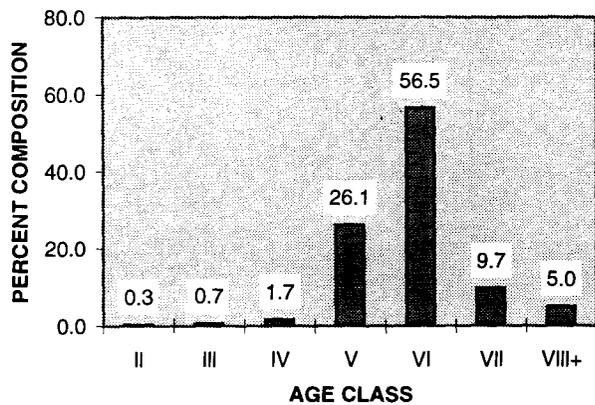
**JUNEAU COMBINED SAMPLE
SUMMARY SPRING 1994 CAST NET**



**WEST BEHM COMBINED SAMPLE
SUMMARY SPRING 1994 CAST NET**



**HOBART/HOUGHTON COMBINED
SAMPLE SUMMARY SPRING 1994
CAST NET**



APPENDIX A

Herring age, sex, and size samples, 1994

1994 Herring A.W.L. Summary Tables**Cat Island****Southeast Cat Island April 7, 1994 Cast Net**

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	8	7.5	178.6	9.1	63.4	11.5	62.5	37.5	0.0
IV	28	26.4	193.8	7.3	81.5	12.0	50.0	50.0	0.0
V	42	39.6	202.0	7.2	93.9	13.2	61.9	38.1	0.0
VI	23	21.7	206.3	8.6	99.2	15.1	43.5	56.5	0.0
VII	2	1.9	220.0	7.0	126.5	21.5	50.0	50.0	0.0
VIII+	3	2.8	225.7	1.7	134.7	11.6	33.3	66.7	0.0
Total Aged	106	100	200.0	11.8	91.2	18.9	53.8	46.2	0.0
Regenerated	1	0.9							
Total	107								

Cat Island East Bight April 7, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	1.1	143.0	0.0	33.0	0.0	100.0	0.0	0.0
III	31	33.0	173.1	8.4	59.1	11.8	48.4	45.2	6.1
IV	25	26.6	193.0	8.1	82.7	13.7	44.0	52.0	3.8
V	22	23.4	203.4	8.2	96.6	19.5	54.5	40.9	4.3
VI	13	13.8	208.2	8.6	108.1	17.6	53.8	46.2	0.0
VII	1	1.1	204.0	0.0	87.0	0.0	100.0	0.0	0.0
VIII+	1	1.1	221.0	0.0	109.0	0.0	0.0	100.0	0.0
Total Aged	94	100	190.8	16.9	81.5	24.0	50.0	45.7	4.0
Regenerated	2	2.1							
Total	96								

Cat Island Grave Point April 7, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	26	29.5	169.0	10.3	54.6	13.8	73.1	11.5	15.4
IV	18	20.5	191.5	11.1	77.7	12.1	66.7	33.3	0.0
V	23	26.1	190.6	41.8	87.8	25.0	65.2	34.8	0.0
VI	21	23.9	206.3	7.5	104.6	14.9	7.6	52.4	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	88	100	188.1	26.8	79.9	25.6	63.6	31.8	4.5
Regenerated	5	5.4							
Total	93								

*U-Unknown sex: immature or spent fish

Appendix A (cont.)

East Cat Island April 7, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.6	158.0	0.0	40.0	0.0	100.0	0.0	0.0
III	22	13.7	170.5	9.2	56.0	10.0	31.8	36.4	31.8
IV	38	23.6	185.7	10.3	73.7	12.8	55.3	36.8	7.9
V	47	29.2	196.7	7.2	89.4	14.7	61.7	38.3	0.0
VI	43	26.7	203.5	9.2	97.2	14.4	55.8	44.2	0.0
VII	6	3.7	213.3	3.4	108.0	12.4	66.7	33.3	0.0
VIII+	4	2.5	214.8	13.0	114.0	19.7	50.0	50.0	0.0
Total Aged	161	100	193.2	15.1	84.2	20.7	54.7	39.1	6.2
Regenerated	9	4.7							
Total	170								

Combined Sample Summary Cat Island April 7, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	0.4	150.5	7.5	36.5	3.5	100.0	0.0	0.0
III	87	19.4	171.7	9.7	57.4	12.3	52.9	32.2	14.9
IV	109	24.3	190.4	9.9	78.4	13.3	53.2	43.1	3.7
V	134	29.8	198.4	19.1	91.7	17.6	61.2	38.1	0.7
VI	100	22.3	205.4	8.8	100.6	15.6	51.0	49.0	0.0
VII	9	2.0	213.8	6.2	109.8	18.1	66.7	33.3	0.0
VIII+	8	1.8	219.6	10.5	121.1	18.9	37.5	62.5	0.0
Total Aged	449	100	193.3	18.2	84.5	22.5	55.2	40.8	4.0
Regenerated	17	3.6							
Total	466								

Cat Island Commercial Fishery (1st Opening) April 9, 1994 Commercial Gillnet

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	12	3.7	207.8	8.1	114.7	20.4	16.7	83.3	0.0
V	94	29.3	211.7	6.6	127.4	13.0	21.3	78.7	0.0
VI	166	51.7	217.5	8.6	134.5	15.7	38.0	62.0	0.0
VII	36	11.2	221.5	7.7	140.9	13.0	50.0	50.0	0.0
VIII+	13	4.0	228.1	9.1	152.7	18.0	61.5	38.5	0.0
Total Aged	321	100	216.3	9.0	133.2	16.4	34.6	65.4	0.0
Regenerated	77	19.3							
Total	398								

Appendix A (cont.)

Cat Island Commercial Fishery (2nd Opening) April 11, 1994 Commercial Gillnet

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	5	5.4	201.0	7.6	103.0	18.3	60.0	40.0	0.0
V	30	32.6	208.9	9.6	120.3	20.4	40.0	60.0	0.0
VI	49	53.3	218.8	7.9	135.3	18.3	38.8	61.2	0.0
VII	7	7.6	224.0	8.4	153.3	10.6	71.4	28.6	0.0
VIII+	1	1.1	232.0	0.0	158.0	0.0	0.0	100.0	0.0
Total Aged	92	100	215.1	10.6	130.3	21.8	42.4	57.6	0.0
Regenerated	12	11.5							
Total	104								

Combined Cat Island Commercial Fishery April 1994 Gillnet (2 1/4" mesh)

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	17	4.1	205.8	8.5	111.2	20.5	29.4	70.6	0.0
V	124	30.0	211.1	7.6	125.7	15.5	25.8	74.2	0.0
VI	215	52.1	217.8	8.4	134.7	16.3	38.1	61.9	0.0
VII	43	10.4	221.9	7.9	142.9	13.4	53.5	46.5	0.0
VIII+	14	3.4	228.4	8.9	153.1	17.4	57.1	42.9	0.0
Total Aged	413	100	216.1	9.4	132.5	17.8	36.3	63.7	0.0
Regenerated	89	17.7							
Total	502								

Ketchikan

Tatoosh Rocks April 23, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	1.1	153.0	0.0	42.0	0.0	0.0	100.0	0.0
III	23	25.6	173.9	5.9	60.0	5.0	39.1	56.5	4.3
IV	22	24.4	188.5	11.9	77.7	16.8	40.9	59.1	0.0
V	30	33.3	198.0	11.3	90.8	17.0	60.0	36.7	3.3
VI	13	14.4	201.1	8.8	95.7	10.8	30.8	69.2	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	1	1.1	220.0	0.0	143.0	0.0	0.0	100.0	0.0
Total Aged	90	100	189.7	15.1	80.5	20.7	44.4	53.3	2.2
Regenerated	0	0							
Total	90								

Appendix A (cont.)

North Betton Island April 26, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	36	29.0	176.4	9.8	63.9	13.3	55.6	44.4	0.0
IV	37	29.8	187.1	9.5	77.4	12.9	51.4	48.6	0.0
V	27	21.8	194.9	8.8	89.4	16.0	55.6	44.4	0.0
VI	22	17.7	202.0	9.5	96.9	18.1	68.2	31.8	0.0
VII	2	1.6	212.5	8.5	112.5	6.5	50.0	50.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	124	100	188.8	13.5	80.1	19.5	56.5	43.5	0.0
Regenerated	6								
Total	130								

Bond Bay South End April 26, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	20	37.7	171.3	5.2	54.6	4.3	65.0	15.0	20.0
IV	15	28.3	187.7	11.4	75.9	14.3	73.3	26.7	0.0
V	10	18.9	196.8	7.9	82.6	11.0	90.0	10.0	0.0
VI	8	15.1	194.6	2.6	78.9	7.9	87.5	12.5	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	53	100	184.3	13.1	69.5	15.4	75.5	17.0	7.5
Regenerated	1	1.9							
Total	54								

Combined Sample Summary Ketchikan Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.4	153.0	0.0	42.0	0.0	0.0	100.0	0.0
III	79	29.6	174.4	8.1	60.4	10.3	53.2	40.5	6.3
IV	74	27.7	187.6	10.7	77.1	14.4	52.7	47.3	0.0
V	67	25.1	196.6	10.0	89.0	16.1	62.7	35.8	1.5
VI	43	16.1	200.3	8.8	93.2	16.2	60.5	39.5	0.0
VII	2	0.7	212.5	8.5	112.5	6.5	50.0	50.0	0.0
VIII+	1	0.4	220.0	0.0	143.0	0.0	0.0	100.0	0.0
Total Aged	267	100	188.2	14.1	78.1	19.6	56.2	41.6	2.2
Regenerated	7	2.6							
Total	274								

Appendix A (cont.)

Tatoosh Rocks #1 April 24, 1994 Commercial Gillnet Test Fishery

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	7	7.7	209.1	5.7	130.6	12.3	14.3	85.7	0.0
V	25	27.5	212.6	5.7	128.9	9.6	40.0	60.0	0.0
VI	48	52.7	217.8	7.7	138.8	13.4	29.2	70.8	0.0
VII	8	8.8	227.8	7.8	159.0	22.5	25.0	75.0	0.0
VIII+	3	3.3	222.3	4.9	142.3	8.7	66.7	33.3	0.0
Total Aged	91	100	216.7	8.4	137.4	15.7	31.9	68.1	0.0
Regenerated	9	9.0							
Total	100								

Tatoosh Rocks #2 April 24, 1994 Commercial Gillnet Test Fishery

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	3	3.0	209.0	4.3	125.7	9.8	33.3	66.7	0.0
V	34	33.7	214.0	6.9	132.2	14.4	29.4	70.6	0.0
VI	42	41.6	216.4	7.3	133.6	14.0	38.1	61.9	0.0
VII	16	15.8	221.3	8.0	142.6	16.4	43.8	56.3	0.0
VIII+	6	5.9	227.7	4.5	148.7	12.4	33.3	66.7	0.0
Total Aged	101	100	216.8	8.1	135.2	15.3	35.6	64.4	0.0
Regenerated	12	10.6							
Total	113								

Combined Sample Summary Tatoosh Rocks Spring 1994 Commercial Gillnet Test Fishery

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	10	5.2	209.1	5.4	129.1	11.8	20.0	80.0	0.0
V	59	30.7	213.4	6.5	130.8	12.7	33.9	66.1	0.0
VI	90	46.9	217.1	7.6	136.4	13.9	33.3	66.7	0.0
VII	24	12.5	223.5	8.5	148.1	20.2	37.5	62.5	0.0
VIII+	9	4.7	225.9	5.3	146.6	11.7	44.4	55.6	0.0
Total Aged	192	100	216.8	8.2	136.2	15.5	33.9	66.1	0.0
Regenerated	21	9.9							
Total	213								

Kasaan**Kasaan Bay April 5, 1994 Cast Net**

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	1.1	153.5	4.5	43.0	0.0	50.0	50.0	0.0
III	50	28.7	167.4	6.5	55.7	9.0	48.0	50.0	2.0
IV	47	27.0	178.6	6.7	67.3	9.5	57.4	40.4	2.1
V	53	30.5	192.3	9.1	84.8	15.0	60.4	37.7	1.9
VI	22	12.6	203.6	7.9	112.7	17.6	36.4	63.6	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	174	100	182.4	14.9	74.8	22.3	52.9	45.4	1.7
Regenerated	2	1.1							
Total	176								

Craig**Port Caldera Winter Bait Fishery Commercial Seine #1 December 11, 1993**

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	4	4.0	146.3	5.8	40.0	8.8	50.0	50.0	0.0
III	9	8.9	172.3	6.6	72.6	9.7	11.1	88.9	0.0
IV	39	38.6	175.4	29.9	79.7	17.4	33.3	66.7	0.0
V	44	43.6	186.3	11.8	91.6	18.2	38.6	61.4	0.0
VI	4	4.0	190.5	5.0	97.0	8.9	50.0	50.0	0.0
VII	1	1.0	193.0	0.0	101.0	0.0	100.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	101	100	179.5	22.2	83.6	20.2	35.6	64.4	0.0
Regenerated	2	2.0							
Total	103								

Port Caldera Winter Bait Fishery Commercial Seine #2 December 11, 1993

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	3	2.5	146.7	7.9	39.3	6.1	33.3	66.7	0.0
III	8	6.7	165.5	8.6	63.8	12.3	50.0	50.0	0.0
IV	42	35.3	179.2	9.9	83.9	15.5	38.1	61.9	0.0
V	55	46.2	184.8	8.5	88.6	12.7	41.8	58.2	0.0
VI	2	1.7	195.5	3.5	104.5	4.5	50.0	50.0	0.0
VII	1	0.8	221.0	0.0	137.0	0.0	0.0	0.0	0.0
VIII+	2	1.7	201.0	5.0	117.0	14.0	50.0	50.0	0.0
Total Aged	113	100	181.8	12.7	85.0	18.1	40.7	59.3	0.0
Regenerated	6	5.3							
Total	119	100							

Appendix A (cont.)

Combined Sample Summary Port Caldera Commercial Fishery December 1993.

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	7	3.3	146.4	6.8	39.7	7.8	57.1	42.9	0.0
III	17	7.9	169.1	8.3	68.4	11.8	70.6	29.4	0.0
IV	81	37.9	177.4	22.0	81.9	16.6	64.2	35.8	0.0
V	99	46.3	185.5	10.1	90.0	15.5	59.6	40.4	0.0
VI	6	2.8	192.2	5.1	99.5	8.5	50.0	50.0	0.0
VII	2	0.9	207.0	14.0	119.0	18.0	50.0	50.0	0.0
VIII+	2	0.9	201.0	5.0	117.0	14.0	50.0	50.0	0.0
Total Aged	214	100	180.4	17.8	84.3	19.1	38.3	61.7	0.0
Regenerated	6	3							
Total	220								

Ulloa Channel Winter Bait Fishery Commercial Seine #1 December 15, 1993

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	7	6.4	195.9	5.6	106.7	15.4	42.9	57.1	0.0
V	19	17.3	203.1	10.6	114.6	21.1	36.8	63.2	0.0
VI	42	38.2	213.1	9.8	142.7	21.7	47.6	52.4	0.0
VII	8	7.3	220.0	9.8	151.5	20.0	50.0	50.0	0.0
VIII+	34	30.9	230.6	8.1	177.2	19.9	44.1	55.9	0.0
Total Aged	110	100	216.2	14.5	146.8	31.6	44.5	55.5	0.0
Regenerated	2	1.8							
Total	112								

Ulloa Channel Winter Bait Fishery Commercial Seine #2 December 15, 1993

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	1.1	152.0	0.0	49.0	0.0	100.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	12	13.2	192.3	11.4	100.4	20.5	33.3	66.7	0.0
V	25	27.5	207.1	7.3	128.9	16.9	48.0	52.0	0.0
VI	28	30.8	210.6	8.2	140.4	16.6	46.4	53.6	0.0
VII	8	8.8	224.5	9.8	158.5	23.5	50.0	50.0	0.0
VIII+	17	18.7	232.2	5.9	182.3	15.6	47.1	52.9	0.0
Total Aged	91	100	211.8	16.0	140.4	31.8	46.2	53.8	0.0
Regenerated	27	22.9							
Total	118								

Appendix A (cont.)

Combined Sample Summary Ulloa Channel Commercial Fishery December 1993.

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.5	152.0	0.0	49.0	0.0	100.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	19	9.5	193.6	9.8	102.7	19.0	36.8	63.2	0.0
V	44	21.9	205.3	9.1	122.7	20.1	43.2	56.8	0.0
VI	70	34.8	212.1	9.3	141.8	19.9	47.1	52.9	0.0
VII	16	8.0	222.3	10.1	155.0	22.1	50.0	50.0	0.0
VIII+	51	25.4	231.2	7.5	178.9	18.8	45.1	54.9	0.0
Total Aged	201	100	214.2	15.4	143.9	31.8	52.7	61.7	0.0
Regenerated	29	12							
Total	230								

Combined Sample Summary Craig December 1993 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	8	1.9	147.1	6.6	40.9	7.9	50.0	50.0	0.0
III	17	4.1	169.1	8.3	68.4	11.8	29.4	70.6	0.0
IV	100	24.1	180.5	21.2	85.8	18.9	36.0	64.0	0.0
V	143	34.5	191.6	13.4	100.0	22.8	41.3	58.7	0.0
VI	76	18.3	210.5	10.5	138.4	22.3	47.4	52.6	0.0
VII	18	4.3	220.6	11.6	151.0	24.5	50.0	50.0	0.0
VIII+	53	12.8	230.0	9.4	176.6	22.0	45.3	54.7	0.0
Total Aged	415	100	196.8	23.8	113.2	39.6	41.7	58.3	0.0
Regenerated	5	1.2							
Total	420								

North of Alberto Island April 1, 1994 Pre-Pound Test Seine Non-Active Spawn

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	1.3	155.5	4.5	42.5	3.5	100.0	0.0	0.0
III	13	8.6	182.0	6.6	81.7	12.0	69.2	30.8	0.0
IV	44	29.1	185.0	9.8	84.0	16.1	56.8	43.2	0.0
V	26	17.2	194.8	9.0	97.8	14.2	65.4	34.6	0.0
VI	44	29.1	201.8	10.7	112.5	21.4	68.2	31.8	0.0
VII	7	4.6	205.7	6.7	124.9	17.9	57.1	42.9	0.0
VIII+	15	9.9	218.3	12.1	144.6	32.0	60.0	40.0	0.0
Total Aged	151	100	194.5	16.0	100.8	29.1	63.6	36.4	0.0
Regenerated	11	6.8							
Total	162								

Appendix A (cont.)

Fish Egg Island March 23, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	2	2.6	156.5	4.5	48.0	4.0	0.0	50.0	50.0
IV	5	6.5	189.0	7.3	83.0	14.3	80.0	0.0	20.0
V	22	28.6	201.0	7.1	108.3	16.6	72.7	22.7	4.5
VI	29	37.7	210.4	6.0	124.7	21.8	44.8	48.3	6.9
VII	15	19.5	221.1	4.3	151.1	22.9	20.0	73.3	6.7
VIII+	4	5.2	230.8	3.8	158.8	18.0	25.0	50.0	25.0
Total Aged	77	100	208.1	14.3	122.2	30.4	48.1	42.9	9.1
Regenerated	0								
Total	77								

Balandra Island April 3, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	2	2.7	161.5	10.5	51.5	14.5	50.0	50.0	0.0
IV	11	14.7	185.8	9.8	77.5	12.6	54.5	45.5	0.0
V	27	36.0	205.6	6.7	103.9	12.2	77.8	22.2	0.0
VI	22	29.3	211.0	7.4	111.5	12.9	72.7	27.3	0.0
VII	7	9.3	215.0	11.2	127.7	21.9	71.4	28.6	0.0
VIII+	6	8.0	232.7	4.5	148.2	21.1	50.0	50.0	0.0
Total Aged	75	100	206.1	15.7	106.6	24.6	69.3	30.7	0.0
Regenerated	0								
Total	75								

Ballena Island April 4, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	2	2.4	160.5	1.5	48.0	0.0	50.0	50.0	0.0
IV	11	13.1	190.0	8.6	79.8	12.9	90.9	9.1	0.0
V	30	35.7	199.8	8.3	94.3	17.3	66.7	33.3	0.0
VI	22	26.2	208.9	7.1	113.9	20.3	50.0	50.0	0.0
VII	17	20.2	221.2	9.1	138.1	18.1	58.8	41.2	0.0
VIII+	2	2.4	239.0	7.0	191.5	21.5	0.0	100.0	0.0
Total Aged	84	100	205.2	15.4	107.6	30.5	61.9	38.1	0.0
Regenerated	0								
Total	84								

Appendix A (cont.)

South of Fish Egg Island April 6, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	3	4.2	179.7	4.8	59.7	5.0	66.7	33.3	0.0
IV	6	8.3	187.0	6.9	73.5	5.8	33.3	16.7	50.0
V	17	23.6	202.6	7.4	95.4	18.5	52.9	47.1	0.0
VI	28	38.9	213.0	8.5	110.7	17.6	53.6	46.4	0.0
VII	16	22.2	228.8	7.3	136.4	17.3	56.3	43.8	0.0
VIII+	2	2.8	238.0	2.0	143.0	6.0	0.0	100.0	0.0
Total Aged	72	100	211.2	16.0	108.5	26.9	51.4	44.4	4.2
Regenerated	0								
Total	72								

West Ballena Island April 8, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	3	3.7	169.7	7.9	59.0	9.1	66.7	33.3	0.0
IV	19	23.5	187.9	9.3	80.5	14.5	63.2	36.8	0.0
V	27	33.3	203.2	9.2	103.8	16.9	48.1	51.9	0.0
VI	22	27.2	210.5	7.2	113.7	14.2	59.1	40.9	0.0
VII	8	9.9	215.1	8.1	126.4	16.0	50.0	50.0	0.0
VIII+	2	2.5	222.0	1.0	139.0	4.0	50.0	50.0	0.0
Total Aged	81	100	202.0	14.3	102.5	23.2	55.6	44.4	0.0
Regenerated	0								
Total	81								

Wadleigh Island April 11, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	4	3.5	156.8	2.3	42.3	1.6	100.0	0.0	0.0
III	13	11.4	161.2	9.9	46.7	9.3	69.2	30.8	0.0
IV	42	36.8	180.2	12.3	67.9	15.1	66.7	33.3	0.0
V	28	24.6	197.4	9.4	88.9	15.6	60.7	39.3	0.0
VI	20	17.5	209.7	9.3	114.2	19.7	60.0	40.0	0.0
VII	6	5.3	221.2	6.6	124.8	11.7	100.0	0.0	0.0
VIII+	1	0.9	224.0	0.0	150.0	0.0	0.0	100.0	0.0
Total Aged	114	100	189.1	20.4	81.6	28.8	66.7	33.3	0.0
Regenerated	0								
Total	114								

Appendix A (cont.)

Combined Sample Summary Craig Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	4	0.8	156.8	2.3	42.3	1.6	100.0	0.0	0.0
III	25	5.0	164.0	10.7	50.3	10.1	60.0	36.0	4.0
IV	94	18.7	184.5	11.2	74.1	15.2	66.0	29.8	4.3
V	151	30.0	201.5	8.6	98.9	17.5	63.6	35.8	0.7
VI	143	28.4	210.7	7.7	115.1	18.9	55.9	42.7	1.4
VII	69	13.7	221.6	9.1	137.0	20.8	53.6	44.9	1.4
VIII+	17	3.4	231.8	6.5	154.2	22.8	29.4	64.7	5.9
Total Aged	503	100	202.5	18.2	103.1	30.6	59.4	38.6	2.0
Regenerated	0								
Total	503								

Vixen Inlet

Vixen Point #1 April 25, 1994 Cast Net Non-Active Spawn

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	5.0	152.0	0.0	39.0	2.0	50.0	50.0	0.0
III	10	25.0	175.6	11.1	66.2	12.7	60.0	40.0	0.0
IV	7	17.5	185.0	5.0	75.7	8.5	57.1	42.9	0.0
V	13	32.5	197.6	10.1	93.5	21.6	69.2	30.8	0.0
VI	7	17.5	199.3	7.1	99.9	9.2	42.9	57.1	0.0
VII	1	2.5	206.0	0.0	107.0	0.0	100.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	40	100	188.1	15.6	82.3	22.3	60.0	40.0	0.0
Regenerated	1	2.4							
Total	41								

Vixen Point #2 April 25, 1994 Cast Net Non-Active Spawn

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	3	1.6	151.7	3.8	40.0	4.1	100.0	0.0	0.0
III	41	22.5	175.3	7.4	63.8	10.4	56.1	36.6	7.3
IV	40	22.0	188.6	10.9	83.2	16.5	35.0	52.5	12.5
V	68	37.4	195.4	14.3	96.8	21.5	45.6	51.5	2.9
VI	30	16.5	198.3	11.4	96.6	15.8	70.0	26.7	3.3
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	182	100	189.1	15.2	85.4	22.5	50.5	43.4	6.0
Regenerated	6	3.2							
Total	188								

Appendix A (cont.)

Combined Sample Summary Vixen Inlet April 25, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	5	2.3	151.8	2.9	39.6	3.4	80.0	20.0	0.0
III	51	23.0	175.3	8.3	64.2	11.0	56.9	37.3	5.9
IV	47	21.2	188.1	10.3	82.1	15.8	38.3	51.1	10.6
V	81	36.5	195.8	13.7	96.3	21.5	49.4	48.1	2.5
VI	37	16.7	198.5	10.7	97.2	14.8	64.9	32.4	2.7
VII	1	0.5	206.0	0.0	107.0	0.0	100.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	222	100	188.9	15.3	84.8	22.5	52.3	42.8	5.0
Regenerated	7	3.1							
Total	229								

Port Houghton / Hobart Bay

Whitney Island January 21, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	1.6	130.0	17.0	24.5	9.5	100.0	0.0	0.0
III	2	1.6	173.5	4.5	64.0	6.0	50.0	50.0	0.0
IV	12	9.8	184.7	6.9	84.8	11.3	66.7	33.3	0.0
V	71	58.2	202.9	8.2	115.8	15.3	46.5	53.5	0.0
VI	33	27.0	216.5	8.4	144.8	16.9	30.3	69.7	0.0
VII	2	1.6	229.0	0.0	166.0	13.0	0.0	100.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	122	100	203.5	16.2	119.1	27.6	44.3	55.7	0.0
Regenerated	1	0.8							
Total	123								

Whitney Island January 25, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.7	141.0	0.0	30.0	0.0	0.0	0.0	100.0
III	4	2.9	171.8	1.5	67.5	2.1	50.0	50.0	0.0
IV	4	2.9	189.5	15.2	95.3	24.8	50.0	50.0	0.0
V	57	41.6	197.0	9.7	109.4	17.8	38.6	61.4	0.0
VI	63	46.0	205.0	10.0	127.5	22.7	49.2	50.8	0.0
VII	7	5.1	212.3	6.6	140.6	14.2	71.4	28.6	0.0
VIII+	1	0.7	221.0	0.0	149.0	0.0	0.0	100.0	0.0
Total Aged	137	100	200.3	13.1	117.4	25.4	45.3	54.0	0.7
Regenerated	6	4.2							
Total	143								

Appendix A (cont.)

Whitney Island February 1, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	1	1.0	173.0	0.0	69.0	0.0	0.0	100.0	0.0
IV	2	2.0	187.5	4.5	96.5	17.5	50.0	50.0	0.0
V	30	30.3	205.4	9.2	128.2	18.7	36.7	63.3	0.0
VI	57	57.6	209.9	29.9	140.0	28.5	36.8	61.4	1.8
VII	5	5.1	213.4	13.2	142.0	26.0	80.0	20.0	0.0
VIII+	4	4.0	221.3	13.7	149.8	24.3	75.0	25.0	0.0
Total Aged	99	100	208.4	24.3	135.3	27.4	40.4	58.6	1.0
Regenerated	21	17.5							
Total	120								

Combined Sample Summary Whitney Island Winter 1994 Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	3	0.8	133.7	14.8	26.3	8.2	66.7	0.0	33.3
III	7	2.0	172.4	2.8	66.7	4.0	42.9	57.1	0.0
IV	18	5.0	186.1	9.5	88.4	16.8	61.1	38.9	0.0
V	158	44.1	201.3	9.6	115.8	18.1	41.8	58.2	0.0
VI	153	42.7	209.3	20.2	135.9	25.0	40.5	58.8	0.7
VII	14	3.9	215.1	10.8	144.7	21.0	64.3	35.7	0.0
VIII+	5	1.4	221.2	12.2	149.6	21.7	60.0	40.0	0.0
Total Aged	358	100	203.6	18.2	122.9	27.8	43.6	55.9	0.6
Regenerated	28	7.3							
Total	386								

Port Houghton April 25, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	1	4.5	214.0	0.0	108.0	0.0	100.0	0.0	0.0
V	8	36.4	204.1	5.6	96.5	12.8	12.5	87.5	0.0
VI	13	59.1	215.5	7.9	121.3	13.5	53.8	46.2	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	22	100	211.3	8.8	111.7	17.5	40.9	59.1	0.0
Regenerated	0	0							
Total	22								

Appendix A (cont.)

Point Hobart April 26, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	2	3.0	178.5	5.5	64.0	12.0	0.0	50.0	50.0
IV	1	1.5	206.0	0.0	112.0	0.0	100.0	0.0	0.0
V	21	31.8	209.1	10.5	113.5	23.4	52.4	47.6	0.0
VI	37	56.1	214.1	9.3	122.1	23.5	70.3	29.7	0.0
VII	3	4.5	219.0	5.7	133.7	21.1	66.7	33.3	0.0
VIII+	2	3.0	242.5	3.5	173.0	9.0	100.0	0.0	0.0
Total Aged	66	100	212.4	12.5	119.5	26.7	63.6	34.8	1.5
Regenerated	3	4.3							
Total	69								

Port Houghton April 26, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	1.3	161.0	0.0	50.0	0.0	100.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V	18	23.1	207.2	7.4	118.4	16.9	50.0	50.0	0.0
VI	45	57.7	215.3	8.2	135.3	21.2	40.0	60.0	0.0
VII	9	11.5	221.6	10.7	152.1	25.9	44.4	55.6	0.0
VIII+	5	6.4	233.0	16.8	177.2	43.7	40.0	60.0	0.0
Total Aged:	78	100	214.6	12.7	134.9	28.8	43.6	56.4	0.0
Regenerated	0	0							
Total	78								

Point Hobart April 27, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	2	4.8	203.5	2.5	109.5	8.5	0.0	100.0	0.0
V	10	23.8	208.5	9.2	114.8	22.0	50.0	50.0	0.0
VI	26	61.9	221.2	7.8	140.2	17.1	46.2	53.8	0.0
VII	3	7.1	214.3	8.0	126.3	16.7	66.7	33.3	0.0
VIII+	1	2.4	238.0	0.0	204.0	0.0	100.0	0.0	0.0
Total Aged	42	100	217.2	10.5	133.2	24.1	47.6	52.4	0.0
Regenerated	2	4.5							
Total	44								

Appendix A (cont.)

Hobart Bay April 29, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	1	1.1	208.0	0.0	91.0	0.0	100.0	0.0	0.0
V	21	23.1	205.5	8.3	102.6	14.7	52.4	42.9	4.8
VI	48	52.7	217.2	7.9	123.8	20.5	50.0	50.0	0.0
VII	14	15.4	221.6	10.7	129.8	19.8	50.0	50.0	0.0
VIII+	7	7.7	237.1	8.8	158.7	22.3	42.9	57.1	0.0
Total Aged	91	100	216.6	11.7	122.1	24.1	50.5	48.4	1.1
Regenerated	5	5.2							
Total	96								

Combined Sample Summary Port Houghton / Hobart Bay Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.3	161.0	0.0	50.0	0.0	100.0	0.0	0.0
III	2	0.7	178.5	5.5	64.0	12.0	0.0	50.0	50.0
IV	5	1.7	207.0	4.2	106.0	9.3	80.0	20.0	0.0
V	78	26.1	207.1	8.8	110.1	20.2	47.4	51.3	1.3
VI	169	56.5	216.5	8.6	128.8	21.7	51.5	48.5	0.0
VII	29	9.7	220.6	10.3	136.8	24.1	51.7	48.3	0.0
VIII+	15	5.0	236.5	11.9	169.8	32.2	40.0	60.0	0.0
Total Aged	299	100	214.8	12.0	125.7	26.7	50.2	49.2	0.7
Regenerated	10	3.2							
Total	309								

Seymour Canal

1st Point South of Sorefinger April 26, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	1	1.1	187.0	0.0	84.0	0.0	0.0	100.0	0.0
IV	3	3.4	190.7	13.4	89.7	18.9	66.7	33.3	0.0
V	20	22.7	193.2	9.9	93.1	14.1	55.0	45.0	0.0
VI	46	52.3	204.1	11.6	112.3	22.6	56.5	43.5	0.0
VII	5	5.7	209.6	14.9	125.6	25.4	40.0	60.0	0.0
VIII+	13	14.8	222.5	10.8	155.8	25.1	23.1	76.9	0.0
Total Aged	88	100	204.0	14.7	114.0	29.2	50.0	50.0	0.0
Regenerated	4	4.3							
Total	92								

Appendix A (cont.)

Black Jack April 26, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	1	1.7	168.0	0.0	56.0	0.0	100.0	0.0	0.0
IV	3	5.0	186.7	11.9	84.0	14.2	100.0	0.0	0.0
V	14	23.3	201.6	8.5	103.2	14.0	50.0	50.0	0.0
VI	28	46.7	204.9	9.2	110.4	15.3	64.3	35.7	0.0
VII	9	15.0	211.8	11.4	121.9	19.9	44.4	55.6	0.0
VIII+	5	8.3	216.2	15.2	140.4	32.1	40.0	60.0	0.0
Total Aged	60	100	204.6	12.7	110.7	22.4	58.3	41.7	0.0
Regenerated	0	0							
Total	60								

Seymour Canal May 13, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.6	140.0	0.0	31.0	0.0	100.0	0.0	0.0
III	2	1.2	164.0	5.0	49.0	3.0	100.0	0.0	0.0
IV	12	7.0	183.3	6.9	70.9	4.1	41.7	41.7	16.7
V	62	36.3	192.6	9.1	84.4	13.4	64.5	35.5	0.0
VI	67	39.2	200.7	11.2	97.7	21.8	64.2	35.8	0.0
VII	16	9.4	210.1	7.7	113.5	15.1	50.0	50.0	0.0
VIII+	11	6.4	219.5	13.8	137.5	34.4	54.5	45.5	0.0
Total Aged	171	100	197.8	14.6	94.1	25.4	61.4	37.4	1.2
Regenerated	5	2.8							
Total	176								

Rock Garden May 14, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	1	1.2	174.0	0.0	65.0	0.0	100.0	0.0	0.0
IV	2	2.4	191.0	7.0	83.5	20.5	100.0	0.0	0.0
V	27	32.1	191.9	11.6	82.5	16.2	66.7	33.3	0.0
VI	38	45.2	195.7	10.4	86.0	13.3	52.6	47.4	0.0
VII	10	11.9	203.8	8.4	98.3	13.7	80.0	20.0	0.0
VIII+	6	7.1	210.7	7.9	116.8	12.0	66.7	33.3	0.0
Total Aged	84	100	196.2	11.9	88.3	17.2	63.1	36.9	0.0
Regenerated	4	4.5							
Total	88								

Appendix A (cont.)

Combined Sample Summary Seymour Canal Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.2	140.0	0.0	31.0	0.0	100.0	0.0	0.0
III	5	1.2	171.4	9.2	60.6	13.2	80.0	20.0	0.0
IV	20	5.0	185.7	12.3	77.0	18.1	60.0	30.0	10.0
V	123	30.5	193.5	10.2	87.5	15.7	61.8	38.2	0.0
VI	179	44.4	201.2	11.3	100.9	22.0	59.8	40.2	0.0
VII	40	9.9	208.8	10.4	113.1	20.0	55.0	45.0	0.0
VIII+	35	8.7	218.6	12.8	141.1	31.0	42.9	57.1	0.0
Total Aged	403	100.0	199.8	14.2	99.7	26.5	58.8	40.7	0.5
Regenerated	13	3.1							
Total	416								

Gambier Bay

Gambier Bay May 10, 1994 Cast Net Pre-Spawn

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	2	2.2	157.0	5.0	44.5	5.5	100.0	0.0	0.0
IV	20	21.5	170.5	8.3	62.1	11.0	45.0	50.0	5.0
V	39	41.9	182.3	13.0	76.4	20.1	51.3	48.7	0.0
VI	32	34.4	192.4	10.9	89.2	17.3	53.1	46.9	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	93	100	182.7	14.4	77.0	20.5	51.6	47.3	1.1
Regenerated	0								
Total	93								

Gambier Bay #2 May 10, 1994 Cast Net Pre-Spawn

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	5	4.7	163.8	5.0	51.6	3.9	80.0	20.0	0.0
IV	29	27.4	171.2	8.6	60.8	10.9	75.9	20.7	3.4
V	40	37.7	183.9	11.8	78.0	18.0	60.0	37.5	2.5
VI	30	28.3	194.6	14.5	95.7	22.1	56.7	43.3	0.0
VII	2	1.9	206.5	0.5	118.5	3.5	0.0	100.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	106	100	182.9	15.4	77.8	23.0	63.2	34.9	1.9
Regenerated	1	0.9							
Total	107								

Appendix A (cont.)

Combined Sample Summary Gambier Bay May 10, 1994 Cast Net Pre-Spawn

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	7	3.5	161.9	5.8	49.6	5.4	85.7	14.3	0.0
IV	49	24.6	170.9	8.5	61.3	10.9	63.3	32.7	4.1
V	79	39.7	183.1	12.4	77.2	19.1	55.7	43.0	1.3
VI	62	31.2	193.5	12.8	92.3	20.0	54.8	45.2	0.0
VII	2	1.0	206.5	0.5	118.5	3.5	0.0	100.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	199	100	182.8	14.9	77.5	21.9	57.8	40.7	1.5
Regenerated	1	0.5							
Total	200								

Whale Bay

Whale Bay #1 January 7, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	6	4.1	155.0	4.7	42.7	4.8	83.3	0.0	16.7
III	11	7.5	178.3	7.4	66.5	7.3	63.6	36.4	0.0
IV	27	18.4	187.0	6.4	79.0	9.3	44.4	55.6	0.0
V	33	22.4	202.3	8.6	100.1	16.2	54.5	45.5	0.0
VI	63	42.9	215.3	7.3	122.5	15.1	50.8	49.2	0.0
VII	6	4.1	223.2	4.9	137.5	13.1	66.7	33.3	0.0
VIII+	1	0.7	228.0	0.0	150.0	0.0	100.0	0.0	0.0
Total Aged	147	100	202.4	18.0	102.8	27.7	53.7	45.6	0.7
Regenerated	0								
Total	147								

Whale Bay #2 January 7, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	4	2.5	154.3	8.8	45.3	10.4	75.0	0.0	25.0
III	24	15.3	174.1	7.0	60.4	8.5	83.3	16.7	0.0
IV	36	22.9	187.6	6.7	78.7	10.0	58.3	41.7	0.0
V	41	26.1	205.9	10.2	104.9	16.3	43.9	56.1	0.0
VI	47	29.9	216.9	6.6	125.1	11.4	44.7	55.3	0.0
VII	5	3.2	229.6	5.5	146.2	16.8	60.0	40.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	157	100	199.6	19.3	97.9	28.9	54.8	44.6	0.6
Regenerated	1	0.6							
Total	158								

Appendix A (cont.)

Combined Sample Summary Whale Bay January 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	10	3.3	154.7	6.7	43.7	7.7	80.0	0.0	20.0
III	35	11.5	175.4	7.4	62.3	8.6	77.1	22.9	0.0
IV	63	20.7	187.4	6.6	78.9	9.7	52.4	47.6	0.0
V	74	24.3	204.3	9.7	102.7	16.4	48.6	51.4	0.0
VI	110	36.2	216.0	7.1	123.6	13.7	48.2	51.8	0.0
VII	11	3.6	226.1	6.1	141.5	15.5	63.6	36.4	0.0
VIII+	1	0.3	228.0	0.0	150.0	0.0	100.0	0.0	0.0
Total Aged	304	100	200.9	18.8	100.3	28.4	54.3	45.1	0.7
Regenerated	1	0.3							
Total	305								

Necker Bay

Necker Bay #1 January 8, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.9	151.0	0.0	42.0	0.0	0.0	0.0	100.0
III	3	2.7	179.7	4.6	74.0	2.9	33.3	66.7	0.0
IV	2	1.8	200.0	12.0	101.5	10.5	50.0	50.0	0.0
V	39	35.1	211.8	6.3	130.5	15.6	53.8	46.2	0.0
VI	60	54.1	217.3	6.7	138.7	15.8	36.7	63.3	0.0
VII	4	3.6	229.3	13.3	153.0	22.4	75.0	25.0	0.0
VIII+	2	1.8	243.5	5.5	181.5	0.5	0.0	100.0	0.0
Total Aged	111	100	214.3	12.3	133.8	22.4	43.2	55.9	0.9
Regenerated	7	5.9							
Total	118								

Necker Bay #2 January 8, 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	3	2.4	153.7	9.0	38.7	5.6	66.7	0.0	33.3
III	3	2.4	168.3	2.5	53.7	3.9	33.3	33.3	33.3
IV	6	4.9	194.5	3.3	93.5	11.1	66.7	33.3	0.0
V	36	29.3	206.7	7.8	121.6	17.9	52.8	47.2	0.0
VI	67	54.5	214.9	6.0	135.4	15.0	49.3	50.7	0.0
VII	7	5.7	224.0	6.5	158.3	15.2	57.1	42.9	0.0
VIII+	1	0.8	230.0	0.0	176.0	0.0	0.0	100.0	0.0
Total Aged	123	100	209.5	14.3	126.6	27.1	51.2	47.2	1.6
Regenerated	1	0.8							
Total	124								

Appendix A (cont.)

Combined Sample Summary Necker Bay January 1994 Winter Bait Fishery Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	4	1.7	153.0	7.9	39.5	5.0	50.0	0.0	50.0
III	6	2.6	174.0	6.8	63.8	10.7	33.3	50.0	16.7
IV	8	3.4	195.9	7.0	95.5	11.5	62.5	37.5	0.0
V	75	32.1	209.3	7.5	126.2	17.3	53.3	46.7	0.0
VI	127	54.3	216.0	6.5	137.0	15.5	43.3	56.7	0.0
VII	11	4.7	225.9	9.9	156.4	18.4	63.6	36.4	0.0
VIII+	3	1.3	239.0	7.8	179.7	2.6	0.0	100.0	0.0
Total Aged	234	100	211.8	13.6	130.0	25.3	47.4	51.3	1.3
Regenerated	8	3.3							
Total	242								

Sitka

Eastern Channel December 20, 1993 Test Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	45	27.3	154.1	9.4	42.8	8.0	13.3	86.7	0.0
III	36	21.8	163.7	24.5	58.9	20.5	33.3	66.7	0.0
IV	6	3.6	181.7	17.5	77.8	24.0	0.0	100.0	0.0
V	3	1.8	184.3	11.9	89.0	12.8	33.3	66.7	0.0
VI	70	42.4	204.5	25.8	120.1	21.2	61.4	38.6	0.0
VII	3	1.8	208.3	6.2	134.3	15.4	33.3	66.7	0.0
VIII+	2	1.2	215.5	6.5	150.0	21.0	50.0	50.0	0.0
Total Aged	165	100	180.2	31.4	83.2	40.3	38.8	61.2	0.0
Regenerated	11	6.3							
Total	176								

Eastern Channel January 31, 1994 Test Seine Set #2 F/V Debrah Ann

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	6	5.2	161.5	4.3	47.3	4.5	16.7	66.7	16.7
III	5	4.3	176.4	9.7	69.8	15.2	40.0	60.0	0.0
IV	4	3.5	192.3	10.9	92.8	19.0	75.0	25.0	0.0
V	3	2.6	206.0	9.4	124.3	18.1	33.3	66.7	0.0
VI	92	80.0	212.9	9.6	131.6	21.9	53.3	46.7	0.0
VII	2	1.7	217.5	3.5	142.0	21.0	0.0	100.0	0.0
VIII+	3	2.6	218.0	14.7	145.3	30.4	66.7	33.3	0.0
Total Aged	115	100	208.0	16.7	123.5	31.3	50.4	48.7	0.9
Regenerated	3	2.5							
Total	118								

Appendix A (cont.)

Eastern Channel February 1, 1994 Test Seine Set #1 (30 ton set) F/V Debrah Ann

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	9	6.3	153.3	10.3	39.7	8.6	11.1	22.2	66.7
III	12	8.4	180.5	11.8	71.6	16.2	41.7	50.0	8.3
IV	3	2.1	185.3	13.5	82.3	23.8	66.7	33.3	0.0
V	5	3.5	205.6	8.1	112.0	10.1	80.0	20.0	0.0
VI	110	76.9	210.1	6.0	125.3	16.1	54.5	45.5	0.0
VII	2	1.4	215.5	8.5	136.5	31.5	0.0	100.0	0.0
VIII+	2	1.4	223.0	4.0	160.0	7.0	0.0	100.0	0.0
Total Aged	143	100	203.6	17.4	114.7	30.2	50.3	44.8	4.9
Regenerated	3	2.1							
Total	146								

Combined Eastern Channel Winter 1994 Test Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	15	5.8	156.6	9.3	42.7	8.1	13.3	40.0	46.7
III	17	6.6	179.3	11.4	71.1	15.9	41.2	52.9	5.9
IV	7	2.7	189.3	12.6	88.3	21.8	71.4	28.6	0.0
V	8	3.1	205.8	8.6	116.6	14.9	62.5	37.5	0.0
VI	202	78.3	211.4	8.0	128.1	19.2	54.0	46.0	0.0
VII	4	1.6	216.5	6.6	139.3	26.9	0.0	100.0	0.0
VIII+	5	1.9	220.0	11.9	151.2	25.0	40.0	60.0	0.0
Total Aged	258	100	205.6	17.3	118.6	31.0	50.4	46.5	3.1
Regenerated	6	2.3							
Total	264								

Halibut Point March 29, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	3	4.2	185.0	2.8	73.3	4.8	100.0	0.0	0.0
IV	3	4.2	185.3	14.5	75.7	12.8	66.7	33.3	0.0
V	3	4.2	209.0	2.9	109.7	6.5	66.7	33.3	0.0
VI	59	81.9	211.7	8.7	124.2	22.7	49.2	50.8	0.0
VII	2	2.8	213.0	9.0	125.5	27.5	100.0	0.0	0.0
VIII+	2	2.8	227.5	7.5	154.5	42.5	100.0	0.0	0.0
Total Aged	72	100	209.8	11.8	120.4	27.0	55.6	44.4	0.0
Regenerated	1	1.4							
Total	73								

Appendix A (cont.)

North Kasiana Island March 30, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	1.1	167.0	0.0	54.0	0.0	0.0	100.0	0.0
III	4	4.3	177.8	5.0	60.0	5.1	25.0	25.0	50.0
IV	1	1.1	187.0	0.0	83.0	0.0	100.0	0.0	0.0
V	6	6.5	205.7	9.2	115.5	26.8	83.3	16.7	0.0
VI	70	76.1	209.2	7.6	120.2	18.8	62.9	35.7	1.4
VII	5	5.4	207.6	5.1	115.8	7.8	100.0	0.0	0.0
VIII+	5	5.4	220.2	4.2	147.8	23.6	20.0	60.0	20.0
Total Aged	92	100	207.4	11.2	117.4	24.6	62.0	33.7	4.3
Regenerated	5	5.2							
Total	97								

Sandy Bay April 1, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	3	4.8	162.0	0.8	48.7	4.7	66.7	0.0	33.3
III	3	4.8	159.7	3.9	47.3	5.0	33.3	0.0	66.7
IV	2	3.2	194.0	7.0	97.0	24.0	50.0	50.0	0.0
V	7	11.1	201.1	10.9	100.6	15.9	85.7	14.3	0.0
VI	41	65.1	208.2	8.9	115.0	21.3	51.2	39.0	9.8
VII	5	7.9	208.8	5.6	113.6	10.4	60.0	40.0	0.0
VIII+	2	3.2	227.5	0.5	162.0	12.0	50.0	50.0	0.0
Total Aged	63	100	203.1	16.8	107.8	28.9	55.6	33.3	11.1
Regenerated	2	3.1							
Total	65								

Aleutkina April 1, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	3	4.3	165.3	0.9	56.0	2.9	66.7	33.3	0.0
III	9	12.9	172.7	16.1	62.9	19.7	44.4	33.3	22.2
IV	3	4.3	187.7	8.3	70.3	4.6	33.3	33.3	33.3
V	4	5.7	203.5	11.3	116.0	26.4	25.0	75.0	0.0
VI	49	70.0	206.0	8.4	115.4	20.6	46.9	46.9	6.1
VII	2	2.9	207.5	9.5	125.0	10.0	0.0	100.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	70	100	199.1	16.6	104.5	29.4	44.3	47.1	8.6
Regenerated	5	6.7							
Total	75								

Appendix A (cont.)

Katlian Bay April 4, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	14	8.1	168.3	16.6	53.4	22.5	57.1	7.1	35.7
III	30	17.4	179.7	13.0	61.2	12.8	53.3	16.7	30.0
IV	21	12.2	195.8	11.6	79.1	20.6	47.6	38.1	14.3
V	20	11.6	203.9	8.8	94.2	16.9	55.0	30.0	15.0
VI	73	42.4	210.7	9.5	102.1	21.4	47.9	34.2	17.8
VII	6	3.5	209.5	4.9	102.3	12.9	50.0	16.7	33.3
VIII+	8	4.7	225.9	14.9	136.5	35.4	37.5	50.0	12.5
Total Aged	172	100	199.9	19.2	88.9	29.2	50.0	29.1	20.9
Regenerated	6	3.4							
Total	178								

Combined Sample Summary Sitka Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	21	4.5	166.9	13.8	53.1	18.6	57.1	14.3	28.6
III	49	10.4	177.3	13.6	61.3	14.1	51.0	18.4	30.6
IV	30	6.4	193.5	11.9	79.2	19.6	50.0	36.7	13.3
V	40	8.5	204.0	9.5	101.8	21.2	62.5	30.0	7.5
VI	292	62.3	209.4	8.9	115.0	22.4	52.1	40.8	7.2
VII	20	4.3	209.0	6.4	113.1	15.6	65.0	25.0	10.0
VIII+	17	3.6	224.6	11.1	144.9	32.6	29.4	58.8	11.8
Total Aged	469	100	203.2	16.6	104.2	30.8	52.7	36.0	11.3
Regenerated	19	3.9							
Total	488								

Sitka Sound #1 (1st opening) March 29, 1994 Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	1.6	161.0	4.0	45.5	2.5	50.0	0.0	50.0
III	3	2.4	183.7	6.9	68.0	11.3	66.7	0.0	33.3
IV	3	2.4	191.0	3.3	79.7	15.1	33.3	66.7	0.0
V	16	12.8	205.2	10.2	100.9	26.2	68.8	25.0	6.3
VI	93	74.4	211.7	8.2	117.3	24.9	50.5	43.0	6.5
VII	4	3.2	219.8	9.4	143.0	13.3	50.0	50.0	0.0
VIII+	4	3.2	226.5	9.2	142.0	24.6	75.0	25.0	0.0
Total Aged	125	100	209.6	12.3	113.6	28.6	53.6	39.2	7.2
Regenerated	3	2.3							
Total	128								

Appendix A (cont.)

Sitka Sound #2 (1st opening) March 29, 1994 Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	4	3.4	179.0	7.8	61.5	12.6	100.0	0.0	0.0
IV	2	1.7	198.0	0.0	81.0	1.0	50.0	50.0	0.0
V	13	11.2	212.9	8.2	113.9	20.5	61.5	38.5	0.0
VI	88	75.9	215.5	8.3	124.4	19.6	60.2	39.8	0.0
VII	3	2.6	215.3	5.9	130.7	11.9	100.0	0.0	0.0
VIII+	6	5.2	227.0	6.6	140.3	14.7	50.0	50.0	0.0
Total Aged	116	100	214.5	11.4	121.8	23.8	62.1	37.9	0.0
Regenerated	3	2.5							
Total	119								

Nakwasina #1 (2nd opening) March 31, 1994 Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	5	3.1	181.0	9.6	74.2	15.5	40.0	60.0	0.0
IV	3	1.9	195.7	10.9	97.0	24.5	100.0	0.0	0.0
V	10	6.2	209.6	8.2	132.7	22.2	20.0	80.0	0.0
VI	134	82.7	210.8	6.9	131.8	20.6	41.0	59.0	0.0
VII	4	2.5	205.8	9.2	133.5	26.0	50.0	50.0	0.0
VIII+	6	3.7	220.0	9.3	158.7	23.5	16.7	83.3	0.0
Total Aged	162	100	209.7	9.4	130.5	24.2	40.1	59.9	0.0
Regenerated	6	3.6							
Total	168								

Nakwasina #2 (2nd opening) March 31, 1994 Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	4	3.6	186.3	6.9	71.8	7.9	100.0	0.0	0.0
IV	1	0.9	198.0	0.0	98.0	0.0	0.0	100.0	0.0
V	8	7.3	214.4	6.5	125.5	15.8	25.0	75.0	0.0
VI	88	80.0	217.6	7.6	136.9	21.0	47.7	52.3	0.0
VII	4	3.6	222.5	7.4	141.5	15.2	25.0	75.0	0.0
VIII+	5	4.5	227.4	4.7	151.6	9.5	80.0	20.0	0.0
Total Aged:	110	100	216.7	9.9	134.2	23.8	48.2	51.8	0.0
Regenerated	3	2.7							
Total	113								

Appendix A (cont.)

Combined Sample Summary Sitka Sound Fishery Spring 1994 Commercial Seine

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	2	0.4	161.0	4.0	45.5	2.5	50.0	0.0	50.0
III	16	3.1	182.3	8.5	69.3	13.4	75.0	18.8	6.3
IV	9	1.8	194.9	7.2	87.8	18.7	55.6	44.4	0.0
V	47	9.2	209.8	9.4	115.5	25.5	48.9	48.9	2.1
VI	403	78.6	213.5	8.2	128.0	22.7	48.9	49.6	1.5
VII	15	2.9	215.9	10.6	137.6	18.5	53.3	46.7	0.0
VIII+	21	4.1	226.4	8.9	151.3	19.7	52.4	47.6	0.0
Total Aged	513	100	212.3	11.1	125.2	26.4	50.1	48.1	1.8
Regenerated	15	2.8							
Total	528								

Hoonah Sound

Hoonah Sound April 22, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	1	1.2	192.0	0.0	74.0	0.0	100.0	0.0	0.0
IV	5	6.2	198.0	10.8	91.2	25.9	60.0	0.0	40.0
V	28	34.6	209.9	5.1	111.8	12.8	67.9	32.1	0.0
VI	38	46.9	218.7	6.5	134.0	18.8	63.2	36.8	0.0
VII	2	2.5	229.5	2.5	154.0	5.0	50.0	50.0	0.0
VIII+	7	8.6	233.3	3.2	160.3	10.3	57.1	42.9	0.0
Total Aged	81	100	215.6	10.5	125.7	24.6	64.2	33.3	2.5
Regenerated	0								
Total	81								

Hoonah Sound April 23, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	4	3.5	185.5	5.1	65.0	3.4	75.0	25.0	0.0
IV	14	12.3	193.7	11.4	77.7	14.1	42.9	57.1	0.0
V	40	35.1	212.9	8.0	109.9	17.1	52.5	47.5	0.0
VI	44	38.6	218.3	7.6	120.7	18.6	40.9	59.1	0.0
VII	7	6.1	229.3	2.4	132.4	13.0	57.1	42.9	0.0
VIII+	5	4.4	233.4	11.1	133.4	15.2	60.0	40.0	0.0
Total Aged	114	100	213.6	13.6	111.0	24.1	48.2	51.8	0.0
Regenerated	1	0.9							
Total	115								

Appendix A (cont.)

Combined Sample Summary Hoonah Sound Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	5	2.6	186.8	5.3	66.8	4.7	80.0	20.0	0.0
IV	19	9.7	194.8	11.4	81.3	19.0	47.4	42.1	10.5
V	68	34.9	211.7	7.1	110.6	15.5	58.8	41.2	0.0
VI	82	42.1	218.5	7.1	126.9	19.9	51.2	48.8	0.0
VII	9	4.6	229.3	2.4	137.2	14.8	55.6	44.4	0.0
VIII+	12	6.2	233.3	7.6	149.1	18.3	58.3	41.7	0.0
Total Aged	195	100	214.4	12.4	117.1	25.3	54.9	44.1	1.0
Regenerated	1	0.5							
Total	196								

Hoonah Sound April 23, 1994 Dip Net from Pound

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	4	4.1	178.8	3.3	61.3	9.9	25.0	75.0	0.0
IV	5	5.2	204.8	8.1	101.6	19.2	80.0	20.0	0.0
V	29	29.9	211.5	8.5	115.0	19.3	58.6	41.4	0.0
VI	48	49.5	218.3	8.5	129.0	24.8	41.7	58.3	0.0
VII	4	4.1	227.8	8.6	157.3	25.5	25.0	75.0	0.0
VIII+	7	7.2	239.4	9.5	177.4	21.7	28.6	71.4	0.0
Total Aged	97	100	215.8	13.7	125.3	31.2	46.4	53.6	0.0
Regenerated	1	1.0							
Total	98								

Juneau

South Shelter Island March 20, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IV	4	4.8	198.5	4.0	97.0	10.7	25.0	75.0	0.0
V	20	24.1	209.1	6.5	122.5	15.4	50.0	50.0	0.0
VI	45	54.2	217.4	6.7	138.8	15.7	68.9	31.1	0.0
VII	10	12.0	227.6	5.0	160.7	14.7	60.0	40.0	0.0
VIII+	4	4.8	235.0	7.0	182.0	16.1	25.0	75.0	0.0
Total Aged	83	100	216.6	10.1	137.6	23.0	59.0	41.0	0.0
Regenerated	0								
Total	83								

Appendix A (cont.)

Berners Bay May 1, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	5	6.3	175.0	11.5	65.8	18.5	80.0	20.0	0.0
IV	15	19.0	193.1	7.6	92.3	11.9	53.3	46.7	0.0
V	31	39.2	200.0	6.4	106.1	13.0	45.2	54.8	0.0
VI	24	30.4	209.4	9.1	124.7	18.5	58.3	41.7	0.0
VII	2	2.5	225.5	3.5	139.0	13.0	50.0	50.0	0.0
VIII+	2	2.5	235.5	2.5	172.5	0.5	100.0	0.0	0.0
Total Aged	79	100	201.5	13.5	109.1	24.4	54.4	45.6	0.0
Regenerated	0								
Total	79								

Lynn Canal Above Sawmill May 4, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.9	156.0	0.0	44.0	0.0	100.0	0.0	0.0
III	2	1.7	174.0	5.0	61.5	10.5	50.0	50.0	0.0
IV	16	13.8	191.1	7.5	79.0	11.7	68.8	31.3	0.0
V	51	44.0	202.4	7.4	95.8	12.0	51.0	49.0	0.0
VI	43	37.1	213.2	7.8	111.7	17.2	72.1	27.9	0.0
VII	2	1.7	229.0	0.0	135.0	7.0	100.0	0.0	0.0
VIII+	1	0.9	230.0	0.0	131.0	0.0	0.0	100.0	0.0
Total Aged	116	100	204.6	12.7	99.3	19.9	62.1	37.9	0.0
Regenerated	1	0.9							
Total	117								

Combined Sample Summary Juneau Spring 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	1	0.4	156.0	0.0	44.0	0.0	100.0	0.0	0.0
III	7	2.5	174.7	10.1	64.6	16.7	71.4	28.6	0.0
IV	35	12.6	192.8	7.6	86.7	13.8	57.1	42.9	0.0
V	102	36.7	203.0	7.6	104.1	16.5	49.0	51.0	0.0
VI	112	40.3	214.1	8.3	125.4	20.8	67.9	32.1	0.0
VII	14	5.0	227.5	4.5	153.9	17.4	64.3	35.7	0.0
VIII+	7	2.5	234.4	5.7	172.0	21.1	42.9	57.1	0.0
Total Aged	278	100	207.3	13.7	113.5	27.5	59.0	41.0	0.0
Regenerated	1	0.4							
Total	279								

Appendix A (cont.)

Yakutat

Chicago Harbor April 19, 1994 Cast Net

Age Class	n	% Contribution	Length (mm)		Weight (g)		% Males	% Females	% U*
			Mean	Std. Dev.	Mean	Std. Dev.			
II	57	32.2	154.8	9.6	46.0	9.1	82.5	17.5	0.0
III	81	45.8	177.5	10.6	70.5	12.4	51.9	48.1	0.0
IV	31	17.5	182.4	10.0	76.4	12.5	67.7	32.3	0.0
V	3	1.7	185.7	4.1	85.0	2.9	0.0	100.0	0.0
VI	5	2.8	206.2	7.5	116.2	18.9	60.0	40.0	0.0
VII	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII+	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Aged	177	100	172.0	16.3	65.2	19.2	63.8	36.2	0.0
Regenerated	5	2.7							
Total	182								

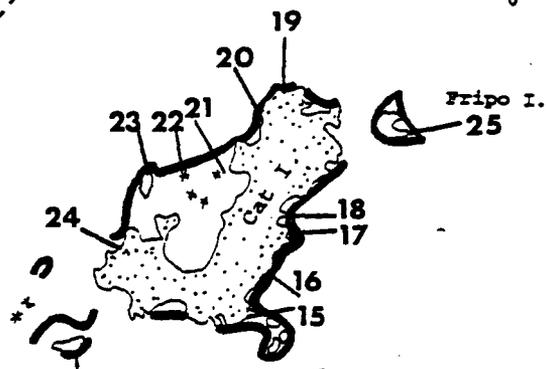
APPENDIX B

Herring spawn deposition survey transect data, by area, 1994

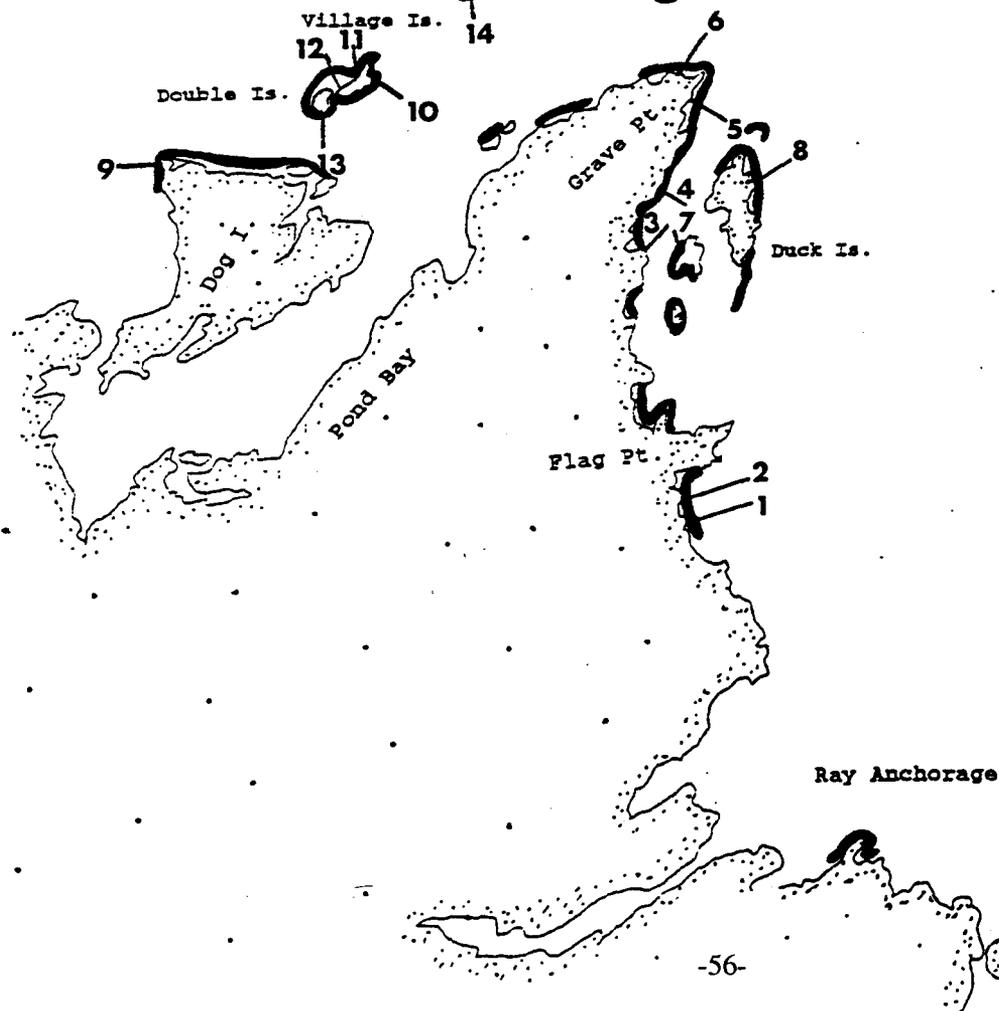
1994 HERRING SPAWN
CAT ISLAND



FELICE STRAIT



REVILLAGIGEDO CHANNEL



CAT ISLAND HERRING SPAWN SURVEY 1994

Divers: Tim Minicucci(TM), Robert Larson(RL), Tim Koeneman(TK), Brian Lynch(BL), Phil Doherty(PD)

DATE	TRAN #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION TYPE	TM EYE	TK EYE	RL EYE	PD EYE	TM CORRECTION	TK CORRECTION	RL CORRECTION	PD CORRECTION	COMMENTS
16-Apr-94	1	908	942	34	35	TM	PD	5	-3	mud	fir	1	0	0	0	0	0	0	1.22	
									-3	mud	fir	0	0	0	0	0	0	0	0	
									-3	mud	fuc	2	0	0	0	0	0	0	1.96	
									-5	rck		0	0	0	0	0	0	0	0	
									-6	rck		0	0	0	0	0	0	0	0	
									-6	rck	lbk	1	0	0	0	0	0	0	1.07	
									-5	rck	lbk	1	0	0	0	0	0	0	1.07	
									-5	rck	lbk	0	0	0	0	0	0	0	0	
									-4	rck	lbk	0	0	0	0	0	0	0	0	
									-4	rck	fuc	0	0	0	0	0	0	0	0	
									-5	rck	fuc	0	0	0	0	0	0	0	0	
									-7	rck	fuc	0	0	0	0	0	0	0	0	
									-4	rck	fuc	0	0	0	0	0	0	0	0	
									-2	rck	fuc	85	0	0	0	0	0	0	83.3	
									1	rck	fuc	35	0	0	0	0	0	0	34.3	
									2	cbf	fir	70	0	0	0	0	0	0	85.4	
									2	snd	fir	5	0	0	0	0	0	0	6.1	
									3	snd		0	0	0	0	0	0	0	0	
									4	snd		0	0	0	0	0	0	0	0	
									4	snd		0	0	0	0	0	0	0	0	
									4	snd		0	0	0	0	0	0	0	0	
									4	snd	elg	65	0	0	0	0	0	0	88.4	
									6	snd	elg	55	0	0	0	0	0	0	74.8	
									7	snd	elg	15	0	0	0	0	0	0	20.4	
									8	snd	elg	8	0	0	0	0	0	0	10.88	
									8	snd	elg	10	0	0	0	0	0	0	13.6	
									8	snd	elg	10	0	0	0	0	0	0	13.6	
									8	snd	elg	12	0	0	0	0	0	0	16.32	
									6	snd	elg	45	0	0	0	0	0	0	61.2	
									8	snd	elg	20	0	0	0	0	0	0	27.2	
									9	snd	elg	15	0	0	0	0	0	0	20.4	
									9	snd	elg	70	0	0	0	0	0	0	95.2	
									8	snd	elg	5	0	0	0	0	0	0	6.8	
									9	snd	lbk	3	0	0	0	0	0	0	3.21	
									10	snd	lbk	1	0	0	0	0	0	0	1.07	
									9	snd	lbk	0	0	0	0	0	0	0	0	
									10	snd	lbk	1	0	0	0	0	0	0	1.07	
									10	snd	lbk	0	0	0	0	0	0	0	0	
									10	snd	elg	1	0	0	0	0	0	0	1.36	
									11	snd	elg	5	0	0	0	0	0	0	6.8	
									11	snd	elg	3	0	0	0	0	0	0	4.08	
									11	snd	elg	2	0	0	0	0	0	0	2.72	
									12	snd	elg	1	0	0	0	0	0	0	1.36	
									12	snd	elg	1	0	0	0	0	0	0	1.36	
									12	snd	elg	0	0	0	0	0	0	0	0	
									12	snd	elg	0	0	0	0	0	0	0	0	
									11	snd	lbk	4	0	0	0	0	0	0	4.28	
									11	snd	lbk	0	0	0	0	0	0	0	0	
									11	snd	lbk	8	0	0	0	0	0	0	8.56	
									11	snd	elg	20	0	0	0	0	0	0	27.2	
									10	snd	elg	1	0	0	0	0	0	0	1.36	
									8	snd	hir	7	0	0	0	0	0	0	7.63	
									8	rck	lbk	0	0	0	0	0	0	0	0	
									7	cbf	lbk	0	0	0	0	0	0	0	0	
									3	rck	lbk	0	0	0	0	0	0	0	0	
									15	snd	lbk	0	0	0	0	0	0	0	0	
									16	snd	lbk	0	0	0	0	0	0	0	0	

	0	cbl	fuc	60	0	0	61.2	0	
	2	cbl	fir	5	0	0	5.3	0	
	1	rck	fil	10	0	0	10.6	0	
	3	rck	fir	10	0	0	10.6	0	
	6	rck	hir	8	0	0	9.76	0	
	9	rck	hir	75	0	0	91.5	0	
	11	rck	hir	25	0	0	30.5	0	
	12	rck	hir	3	0	0	3.66	0	
	13	rck	hir	1	0	0	1.22	0	
	14	cbl	hir	0	0	0	0	0	
	14	cbl	lbk	0	0	0	0	0	
	16	cbl	lbk	0	0	0	0	0	
	18	cbl	agm	0	0	0	0	0	
	19	cbl	agm	0	0	0	0	0	
	20	cbl	agm	0	0	0	0	0	
	21	gvl	agm	0	0	0	0	0	
	22	gvl	agm	0	0	0	0	0	
	24	gvl		0	0	0	0	0	
	25	gvl		0	0	0	0	0	red urchins 25' to 30'
	26	gvl		0	0	0	0	0	
	28	gvl		0	0	0	0	0	
	30	snd		0	0	0	0	0	geoducks start
	32	snd		0	0	0	0	0	gravel in sand, diggable??
	34	snd		0	0	0	0	0	geoducks 2/meter2
	36	snd		0	0	0	0	0	cleaner sand and more ducks at 40'
15-Apr-94	9	1328	1346	18	22	TM	TK	5	
	3	cbl	fir	0	0	0	0	0	
	6	cbl	lbk	0	0	0	0	0	
	8	cbl	fir	0	0	0	0	0	
	8	cbl	fir	0	0	0	0	0	
	9	cbl	fir	0	0	0	0	0	
	9	cbl	fir	0	0	0	0	0	
	6	cbl	fir	0	0	0	0	0	
	3	rck	fir	0	0	0	0	0	
	3	rck	fir	0	0	0	0	0	
	12	rck	agm	0	0	0	0	0	
	14	rck	ulv	0	0	0	0	0	
	15	rck	hir	0	0	0	0	0	
	15	cbl		0	0	0	0	0	
	13	cbl	fir	0	0	0	0	0	
	15	cbl	lbk	0	0	0	0	0	
	15	cbl	lbk	0	0	0	0	0	
	17	cbl	lbk	0	0	0	0	0	
	19	cbl	lbk	0	0	0	0	0	
	21	cbl	lbk	0	0	0	0	0	
	23	cbl	lbk	0	0	0	0	0	
	25	cbl	lbk	0	0	0	0	0	
15-Apr-94	10	1628	1706	38	31	TM	TK	5	
	4	rck	fuc	0	0	0	0	0	
	6	rck	fuc	0	0	0	0	0	
	8	rck	fuc	1	0	0.78	0	0	
	10	rck	fir	2	0	1.72	0	0	
	12	rck	fir	20	0	17.2	0	0	
	14	rck	fir	50	0	43	0	0	
	15	cbl	fuc	30	0	23.4	0	0	
	16	cbl	fir	5	0	4.3	0	0	
	17	cbl	fir	1	0	0.86	0	0	
	18	cbl	fir	20	0	17.2	0	0	
	18	snd	fir	0	0	0	0	0	
	19	gvl	fir	4	0	3.44	0	0	
	19	gvl	fir	3	0	2.58	0	0	
	19	gvl	fir	4	0	3.44	0	0	
	19	cbl	fir	4	0	3.44	0	0	
	19	gvl	hir	2	0	1.76	0	0	
	19	rck	fir	15	0	12.9	0	0	
	19	rck	fir	8	0	6.88	0	0	
	20	cbl	hir	16	0	14.1	0	0	
	20	gvl	fir	3	0	2.58	0	0	
	20	gvl	fir	4	0	3.44	0	0	
	20	gvl	fir	10	0	8.6	0	0	
	20	gvl	fir	8	0	6.88	0	0	
	21	gvl	fir	12	0	10.3	0	0	
	21	gvl	hir	15	0	13.2	0	0	
	20	rck	lbk	0	0	0	0	0	
	19	rck	hir	5	0	4.4	0	0	
	20	gvl	fir	2	0	1.72	0	0	

	10	gvl	agm	60	0	57	0	0	
	10	cbl	hir	8	0	7.04	0	0	
	10	cbl	agm	12	0	11.4	0	0	
	10	cbl	hir	2	0	1.76	0	0	
	11	cbl	lbk	4	0	3.8	0	0	
	11	gvl	agm	1	0	0.95	0	0	
	12	gvl	lbk	13	0	12.4	0	0	
	13	gvl	hir	1	0	0.88	0	0	
	13	cbl	agm	20	0	19	0	0	
	14	cbl	agm	15	0	14.3	0	0	
	14	cbl	agm	8	0	7.6	0	0	
	14	cbl	agm	5	0	4.75	0	0	
	15	cbl	agm	3	0	2.85	0	0	
	16	cbl	agm	2	0	1.9	0	0	
	17	cbl	agm	1	0	0.95	0	0	
	17	gvl	agm	2	0	1.9	0	0	
	18	gvl	agm	2	0	1.9	0	0	
	19	gvl	agm	4	0	3.8	0	0	
	20	gvl	agm	1	0	0.95	0	0	
	21	gvl	agm	1	0	0.95	0	0	
	22	gvl	hir	0	0	0	0	0	first cuc
	23	gvl	lbk	1	0	0.95	0	0	
	25	gvl	lbk	0	0	0	0	0	
	26	gvl	lbk	0	0	0	0	0	
	27	cbl	agm	0	0	0	0	0	
	29	cbl	agm	0	0	0	0	0	
	31	cbl	agm	0	0	0	0	0	
17-Apr-94	16	956	1009	13	42	BL	TK	5	
	-3	rck		0	0	0	0	0	
	1	rck	fir	0	0	0	0	0	
	8	cbl	fil	3	0	2.58	0	0	
	11	cbl	lbk	0	0	0	0	0	
	10	rck	hir	0	0	0	0	0	
	15	rck	agm	10	0	9.5	0	0	
	24	cbl	los	4	0	3.44	0	0	
	25	cbl	agm	30	0	28.5	0	0	
	26	cbl	agm	20	0	19	0	0	
	27	cbl		25	0	19.3	0	0	
	29	cbl	agm	0	0	0	0	0	
	30	cbl	agm	2	0	1.9	0	0	
	32	cbl	agm	2	0	1.9	0	0	
	33	cbl	agm	5	0	4.75	0	0	
	35	cbl	agm	4	0	3.8	0	0	first cuc
	36	cbl	agm	1	0	0.95	0	0	
	37	cbl	agm	0	0	0	0	0	
	38	cbl	agm	0	0	0	0	0	
	41	cbl	agm	0	0	0	0	0	
	42	cbl	agm	0	0	0	0	0	
17-Apr-94	17	1036	1048	12	36	BL	TM	5	
	-2	rck	fuc	0	0	0	0	0	
	0	cbl		0	0	0	0	0	
	0	cbl		0	0	0	0	0	
	-1	rck	fir	10	11	0	0	0	
	-2	rck	fuc	50	57	0	0	0	
	-4	rck	fuc	5	5.7	0	0	0	
	-7	rck	fuc	10	11	0	0	0	
	-5	rck	fuc	0	0	0	0	0	
	-3	rck	fuc	10	11	0	0	0	
	0	rck	fuc	10	11	0	0	0	
	2	rck	fir	110	117	0	0	0	
	7	rck	fir	2	2.1	0	0	0	
	10	rck	lbk	3	2.6	0	0	0	
	11	rck	hir	2	2.1	0	0	0	
	12	cbl	lbk	0	0	0	0	0	
	13	cbl	lbk	0	0	0	0	0	
	14	cbl	hir	0	0	0	0	0	
	15	cbl	hir	0	0	0	0	0	
	15	cbl	agm	0	0	0	0	0	
	16	cbl	agm	0	0	0	0	0	
	16	cbl	agm	0	0	0	0	0	
	17	cbl	agm	0	0	0	0	0	
	18	cbl	agm	0	0	0	0	0	
	20	cbl	agm	0	0	0	0	0	
	20	cbl	agm	0	0	0	0	0	a few red urchins
	21	cbl	agm	0	0	0	0	0	
	21	cbl	agm	0	0	0	0	0	

									22	cbl	agm	0						0	0	0	0	
									23	cbl	agm	0						0	0	0	0	
									29	cbl	agm	0						0	0	0	0	
									32	cbl	agm	0						0	0	0	0	
									36	cbl	agm	0						0	0	0	0	
17-Apr-94	18	1130	1150	20	28	BL	TM	5	-6	wdy		0						0	0	0	0	
									-6	snd	los	600						636	0	0	0	
									-2	cbl	fuc	0						0	0	0	0	
									-1	rck	fuc	20						23	0	0	0	
									0	rck	fuc	15						17	0	0	0	
									1	rck	fir	20						21	0	0	0	
									2	rck	fir	30						32	0	0	0	
									2	rck	fir	130						138	0	0	0	
									2	rck	fir	70						74	0	0	0	
									2	rck	fir	60						64	0	0	0	
									3	rck	lbk	1						0.9	0	0	0	
									3	rck	lbk	30						26	0	0	0	
									4	rck	lbk	10						8.6	0	0	0	
									6	rck	lbk	8						6.9	0	0	0	
									7	rck	lbk	5						4.3	0	0	0	
									7	rck	hir	1						1	0	0	0	
									7	rck	hir	1						1	0	0	0	
									8	rck	hir	0						0	0	0	0	
									8	rck	hir	0						0	0	0	0	
									8	rck	hir	2						2.1	0	0	0	
									9	rck	hir	7						7.2	0	0	0	
									9	rck	hir	15						15	0	0	0	
									10	rck	hir	25						26	0	0	0	
									10	rck	hir	1						1	0	0	0	
									10	rck	hir	1						1	0	0	0	
									10	rck	hir	1						1	0	0	0	
									10	rck	hir	1						1	0	0	0	
									12	rck	lbk	0						0	0	0	0	
									13	rck	lbk	0						0	0	0	0	
									14	rck	lbk	0						0	0	0	0	
									16	rck	agm	0						0	0	0	0	
									17	rck	agm	0						0	0	0	0	
									18	rck	agm	0						0	0	0	0	
									20	rck	agm	0						0	0	0	0	
									22	rck	agm	0						0	0	0	0	
									23	rck	agm	0						0	0	0	0	
									24	rck	agm	0						0	0	0	0	
									26	rck	agm	0						0	0	0	0	
									28	rck	agm	0						0	0	0	0	
16-Apr-94	19	1615	1631	16	34	PD	TM	5	2	rck	fuc							0	0	0	0	
									2	rck	fuc								0	0	0	0
									2	rck	fuc								0	0	0	0
									3	rck	fuc								0	0	0	0
									3	rck	fir								0	0	0	0
									4	rck									0	0	0	0
									4	rck	fuc								0	0	0	0
									7	rck	fir								0	0	0	0
									10	rck	fir								0	0	0	0
									12	rck	fir								0	0	0	0
									12	rck	fir								0	0	0	0
									12	rck	fir								0	0	0	0
									13	rck	fir								0	0	0	0
									16	rck	fir								0	0	0	0
									19	rck	lbk								0	0	0	0
									21	rck	lbk								0	0	0	0
									21	rck	lbk							15	0	0	0	16.05
									22	rck	agm								0	0	0	0
									23	rck	lbk								0	0	0	0
									24	rck	lbk								0	0	0	0
									25	cbl	lbk								0	0	0	0
									26	cbl	lbk								0	0	0	0
									28	cbl	lbk							15	0	0	0	16.05
									28	cbl	lbk								0	0	0	0
									28	cbl	lbk								0	0	0	0
									30	cbl	lbk								0	0	0	0
									32	cbl	lbk								0	0	0	0
									33	cbl	lbk								2	0	0	2.14
									34	cbl	lbk								0	0	0	0
16-Apr-94	20	1547	1614	27	35	RL	TK	5	0	rck	fuc								0	0	0	
									3	rck										0	0	0

4	rck	fil	0	0	0	0	0	
7	rck	fil	10	0	8.6	0	0	
9	rck	fil	4	0	3.44	0	0	
10	rck	fir	30	0	25.8	0	0	
11	rck	fil	6	0	5.16	0	0	
12	rck	fil	35	0	30.1	0	0	
14	rck	red	65	0	55.9	0	0	
17	rck	lbk	3	0	2.85	0	0	
19	rck	lbk	15	0	14.3	0	0	
20	rck	lbk	2	0	1.9	0	0	
22	rck	lbk	2	0	1.9	0	0	
22	cbl	lbk	3	0	2.85	0	0	
23	cbl	lbk	45	0	42.8	0	0	
24	cbl	lbk	30	0	28.5	0	0	
24	gvl	lbk	6	0	5.7	0	0	
25	gvl	lbk	4	0	3.8	0	0	
26	cbl	lbk	8	0	7.6	0	0	
27	cbl	lbk	3	0	2.85	0	0	
28	snd	lbk	1	0	0.95	0	0	
29	snd	lbk	0	0	0	0	0	
30	snd	lbk	0	0	0	0	0	
31	snd	lbk	0	0	0	0	0	
31	snd	lbk	0	0	0	0	0	
32	snd	lbk	0	0	0	0	0	
33	snd	lbk	0	0	0	0	0	
34	snd	lbk	0	0	0	0	0	
35	snd	lbk	0	0	0	0	0	
16-Apr-94 21 1442 1527 45 38 RL TK 5	-15	gvl	los	9	0	0	9.54	0
	-13	cbl	los	1	0	0	1.06	0
	-12	rck	fuc	0	0	0	0	0
	-10	gvl	fuc	0	0	0	0	0
	-8	gvl		0	0	0	0	0
	-6	gvl		0	0	0	0	0
	-4	cbl	fuc	0	0	0	0	0
	-2	snd		0	0	0	0	0
	-1	snd		0	0	0	0	0
	-1	snd		0	0	0	0	0
	-3	gvl	fuc	0	0	0	0	0
	-4	gvl	fuc	0	0	0	0	0
	-5	rck	fuc	0	0	0	0	0
	-2	cbl	fuc	0	0	0	0	0
	-1	rck	fuc	0	0	0	0	0
	1	cbl	fuc	8	0	0	8.16	0
	3	rck	fir	1	0	0	1.06	0
	4	rck	fir	10	0	0	10.6	0
	7	cbl	fir	1	0	0	1.06	0
	7	rck	fir	25	0	0	26.5	0
	8	rck	fir	100	0	0	106	0
	10	gvl	fil	1	0	0	1.06	0
	11	gvl	fil	1	0	0	1.06	0
	11	gvl	fil	6	0	0	6.36	0
	11	gvl	fil	2	0	0	2.12	0
	11	gvl	fil	20	0	0	21.2	0
	12	gvl	fil	1	0	0	1.06	0
	12	cbl	fir	4	0	0	4.24	0
	11	rck	fir	125	0	0	133	0
	12	rck	fir	110	0	0	117	0
	13	rck	fir	80	0	0	84.8	0
	14	rck	fir	25	0	0	26.5	0
	15	rck	fil	75	0	0	79.5	0
	18	cbl	lbk	2	0	0	2.16	0
	18	cbl	lbk	1	0	0	1.08	0
	19	cbl	lbk	35	0	0	37.8	0
	19	cbl	lbk	30	0	0	32.4	0
	20	rck	lbk	15	0	0	16.2	0
	21	gvl	hir	20	0	0	24.4	0
	23	rck	hir	15	0	0	18.3	0
	24	snd	lbk	1	0	0	1.08	0
	25	gvl	lbk	0	0	0	0	0
	26	snd	lbk	1	0	0	1.08	0
	26	snd	lbk	0	0	0	0	0
	26	snd	lbk	1	0	0	1.08	0
	27	snd	lbk	1	0	0	1.08	0
	28	snd	lbk	2	0	0	2.16	0

16-Apr-94 22 1426 1512 46 25 PD TM 5

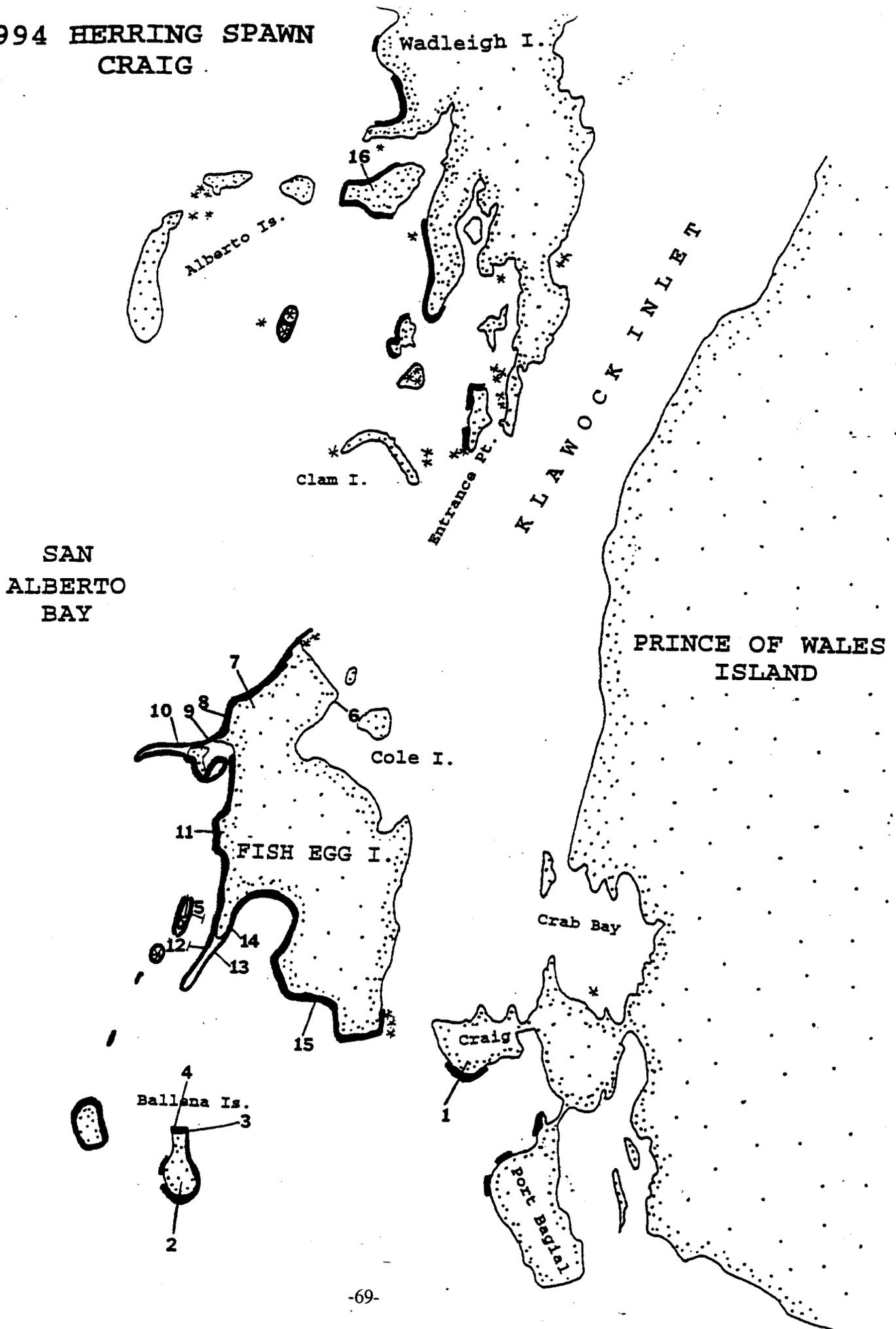
29	snd	ibk	1	0	0	1.08	0
30	snd	ibk	1	0	0	1.08	0
30	snd	ibk	2	0	0	2.16	0
31	snd	ibk	1	0	0	1.08	0
32	snd		0	0	0	0	0
33	snd		0	0	0	0	0
33	snd		0	0	0	0	0
33	snd		0	0	0	0	0
34	snd		0	0	0	0	0
35	snd		0	0	0	0	0
36	snd		0	0	0	0	0
37	snd		0	0	0	0	0
38	snd		0	0	0	0	0
3	cbl		0	0	0	0	0
3	cbl		0	0	0	0	0
3	cbl		0	0	0	0	0
3	cbl		0	0	0	0	0
3	rck	fuc	0	0	0	0	0
6	rck	fil	5	0	0	0	6.1
7	snd	elg	0	0	0	0	0
7	snd	elg	0	0	0	0	0
7	snd	elg	0	0	0	0	0
7	snd	elg	0	0	0	0	0
8	snd	fil	3	0	0	0	3.66
8	snd	elg	0	0	0	0	0
8	snd	elg	6	0	0	0	8.16
9	snd	elg	3	0	0	0	4.08
9	cbl		0	0	0	0	0
9	snd	elg	12	0	0	0	16.32
8	snd	elg	4	0	0	0	5.44
8	cbl	fil	40	0	0	0	48.8
8	cbl	fil	35	0	0	0	42.7
9	cbl	fil	10	0	0	0	12.2
8	rck	fuc	15	0	0	0	14.7
8	rck	fil	10	0	0	0	12.2
8	rck	fil	1	0	0	0	1.22
8	rck	fuc	5	0	0	0	4.9
8	rck	fil	25	0	0	0	30.5
8	rck	fuc	25	0	0	0	24.5
9	rck	fil	70	0	0	0	85.4
12	rck	fil	45	0	0	0	54.9
13	cbl	fir	5	0	0	0	6.1
14	cbl	ibk	8	0	0	0	8.56
15	cbl	ibk	20	0	0	0	21.4
15	cbl	hir	110	0	0	0	119.9
15	cbl	fil	10	0	0	0	12.2
15	cbl	fil	18	0	0	0	21.96
15	cbl	hir	10	0	0	0	10.9
16	cbl	fil	5	0	0	0	6.1
16	cbl	hir	130	0	0	0	141.7
17	cbl	hir	90	0	0	0	98.1
16	cbl	hir	30	0	0	0	32.7
18	cbl	hir	30	0	0	0	32.7
18	cbl	hir	95	0	0	0	103.6
19	cbl	hir	20	0	0	0	21.8
19	cbl	hir	20	0	0	0	21.8
18	cbl	hir	100	0	0	0	109
19	cbl	hir	45	0	0	0	49.05
20	cbl	hir	65	0	0	0	70.85
20	cbl	hir	120	0	0	0	130.8
21	cbl	ibk	5	0	0	0	5.35
22	cbl	hir	30	0	0	0	32.7
22	cbl	hir	10	0	0	0	10.9
22	cbl		0	0	0	0	0
22	cbl	fil	3	0	0	0	3.66
23	cbl	fil	1	0	0	0	1.22
23	cbl	fil	1	0	0	0	1.22
23	cbl	fil	1	0	0	0	1.22
23	cbl	fil	1	0	0	0	1.22
23	cbl	fil	0	0	0	0	0
23	cbl	fil	0	0	0	0	0
25	snd	ibk	0	0	0	0	0
25	snd	ibk	0	0	0	0	0

no geoducks observed

4-May-94	12	1543	1600	17	35	TM	SW	5	-10	rck		0		0	0	0	0
									-9	rck		0		0	0	0	0
									-6	rck	fuc	10		11.3	0	0	0
									-4	rck	fir	10		10.6	0	0	0
									-1	rck	fir	70		74.2	0	0	0
									2	rck	lbk	25		21.5	0	0	0
									14	gvl	lbk	35		30.1	0	0	0
									20	rck	lbk	5		4.3	0	0	0
									25	cbl	lbk	0		0	0	0	0
									30	cbl	lbk	0		0	0	0	0
									35	cbl	lbk	0		0	0	0	0
5-May-94	13	911	921	10	30	WB	PD	5	-2	rck	fuc		0	0	0	0	0
									6	rck			0	0	0	0	0
									6	gvl			0	0	0	0	0
									7	gvl	fir		0	0	0	0	0
									7	gvl	fir		0	0	0	0	0
									7	rck	fir		0	0	0	0	0
									8	rck	fir		5	0	0	0	5
									7	gvl			0	0	0	0	0
									9	gvl	ulv		0	0	0	0	0
									9	rck	fir		25	0	0	0	25
									10	rck	fir		40	0	0	0	40
									13	rck	ulv		0	0	0	0	0
									11	rck	fir		45	0	0	0	45
									12	rck	fir		110	0	0	0	110
									18	rck	hir		20	0	0	0	23.8
									22	rck	lbk		20	0	0	0	17.2
									30	snd			0	0	0	0	0
5-May-94	14	844	855	11	29	WB	PD	5	-1	rck	fuc	0	0	0	0	0	0
									1	rck	fuc	0	0	0	0	0	0
									3	rck	fuc	1	0	1	0	0	0
									7	rck	fil	3	0	3.7	0	0	0
									10	rck		120	0	163	0	0	0
									13	rck	fir	90	0	110	0	0	0
									15	snd	fir	20	0	24	0	0	0
									18	snd	elg	1	0	1.4	0	0	0
									19	snd	elg	0	0	0	0	0	0
									20	snd	elg	0	0	0	0	0	0
									22	snd	elg	0	0	0	0	0	0
									24	snd		0	0	0	0	0	0
									26	snd		0	0	0	0	0	0
									29	snd		0	0	0	0	0	0
5-May-94	15	849	903	14	30	TM	SW	5	-3	rck	fuc	0	0	0	0	0	0
									-2	rck	fuc	0	0	0	0	0	0
									-1	rck	fuc	0	0	0	0	0	0
									9	rck	fuc	0	0	0	0	0	0
									11	snd	elg	10	12.4	0	0	0	0
									11	snd	elg	15	18.6	0	0	0	0
									12	snd	fir	5	5.3	0	0	0	0
									12	snd	elg	2	2.48	0	0	0	0
									12	snd	elg	0	0	0	0	0	0
									13	snd	elg	0	0	0	0	0	0
									13	snd	elg	0	0	0	0	0	0
									15	snd	elg	0	0	0	0	0	0
									15	snd	elg	0	0	0	0	0	0
									16	snd	elg	0	0	0	0	0	0
									16	snd	elg	0	0	0	0	0	0
									16	snd	elg	0	0	0	0	0	0
									17	snd	elg	0	0	0	0	0	0
									17	snd	elg	0	0	0	0	0	0
									17	snd	elg	0	0	0	0	0	0
									17	snd	elg	0	0	0	0	0	0
									15	rck	lbk	0	0	0	0	0	0
									14	rck	lbk	0	0	0	0	0	0
									20	rck	lbk	0	0	0	0	0	0
									23	rck	lbk	0	0	0	0	0	0
									25	snd	lbk	0	0	0	0	0	0
									30	snd	lbk	0	0	0	0	0	0

good #s of cucs

1994 HERRING SPAWN
CRAIG



CRAIG AREA HERRING SPAWN SURVEY 1994

DIVERS: Tim Minicucci(TM), Robert Larson(RL), Tim Koeneman(TK), Brian Lynch(BL), Phil Doherty(PD)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION TYPE	TM EYE	TK EYE	RL EYE	PD EYE	TM CORRECTION	TK CORRECTION	RL CORRECTION	PD CORRECTION	COMMENTS	
18-Apr-94	1	1420	1430	10	30	TM	PD	5	-2	cbl	fuc	0				0	0	0	0		
									1	cbl	fuc	4				4.52	0	0	0	0	
									1	cbl	fuc	3				3.38	0	0	0	0	
									3	cbl	lv	0				0	0	0	0	0	
									4	cbl	lwk	0				0	0	0	0	0	
									4	cbl	lwk	0				0	0	0	0	0	
									7	cbl	mac	75				79.5	0	0	0	0	
									15	cbl	lwk	1				0.86	0	0	0	0	
									20	cbl	lwk	0				0	0	0	0	0	
									22	cbl	lwk	0				0	0	0	0	0	
									24	cbl	lwk	0				0	0	0	0	0	
									27	cbl	lwk	0				0	0	0	0	0	
									30	cbl	lwk	0				0	0	0	0	0	
18-Apr-94	2	1449	1515	26	40	TK	BL	5	0	rk	fuc	0	0			0	0	0	0		
									1	rk	fuc	35				0	27.3	0	0	0	
									2	cbl	fir	60				0	51.6	0	0	0	
									4	cbl	fir	25				0	21.5	0	0	0	
									7	cbl	cor	2				0	1.72	0	0	0	
									7	cbl	red	45				0	38.7	0	0	0	
									10	cbl	red	110				0	94.6	0	0	0	
									13	cbl	red	70				0	60.2	0	0	0	
									16	cbl	lwk	15				0	14.3	0	0	0	
									18	cbl	red	10				0	8.6	0	0	0	
									21	gvl	lwk	15				0	14.3	0	0	0	
									23	gvl	lwk	4				0	3.8	0	0	0	
									24	gvl	lwk	0				0	0	0	0	0	
									25	gvl	lwk	25				0	23.8	0	0	0	
									26	gvl	lwk	5				0	4.75	0	0	0	
									28	snd		0				0	0	0	0	0	
									30	snd	lwk	0				0	0	0	0	0	
									31	snd	lwk	1				0	0.95	0	0	0	
									34	snd	lwk	1				0	0.95	0	0	0	
									35	snd	lwk	1				0	0.95	0	0	0	
36	snd	los	1				0	0.86	0	0	0										
36	snd		0				0	0	0	0	0										
37	snd	lwk	1				0	0.95	0	0	0										
38	snd	lwk	15				0	14.3	0	0	0										
38	snd	lwk	40				0	38	0	0	0										
39	snd	lwk	1				0	0.95	0	0	0										
39	snd	lwk	15				0	14.3	0	0	0										
39	snd	lwk	50				0	47.5	0	0	0										
40	snd	lwk	20				0	19	0	0	0										
40	snd	lwk	2				0	1.9	0	0	0										
39	snd	lwk	1				0	0.95	0	0	0										
40	snd	lwk	9				0	8.55	0	0	0										
40	snd	lwk	2				0	1.9	0	0	0										
18-Apr-94	3	1625	1650	25	41	TK	BL	5	0	cbl		0	0			0	0	0	0		
									2	cbl	fuc	80				0	62.4	0	0	0	
									4	cbl	fir	200				0	172	0	0	0	
									5	cbl	fir	200				0	172	0	0	0	
									8	cbl	cor	140				0	120	0	0	0	

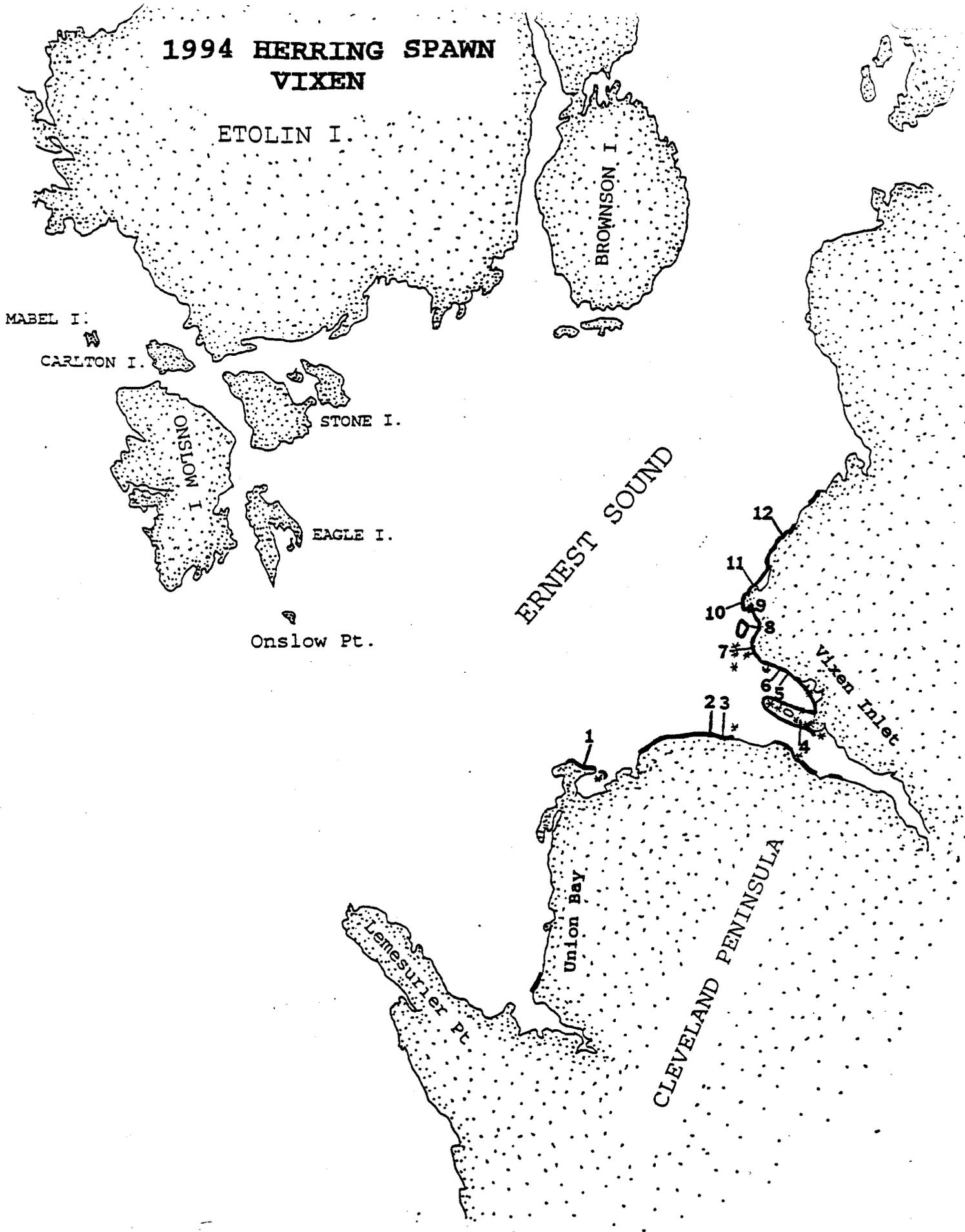
										9	cbl	lbk	2		0	1.9	0	0
										10	cbl	red	120		0	103	0	0
										13	cbl	red	40		0	34.4	0	0
										16	cbl	lbk	15		0	14.3	0	0
										19	cbl	mac	5		0	4.3	0	0
										22	cbl	mac	35		0	30.1	0	0
										26	cbl	lbk	30		0	28.5	0	0
										29	gvl	lbk	60		0	57	0	0
										31	gvl	lbk	80		0	76	0	0
										33	gvl	lbk	0		0	0	0	0
										41	snd	lbk	0		0	0	0	0
18-Apr-94	4	1543	1604	21	30	TK	BL	5	0	cbl			0		0	0	0	0
									1	cbl			0		0	0	0	0
									2	cbl	fil		1		0	0.86	0	0
									4	snd	elg		140		0	108	0	0
									5	cbl	fil		5		0	4.3	0	0
									5	snd	elg		90		0	69.3	0	0
									7	cbl	red		20		0	17.2	0	0
									8	cbl	lbk		0		0	0	0	0
									10	cbl	lbk		6		0	5.7	0	0
									13	cbl	lbk		2		0	1.9	0	0
									19	cbl	lbk		0		0	0	0	0
									23	cbl	los		1		0	0.86	0	0
									25	gvl	lbk		0		0	0	0	0
									27	gvl	lbk		0		0	0	0	0
									29	gvl	lbk		0		0	0	0	0
									30	gvl	lbk		0		0	0	0	0
19-Apr-94	5	1145	1156	11	25	RL	PD	5	-6	rck				0	0	0	0	0
									-2	rck	fuc			0	0	0	0	0
									1	rck	elg			160	0	0	0	217.6
									4	rck	cor			90	0	0	0	109.8
									7	cbl	mac			110	0	0	0	134.2
									19	rck	lbk			35	0	0	0	37.45
									24	snd	lbk			0	0	0	0	0
									24	snd				0	0	0	0	0
									25	snd	lbk			0	0	0	0	0
									25	snd	lbk			0	0	0	0	0
									24	snd	lbk			0	0	0	0	0
									21	snd				0	0	0	0	0
									21	snd				0	0	0	0	0
									18	snd	elg			0	0	0	0	0
									17	snd	elg			0	0	0	0	0
									14	snd	elg			0	0	0	0	0
									12	snd	elg			1	0	0	0	1.36
									11	snd				0	0	0	0	0
									8	snd	lbk			5	0	0	0	5.35
									7	snd	lbk			3	0	0	0	3.21
									7	cbl	lbk			0	0	0	0	0
19-Apr-94	6	1022	1026	4	24	RL	PD	5	-4	cbl				0	0	0	0	0
									-1	cbl	fuc			0	0	0	0	0
									1	cbl	fuc			0	0	0	0	0
									3	snd	fir			8	0	0	0	9.76
									5	snd	elg			90	0	0	0	122.4
									6	snd	elg			50	0	0	0	68
									11	snd	elg			0	0	0	0	0
									16	snd	elg			0	0	0	0	0
									19	snd	fil			0	0	0	0	0
									21	snd				0	0	0	0	0
									24	snd				0	0	0	0	0
19-Apr-94	7	1202	1216	14	26	BL	TK	5	-2	cbl				0	0	0	0	0
									1	snd	los			30	0	25.8	0	0
									1	snd	los			20	0	17.2	0	0
									2	snd	elg			85	0	65.5	0	0
									3	snd	elg			75	0	57.8	0	0

7	lbk	red	100	0	86	0	0
7	lbk	red	60	0	51.6	0	0
8	gvl	eig	85	0	65.5	0	0
8	gvl	eig	30	0	23.1	0	0
9	gvl	eig	60	0	46.2	0	0
10	gvl	los	35	0	30.1	0	0
10	gvl	eig	25	0	19.3	0	0
10	gvl	lbk	0	0	0	0	0
11	gvl		0	0	0	0	0
11	snd	lbk	1	0	0.95	0	0
11	snd		0	0	0	0	0
12	snd		0	0	0	0	0
12	snd	eig	2	0	1.54	0	0
12	snd	lbk	1	0	0.95	0	0
12	snd	los	1	0	0.86	0	0
12	snd		0	0	0	0	0
12	snd	lbk	4	0	3.8	0	0
13	snd	red	0	0	0	0	0
13	snd	lbk	2	0	1.9	0	0
14	snd	mac	20	0	17.2	0	0
14	snd	lbk	1	0	0.95	0	0
14	snd		10	0	7.7	0	0
15	snd	lbk	0	0	0	0	0
15	snd	lbk	1	0	0.95	0	0
15	snd	lbk	0	0	0	0	0
16	snd	lbk	10	0	9.5	0	0
16	snd	lbk	1	0	0.95	0	0
16	gvl		5	0	3.85	0	0
17	gvl	lbk	0	0	0	0	0
17	gvl	lbk	1	0	0.95	0	0
17	gvl	lbk	1	0	0.95	0	0
17	gvl	lbk	2	0	1.9	0	0
18	gvl		2	0	1.54	0	0
18	gvl	lbk	0	0	0	0	0
18	gvl	mac	1	0	0.86	0	0
18	gvl	lbk	120	0	114	0	0
19	snd	lbk	0	0	0	0	0
19	snd	lbk	2	0	1.9	0	0
19	snd	lbk	2	0	1.9	0	0
20	snd	lbk	0	0	0	0	0
20	snd	lbk	1	0	0.95	0	0
21	snd	lbk	2	0	1.9	0	0
21	snd	lbk	2	0	1.9	0	0
21	snd	lbk	1	0	0.95	0	0
22	snd	lbk	0	0	0	0	0
22	snd	lbk	0	0	0	0	0
22	snd	lbk	1	0	0.95	0	0
23	snd	lbk	1	0	0.95	0	0
2	bld		0	0	0	0	0
3	bld	fuc	1.0	0	0.78	0	0
3	bld	fuc	3.0	0	2.34	0	0
4	bld	fir	50	0	43	0	0
4	bld	fir	100	0	86	0	0
5	cbl	eig	170	0	131	0	0
5	cbl	eig	150	0	116	0	0
4	bld	fir	10	0	8.6	0	0
5	bld	urv	5	0	4.3	0	0
5	bld	eig	60	0	46.2	0	0
4	bld	eig	130	0	100	0	0
4	bld	eig	70	0	53.9	0	0
4	bld	fil	0	0	0	0	0
3	rck	fil	0	0	0	0	0
4	rck	fil	0	0	0	0	0
8	rck	hir	0	0	0	0	0

19-Apr-94 10 908 933 25 28 BL TK 5

	4	cbl	elg	10					12.4	0	0	0				
	4	cbl	elg	35					43.4	0	0	0				
	7	cbl	red	1					1.06	0	0	0				
	9	cbl	cor	15					15.9	0	0	0				
	9	cbl	mac	20					21.2	0	0	0				
	10	cbl	los	2					2.12	0	0	0				
	11	cbl	cor	1					1.06	0	0	0				
	13	cbl	elg	0					0	0	0	0				
	15	cbl	lbk	0					0	0	0	0				
	17	cbl	lbk	2					1.72	0	0	0				
	19	cbl		0					0	0	0	0				
	21	cbl		0					0	0	0	0				
	23	cbl		0					0	0	0	0				
	25	cbl		0					0	0	0	0				
18-Apr-94	14	1534	1544	10	20	TM	PD	5	-3	cbl		0	0	0	0	0
									-2	cbl		0	0	0	0	0
									-1	cbl		0	0	0	0	0
									0	cbl		0	0	0	0	0
									1	cbl		0	0	0	0	0
									1	cbl	utv	0	0	0	0	0
									2	cbl	utv	0	0	0	0	0
									3	cbl	utv	10	0	0	0	12.2
									4	cbl	utv	40	0	0	0	48.8
									4	mud	elg	90	0	0	0	122.4
									4	mud	elg	130	0	0	0	176.8
									4	mud	fir	10	0	0	0	12.2
									8	mud	elg	30	0	0	0	40.8
									12	mud	fir	5	0	0	0	6.1
									15	mud	elg	0	0	0	0	0
									15	mud	elg	0	0	0	0	0
									16	mud	elg	0	0	0	0	0
									20	mud		0	0	0	0	0
18-Apr-94	15	1445	1510	25	22	TM	PD	5	-3	cbl		0	0	0	0	0
									0	cbl		0	0	0	0	0
									1	cbl	elg	60	74.4	0	0	0
									1	cbl	elg	25	31	0	0	0
									2	cbl	elg	45	55.8	0	0	0
									2	cbl	fir	60	63.6	0	0	0
									3	cbl	fir	45	47.7	0	0	0
									5	cbl	elg	35	43.4	0	0	0
									7	cbl	elg	30	37.2	0	0	0
									9	cbl	elg	12	14.88	0	0	0
									10	cbl	elg	7	8.68	0	0	0
									11	cbl	elg	5	6.2	0	0	0
									13	snd	elg	0	0	0	0	0
									14	snd	elg	0	0	0	0	0
									15	snd	elg	0	0	0	0	0
									16	snd	elg	0	0	0	0	0
									17	snd	elg	0	0	0	0	0
									18	snd	elg	0	0	0	0	0
									22	snd		0	0	0	0	0
19-Apr-94	16	919	931	12	37	RL	PD	5	0	cbl	fil	20	0	0	0	24.4
									1	cbl	fil	90	0	0	0	109.8
									3	cbl	fil	60	0	0	0	73.2
									6	cbl	elg	75	0	0	0	102
									10	cbl	lbk	30	0	0	0	32.1
									15	snd		0	0	0	0	0
									20	snd	lbk	5	0	0	0	5.35
									26	snd	lbk	10	0	0	0	10.7
									32	mud		0	0	0	0	0
									37	mud		0	0	0	0	0

1994 HERRING SPAWN VIXEN



VIXEN INLET/UNION BAY (ERNEST SOUND) HERRING SPAWN DEPOSITION

DIVERS: Tim Minicucci(TM), Robert Larson(RL), Will Bergmann(WB), Brian Lynch (BL), Randy Timothy (RT)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	RL EYE	WB EYE	TM CORRECTION	RL CORRECTION	WB CORRECTION	COMMENTS									
6-May-94	1	902	926	24	30	TM	BL	5	-3	rck	fuc	0			0	0	0										
									-2	rck	fuc	0			0	0	0										
									0	rck	fuc	0			0	0	0										
									2	rck	fr	0			0	0	0										
									2	rck	fuc	0			0	0	0										
									3	rck	fr	0			0	0	0										
									8	rck	fuc	2			2.26	0	0	0									
									10	rck	fr	2			2.12	0	0	0									
									12	rck	fr	8			84.8	0	0	0									
									14	rck	lck	25			21.5	0	0	0									
									16	snd	lck	0			0	0	0	0									
									18	snd	elg	0			0	0	0	0									
									20	snd	elg	0			0	0	0	0									
									22	snd	elg	0			0	0	0	0									
									26	snd		0			0	0	0	0	cucs 2-3 /meter								
									28	snd		0			0	0	0	0									
									30	snd		0			0	0	0	0									
									6-May-94	2	926	943	17	36	TM	BL	5	-3	rck	fuc	0			0	0	0	
																		-2	rck	fuc	0			0	0	0	
																		0	rck	fuc	0			0	0	0	
																		4	rck	fuc	0			0	0	0	
																		4	rck	ulv	0			0	0	0	
																		5	rck	ulv	0			0	0	0	
																		7	rck	ulv	0			0	0	0	
																		8	rck	fr	0			0	0	0	
																		10	rck	fuc	0			0	0	0	
																		13	rck	fr	0			0	0	0	
																		14	rck	fr	0			0	0	0	
																		15	rck	lck	0			0	0	0	
																		17	rck	lck	0			0	0	0	
19	rck	lck	0			0	0	0																			
19	rck	lck	0			0	0	0																			
20	rck	hir	20			20.6	0	0										0									
20	rck	hir	25			25.8	0	0										0									
21	rck	hir	15			15.5	0	0										0									
21	rck	hir	30			30.9	0	0										0									
21	rck	hir	12			12.4	0	0										0									
21	rck	hir	10			10.3	0	0	0																		
21	rck	hir	3			3.09	0	0	0																		
22	rck	lck	0			0	0	0	0																		
24	snd	lck	0			0	0	0	0																		
25	rck	lck	0			0	0	0	0																		
26	obl	lck	0			0	0	0	0	few cucs																	
27	obl	lck	0			0	0	0	0																		
31	obl	lck	0			0	0	0	0																		
36	snd	lck	0			0	0	0	0																		
6-May-94	3	954	1004	10	37	TM	BL	5	-2	rck	fuc	0			0	0	0										
									-1	rck	fuc	0			0	0	0										
									3	rck	fuc	0			0	0	0										
									4	rck	fuc	0			0	0	0										
									5	rck	fuc	0			0	0	0										
									6	rck	fuc	0			0	0	0										
									7	rck	fuc	0			0	0	0										
									8	rck	fuc	0			0	0	0										
									9	rck	fuc	0			0	0	0										
									10	rck	fuc	0			0	0	0										
									11	rck	fuc	0			0	0	0										
									12	rck	fuc	0			0	0	0										
12	rck	fr	0			0	0	0																			

										14	rck	fir	0		0	0	0	
										15	rck	lwk	0		0	0	0	
										16	rck	lwk	0		0	0	0	
										19	rck	lwk	0		0	0	0	
										21	rck	lwk	0		0	0	0	
										24	rck	lwk	0		0	0	0	
										27	rck	lwk	0		0	0	0	
										30	rck	lwk	0		0	0	0	
										33	rck	lwk	0		0	0	0	few cucs
										37	snd	lwk	0		0	0	0	
6-May-94	4	1048	1102	14	36	TM	BL	5		-1	rck	fuc	0		0	0	0	
										9	rck	fir	45		47.7	0	0	
										14	rck	fir	60		63.6	0	0	
										17	cbl		0		0	0	0	
										20	cbl	elg	30		37.2	0	0	
										21	cbl	lwk	15		12.9	0	0	
										22	cbl	elg	25		31	0	0	
										23	cbl	elg	2		2.48	0	0	
										24	cbl	elg	5		6.2	0	0	
										25	snd	lwk	3		2.58	0	0	
										25	snd		0		0	0	0	
										28	snd	lwk	1		0.86	0	0	
										30	snd	lwk	1		0.86	0	0	
										32	snd		0		0	0	0	
										35	snd	lwk	0		0	0	0	
										36	snd	lwk	0		0	0	0	a few big cucs
6-May-94	5	1114	1124	10	30	TM	BL	5		-1	rck	fuc	0		0	0	0	
										3	rck	fuc	7		7.91	0	0	
										7	rck	fuc	0		0	0	0	
										9	rck	fuc	1		1.13	0	0	
										12	rck	fir	5		5.3	0	0	
										13	rck	fuc	10		11.3	0	0	
										14	rck	fir	3		3.18	0	0	
										14	snd	elg	13		16.1	0	0	
										17	snd	fir	3		3.18	0	0	
										18	snd	elg	1		1.24	0	0	
										19	snd	elg	0		0	0	0	
										21	snd	elg	0		0	0	0	
										23	snd	elg	0		0	0	0	
										25	snd		0		0	0	0	
										28	snd		0		0	0	0	
										30	snd		0		0	0	0	
6-May-94	6	1314	1329	15	41	TM	BL	5		-3	rck	fir	0		0	0	0	
										-2	rck	fir	0		0	0	0	
										0	rck	fir	0		0	0	0	
										2	rck	fir	1		1.06	0	0	
										7	rck	fir	1		1.06	0	0	
										7	rck	fir	0		0	0	0	
										8	rck	fuc	3		3.39	0	0	
										12	rck	fir	10		10.6	0	0	
										13	rck	fuc	0		0	0	0	
										16	rck	red	25		26.5	0	0	
										18	rck	hir	35		36.1	0	0	
										20	rck	lwk	20		17.2	0	0	
										20	rck	cor	20		21.2	0	0	
										22	rck	hir	120		124	0	0	
										22	rck	hir	1		1.03	0	0	
										24	rck	hir	90		92.7	0	0	
										25	rck	lwk	5		4.3	0	0	
										28	rck	lwk	10		8.6	0	0	
										29	rck	lwk	2		1.72	0	0	
										31	rck	lwk	0		0	0	0	
										33	rck	lwk	0		0	0	0	
										38	rck	lwk	0		0	0	0	
										41	mud		0		0	0	0	
6-May-94	7	1314	1329	15	41	TM	BL	5		-3	gvl	fuc	1		0	1.02	0	
										-3	rck	fuc	0		0	0	0	
										2	rck	fuc	8		0	8.16	0	
										5	rck	ulv	2		0	2.12	0	
										6	cbl	fuc	4		0	4.08	0	

								9	snd	ulv	0	0	0	0	
								9	snd	ulv	0	0	0	0	
								10	snd	ulv	0	0	0	0	
								10	snd	elg	0	0	0	0	
								10	snd	elg	0	0	0	0	
								10	snd	elg	1	0	1.03	0	
								10	snd	elg	1	0	1.03	0	
								10	snd	elg	0	0	0	0	
6-May-94	10	1134	1148	14	30	RL	RT	5	0	rck	fuc	0	0	0	0
									3	rck	fuc	0	0	0	0
									4	rck	red	0	0	0	0
									6	rck	fuc	35	0	35.7	0
									9	rck	fir	50	0	53	0
									12	rck	fir	100	0	106	0
									15	rck	hir	240	0	293	0
									16	cbl	fir	4	0	4.24	0
									18	gvl	hir	50	0	61	0
									20	snd	elg	10	0	10.3	0
									22	snd	elg	0	0	0	0
									24	snd	elg	0	0	0	0
									27	snd	elg	0	0	0	0
									30	snd	elg	0	0	0	0
6-May-94	11	1336	1343	7	29	RL	WB	5	0	rck	fuc	40	0	0	49.2
									2	rck	fuc	25	0	0	30.8
									7	rck	fir	160	0	0	160
									9	rck	fir	110	0	0	110
									11	rck	fir	140	0	0	140
									14	rck	lbk	20	0	0	17.2
									16	rck	agm	0	0	0	0
									21	rck	agm	0	0	0	0
									25	rck	agm	0	0	0	0
									29	rck	agm	0	0	0	0
6-May-94	12	1407	1422	15	27	RL	WB	5	1	cbl	fuc	3	0	3.06	0
									3	cbl		0	0	0	0
									5	cbl	fil	1	0	1.06	0
									5	cbl	fil	0	0	0	0
									8	cbl	fil	10	0	10.6	0
									9	snd	elg	30	0	30.9	0
									9	snd	elg	20	0	20.6	0
									9	snd	elg	20	0	20.6	0
									9	snd	elg	0	0	0	0
									10	snd	elg	60	0	61.8	0
									10	snd	elg	35	0	36.1	0
									10	snd	elg	35	0	36.1	0
									10	snd	elg	35	0	36.1	0
									11	snd	elg	30	0	30.9	0
									12	snd	elg	8	0	8.24	0
									14	snd	elg	5	0	5.15	0
									15	snd	elg	3	0	3.09	0
									16	snd	elg	3	0	3.09	0
									17	snd	elg	1	0	1.03	0
									18	snd	elg	0	0	0	0
									18	snd	elg	0	0	0	0
									18	snd	elg	0	0	0	0
									19	snd		0	0	0	0
									19	snd		0	0	0	0
									20	snd		0	0	0	0
									22	snd		0	0	0	0
									25	snd		0	0	0	0
									27	snd		0	0	0	0

first cuc
2 red urchins/ meter

fair numbers of cukes
occasional red urchins

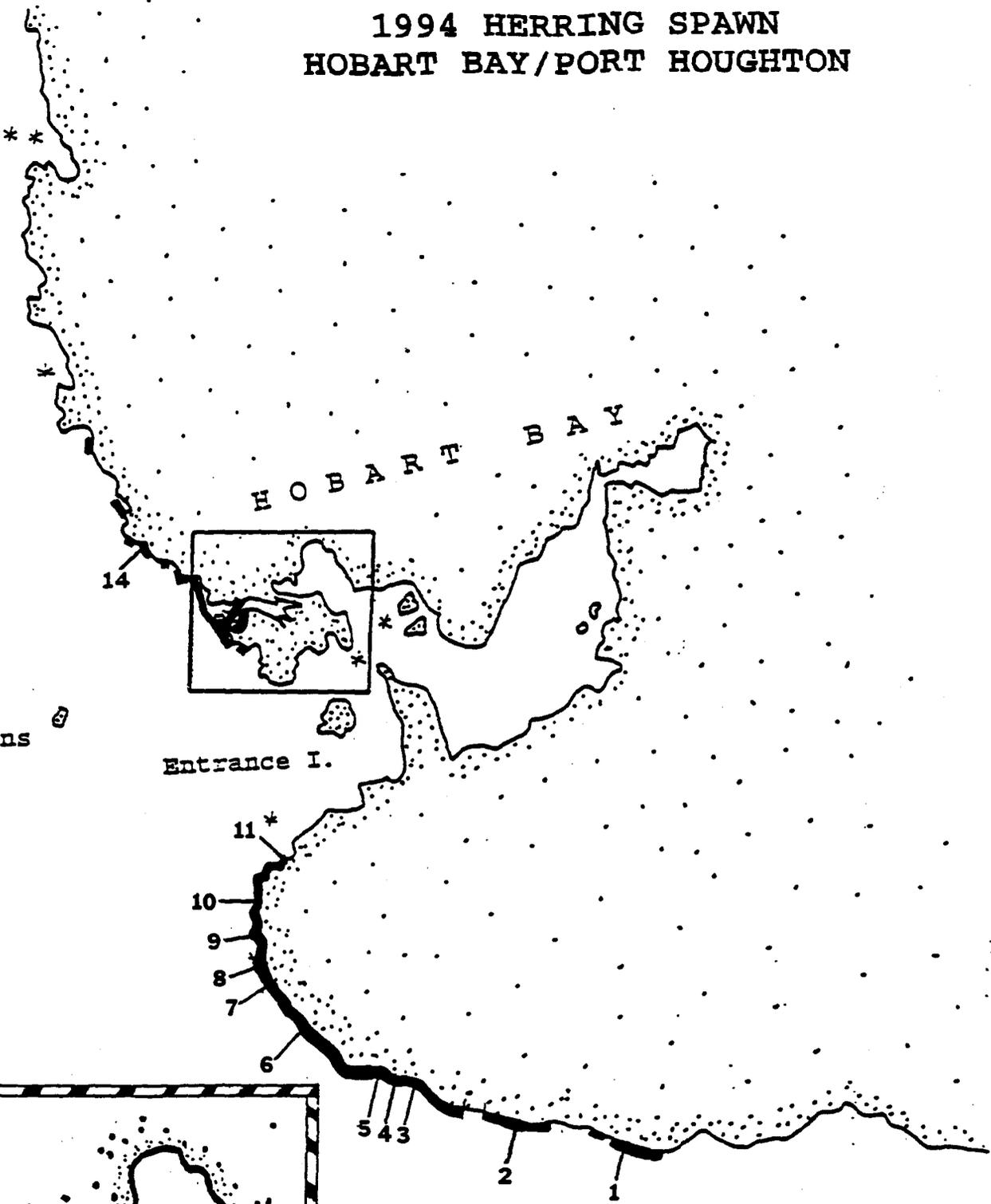
1994 HERRING SPAWN
HOBART BAY/PORT HOUGHTON

*
Sunset I.

The Twins

Entrance I.

PORT HOUGHTON



HOBART BAY/PORT HOUGHTON AREA HERRING SPAWN DEPOSITION SURVEY 1994

DIVERS: Tim Minicucci(TM), Robert Larson(RL), Will Bergmann(WB), Brian Lynch (BL). Randy Timothy (RT)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	BL EYE	RL EYE	WB EYE	TM CORRECTION	BL CORRECTION	RL CORRECTION	WB CORRECTION	COMMENTS			
7-May-94	1	1716	1723	7	30	BL	TM	5	-5	rk	luc	0				0	0	0	0				
									-4	rk	luc	0				67.8	0	0	0	0			
									-3	rk	luc	10				11.3	0	0	0	0	0		
									-1	rk	luc	10				11.3	0	0	0	0	0		
									1	rk	luc	0				0	0	0	0	0	0		
									2	rk	flr	10				10.6	0	0	0	0	0	0	
									3	snd	elg	3				3.72	0	0	0	0	0	0	
									4	snd	elg	10				12.4	0	0	0	0	0	0	
									5	snd	elg	3				3.72	0	0	0	0	0	0	
									6	snd	elg	3				3.72	0	0	0	0	0	0	
									8	snd	elg	1				1.24	0	0	0	0	0	0	
									10	snd	elg	1				1.24	0	0	0	0	0	0	
									12	snd	elg	0				0	0	0	0	0	0	0	
									14	snd	elg	0				0	0	0	0	0	0	0	
									7-May-94	2	1736	1746	10	32	BL	TM	5	15	snd	lbc	0		
19	snd	lbc	0				0	0										0	0	0	0		
25	snd	lbc	0				0	0										0	0	0	0	0	
30	snd	lbc	0				0	0										0	0	0	0	0	
-3	cbl		0				0	0										0	0	0	0	0	
-2	cbl		0				0	0										0	0	0	0	0	
-1	cbl		0				0	0										0	0	0	0	0	
0	cbl		0				0	0										0	0	0	0	0	
1	cbl		0				0	0										0	0	0	0	0	
1	cbl		0				0	0										0	0	0	0	0	
7-May-94	3	1801	1817	6	32	BL	TM	5	1	snd		0				0	0	0	0				
									2	snd		0				0	0	0	0	0	0		
									3	snd		0				0	0	0	0	0	0	0	
									4	snd	elg	0				0	0	0	0	0	0	0	
									4	snd		1				1.24	0	0	0	0	0	0	
									4	snd		0				0	0	0	0	0	0	0	
									4	snd		0				0	0	0	0	0	0	0	
									4	snd		0				0	0	0	0	0	0	0	
									4	snd		0				0	0	0	0	0	0	0	
									5	snd		0				0	0	0	0	0	0	0	
									6	snd		0				0	0	0	0	0	0	0	
									7	snd		0				0	0	0	0	0	0	0	
									8	snd		0				0	0	0	0	0	0	0	
8	snd		0				0	0	0	0	0	0	0										
8	snd		0				0	0	0	0	0	0	0										
8	snd	elg	2				2.48	0	0	0	0	0	0	0									
9	snd	elg	1				1.24	0	0	0	0	0	0	0									
10	snd		0				0	0	0	0	0	0	0	0									
11	snd		0				0	0	0	0	0	0	0	0									
12	snd		0				0	0	0	0	0	0	0	0									
13	snd		0				0	0	0	0	0	0	0	0									

										14	snd		0			0	0	0	0	0
										17	snd		0			0	0	0	0	0
										19	snd		0			0	0	0	0	0
										21	snd		0			0	0	0	0	0
										23	snd		0			0	0	0	0	0
										25	snd		0			0	0	0	0	0
										27	snd		0			0	0	0	0	0
										29	snd		0			0	0	0	0	0
										32	snd		0			0	0	0	0	0
8-May-94	4	700	711	11	23	RT	TM	5		-5	rck		0			0	0	0	0	0
										-5	rck	fuc	5			5.65	0	0	0	0
										-5	rck	fuc	3			3.39	0	0	0	0
										-5	rck	fuc	10			11.3	0	0	0	0
										-4	rck	fuc	3			3.39	0	0	0	0
										-3	rck	fuc	10			11.3	0	0	0	0
										-2	rck	fuc	3			3.39	0	0	0	0
										-1	rck	fuc	1			1.13	0	0	0	0
										0	rck	lbk	3			2.58	0	0	0	0
										1	rck	lbk	5			4.3	0	0	0	0
										2	rck	lbk	0			0	0	0	0	0
										2	snd	lbk	0			0	0	0	0	0
										2	snd	eig	0			0	0	0	0	0
										2	snd	eig	1			1.24	0	0	0	0
										2	snd	eig	0			0	0	0	0	0
										3	snd	eig	0			0	0	0	0	0
										5	snd	eig	0			0	0	0	0	0
										7	snd	eig	0			0	0	0	0	0
										9	snd	eig	0			0	0	0	0	0
										11	snd	eig	0			0	0	0	0	0
										13	snd	eig	0			0	0	0	0	0
										15	snd	eig	0			0	0	0	0	0
										17	snd	eig	0			0	0	0	0	0
										19	snd	eig	0			0	0	0	0	0
										21	snd	eig	0			0	0	0	0	0
										23	snd	eig	0			0	0	0	0	0
8-May-94	5	715	720	15	23	RL	WB	5		-12	snd	los		1		0	0	1.06	0	0
										-11	snd	los		15		0	0	15.9	0	0
										-10	gvl	los		1		0	0	1.06	0	0
										-9	gvl	los		2		0	0	2.12	0	0
										-9	gvl			0		0	0	0	0	0
										-8	cbl			1		0	0	1.03	0	0
										-7	bid			0		0	0	0	0	0
										-6	bid			0		0	0	0	0	0
										-6	bid	fuc		1		0	0	1.02	0	0
										-5	bid	fuc		0		0	0	0	0	0
										-5	bid	fuc		5		0	0	5.1	0	0
										-4	bid	fuc		8		0	0	8.16	0	0
										-4	bid	fuc		10		0	0	10.2	0	0
										-3	bid	fuc		1		0	0	1.02	0	0
										-3	bid	fuc		7		0	0	7.14	0	0
										-2	bid	fuc		20		0	0	20.4	0	0
										0	bid			0		0	0	0	0	0
										2	cbl			0		0	0	0	0	0
										5	cbl			0		0	0	0	0	0
										6	snd	los		1		0	0	1.06	0	0
										7	snd	los		1		0	0	1.06	0	0
										16	snd			0		0	0	0	0	0
										23	snd			0		0	0	0	0	0
7-May-94	6	1810	1828	18	9	RT	WB	5		-12	rck	fuc			60	0	0	0	0	73.8
										-10	rck				0	0	0	0	0	0
										-8	bid				0	0	0	0	0	0
										-7	bid	fuc			40	0	0	0	0	49.2
										-5	bid	fuc			100	0	0	0	0	123
										-3	bid				90	0	0	0	0	69.3
										0	bid				0	0	0	0	0	0
										0	bid				0	0	0	0	0	0
										1	cbl				0	0	0	0	0	0
										2	cbl	ala			50	0	0	0	0	50
										2	rck	ala			60	0	0	0	0	60
										3	cbl	ala			20	0	0	0	0	20
										3	cbl	ala			35	0	0	0	0	35
										6	rck	ala			20	0	0	0	0	20
										7	rck	ala			4	0	0	0	0	4
										8	cbl	lbk			8	0	0	0	0	6.88
										8	cbl	lbk			0	0	0	0	0	0
										9	snd				0	0	0	0	0	0

very sparse eel grass

sparse pink necks

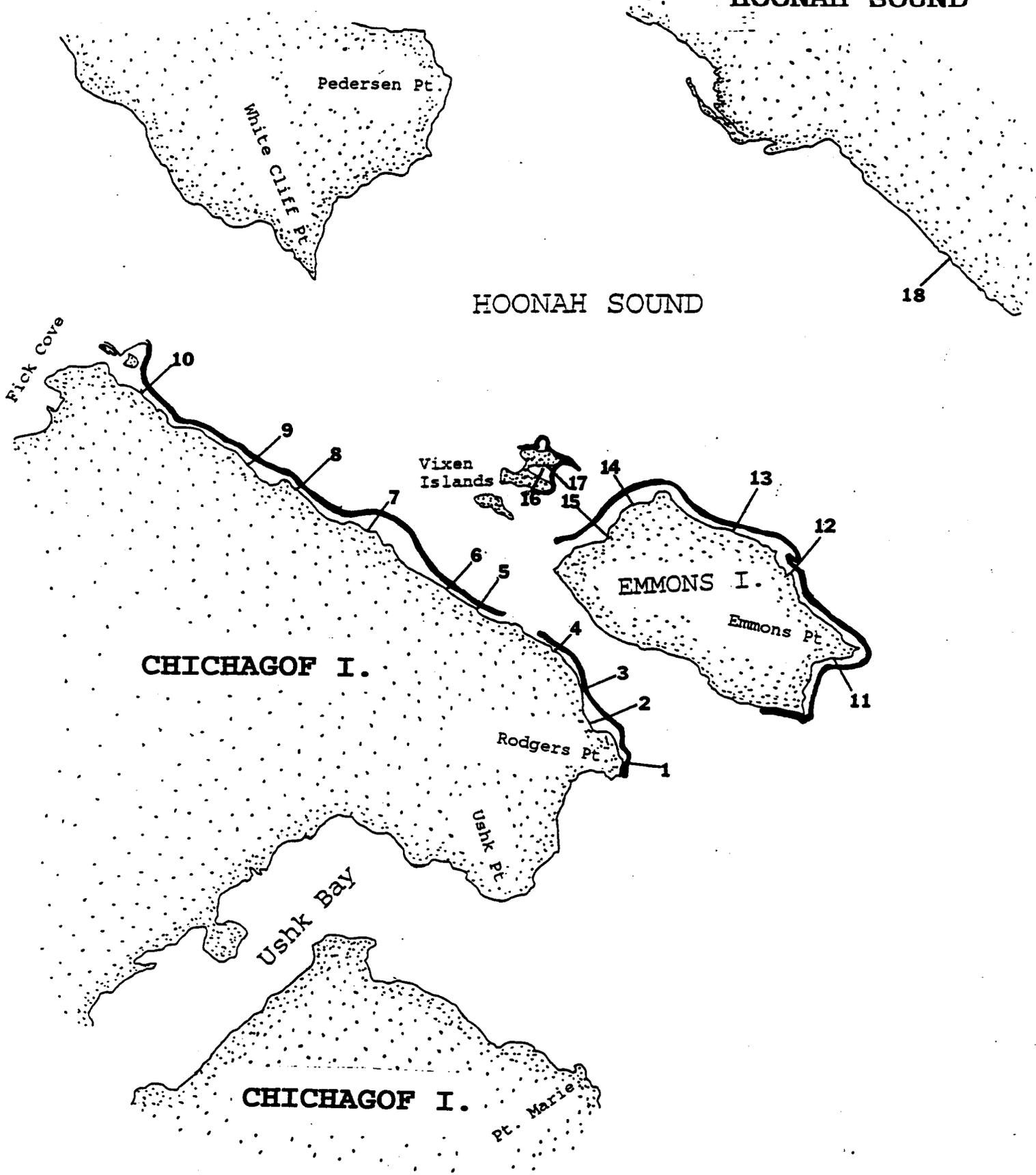
									9	snd		0	0	0	0	0	
									9	snd		0	0	0	0	0	no additional substrate
7-May-94	7	1727	1743	16	25	RT	WB	5	-12	rk	fuc	60	0	0	0	0	73.8
									-11	rk		12	0	0	0	0	9.24
									-11	rk	fuc	60	0	0	0	0	73.8
									-9	gvl	fuc	45	0	0	0	0	55.4
									-8	bld		3	0	0	0	0	2.31
									-7	cbl	fuc	70	0	0	0	0	86.1
									-6	bld	fuc	100	0	0	0	0	123
									-4	cbl	los	70	0	0	0	0	70
									-3	rk	los	160	0	0	0	0	160
									-2	bld		25	0	0	0	0	19.3
									0	rk	red	3	0	0	0	0	3
									0	rk	red	0	0	0	0	0	0
									0	cbl		0	0	0	0	0	0
									0	cbl		0	0	0	0	0	0
									0	cbl		0	0	0	0	0	0
									1	cbl	ulv	0	0	0	0	0	0
									2	rk	ulv	0	0	0	0	0	0
									2	rk	ala	5	0	0	0	0	5
									3	rk		0	0	0	0	0	0
									3	cbl		0	0	0	0	0	0
									3	rk		1	0	0	0	0	0.77
									5	rk	ala	30	0	0	0	0	30
									6	snd	fir	1	0	0	0	0	1
									8	snd	hir	20	0	0	0	0	23.8
									8	rk	ala	140	0	0	0	0	140
									2	rk	ala	0	0	0	0	0	0
									7	rk	hir	140	0	0	0	0	167
									9	snd		0	0	0	0	0	0
									11	snd		0	0	0	0	0	0
									11	snd		0	0	0	0	0	0
									12	snd	hir	1	0	0	0	0	1.19
									13	snd	los	2	0	0	0	0	2
									13	snd		0	0	0	0	0	0
									15	snd		0	0	0	0	0	0
									16	snd		0	0	0	0	0	0
									16	snd		0	0	0	0	0	0
									18	snd		0	0	0	0	0	0
									19	snd		0	0	0	0	0	0
									20	snd		0	0	0	0	0	0
									22	snd		0	0	0	0	0	0
									24	snd		0	0	0	0	0	0
									25	snd		0	0	0	0	0	0
7-May-94	8	1516	1541	25	25	RL	RT	5	1	rk	los	4	0	0	0	4.24	0
									2	rk	fuc	30	0	0	0	30.6	0
									3	rk	fuc	20	0	0	0	20.4	0
									5	rk	fuc	1	0	0	0	1.02	0
									5	cbl	fuc	1	0	0	0	1.02	0
									6	cbl	fuc	5	0	0	0	5.1	0
									6	cbl	fir	4	0	0	0	4.24	0
									6	cbl		1	0	0	0	1.03	0
									7	snd	lbk	0	0	0	0	0	0
									7	snd	lbk	0	0	0	0	0	0
									7	rk	lbk	0	0	0	0	0	0
									8	rk	lbk	3	0	0	0	3.24	0
									10	rk	lbk	75	0	0	0	81	0
									11	rk	lbk	110	0	0	0	119	0
									12	rk	lbk	15	0	0	0	16.2	0
									13	rk	lbk	2	0	0	0	2.16	0
									14	rk	lbk	1	0	0	0	1.08	0
									14	rk	fir	0	0	0	0	0	0
									14	rk	lbk	0	0	0	0	0	0
									14	rk	lbk	0	0	0	0	0	0
									15	rk	lbk	1	0	0	0	1.08	0
									16	rk	lbk	5	0	0	0	5.4	0
									16	rk	lbk	3	0	0	0	3.24	0
									17	rk	lbk	0	0	0	0	0	0
									18	rk	lbk	0	0	0	0	0	0
									18	rk	lbk	0	0	0	0	0	0
									17	rk	lbk	0	0	0	0	0	0
									19	snd		0	0	0	0	0	0
									20	snd		0	0	0	0	0	0
									21	snd		0	0	0	0	0	0
									21	snd		0	0	0	0	0	0
									22	snd		0	0	0	0	0	0
									23	snd		0	0	0	0	0	0

										15	snd		0	0	0	0	0	0	
										12	snd		0	0	0	0	0	0	
										12	snd		0	0	0	0	0	0	
										11	snd		0	0	0	0	0	0	
										11	snd		0	0	0	0	0	0	
										12	snd		0	0	0	0	0	0	
										12	snd		0	0	0	0	0	0	
										12	snd		0	0	0	0	0	0	
										12	snd		0	0	0	0	0	0	
										13	snd		0	0	0	0	0	0	
										14	snd		0	0	0	0	0	0	
										14	snd		0	0	0	0	0	0	
										15	snd		0	0	0	0	0	0	
										16	snd		0	0	0	0	0	0	
										17	snd		0	0	0	0	0	0	
										17	snd		0	0	0	0	0	0	
										18	snd		0	0	0	0	0	0	
										20	snd		0	0	0	0	0	0	
										21	snd		0	0	0	0	0	0	
										22	snd		0	0	0	0	0	0	
										23	snd		0	0	0	0	0	0	
										26	snd		0	0	0	0	0	0	
										26	snd		0	0	0	0	0	0	
										27	snd		0	0	0	0	0	0	
										27	snd		0	0	0	0	0	0	
7-May-94	12	1336	1344	8	12	RL	BL	5		0	rck	fuc	0	0	0	0	0	0	
										2	rck	fuc	0	0	0	0	0	0	
										3	cbl	fuc	0	0	0	0	0	0	
										6	cbl	fuc	0	0	0	0	0	0	
										9	rck	red	0	0	0	0	0	0	
										11	gvl	utv	0	0	0	0	0	0	
										11	rck	fil	0	0	0	0	0	0	
										10	rck	utv	0	0	0	0	0	0	
										9	rck	fil	0	0	0	0	0	0	
										9	rck	fil	0	0	0	0	0	0	
										10	rck	red	0	0	0	0	0	0	
										11	rck		0	0	0	0	0	0	green urchins present
										11	rck	lbk	3	0	0	3.24	0	0	
										10	rck	lbk	1	0	0	1.08	0	0	
										12	rck	lbk	0	0	0	0	0	0	
										12	rck	lbk	1	0	0	1.08	0	0	stopped 1/2 way across bay
7-May-94	13	1302	1330	28	19	WB	TM	5		0	rck	fuc	0	0	0	0	0	0	
										3	rck	fuc	0	0	0	0	0	0	
										8	rck	fuc	1	1.13	0	0	0	0	
										6	rck	fuc	0	0	0	0	0	0	
										12	rck	hir	90	92.7	0	0	0	0	
										14	rck	lbk	80	68.8	0	0	0	0	
										17	rck	lbk	90	77.4	0	0	0	0	
										17	rck	lbk	60	51.6	0	0	0	0	
										18	rck	lbk	100	86	0	0	0	0	
										19	rck	lbk	150	129	0	0	0	0	
										19	cbl	lbk	45	38.7	0	0	0	0	
										18	rck	lbk	50	43	0	0	0	0	
										18	rck	lbk	80	68.8	0	0	0	0	
										17	rck	lbk	40	34.4	0	0	0	0	
										17	rck	hir	45	46.4	0	0	0	0	
										18	rck	lbk	45	38.7	0	0	0	0	
										16	cbl	lbk	10	8.6	0	0	0	0	
										15	cbl	lbk	140	120	0	0	0	0	
										15	cbl	lbk	90	77.4	0	0	0	0	
										13	cbl	lbk	60	51.6	0	0	0	0	
										14	cbl	fir	25	26.5	0	0	0	0	
										13	cbl	fir	45	47.7	0	0	0	0	
										11	cbl	fir	5	5.3	0	0	0	0	
										11	cbl	lbk	0	0	0	0	0	0	
										9	cbl	lbk	0	0	0	0	0	0	
										9	cbl	lbk	0	0	0	0	0	0	
										9	cbl	lbk	0	0	0	0	0	0	
										9	cbl	lbk	0	0	0	0	0	0	no cucs or urchins
7-May-94	14	1308	1318	10	26	RL	BL	5		0	rck	fuc	0	0	0	0	0	0	
										4	cbl	fuc	0	0	0	0	0	0	
										6	cbl	fuc	0	0	0	0	0	0	
										7	snd	fuc	0	0	0	0	0	0	
										9	cbl	fuc	0	0	0	0	0	0	
										10	cbl	fuc	0	0	0	0	0	0	
										11	snd	red	0	0	0	0	0	0	
										11	snd	lbk	0	0	0	0	0	0	

11	snd	hir	0	0	0	0	0
11	cbl	hir	0	0	0	0	0
11	blt	hir	0	0	0	0	0
12	cbl	utv	0	0	0	0	0
11	cbl	tuc	0	0	0	0	0
11	cbl	utv	0	0	0	0	0
15	snd	lbt	0	0	0	0	0
15	snd		0	0	0	0	0
15	snd		0	0	0	0	0
15	snd		0	0	0	0	0
15	snd		0	0	0	0	0
15	snd		0	0	0	0	0
16	snd		0	0	0	0	0
16	snd		0	0	0	0	0
18	snd		0	0	0	0	0
19	snd		0	0	0	0	0
20	snd		0	0	0	0	0
21	snd		0	0	0	0	0
22	snd		0	0	0	0	0
24	snd		0	0	0	0	0
26	snd		0	0	0	0	0

no cucs or urchins

1994 HERRING SPAWN
HOONAH SOUND



HOONAH SOUND HERRING SPAWN SURVEY 1994

DIVERS: Tim Minicucci(TM), Robert Larson(RL), Will Bergmann(WB), Bob DeJong(BDJ), Bill Davidson(BD), Linda Perkins(LP)

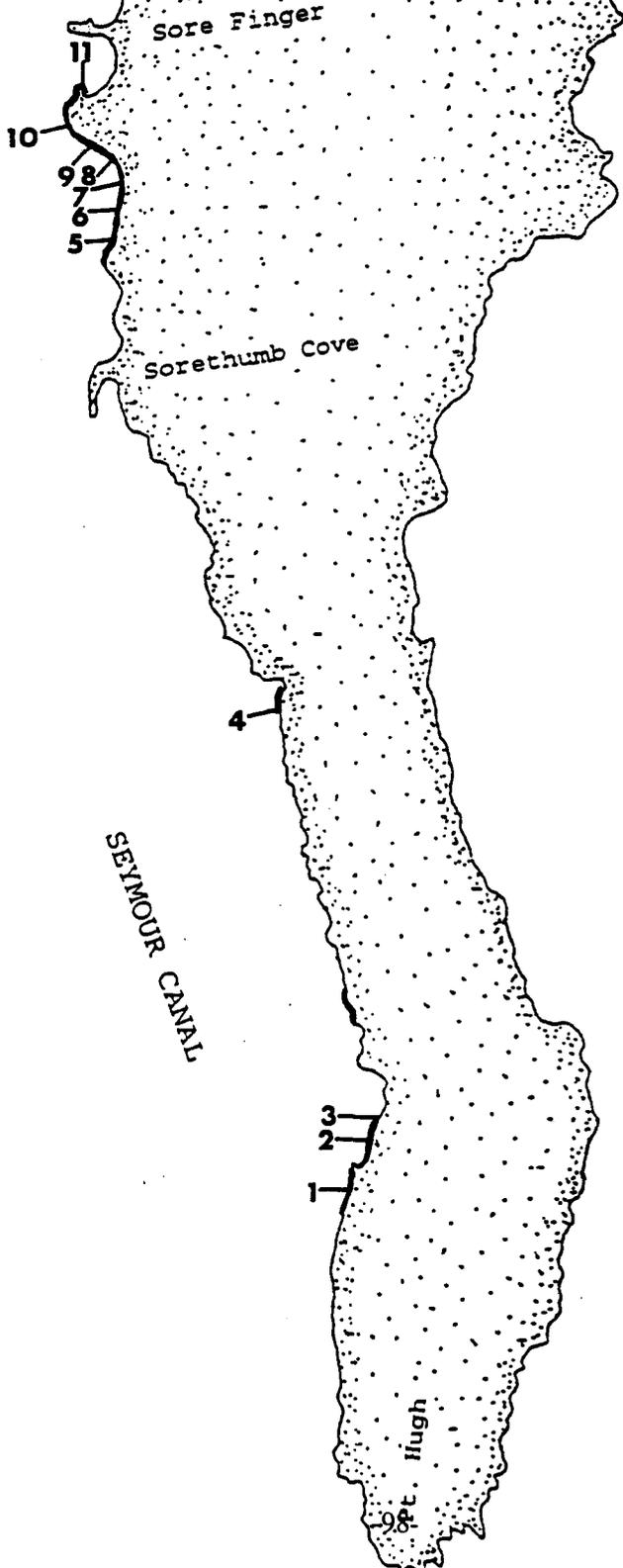
DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	BD EYE	RL EYE	WB EYE	BDJ EYE	TM CORRECTION	BD CORRECTION	RL CORRECTION	WB CORRECTION	BDJ CORRECTION	COMMENTS											
29-Apr-94	1	1230	1240	10	25	TM	LP	5	-8	rk	fuc					20	0	0	0	0	0	23											
									-7	rk	≡						5	0	0	0	0	0	0	0	0	0	5.4						
									-6	bd	fuc							15	0	0	0	0	0	0	0	0	0	0	0	17			
									-6	bd	fuc							1	0	0	0	0	0	0	0	0	0	0	0	1			
									-5	bd	fuc							30	0	0	0	0	0	0	0	0	0	0	0	35			
									-5	bd								10	0	0	0	0	0	0	0	0	0	0	0	0	10		
									-4	bd								3	0	0	0	0	0	0	0	0	0	0	0	0	3		
									-2	bd								2	0	0	0	0	0	0	0	0	0	0	0	0	2		
									0	bd								3	0	0	0	0	0	0	0	0	0	0	0	0	3		
									3	rk	fuc							6	rk	fuc	0				0	0	0	0	0	0	0	0	
									6	rk								6	rk	lbk	0				0	0	0	0	0	0	0	0	
									7	rk	lbk							7	rk	lbk	0				0	0	0	0	0	0	0	0	
									8	rk	lbk							8	rk	lbk	0				0	0	0	0	0	0	0	0	
									9	rk	lbk							9	rk	lbk	0				0	0	0	0	0	0	0	0	
									10	rk	lbk							10	rk	lbk	0				0	0	0	0	0	0	0	0	
									11	rk	lbk							11	rk	lbk	0				0	0	0	0	0	0	0	0	
									13	rk	lbk							13	rk	lbk	0				0	0	0	0	0	0	0	0	
									14	rk	lbk							14	rk	lbk	0				0	0	0	0	0	0	0	0	
									15	rk	lbk							15	rk	lbk	0				0	0	0	0	0	0	0	0	
									16	rk	lbk							16	rk	lbk	0				0	0	0	0	0	0	0	0	
									19	rk	lbk							19	rk	lbk	0				0	0	0	0	0	0	0	0	
									22	rk	lbk							22	rk	lbk	0				0	0	0	0	0	0	0	0	
									23	rk	lbk							23	rk	lbk	0				0	0	0	0	0	0	0	0	
									24	rk	lbk							24	rk	lbk	0				0	0	0	0	0	0	0	0	
									25	rk	lbk							25	rk	lbk	0				0	0	0	0	0	0	0	0	
29-Apr-94	2	1310	1320	10	21	TM	LP	5	-3	bd						0	0	0	0	0	0	0											
									-3	bd	fuc											35	0	0	0	0	0	0	40				
									-2	bd	fuc												40	0	0	0	0	0	0	0	46		
									-1	bd	fuc												60	0	0	0	0	0	0	0	69		
									0	bd	fuc												35	0	0	0	0	0	0	0	0	40	
									-1	bd	fuc												0	0	0	0	0	0	0	0	0	0	
									2	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									5	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									9	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									10	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									11	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									12	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									14	rk	lbk	0								0				0	0	0	0	0	0	0	0	0	
									15	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
									16	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
									17	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
									18	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
									18	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
									18	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
									19	snd	lbk	0								0				0	0	0	0	0	0	0	0	0	
20	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
20	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
20	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
20	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
21	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
21	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
21	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
21	snd	lbk	0								0				0	0	0	0	0	0	0	0	0										
29-Apr-94	3	1345	1400	15	22	TM	LP	5	-4	rk						0	0	0	0	0	0	0											
									-4	rk	fuc											30	0	0	0	0	0	35					
									-4	rk	hir									240	0	0	0	0	0	0	0	0	247				
									-4	rk	fuc									70	0	0	0	0	0	0	0	81					

									20	snd		0	0	0	0	0	0	
30-Apr-94	11	941	946	5	21	WB	BD	5	-10	rck		0	0	0	0	0	0	
									-8	rck	fuc	0	0	0	0	0	0	
									-6	rck	fuc	0	0	0	0	0	0	
									-3	rck	fuc	0	0	0	0	0	0	
									3	bid	fuc	0	0	0	0	0	0	
									7	cbl	fil	0	0	0	0	0	0	
									10	cbl	fil	0	0	0	0	0	0	
									11	cbl		0	0	0	0	0	0	green urchins
									13	cbl		0	0	0	0	0	0	green urchins
									15	cbl		0	0	0	0	0	0	green urchins
									17	snd		0	0	0	0	0	0	cucs and urchins
									19	snd		0	0	0	0	0	0	
									21	snd		0	0	0	0	0	0	
30-Apr-94	12	845	905	20	21	TM	LP	5	-5	rck		0	0	0	0	0	0	
									-5	rck		0	0	0	0	0	0	
									-5	rck		0	0	0	0	0	0	
									-5	rck		0	0	0	0	0	0	
									-4	rck	fuc	35	40	0	0	0	0	
									-4	rck	fuc	50	57	0	0	0	0	
									-3	rck	fuc	5	5.7	0	0	0	0	
									-2	rck	fir	80	85	0	0	0	0	
									-1	rck	fir	70	74	0	0	0	0	
									0	rck	fir	3	3.2	0	0	0	0	
									2	rck	los	1	1.1	0	0	0	0	
									3	snd	ulv	0	0	0	0	0	0	
									5	snd		0	0	0	0	0	0	
									7	snd		0	0	0	0	0	0	
									9	snd	los	1	1.1	0	0	0	0	
									10	snd	los	30	32	0	0	0	0	
									10	snd	red	5	5.3	0	0	0	0	
									10	cbl	ulv	5	5.3	0	0	0	0	
									10	cbl	fir	0	0	0	0	0	0	
									7	rck	hir	10	10	0	0	0	0	
									3	rck	fir	50	53	0	0	0	0	
									7	rck	fir	60	64	0	0	0	0	
									12	rck	lwk	0	0	0	0	0	0	
									13	snd	lwk	0	0	0	0	0	0	
									14	snd	lwk	0	0	0	0	0	0	
									14	snd	lwk	0	0	0	0	0	0	
									15	snd	lwk	0	0	0	0	0	0	
									16	snd	lwk	0	0	0	0	0	0	
									16	snd	lwk	0	0	0	0	0	0	
									16	snd	lwk	0	0	0	0	0	0	
									16	snd	lwk	0	0	0	0	0	0	
									16	snd	lwk	0	0	0	0	0	0	
									16	snd	lwk	0	0	0	0	0	0	
									17	snd	lwk	0	0	0	0	0	0	
									18	snd	lwk	0	0	0	0	0	0	
									19	snd	lwk	0	0	0	0	0	0	
									20	snd	lwk	0	0	0	0	0	0	
									21	snd	lwk	0	0	0	0	0	0	see to 25+feet sand 0 eggs
29-Apr-94	13	1449	1508	19	29	WB	RL	5	-12	cbl		5	0	0	0	3.9	0	
									-10	cbl		1	0	0	0	0.8	0	
									-8	cbl		0	0	0	0	0	0	
									-6	cbl		0	0	0	0	0	0	
									-5	cbl		15	0	0	0	12	0	
									-4	cbl		7	0	0	0	5.4	0	
									-2	cbl		20	0	0	0	15	0	
									0	cbl	fuc	50	0	0	0	62	0	
									1	cbl		5	0	0	0	3.9	0	
									2	cbl		50	0	0	52	0	0	
									3	cbl	fil	75	0	0	80	0	0	
									4	rk		45	0	0	46	0	0	
									5	rk	fil	45	0	0	48	0	0	
									7	cbl		120	0	0	124	0	0	
									8	cbl	fil	35	0	0	37	0	0	
									10	cbl	fil	10	0	0	11	0	0	
									11	cbl	fil	100	0	0	106	0	0	
									13	cbl	fil	35	0	0	37	0	0	
									14	cbl	fil	280	0	0	297	0	0	
									15	snd	elg	125	0	0	129	0	0	
									15	gvl	fil	4	0	0	4.2	0	0	
									16	gvl	lwk	10	0	0	11	0	0	
									16	gvl	los	1	0	0	1.1	0	0	
									17	gvl	los	1	0	0	1.1	0	0	
									17	snd		0	0	0	0	0	0	
									17	snd		0	0	0	0	0	0	

ADMIRALTY
ISLAND

1994 HERRING SPAWN
SEYMOUR #1

SEYMOUR CANAL



SEYMOUR CANAL

SEYMOUR CANAL HERRING SPAWN DEPOSITION SURVEY #1 1994

DIVERS: Tim Minicucci(TM), Robert Larson(RL), Bill Davidson (BD), Don Ingledue (DI)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	BD EYE	RL EYE	TM CORRECTION	BD CORRECTION	RL CORRECTION	COMMENTS
12-May-94	1	1102	1108	6	29	RL	DI	5	-10	bld	fuc			0	0	0	0	
									-7	bld	fuc			0	0	0	0	
									-6	bld	fuc			0	0	0	0	
									-3	bld				0	0	0	0	
									-2	bld				15	0	0	15.45	
									1	bld	fuc			25	0	0	25.5	
									3	cbi	fuc			1	0	0	1.02	
									4	cbi				0	0	0	0	
									5	rck	lck			0	0	0	0	
									7	rck	lck			1	0	0	1.08	
									11	rck	lck			0	0	0	0	
									19	rck	lck			0	0	0	0	
									29	snd				0	0	0	0	
									12-May-94	2	1048	1101	13	38	TM	BD	5	-1
2	rck	lck	3		2.58	0	0											
2	rck	lck	15		12.9	0	0											
8	rck	lck	1		0.86	0	0											
10	cbi	lck	3		2.58	0	0											
10	cbi		2		2.48	0	0											
10	rck	lck	20		17.2	0	0											
7	rck	lck	5		4.3	0	0											
3	rck	lck	0		0	0	0											
9	rck	lck	5		4.3	0	0											
15	rck	lck	5		4.3	0	0											
23	rck	lck	0		0	0	0											
30	rck	lck	3		2.58	0	0											
32	shl	lck	0		0	0	0											
34	shl		0		0	0	0											
36	shl		0		0	0	0											
37	snd		0		0	0	0											
38	snd		0		0	0	0											
12-May-94	3	1124	1129	5	9	RL	DI	5	-10	rck	fuc			0	0	0	0	
									-10	rck	fuc			0	0	0	0	
									-5	rck	fuc			0	0	0	0	
									-8	rck	fuc			0	0	0	0	
									-6	rck	fuc			0	0	0	0	
									-4	bld	fil			0	0	0	0	
									-2	bld				0	0	0	0	
									0	bld				0	0	0	0	
									3	rck				0	0	0	0	
									7	cbi				0	0	0	0	
									8	cbi				0	0	0	0	
									8	snd				0	0	0	0	
									9	snd				0	0	0	0	
									9	snd				0	0	0	0	
9	snd				0	0	0	0										
12-May-94	4	1120	1126	6	36	TM	BD	5	-4	rck		0		0	0	0	0	
									-1	rck		0		0	0	0	0	
									4	rck	fuc	0		0	0	0	0	
									4	rck	lck	0		0	0	0	0	

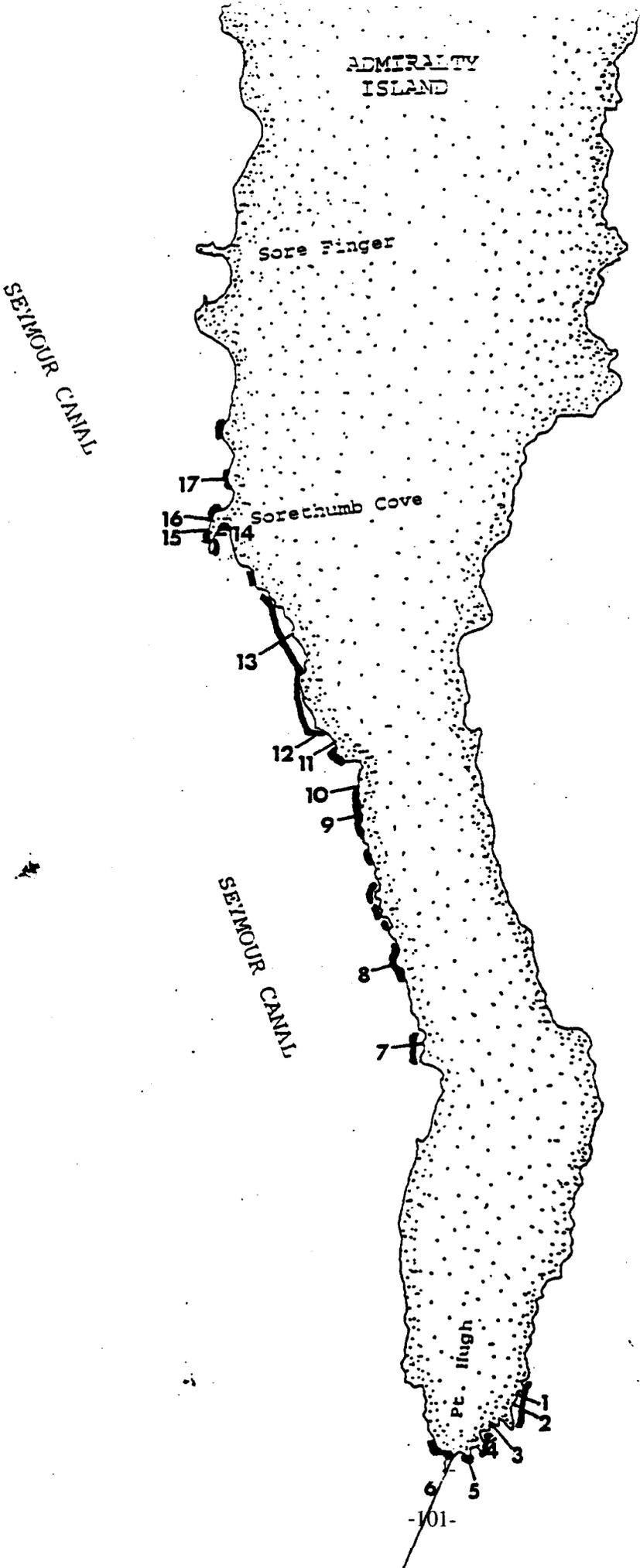
	6	snd		0		0	0	0
	7	snd		0		0	0	0
	8	snd		0		0	0	0
	10	snd		0		0	0	0
	12	snd	lbk	0		0	0	0
	16	snd	lbk	0		0	0	0
	22	snd	lbk	0		0	0	0
	29	snd		0		0	0	0
	36	snd	lbk	0		0	0	0
12-May-94	5	1212	1225	13	31	RL	DI	5
	-9	rck						0
	-8	rck	fuc					0
	-4	rck	fuc					0
	-4	rck	bar					0
	-3	rck	mus					0
	-1	bid	mus					0
	1	bid	fil					0
	0	bid	bar					0
	2	bid	bar					0
	2	cbl	bar					0
	3	rck	fir					1.06
	4	rck	fuc					5.1
	6	rck	fuc					10.2
	7	rck	ala					4.24
	11	rck	lbk					3.24
	15	snd	lbk					2.16
	16	gvl	fil					1.06
	17	snd	fil					0
	17	snd	fil					1.06
	16	snd	fil					0
	17	snd	fil					3.18
	18	cbl	lbk					3.24
	19	snd						1.03
	20	snd						0
	22	snd						0
	24	snd						0
	26	snd						0
	27	snd						0
	30	snd						0
	31	snd						0
12-May-94	6	1148	1207	19	33	TM	BD	5
	-3	rck		0				0
	-2	rck		0				0
	2	rck	fuc	0				0
	2	rck	fuc	5				5.65
	3	rck	fuc	1				1.13
	6	rck	fuc	5				5.65
	9	rck	lbk	0				0
	9	rck	lbk	10				8.6
	11	rck	lbk	0				0
	13	rck	lbk	0				0
	14	rck	lbk	2				1.72
	16	rck	lbk	0				0
	16	rck	lbk	5				4.3
	17	shl	lbk	0				0
	18	cbl	lbk	0				0
	18	gvl	lbk	0				0
	18	gvl	lbk	0				0
	19	cbl	lbk	0				0
	22	gvl	lbk	0				0
	24	snd	lbk	0				0

	25	gvl	lbk	0					0	0	0	0			
	25	gvl	lbk	0					0	0	0	0			
	26	gvl	lbk	0					0	0	0	0			
	27	gvl	lbk	0					0	0	0	0			
	29	gvl	lbk	0					0	0	0	0			
	30	gvl	lbk	0					0	0	0	0			
	31	gvl	lbk	0					0	0	0	0			
	33	gvl	lbk	0					0	0	0	0			
12-May-94	7	1244	1303	19	30	RL	DI	5	-6	bld		0	0	0	0
									-3	bld		0	0	0	0
									0	bld		0	0	0	0
									2	bld		0	0	0	0
									4	rck	mus	0	0	0	0
									5	bld	fuc	0	0	0	0
									6	bld	ulv	0	0	0	0
									7	bld	red	0	0	0	0
									7	bld		0	0	0	0
									10	bld		0	0	0	0
									11	bld		0	0	0	0
									14	snd		0	0	0	0
									14	snd		0	0	0	0
									16	snd		1	0	0	1.03
									18	snd		0	0	0	0
									18	snd		0	0	0	0
									19	snd	lbk	0	0	0	0
									19	snd	lbk	0	0	0	0
									21	snd	lbk	0	0	0	0
									21	snd	lbk	0	0	0	0
									20	snd	lbk	0	0	0	0
									22	snd	lbk	3	0	0	3.24
									23	snd	lbk	6	0	0	6.48
									24	snd	lbk	0	0	0	0
									24	gvl	lbk	1	0	0	1.08
									25	gvl		0	0	0	0
									25	gvl	agm	1	0	0	1.08
									25	gvl	lbk	1	0	0	1.08
									24	gvl		0	0	0	0
									26	cbl	lbk	2	0	0	2.16
									25	cbl	lbk	1	0	0	1.08
									26	cbl	lbk	1	0	0	1.08
									27	gvl	lbk	0	0	0	0
									27	gvl	lbk	1	0	0	1.08
									28	gvl	lbk	0	0	0	0
									28	gvl		0	0	0	0
									28	gvl	agm	0	0	0	0
									29	gvl	agm	0	0	0	0
									30	gvl	agm	0	0	0	0
									30	gvl	agm	0	0	0	0
12-May-94	8	1219	1234	15	19	TM	BD	5	-2	cbl		0	0	0	0
									1	cbl	mus	0	0	0	0
									3	cbl	mus	0	0	0	0
									4	cbl	mus	0	0	0	0
									5	cbl	mus	0	0	0	0
									6	cbl	fir	0	0	0	0
									6	cbl	fir	0	0	0	0
									8	cbl	fuc	5	0	5.7	0
									8	snd		0	0	0	0
									8	snd		0	0	0	0
									8	snd		0	0	0	0

46 male king crab

										8	snd	0	0	0	0	
										9	snd	0	0	0	0	
										9	snd	0	0	0	0	
										10	snd	0	0	0	0	start of 1.5' green urchins
										11	snd	0	0	0	0	
										12	snd	0	0	0	0	
										15	gvl	0	0	0	0	
										15	gvl	0	0	0	0	
										16	gvl	0	0	0	0	
										16	gvl	0	0	0	0	
										17	gvl	0	0	0	0	
										17	cbl	hir	0	0	0	0
										18	cbl	hir	0	0	0	0
										18	cbl	hir	0	0	0	0
										19	cbl	hir	0	0	0	0
										19	cbl	hir	0	0	0	0
										19	cbl	hir	0	0	0	0
										19	cbl	hir	0	0	0	0
										19	cbl	lbk	0	0	0	0
										19	cbl	lbk	0	0	0	0
										19	cbl	lbk	0	0	0	0
										19	cbl	lbk	0	0	0	0
12-May-94	9	1325	1329	14	26	RL	DI	5	-3	bld		0	0	0	0	
									0	bld	fuc	0	0	0	0	
									2	bld	fuc	0	0	0	0	
									3	rck	fir	0	0	0	0	
									4	rck	mus	0	0	0	0	
									5	rck	fuc	0	0	0	0	
									6	bld	fir	0	0	0	0	
									6	rck	fil	0	0	0	0	
									6	bld	fuc	0	0	0	0	
									7	bld	fil	0	0	0	0	
									7	rck	fil	0	0	0	0	
									8	rck		0	0	0	0	
									8	rck	ala	2	0	0	2.12	
									9	rck	ala	0	0	0	0	
									12	rck	ala	1	0	0	1.06	
									11	rck	ala	0	0	0	0	
									13	rck	ala	0	0	0	0	
									16	rck	ala	0	0	0	0	
									18	gvl		0	0	0	0	
									17	rck	lbk	0	0	0	0	
									19	bld	lbk	0	0	0	0	
									19	bld	lbk	0	0	0	0	
									19	bld	lbk	0	0	0	0	
									20	bld	agm	0	0	0	0	
									21	gvl	agm	0	0	0	0	
									23	bld	agm	0	0	0	0	
									26	bld	agm	0	0	0	0	
12-May-94	10	1249	1300	11	37	TM	BD	5	0	cbl		0	0	0	0	
									2	cbl		0	0	0	0	
									7	cbl	fuc	8	9.04	0	0	
									9	cbl	fuc	2	2.26	0	0	
									12	snd	lbk	0	0	0	0	
									13	snd	fuc	3	3.39	0	0	
									15	snd	hir	10	10.3	0	0	
									16	snd		0	0	0	0	
									17	snd		0	0	0	0	needlefish in sand
									19	snd		0	0	0	0	

1994 HERRING SPAWN
SEYMOUR #2



SEYMOUR CANAL HERRING SPAWN DEPOSITION SURVEY #1 1994

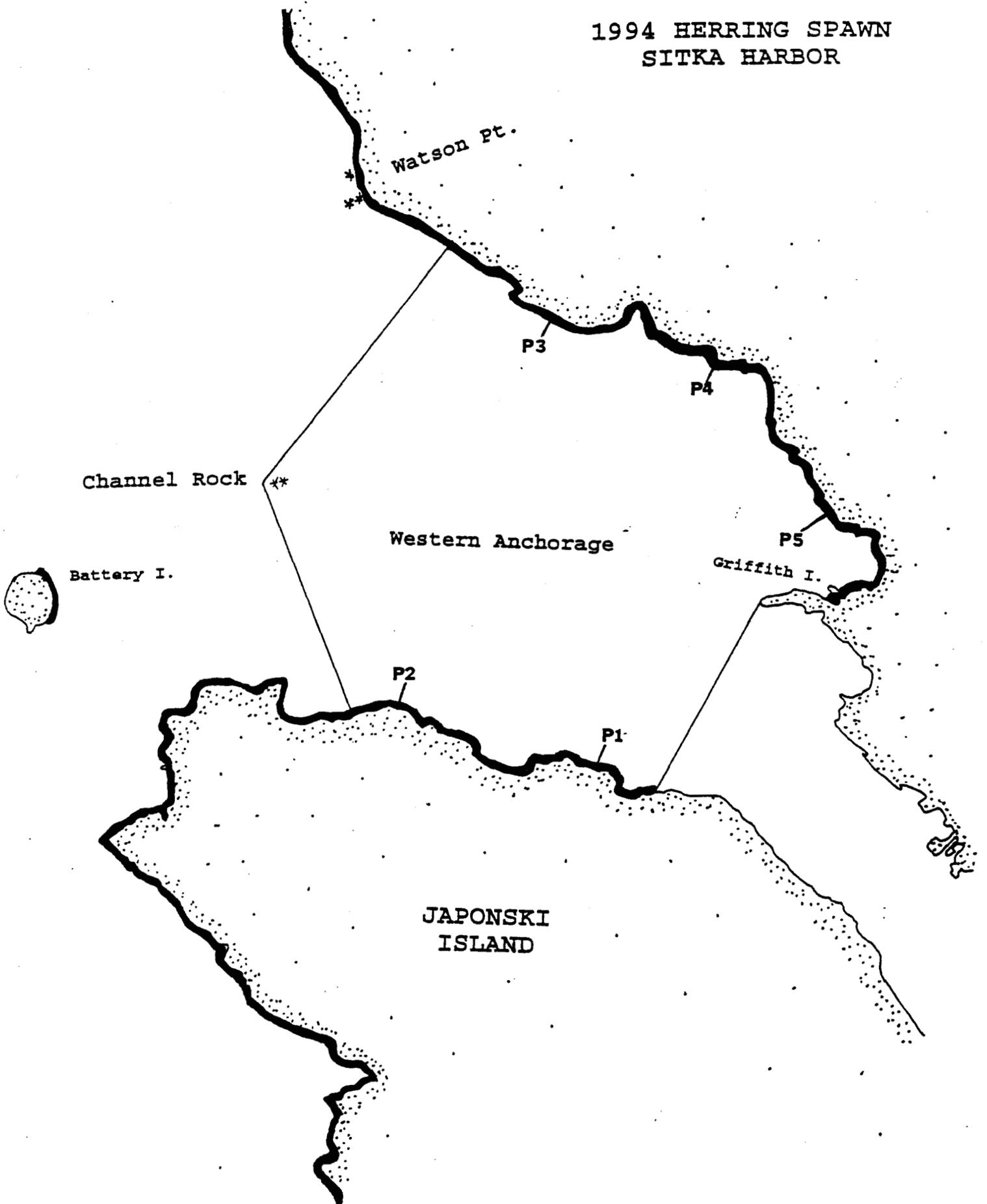
DIVERS: Tim Minicucci(TM), Robert Larson(RL), Bill Davidson (BD), Don Ingledue (DI)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	BD EYE	RL EYE	TM CORRECTION	BD CORRECTION	RL CORRECTION	COMMENTS
12-May-94	1	1102	1108	6	29	RL	DI	5	-10	bld	fuc			0	0	0	0	
									-7	bld	fuc			0	0	0	0	
									-6	bld	fuc			0	0	0	0	
									-3	bld				0	0	0	0	
									-2	bld				15	0	0	15.45	
									1	bld	fuc			25	0	0	25.5	
									3	cbl	fuc			1	0	0	1.02	
									4	cbl				0	0	0	0	
									5	rck	lbk			0	0	0	0	
									7	rck	lbk			1	0	0	1.08	
									11	rck	lbk			0	0	0	0	
									19	rck	lbk			0	0	0	0	
									29	snd				0	0	0	0	
									12-May-94	2	1048	1101	13	38	TM	BD	5	-1
2	rck	lbk	3		2.58	0	0											
2	rck	lbk	15		12.9	0	0											
8	rck	lbk	1		0.86	0	0											
10	cbl	lbk	3		2.58	0	0											
10	cbl		2		2.48	0	0											
10	rck	lbk	20		17.2	0	0											
7	rck	lbk	5		4.3	0	0											
3	rck	lbk	0		0	0	0											
9	rck	lbk	5		4.3	0	0											
15	rck	lbk	5		4.3	0	0											
23	rck	lbk	0		0	0	0											
30	rck	lbk	3		2.58	0	0											
32	shl	lbk	0		0	0	0											
34	shl	lbk	0		0	0	0											
36	shl		0		0	0	0											
37	snd		0		0	0	0											
38	snd		0		0	0	0											
12-May-94	3	1124	1129	5	9	RL	DI	5	-10	rck	fuc			0	0	0	0	
									-10	rck	fuc			0	0	0	0	
									-5	rck	fuc			0	0	0	0	
									-8	rck	fuc			0	0	0	0	
									-6	rck	fuc			0	0	0	0	
									-4	bld	fil			0	0	0	0	
									-2	bld				0	0	0	0	
									0	bld				0	0	0	0	
									3	rck				0	0	0	0	
									7	cbl				0	0	0	0	
									8	cbl				0	0	0	0	
									8	snd				0	0	0	0	
									9	snd				0	0	0	0	
									9	snd				0	0	0	0	
9	snd				0	0	0	0										
12-May-94	4	1120	1126	6	36	TM	BD	5	-4	rck		0		0	0	0	0	
									-1	rck		0		0	0	0	0	
									4	rck	fuc	0		0	0	0	0	
									4	rck	lbk	0		0	0	0	0	

	8	snd		0	0	0	0	
	9	snd		0	0	0	0	
	9	snd		0	0	0	0	
	10	snd		0	0	0	0	start of 1.5" green urchins
	11	snd		0	0	0	0	
	12	snd		0	0	0	0	
	15	gvl		0	0	0	0	
	15	gvl		0	0	0	0	
	16	gvl		0	0	0	0	
	16	gvl		0	0	0	0	
	17	gvl		0	0	0	0	
	17	cbl	hir	0	0	0	0	
	18	cbl	hir	0	0	0	0	
	18	cbl	hir	0	0	0	0	
	19	cbl	hir	0	0	0	0	
	19	cbl	hir	0	0	0	0	
	19	cbl	hir	0	0	0	0	
	19	cbl	hir	0	0	0	0	
	19	cbl	lbk	0	0	0	0	
	19	cbl	lbk	0	0	0	0	
	19	cbl	lbk	0	0	0	0	
	19	cbl	lbk	0	0	0	0	
12-May-94	9	1325	1329	14	26	RL	DI	5
	-3	bld			0	0	0	0
	0	bld	fuc		0	0	0	0
	2	bld	fuc		0	0	0	0
	3	rck	fir		0	0	0	0
	4	rck	mus		0	0	0	0
	5	rck	fuc		0	0	0	0
	6	bld	fir		0	0	0	0
	6	rck	fil		0	0	0	0
	6	bld	fuc		0	0	0	0
	7	bld	fil		0	0	0	0
	7	rck	fil		0	0	0	0
	8	rck			0	0	0	0
	8	rck	ala		2	0	0	2.12
	9	rck	ala		0	0	0	0
	12	rck	ala		1	0	0	1.06
	11	rck	ala		0	0	0	0
	13	rck	ala		0	0	0	0
	16	rck	ala		0	0	0	0
	18	gvl			0	0	0	0
	17	rck	lbk		0	0	0	0
	19	bld	lbk		0	0	0	0
	19	bld	lbk		0	0	0	0
	19	bld	lbk		0	0	0	0
	20	bld	agm		0	0	0	0
	21	gvl	agm		0	0	0	0
	23	bld	agm		0	0	0	0
	26	bld	agm		0	0	0	0
12-May-94	10	1249	1300	11	37	TM	BD	5
	0	cbl		0		0	0	0
	2	cbl		0		0	0	0
	7	cbl	fuc	8		9.04	0	0
	9	cbl	fuc	2		2.26	0	0
	12	snd	lbk	0		0	0	0
	13	snd	fuc	3		3.39	0	0
	15	snd	hir	10		10.3	0	0
	16	snd		0		0	0	0
	17	snd		0		0	0	0
	19	snd		0		0	0	0
								needlefish in sand

	22	snd		0		0	0	0
	25	snd		0		0	0	0
	33	snd		0		0	0	0
	37	snd		0		0	0	0
12-May-94	11	1307	1320	13	28	TM	BD	5
	-2	bld	fuc	0		0	0	0
	0	bld	fuc	0		0	0	0
	2	rck	mus	0		0	0	0
	3	cbl	lbk	2		0	1.7	0
	4	rck	mus	0		0	0	0
	6	rck	fuc	1		0	1.14	0
	7	rck	fuc	1		0	1.14	0
	7	rck	fuc	0		0	0	0
	7	rck	fuc	2		0	2.28	0
	10	cbl	fuc	10		0	11.4	0
	13	cbl	red	0		0	0	0
	15	rck	lbk	0		0	0	0
	20	snd	lbk	0		0	0	0
	23	snd	lbk	0		0	0	0
	25	snd	lbk	0		0	0	0
	26	snd		0		0	0	0
	28	snd	hir	0		0	0	0
	28	snd		0		0	0	0

1994 HERRING SPAWN
SITKA HARBOR



SITKA BOAT HARBOR HERRING SPAWN SURVEY 1994

DIVERS: Bill Davidson (BD), Bob DeJong (BDJ), Ed Grossman (EG), Bill Hughes (BH),
Robert Larson (RL), Tim Minicucci (TM), Linda Perkins (LP)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	BDJ EYE	RL EYE	TM CORRECTION	BDJ CORRECTION	RL CORRECTION	COMMENTS									
08-Apr-94	P-1	1616	1650	34	32	RL	LP	5	0	rck	fuc			30	0	0	30.6										
									5	7	rck	lbc			80	0	0	86.4									
									5	9	rck	lbc			5	0	0	5.4									
									5	11	rck	lbc			5	0	0	5.4									
									5	13	rck	lbc			9	0	0	9.72									
									5	15	rck	lbc			75	0	0	81									
									5	17	rck	lbc			10	0	0	10.8									
									5	20	gvl	lbc			7	0	0	7.56									
									5	23	gvl	lbc			3	0	0	3.24									
									5	25	gvl	lbc			15	0	0	16.2									
									5	26	gvl	lbc			1	0	0	1.08									
									5	25	gvl	lbc			6	0	0	6.48									
									5	28	mud	shl			0	0	0	0									
									5	29	mud	lbc			2	0	0	2.16									
									5	30	mud				0	0	0	0									
									5	31	mud	lbc			3	0	0	3.24									
									5	32	mud				0	0	0	0									
									08-Apr-94	P-2	1105	1158	53	39	BDJ	BD	5	3	rck			0	0	0	0	0	2' visibility
																		5	6	rck	hir		1	0	1.03	0	
																		5	7	rck	hir		0	0	0	0	
5	7	rck	red		20	0	21.6	0																			
5	7	rck	red		15	0	16.2	0																			
5	7	rck	red		2	0	2.16	0																			
5	8	rck	hir		60	0	61.8	0																			
5	9	rck	hir		20	0	20.6	0																			
5	9	rck	hir		30	0	30.9	0																			
5	9	rck	lbc		10	0	9.5	0																			
5	9	rck	lbc		10	0	9.5	0																			
5	10	rck	lbc		8	0	7.6	0																			
5	10	rck	hir		2	0	2.06	0																			
5	11	rck	hir		4	0	4.12	0																			
5	11	rck	hir		60	0	61.8	0																			
5	12	rck	lbc		40	0	38	0																			
5	12	snd	lbc		80	0	76	0																			
5	13	snd	lbc		7	0	6.65	0																			
5	13	snd	lbc		25	0	23.8	0																			
5	14	snd	lbc		7	0	6.65	0																			
5	15	snd	lbc		4	0	3.8	0																			
5	15	snd	hir		1	0	1.03	0																			
5	16	snd	hir		5	0	5.15	0																			
5	17	snd	hir		4	0	4.12	0																			
5	18	snd	hir		5	0	5.15	0																			
5	19	snd			0	0	0	0																			
5	20	snd	hir		4	0	4.12	0																			
5	21	snd	lbc		8	0	7.6	0																			
5	22	snd	lbc		30	0	28.5	0																			
5	23	snd	lbc		25	0	23.8	0																			
5	25	snd	lbc		20	0	19	0																			
5	31	snd	lbc		30	0	28.5	0																			
5	33	snd	lbc		30	0	28.5	0																			
5	36	mud			1	0	1.01	0																			
5	37	mud			0	0	0	0																			
5	39	mud			0	0	0	0																			
08-Apr-94	P-3	1600	1635	35	30	TM	EG	5	6	cbl		0			0	0	0										
									5	6	cbl	elg	60		74.4	0	0										
									5	6	cbl	hir	50		51.5	0	0										
									5	6	rck	hir	120		124	0	0										
5	6	rck	lbc	70		60.2	0	0																			

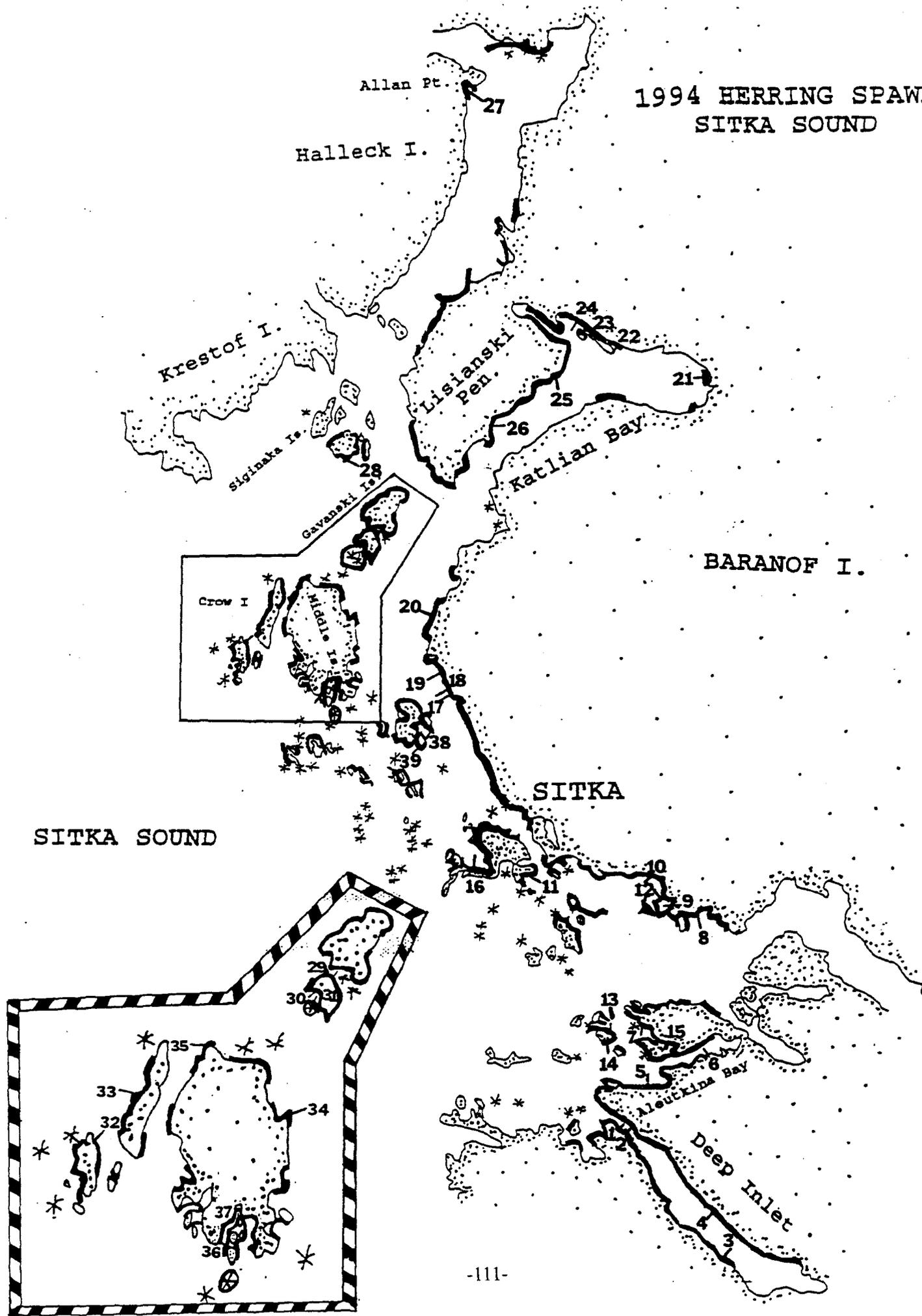
5	6	rck	lbk	110	94.6	0	0
5	6	rck	lbk	50	43	0	0
5	6	rck	hir	40	41.2	0	0
5	6	rck	lbk	1	0.86	0	0
5	11	snd	lbk	1	0.86	0	0
5	12	snd	hir	1	1.03	0	0
5	13	rck	ala	10	10.6	0	0
5	14	snd	hir	1	1.03	0	0
5	15	rck	hir	3	3.09	0	0
5	16	rck	hir	0	0	0	0
5	17	rck		4	4.96	0	0
5	18	rck	lbk	50	43	0	0
5	18	rck		20	24.8	0	0
5	19	rck	lbk	35	30.1	0	0
5	19	rck	lbk	50	43	0	0
5	20	rck	lbk	40	34.4	0	0
5	20	rck	lbk	50	43	0	0
5	21	rck	lbk	60	51.6	0	0
5	21	rck	lbk	20	17.2	0	0
5	22	rck		0	0	0	0
5	22	cbl		0	0	0	0
5	22	snd		0	0	0	0
5	22	snd		0	0	0	0
5	23	snd		0	0	0	0
5	24	snd		0	0	0	0
5	24	snd		0	0	0	0
5	24	snd		0	0	0	0
5	24	snd		0	0	0	0
5	25	snd		0	0	0	0
5	25	snd		0	0	0	0
5	25	snd		0	0	0	0
5	26	snd		0	0	0	0
5	26	snd		0	0	0	0
5	27	snd		0	0	0	0
5	28	snd		0	0	0	0
5	30	snd		0	0	0	0
5	4	cbl			0	0	0
5	6	cbl			0	0	0
5	6	cbl			0	0	0
5	7	snd	red		0	0	0
5	7	snd			0	0	0
5	7	snd			6	0	6.18
5	7	cbl	red		15	0	15.9
5	7	cbl	red		90	0	95.4
5	7	cbl	red		150	0	159
5	8	cbl	fir		60	0	63.6
5	9	cbl	fir		110	0	117
5	9	cbl	fir		35	0	37.1
5	10	cbl	red		20	0	21.2
5	10	snd	elg		80	0	82.4
5	11	snd	elg		110	0	113
5	11	snd	elg		100	0	103
5	11	snd	elg		50	0	51.5
5	11	snd	elg		70	0	72.1
5	11	snd	elg		60	0	61.8
5	11	snd	elg		50	0	51.5
5	12	snd	elg		35	0	36.1
5	12	snd	elg		30	0	30.9
5	13	snd	elg		10	0	10.3
5	13	snd	elg		20	0	20.6
5	13	snd	elg		15	0	15.5
5	13	snd	elg		10	0	10.3
5	14	snd	elg		5	0	5.15
5	14	snd	elg		5	0	5.15
5	14	snd	ala		5	0	5.3
5	14	snd	ala		3	0	3.18
5	15	cbl	ala		2	0	2.12
5	15	cbl	lbk		5	0	5.4
5	15	cbl	lbk		1	0	1.08
5	16	cbl	lbk		4	0	4.32
5	16	cbl	lbk		1	0	1.08
5	17	gvl	lbk		0	0	0
5	17	gvl	lbk		10	0	10.8

no vis.

08-Apr-94 P-4 1400 1447 47 33 RL BH

	5	18	rck	lbk		15	0	0	16.2	
	5	19	gvl	lbk		2	0	0	2.16	
	5	20	gvl	lbk		1	0	0	1.08	
	5	21	gvl	lbk		2	0	0	2.16	
	5	21	gvl	lbk		40	0	0	43.2	
	5	23	gvl	lbk		0	0	0	0	
	5	23	gvl	lbk		20	0	0	21.6	
	5	24	gvl	lbk		2	0	0	2.16	
	5	26	gvl	lbk		0	0	0	0	
	5	27	gvl	lbk		35	0	0	37.8	
	5	29	gvl	lbk		1	0	0	1.08	
	5	33	mud			0	0	0	0	
	5	33	mud			0	0	0	0	
08-Apr-94	P-5	1105	1158	53	30	TM	EG			
	5	4	rck		0		0	0	0	15 m to top of rock
	5	5	rck		0		0	0	0	
	5	5	rck		0		0	0	0	
	5	7	rck		0		0	0	0	
	5	7	snd		0		0	0	0	
	5	7	snd		0		0	0	0	
	5	7	snd	elg	1		1.24	0	0	
	5	8	snd	elg	0		0	0	0	
	5	8	snd	hir	90		92.7	0	0	
	5	9	snd	hir	15		15.5	0	0	
	5	9	snd	elg	30		37.2	0	0	
	5	9	snd	ulv	0		0	0	0	
	5	9	snd	ulv	0		0	0	0	
	5	9	snd	elg	20		24.8	0	0	
	5	10	snd	elg	15		18.6	0	0	
	5	10	snd	elg	30		37.2	0	0	
	5	10	snd	elg	30		37.2	0	0	
	5	10	snd	elg	35		43.4	0	0	
	5	10	snd		0		0	0	0	
	5	10	snd		0		0	0	0	
	5	10	snd	elg	1		1.24	0	0	
	5	10	snd		0		0	0	0	
	5	11	snd		0		0	0	0	
	5	12	snd	hir	2		2.06	0	0	
	5	12	snd	lam	3		3.18	0	0	
	5	14	snd	elg	2		2.48	0	0	
	5	15	snd	hir	1		1.03	0	0	
	5	18	snd	lbk	1		0.86	0	0	
	5	18	snd	lbk	1		0.86	0	0	
	5	19	snd	lbk	1		0.86	0	0	
	5	20	snd	lbk	0		0	0	0	
	5	20	snd		0		0	0	0	
	5	21	snd		0		0	0	0	
	5	22	snd		0		0	0	0	
	5	22	snd	lbk	0		0	0	0	
	5	22	snd		0		0	0	0	
	5	22	snd	hir	0		0	0	0	
	5	23	snd	lbk	0		0	0	0	
	5	23	snd		0		0	0	0	
	5	23	snd	lam	0		0	0	0	
	5	24	snd	lam	2		2.12	0	0	
	5	24	snd	lam	0		0	0	0	
	5	24	snd	lam	15		15.9	0	0	
	5	24	snd	lam	20		21.2	0	0	
	5	24	snd	lam	0		0	0	0	visibility <1'
	5	25	cbl		0		0	0	0	
	5	25	cbl	lbk	2		1.72	0	0	
	5	26	cbl	lbk	5		4.3	0	0	
	5	26	cbl	lbk	0		0	0	0	
	5	27	cbl		0		0	0	0	
	5	27	cbl		0		0	0	0	
	5	28	cbl		0		0	0	0	
	5	28	cbl		0		0	0	0	
	5	30	snd		0		0	0	0	
	5	30	snd		0		0	0	0	

1994 HERRING SPAWN
SITKA SOUND



SITKA SOUND HERRING SPAWN DEPOSITION SURVEY 1994

DIVERS: Bill Davidson (BD), Bob DeJong (BDJ), Ed Grossman (EG), Bill Hughes (BH), Robert Larson (RL), Tim Minicucci (TM)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	BD EYE	BDJ EYE	RL EYE	TM CORRECTION	BD CORRECTION	BDJ CORRECTION	RL CORRECTION	COMMENTS
11-Apr-94	1	1518	1522	4	40	TM	BD	5	0	rck		70				74.2	0	0	0	
									5	rck		140			148.4	0	0	0		
									16	rck		80			63.6	0	0	0		
									27	rck		0			0	0	0	0		
									34	rck		0			0	0	0	0		
11-Apr-94	2	1527	1540	13	47	TM	BD	5	2	rck			30			0	31.8	0	0	
									11	rck			25			26.5	0	0		
									21	rck			50			53	0	0		
									29	rck			20			21.2	0	0		
									38	rck			0			0	0	0		
11-Apr-94	3	1320	1330	10	36	RL	EG	5	1	rck	fuc				0	0	0	0	0	
									4	rck	fir			15	0	0	0	15.9		
									9	cbl	red			20	0	0	0	21.2		
									14	cbl	lck			45	0	0	0	48.6		
									20	rck	lck			25	0	0	0	27		
11-Apr-94	4	1348	1355	7	35	RL	EG	5	4	rck	fuc			130	0	0	0	132.6		
									14	rck	lck			110	0	0	0	118.8		
									23	rck	lck			80	0	0	0	86.4		
									35	rck	lck			0	0	0	0	0		
11-Apr-94	5	1440	1452	12	32	BD	BDJ	5	0	bid			40			0	0	43.2	0	
									2	bid	fuc			50	0	0	57.5	0		
									5	rck	fuc			50	0	0	57.5	0		
									9	cbl	fir			17	0	0	18.36	0		
									12	cbl	red			30	0	0	32.4	0		
									13	snd	hir			15	0	0	15.45	0		
									20	snd	lck			2	0	0	1.9	0		
									32	snd	lck			4	0	0	3.8	0		
11-Apr-94	6	1410	1422	12	32	BD	BDJ	5	0	rck					0	0	0	0	0	
									2	rck	fuc			17	0	0	19.55	0		
									4	rck	fuc			1	0	0	1.15	0		
									7	rck	fuc			0	0	0	0	0		
									9	rck	fuc			5	0	0	5.75	0		
									9	mud	elg			25	0	0	25.25	0		
									9	mud	elg			40	0	0	40.4	0		
									9	mud	elg			20	0	0	20.2	0		
									9	mud	elg			25	0	0	25.25	0		
									9	mud	elg			2	0	0	2.02	0		
									9	mud	elg			5	0	0	5.05	0		
									10	mud	elg			1	0	0	1.01	0		
									10	mud				0	0	0	0	0		
									13	mud				0	0	0	0	0		
									19	mud				0	0	0	0	0		
25	rck				0	0	0	0	0											
32	mud	lck			0	0	0	0	0											
11-Apr-94	7	1153	1208	15	47	TM	BD	5	0	rck	fuc	12			0	13.68	0	0	0	
									8	rck	lck	100			0	85	0	0		
									16	rck		45			0	47.7	0	0		
									21	rck	lck	30			0	31.8	0	0		
									24	rck	lck	50			0	42.5	0	0		
									33	rck		7			0	7.42	0	0		
									43	snd	lck	3			0	3.18	0	0		
47	snd	lck	2			0	2.12	0	0											
11-Apr-94	8	1108	1122	14	37	TM	BD	5	1	rck	fuc	55		62.15	0	0	0	5m to mhw		

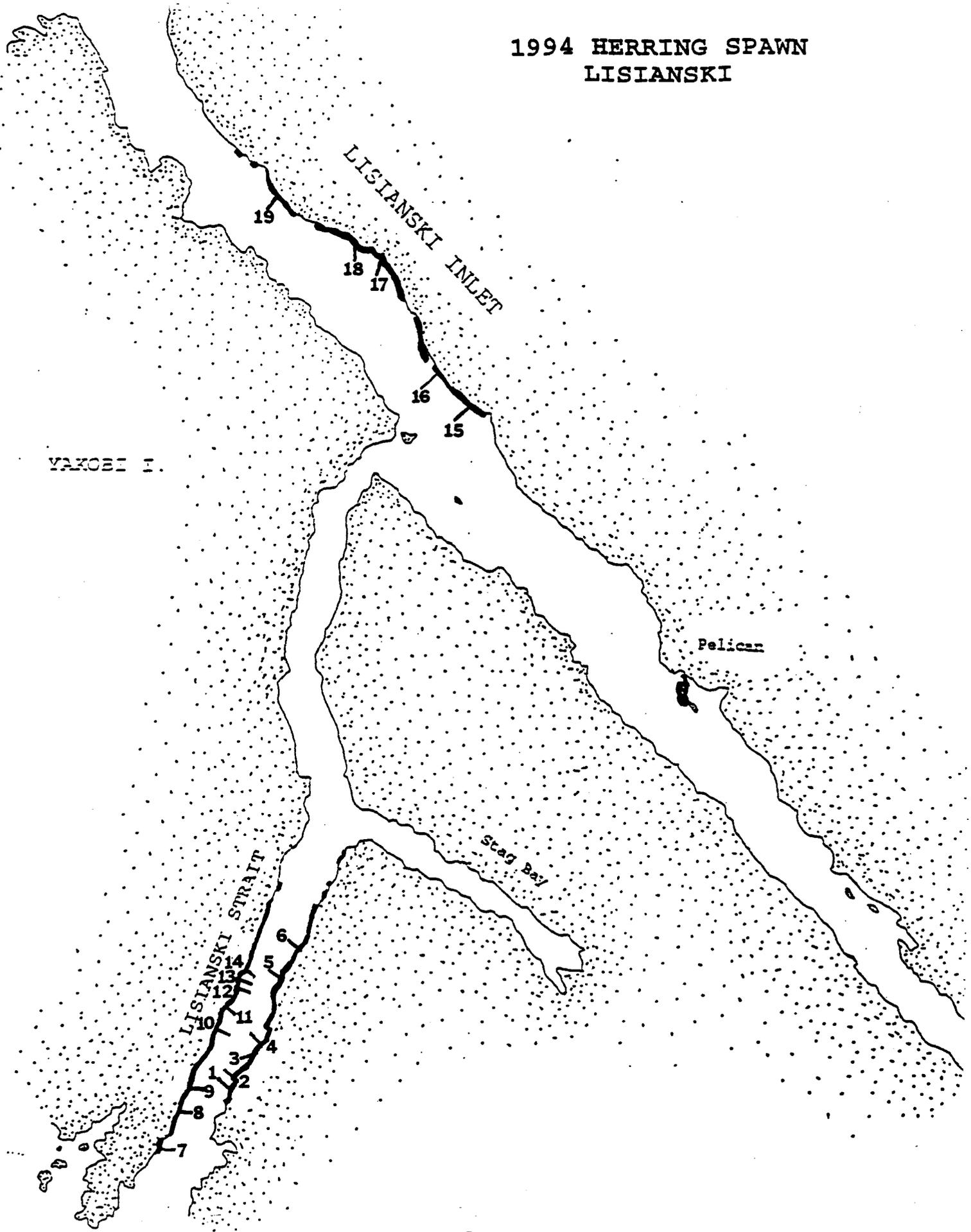
									19	rck		0	0	0	0	0	
									23	rck		0	0	0	0	0	
									31	cbl	shl	0	0	0	0	0	
11-Apr-94	15	1222	1226	4	22	TM	BD	5	0	rck	fuc	0	0	0	0	0	
									10	cbl	lbk	0	0	0	0	0	cuc present
									14	mud		0	0	0	0	0	
									16	mud		0	0	0	0	0	
									18	mud		0	0	0	0	0	
									19	mud		0	0	0	0	0	
									19	mud		0	0	0	0	0	
									20	mud		0	0	0	0	0	
									21	mud		0	0	0	0	0	
									22	mud		0	0	0	0	0	
8-Apr-94	16	1240	1250	10	40	BDJ	BD	5	3	rck		0	0	0	0	0	
									19	rck	lbk	0	0	0	0	0	
									29	rck	hir	0	0	0	0	0	
									35	rck		0	0	0	0	0	
									40	rck	lbk	0	0	0	0	0	poor visibility
9-Apr-94	17	1026	1043	17	26	RL	BH	5	7	rck	fir	120	0	0	0	127.2	
									9	rck	hir	25	0	0	0	30.5	
									10	snd	elg	150	0	0	0	154.5	
									11	snd	lbk	20	0	0	0	21.6	
									12	gvl	lbk	2	0	0	0	2.16	
									13	gvl	lbk	0	0	0	0	0	
									14	gvl	lbk	1	0	0	0	1.08	
									16	gvl	lbk	0	0	0	0	0	
									18	gvl	lbk	1	0	0	0	1.08	
									17	gvl	lbk	0	0	0	0	0	
									19	gvl	lbk	0	0	0	0	0	
									23	snd	lbk	0	0	0	0	0	
									26	gvl		0	0	0	0	0	
									26	gvl		0	0	0	0	0	
9-Apr-94	18	1101	1125	24	25	RL	BH	5	3	gvl		0	0	0	0	0	
									6	rck		50	0	0	0	53	
									7	rck	fuc	100	0	0	0	102	
									8	rck	fuc	120	0	0	0	122.4	
									8	rck	fuc	130	0	0	0	132.6	
									8	rck	elg	220	0	0	0	226.6	
									9	rck	los	40	0	0	0	42.4	
									9	rck	los	30	0	0	0	31.8	
									10	snd	elg	70	0	0	0	72.1	
									10	rck	lbk	20	0	0	0	21.6	
									11	snd	elg	110	0	0	0	113.3	
									11	rck	lbk	30	0	0	0	32.4	
									12	snd	elg	100	0	0	0	103	
									12	snd	elg	40	0	0	0	41.2	
									12	snd	elg	90	0	0	0	92.7	
									13	snd	elg	125	0	0	0	128.8	
									15	snd	elg	50	0	0	0	51.5	
									17	gvl	lbk	0	0	0	0	0	
									18	snd	hir	0	0	0	0	0	
									18	snd	lbk	0	0	0	0	0	
									18	snd		0	0	0	0	0	
									21	snd		0	0	0	0	0	
									22	snd	lbk	0	0	0	0	0	
									25	snd		0	0	0	0	0	
9-Apr-94	19	1144	1157	13	24	RL	BH	5	2	gvl	lbk	0	0	0	0	0	
									3	gvl	lbk	0	0	0	0	0	
									6	gvl	lbk	0	0	0	0	0	
									8	cbl	lbk	1	0	0	0	1.08	
									9	snd	elg	30	0	0	0	30.9	
									10	snd	elg	160	0	0	0	164.8	
									12	snd	elg	250	0	0	0	257.5	
									14	snd	elg	50	0	0	0	51.5	
									15	snd	elg	75	0	0	0	77.25	
									16	snd	elg	1	0	0	0	1.03	
									18	snd	elg	1	0	0	0	1.03	
									19	snd	elg	1	0	0	0	1.03	
									20	snd		0	0	0	0	0	

									19	snd								0	0	0	0	0
									20	snd	lbk							0	0	0	0	0
									21	snd								0	0	0	0	0
									22	snd								0	0	0	0	0
									23	snd								0	0	0	0	0
									24	snd								0	0	0	0	0
9-Apr-94	20	1214	1228	14	30	RL	BH	5	4	rck							0	0	0	0	0	
									6	cbl							0	0	0	0	0	
									7	cbl	fuc						65	0	0	0	66.3	
									9	cbl	elg						130	0	0	0	133.9	
									10	cbl	lbk						45	0	0	0	48.6	
									11	cbl							10	0	0	0	10.6	
									12	gvl	lbk						0	0	0	0	0	
									15	gvl	lbk						2	0	0	0	2.16	
									17	gvl	lbk						4	0	0	0	4.32	
									20	gvl	lbk						5	0	0	0	5.4	
									23	snd							0	0	0	0	0	
									26	snd							0	0	0	0	0	
									30	snd							0	0	0	0	0	
10-Apr-94	21	1116	1127	11	28	BD	BDJ	5	5	mud	fuc	1					0	1.14	0	0	0	
									6	mud	elg	0					0	0	0	0	0	
									6	mud		0					0	0	0	0	0	
									6	mud		0					0	0	0	0	0	
									7	mud		0					0	0	0	0	0	
									7	mud		0					0	0	0	0	0	
									12	mud	fuc	4					0	4.56	0	0	0	
									16	mud	fuc	4					0	4.56	0	0	0	
									28	mud		0					0	0	0	0	0	
10-Apr-94	22	1159	1205	6	40	BD	TM	5	13	rck	lbk	1					0.86	0	0	0	0	
									21	rck	lbk	0					0	0	0	0	0	
									28	mud	lbk	0					0	0	0	0	0	
									34	mud	lbk	0					0	0	0	0	0	
									40	mud		0					0	0	0	0	0	
10-Apr-94	23	1236	1245	9	35	RL	EG	5	3	cbl	fuc						0	0	0	0	0	
									8	cbl	fil						0	0	0	0	0	
									14	shl	elg						5	0	0	0	5.15	
									21	shl	lbk						0	0	0	0	0	
									26	shl	lbk						0	0	0	0	0	
									35	shl	lbk						0	0	0	0	0	
10-Apr-94	24	1215	1222	7	28	RL	EG	5	2	cbl	fuc						0	0	0	0	0	
									4	cbl	fuc						0	0	0	0	0	
									8	cbl	fil						0	0	0	0	0	
									12	snd	elg						15	0	0	0	15.45	
									21	snd	elg						0	0	0	0	0	
									28	mud							0	0	0	0	0	
10-Apr-94	25	1148	1156	8	31	RL	EG	5	5	rck	fuc						25	0	0	0	25.5	
									9	rck	fil						250	0	0	0	265	
									15	cbl	los						10	0	0	0	10.6	
									22	cbl	lbk						0	0	0	0	0	
									31	snd	lbk						0	0	0	0	0	
10-Apr-94	26	1112	1125	13	29	RL	EG	5	3	rck	fuc						30	0	0	0	30.6	
									7	rck	fuc						50	0	0	0	51	
									10	rck	lbk						20	0	0	0	21.6	
									18	rck	lbk						25	0	0	0	27	
									29	cbl	lbk						0	0	0	0	0	
9-Apr-94	27	1438	1449	11	40	TM	BD	5	8	snd	fuc	1					1.13	0	0	0	60 meters to 8' 0 cbl	
									10	snd	elg	10					12.4	0	0	0	0	
									12	snd	elg	7					8.68	0	0	0	0	
									17	mud	elg	0					0	0	0	0	0	
									24	mud	elg	0					0	0	0	0	0	
									30	mud		0					0	0	0	0	0	
									36	mud		0					0	0	0	0	0	
									40	mud		0					0	0	0	0	0	
9-Apr-94	28	1521	1529	8	36	BDJ	TM	5	0	rck	fuc						0	0	0	0	0	
									8	rck	hir						25	0	0	25.75	0	
									19	rck	lbk						50	0	0	47.5	0	
									26	cbl							1	0	0	1.08	0	
									30	snd							0	0	0	0	0	
									36	snd							0	0	0	0	0	

9-Apr-94	29	1700	1710	10	42	TM	EG	5	1	rck	fuc	15	16.95	0	0	0	5 m. to mhw
									8	rck	lck	25	21.5	0	0	0	
									14	rck	lck	5	4.3	0	0	0	
									20	rck		0	0	0	0	0	
									30	rck		0	0	0	0	0	
									35	rck	lck	1	0.86	0	0	0	
									40	rck		0	0	0	0	0	
									42	rck		0	0	0	0	0	
9-Apr-94	30	1637	1648	11	20	TM	EG	5	3	rck	hir	90	92.7	0	0	0	
									4	rck	lck	70	60.2	0	0	0	
									9	rck	lck	35	30.1	0	0	0	
									10	rck	lck	80	68.8	0	0	0	
									14	rck	lck	3	2.58	0	0	0	
									17	rck	lck	15	12.9	0	0	0	
									19	rck	lck	2	1.72	0	0	0	
									20	chl		0	0	0	0	0	20 m to 30' cbl/mud 0
9-Apr-94	31	1556	1615	19	35	RL	EG	5	2	rck	fil		30	0	0	0	31.8
									5	rck	fir		125	0	0	0	132.5
									13	rck			150	0	0	0	159
									17	rck	lck		65	0	0	0	70.2
									24	rck			30	0	0	0	31.8
									28	rck	los		20	0	0	0	21.2
									29	shl	los		1	0	0	0	1.06
									31	shl	los		3	0	0	0	3.18
									32	shl	los		4	0	0	0	4.24
									34	shl	lck		0	0	0	0	0
									34	shl			0	0	0	0	0
									35	shl			0	0	0	0	0
									35	shl			0	0	0	0	0
10-Apr-92	32	1006	1011	5	39	BD	TM	5	1	snd		0	0	0	0	0	
									2	snd		0	0	0	0	0	
									3	rck		90	0	95.4	0	0	
									4	snd	fir	30	0	31.8	0	0	
									6	snd	los	2	0	2.12	0	0	clams
									9	snd		0	0	0	0	0	clams
									15	snd	hir	0	0	0	0	0	clams
									21	snd	lck	0	0	0	0	0	cucumbers
									31	snd		0	0	0	0	0	
									39	snd		0	0	0	0	0	
10-Apr-92	33	1025	1038	13	46	BD	TM	5	6	rck	lck	3	2.58	0	0	0	5 m to mhw
									7	rck		0	0	0	0	0	
									9	rck	lck	0	0	0	0	0	
									13	rck		0	0	0	0	0	
									19	rck		0	0	0	0	0	
									21	rck	lck	3	2.58	0	0	0	
									23	rck	lck	1	0.86	0	0	0	
									25	rck		1	1.06	0	0	0	
									28	rck	lck	18	15.48	0	0	0	
									31	rck	lck	1	0.86	0	0	0	
									35	rck	lck	5	4.3	0	0	0	
									36	rck	lck	25	21.5	0	0	0	
									42	rck	lck	100	86	0	0	0	
									46	rck		0	0	0	0	0	
9-Apr-94	34	1336	1350	14	49	TM	EG	5	3	rck	fuc	30	33.9	0	0	0	
									10	rck	lck	100	86	0	0	0	
									11	rck	lck	140	120.4	0	0	0	
									15	rck	lck	110	94.6	0	0	0	
									21	rck	lck	50	43	0	0	0	
									26	rck	lck	80	68.8	0	0	0	
									32	rck	lck	90	77.4	0	0	0	
									38	snd	lck	15	12.9	0	0	0	
									45	snd	lck	2	1.72	0	0	0	
									49	snd	lck	2	1.72	0	0	0	
9-Apr-94	35	1452	1510	18	44	RL	EG	5	3	rck	fuc		40	0	0	0	40.8
									9	rck	fil		100	0	0	0	106
									16	rck			140	0	0	0	148.4
									26	rck	agm		30	0	0	0	32.4
									33	rck	agm		1	0	0	0	1.08
									37	shl	agm		20	0	0	0	21.6

							44	shl		0	0	0	0	0	0
9-Apr-94	36	1158	1212	14	38	BDJ	BDJ	5	0	rck		0	0	0	0
							6	rck	fuc	35	0	0	40.25	0	0
							12	rck	lbk	100	0	0	95	0	0
							13	rck	lbk	80	0	0	76	0	0
							17	rck	lbk	60	0	0	57	0	0
							20	snd	lbk	60	0	0	57	0	0
							24	snd	lbk	22	0	0	20.9	0	0
							27	snd	lbk	5	0	0	4.75	0	0
							32	cbl	lbk	25	0	0	23.75	0	0
							34	mud	lbk	4	0	0	3.8	0	0
							37	gvl		0	0	0	0	0	0
							38	gvl		0	0	0	0	0	0
															cucumbers
9-Apr-94	37	1126	1137	11	8	BDJ	BD	5	0	bld		0	0	0	0
							2	cbl	fuc	5	0	5.7	0	0	0
							5	cbl	ulv	0	0	0	0	0	0
							8	snd	ulv	0	0	0	0	0	0
							7	mud	elg	1	0	1.05	0	0	0
							8	mud	elg	3	0	3.15	0	0	0
							8	shl		0	0	0	0	0	0
							8	mud	elg	0	0	0	0	0	0
8-Apr-94	38	1314	1338	24	37	BDJ	BD	5	3	cbl		0	0	0	0
							5	rck	fuc	100	0	0	115	0	0
							7	snd	hir	35	0	0	36.05	0	0
							9	rck	hir	60	0	0	61.8	0	0
							11	cbl	lbk	35	0	0	33.25	0	0
							11	rck	lbk	55	0	0	52.25	0	0
							12	rck		10	0	0	10.8	0	0
							12	rck	lbk	5	0	0	4.75	0	0
							13	rck	lbk	20	0	0	19	0	0
							14	snd		260	0	0	280.8	0	0
							14	snd	cri	3	0	0	3.24	0	0
							15	gvl	hir	90	0	0	82.4	0	0
							17	snd	hir	50	0	0	51.5	0	0
							18	snd	lbk	2	0	0	1.9	0	0
							20	snd	hir	10	0	0	10.3	0	0
							22	snd	lbk	1	0	0	0.95	0	0
							25	snd		0	0	0	0	0	0
							26	snd		0	0	0	0	0	0
							29	snd		0	0	0	0	0	0
							30	snd		0	0	0	0	0	0
							34	snd	shl	0	0	0	0	0	0
							37	snd	shl	0	0	0	0	0	0
9-Apr-94	39	1015	1045	30	44	BDJ	BD	5	0	rck		0	0	0	0
							11	rck		0	0	0	0	0	0
							14	rck	lbk	1	0	0.85	0	0	0
							14	rck	lbk	3	0	2.55	0	0	0
							15	bld	lbk	4	0	3.4	0	0	0
							17	bld	lbk	40	0	34	0	0	0
							18	snd	lbk	2	0	1.7	0	0	0
							19	snd	lbk	12	0	10.2	0	0	0
							20	snd	lbk	30	0	25.5	0	0	0
							21	snd	lbk	45	0	38.25	0	0	0
							22	bld	lbk	3	0	2.55	0	0	0
							23	snd	lbk	6	0	5.1	0	0	0
							25	snd	lbk	8	0	6.8	0	0	0
							26	rck	lbk	10	0	8.5	0	0	0
							27	rck		50	0	53	0	0	0
							29	rck		3	0	3.18	0	0	0
							30	gvl	lbk	2	0	1.7	0	0	0
							31	snd		0	0	0	0	0	0
							33	rck	lbk	45	0	38.25	0	0	0
							36	snd	lbk	8	0	6.8	0	0	0
							37	snd	lbk	50	0	42.5	0	0	0
							39	snd	lbk	15	0	12.75	0	0	0
							42	snd	lbk	13	0	11.05	0	0	0
							43	snd	lbk	3	0	2.55	0	0	0
							44	snd	lbk	0	0	0	0	0	0

1994 HERRING SPAWN
LISIANSKI



LISIANSKI INLET AND STRAIT HERRING SPAWN DEPOSITION SURVEY 1994

Divers: Tim Minicucci(TM), Robert Larson(RL), Will Bergmann(WB), Bob DeJong(BDJ)

DATE	TRANSECT #	TIME IN	TIME OUT	TOTAL TIME	MAX DEPTH	DIVER #1	DIVER #2	INCREMENT (Meters)	DEPTH (Feet)	BOTTOM TYPE	VEGETATION	TM EYE	RL EYE	WB EYE	BDJ EYE	TM CORRECTION	RL CORRECTION	WB CORRECTION	BDJ CORRECTION	COMMENTS							
1-May-94	1	1627	1633	6	27	RL	BDJ	5	0	rck	fuc					0	0	0	0	0							
									8	rck	bk							4	0	0	0	0	3.8				
									13	rck	hir								3	0	0	0	0	3.1			
									19	shl	bk								5	0	0	0	0	4.8			
									23	shl									0	0	0	0	0	0	0		
1-May-94	2	1632	1638	6	36	TM	WB	5	27	shl						0	0	0	0	0	no cucs or urchins						
									0	rck	fuc	0															
									11	rck	bk	1								0.9	0	0	0	0	0		
									26	rck	bk	0									0	0	0	0	0		
									36	rck	bk	0									0	0	0	0	0	no cucs or urchins	
1-May-94	3	1646	1651	5	28	RL	BDJ	5	0	rck						0	2.1	0	0	0							
									7	rck	red	2	30							0	32	0	0	0			
									8	rck	bk		65								0	70	0	0	0		
									9	rck	bk		12								0	13	0	0	0		
									10	rck	hir		400								0	488	0	0	0		
									11	shl	bk		10								0	11	0	0	0		
									12	shl	hir		350								0	427	0	0	0		
									12	shl	bk		2								0	2.2	0	0	0		
									14	shl	hir		450								0	549	0	0	0		
									16	shl	bk		0								0	0	0	0	0		
									18	shl	bk		0								0	0	0	0	0	0	
									22	rck	bk		1								0	1.1	0	0	0	0	
									1-May-94	4	1649	1656	7	35	TM	WB	5	28	rck	hir	0				0	0	0
6	rck	fil																			1	0	0	1	0		
16	rck																				0	0	0	0	0	4 meter band of 20K	
25	rck	agm																			2	0	0	1.7	0		
35	rck	bk																			0	0	0	0	0	0	no cucs or urchins
1-May-94	5	1708	1718	10	35	RL	BDJ	5	0	rck	fuc					0	0	0	0	0							
									1	rck																	
									2	rck	fir											50	0	0	0	54	
									8	rck	red											35	0	0	0	38	
									9	rck	red											30	0	0	0	32	
									12	rck	bk											15	0	0	0	14	
									15	rck	hir											20	0	0	0	21	
									16	snd	bk											0	0	0	0	0	
									20	cbi	bk											0	0	0	0	0	
									24	cbi	bk											2	0	0	0	1.9	
									28	rck	bk											0	0	0	0	0	
									32	cbi	bk											1	0	0	0	1	
									35	cbi	bk											0	0	0	0	0	no invertebrates
1-May-94	6	1708	1714	6	35	TM	WB	5	0	rck	fuc	0				0	0	0	0	0							
									7	rck	fir	90									95	0	0	0	0		
									15	rck	bk	15										13	0	0	0	0	
									25	snd	bk	0											0	0	0	0	
									35	snd	bk	0											0	0	0	0	
1-May-94	7	1733	1740	7	29	RL	BDJ	5	0	rck						0	0	0	0	0							
									8	rck	mac											4	0	0	0	4.3	
									13	rck	bk											0	0	0	0	0	
									20	rck	bk											0	0	0	0	0	
									29	rck	bk											0	0	0	0	0	no invertebrates
2-May-94	8	913	920	7	41	RL	BDJ	5	0	rck						0	0	0	0	0							
									7	rck	fir											18	0	0	0	19	
									10	rck	red											20	0	0	0	22	
									20	rck	bk											20	0	0	0	19	
									27	rck	bk											30	0	0	0	29	
									34	rck	bk									50			0	54	0	0	
41	snd	bk												0	0	0	0	no invertebrates									

2-May-94	9	926	934	8	41	RL	BDJ	5	0	rck	fuc	7	0	7.1	0	0		
									6	rck	red	50	0	53	0	0		
									11	rck	lck	1	0	1.1	0	0		
									17	rck	agm	45	0	49	0	0		
									27	rck	agm	20	0	22	0	0		
									35	rck	agm	6	0	6.5	0	0		
2-May-94	10	942	951	9	43	RL	BDJ	5	44	rck	agm	4	0	4.3	0	0	no invertebrates	
									0	rck	fuc		25	0	0	0	29	
									6	rck	red		35	0	0	0	38	
									9	rck	lck		0	0	0	0	0	
									11	snd	lck		1	0	0	0	1	
									15	snd	lck		0	0	0	0	0	
									19	snd	lck		3	0	0	0	2.9	
									24	snd	lck		1	0	0	0	1	
									27	snd	hir		10	0	0	0	10	
									30	snd	red		4	0	0	0	4.3	
2-May-94	11	933	943	10	44	TM	WB	5	33	cbl	lck	2	0	0	0	1.9		
									37	cbl	lck	7	0	0	0	6.7		
									39	cbl		0	0	0	0	0		
									43	cbl		0	0	0	0	0	no invertebrates	
									0	rck		0	0	0	0	0		
									3	rck	fir	30	32	0	0	0		
									9	rck	lck	5	4.3	0	0	0		
									13	rck	hir	80	82	0	0	0		
									20	snd	lck	7	6	0	0	0		
									25	snd	lck	25	22	0	0	0		
1-May-94	12	1744	1754	10	36	TM	WB	5	32	rck	lck	30	26	0	0	0		
									42	cbl	lck	10	8.6	0	0	0		
									44	rck	lck	0	0	0	0	0	cucs, abs, urchins=0	
									1	rck	fuc	30	34	0	0	0		
									6	rck	fil	35	37	0	0	0		
									13	rck	fil	8	8.5	0	0	0		
									13	rck	hir	15	15	0	0	0		
									16	rck	lck	2	1.7	0	0	0		
									19	rck	lck	45	39	0	0	0		
									27	snd	lck	1	0.9	0	0	0		
2-May-94	13	915	924	9	35	TM	WB	5	31	snd	los	5	5.3	0	0	0	cucs, abs, urchins=0	
									36	snd	los	1	1.1	0	0	0		
									-1	rck	fuc		50	0	0	62	0	
									7	rck	fir		180	0	0	180	0	
									12	rck	lck		40	0	0	34	0	
									17	rck	lck		70	0	0	60	0	
									25	snd	lck		3	0	0	2.6	0	
									31	snd			0	0	0	0	0	
									35	snd			0	0	0	0	0	
									1-May-94	14	1725	1734	9	34	TM	WB	5	0
6	rck	hir	45	0	0	54	0											
13	shl	lck	1	0	0	0.9	0											
16	shl	agm	20	0	0	17	0											
22	shl	hir	18	0	0	21	0											
27	shl	lck	6	0	0	5.2	0											
34	shl		0	0	0	0	0											
2-May-94	15	1142	1149	7	39	RL	BDJ	5	-10	gvl	fuc	3	0	0	3.7	0	cucs, abs, urchins=0	
-8	gvl	fuc	25	0	0	31	0											
-6	gvl	fuc	10	0	0	12	0											
1	cbl	fuc	15	0	0	18	0											
4	cbl	lck	9	0	9.7	0	0											
9	cbl	lck	0	0	0	0	0											
24	cbl		0	0	0	0	0											
39	cbl		0	0	0	0	0											
2-May-94	16	1156	1204	8	41	RL	BDJ	5	-8	rck	fuc	0	0	0	0	0	a few small cucs	
-5	rck	fuc	90	102	0	0	0											
0	rck	fuc	30	34	0	0	0											
2	rck	lck		0	0	0	0											
5	rck	lck		0	0	0	0											
10	rck	lck		0	0	0	0											
14	cbl	lck		0	0	0	0											
18	cbl	lck		0	0	0	0											
23	snd	lck		0	0	0	0											
28	blid	lck		0	0	0	0											

									35	bid	lbk								0	0	0	0	0	
									41	snd	lbk								0	0	0	0	0	cucs, small scallops
2-May-94	17	1216	1227	11	27	RL	BDJ	5	-5	cbl								0	0	0	0	0		
									-3	cbl		0							0	0	0	0	0	
									-1	cbl		0							0	0	0	0	0	
									0	cbl									0	0	0	0	0	
									1	cbl	lbk								0	0	0	0	0	
									3	cbl	hir								3	0	0	0	0	3.1
									4	snd	lbk								2	0	0	0	0	1.9
									5	snd	hir								180	0	0	0	0	185
									6	snd	hir								120	0	0	0	0	124
									7	snd	lbk								10	0	0	0	0	9.5
									8	snd	hir								100	0	0	0	0	103
									10	snd	lbk								4	0	0	0	0	3.8
									13	gvl	lbk								0	0	0	0	0	
									17	cbl	lbk								0	0	0	0	0	
									22	gvl									0	0	0	0	0	
									27	gvl									0	0	0	0	0	
2-May-94	18	1246	1253	7	25	TM	WB	5	-3	cbl	fuc							0	0	0	0	0		
									0	cbl	fuc								0	0	0	0	0	
									2	gvl	lbk								0	0	0	0	0	
									5	gvl	lbk								0	0	0	0	0	
									8	gvl	lbk								0	0	0	0	0	
									10	gvl	lbk								0	0	0	0	0	
									12	gvl	lbk								0	0	0	0	0	
									16	gvl	lbk								0	0	0	0	0	
									21	gvl	lbk								0	0	0	0	0	
									25	gvl	lbk								0	0	0	0	0	gr. urchins 20/meter no abs no cucs
2-May-94	19	1305	1315	10	32	TM	RL	5	-6	cbl	fuc							22	0	0	27	0		
									-2	cbl	fuc								65	0	0	80	0	
									2	cbl	fuc								0	0	0	0	0	
									5	cbl	hir	90							0	0	110	0	0	
									9	cbl	hir	15							0	0	18	0	0	
									11	cbl	hir	8							0	0	9.8	0	0	
									13	cbl	lbk	0							0	0	0	0	0	
									14	cbl	lbk	0							0	0	0	0	0	
									15	cbl	lbk	0							0	0	0	0	0	
									17	rck	lbk	0							0	0	0	0	0	
									22	rck	agm	0							0	0	0	0	0	
									27	cbl	agm	0							0	0	0	0	0	
									32	rck	agm	0							0	0	0	0	0	severe otter predation

APPENDIX C

Aerial/skiff herring spawning ground surveys, 1994

1994 AERIAL-SKIFF HERRING SURVEYS

ANNETTE ISLAND/CAT ISLAND/KAH SHAKES

- 3-10 15 sea lions around Quadra Pt. Two sea lions N of Slate Is. No activity around Cat Is.
- 3-16 5 sea lions S of Quadra Pt. Birds W of Cat Is. Annette Is., 1 sea lion.
- 3-21 6 sea lions S of Quadra Pt. No activity around Cat Is. Annette Is., no activity.
- 3-24 Two schools N of Slate Is. School S of Quadra Pt. No activity around Cat Is.
- 3-27 4 sea lions N of Kah Shakes Pt., 3 sea lions and birds W of Kah Shakes. No activity at Cat Is. Annette Is., no activity.
- 3-30 16 sea lions N of Dog Is., 12 sea lions N of Village Is., 10 sea lions N of Fripo Is. Annette Is., 4 sea lions N of Crab Bay.
- 3-31 26 sea lions in Dog Bay, 18 sea lions E of Double Is., 5 sea lions N of Cat Is.
- 4-01 No activity at Kah Shakes. 16 sea lions around Grave Pt., 4 sea lions E of Duck Is., 25 sea lions and fish N of Double Is., 32 sea lions around Dog Bay. Annette Is., no activity
- 4-03 No activity at Kah Shakes. 15 sea lions W of Edge Pt., 12 sea lions E of Cat Is., 20 sea lions W of Dog Is., 41 sea lions W of Village Is.. Annette Is., no activity.
- 4-04 Spot **spawn** N of Dog Is., SW of Cat Is., and S of Double Is.. 3 sea lions N of Duck Is., 40 sea lions N of Village Is., 8 sea lions N of Double Is., 10 N of Fripo Is., and 6 W of Cat Is. Annette Is., 4 sea lions N of Crab Bay.
- 4-05 **Spawn** on S end of Village Is. Old **spawn** N of Duke Pt. Herring in Dog Bay, and S of Village Is. Sea lions E of Cat Is., SW of Cat Is., and S of Village Is. Annette Is., herring S of Kwain Bay, herring N of Crab Bay, spot **spawn** N of Crab Bay. Indians are fishing.
- 4-06 Spot **spawn** E of Cat Is. and NW of Mary Is. 20 sea lions N of Cat Is., 33 sea lions E of Cat Is. and 3 sea lions in Dog Bay. Birds N of Duck Is. Annette Is.: **spawn** in N end of Kwain Bay, **spawn** N of Crab Bay.
- 4-06 **Spawn** on E side of Cat Is., and N end of Fripo Is. Schools of fish E and S of Cat Is., schools E of Double and Village Is. Fish in N end of Pond Bay and NW of Dog Is. Annette Is.: **spawn** in N and SW end of Kwain Bay, **spawn** N of Crab Bay (about 2 miles).
- 4-07 Spot **spawn** on E and W sides of Cat Is. **Spawn** on Grave Pt., spot **spawn** on NW tip of Mary Is. Sea lions S of Double Is., N of Village Is., W and N of Cat Is.. Annette Is.: **spawn** in N Kwain Bay, **spawn** N of Crab Bay.
- 4-07 **Spawn** E and W of Cat Is., three areas of spot **spawns** on N end of Double Is., **spawn** on Grave Pt., **spawn** S of Duck Is.. Fish seen on N and S ends of Cat Is., schools seen on NW side of Annette Is., schools seen around Double Is.. Annette Is.: About a mile of **spawn** N of Crab Bay, spot **spawn** N end of Kwain Bay.
- 4-08 **Spawn** on E and W side of Cat Is., a small spot **spawn** on the N tip of Cat Is., around Fripo Is., N of Duck Is., in Reef Harbor, and N of Double Is..

Annette Is.: Three areas of spot **spawn** N of Crab Bay.

- 4-08 **Spawn** on E and W side of Cat Is., N of Fripo Is., N end of Duck Is., E of Double Is., E of Grave Pt. Herring seen SE of Cat Is.
- 4-08 **Spawn** E and W of Cat Is., E of Double Is., E of Duck Is., S end of Reef Harbor, W of Grave Pt., NE of Mary Is. Many sea lions.
- 4-09 **Spawn** around Cat Is., Fripo Is., Village Is., Double Is., Reef Harbor, Grave Pt., and Duck Is.
- 4-09 **Spawn** around Cat Is., Fripo Is., Village Is., Double Is., N of Dog Is., Duck Is., and around Flag Pt.
- 4-09 **Spawn** all around Cat Is., Fripo Is., Village Is., Double Is., Grave Pt., top part of Dog Is., Duck Is., and N of Flag Pt. Two schools of fish seen around Flag Pt.
- 4-11 **Spawn** N of Flag Pt., **spawn** SW of Grave Pt., **spawn** S, W, and N of Cat Is.
- 4-11 25 sea lions E of Cat Is.
- 4-15 Birds SW of Double Is. Birds around Cat Is. Six sea lions W of Kirk Pt. Annette Is.: Birds N of Crab Bay.
- 4-25 Feeding birds. Light **spawn** E of Metlakatla.
- Total spawn observed, Cat and Duke Is.: 12.6 nautical miles

WEST BEHM CANAL

- 4-5 Approximately 40 schools of herring from Joe Is. to Survey Pt. and Tatoosh Is. Fish leading the beach with numerous schools in the deeper water. Approximately 20 to 30 sea lions in the area with good bird activity. Schools in the Tatoosh area (approx. 20) in very shallow water. A major spawn should occur very soon. No spawn observed on this survey. Most herring ever seen in W Behm by Minicucci. Visual est. is approx. 4,000 to 5,000 tons.
- 4-6 40 schools, no active spawn. Schools of herring on E side of Vallenar Pt., at Pt. Higgins, in Clover Passage from Knudson Cove to Joe Is., on S side of Betton Is., on N end of Back and Betton Is., and around Tatoosh Is. Schools of herring from N of Bond Bay to Smugglers Cove. 12 sea lions S of Smugglers Cove, 6 sea lions W of Caamano Pt., and 12 sea lions in Tatoosh Is.
- 4-7 Schools of herring from N of Knudson Cove to Stack Is., 1 SW side of Grant Is., 3 W side of Back Is., several across N end of Betton Is. and around Tatoosh Is., and from Bond Bay to Mike Pt. No active spawn.
- 4-8 Schools of herring S of Smugglers Cove, 10 schools in Helm Bay, a school S of Mike Pt., schools from Raymond Cove to Pt. Francis, schools from Moser Is. to N of Settlers Cove, 10 schools NE side of Betton Is. and 3 schools in middle of Tatoosh Is.
- 4-11 No schools of herring, no activity.
- 4-12 Very windy, no schools of herring observed. No activity.
- 4-15 In Tongass Narrows, 14 sea lions S of Pt. Higgins, and 6 sea lions above. On the W side, Bond Bay had the only activity. In Bond Bay, there were 20 sea lions and two separate groups of birds along the shore.

- 4-17 Sea lion activity observed earlier in the N portion of Tongass Narrows no longer evident. A good size school of herring on the SE side of Betton Is. A second very small school of herring observed on the SW side of Grant Is. On the W side, 8 sea lions at Helm Pt., 20 sea lions and bird activity at Bond Bay, and 3 sea lions E of Caamano Pt. On the NE side of Betton Is., 5 sea lions were observed.
- 4-18 Observed herring on the SW side of Grant Is. and a small ball of herring on E side of Stack Is. Along W side, observed 39 sea lions from Smugglers Cove to Caamano Pt., with the majority being from Bond Bay to Smugglers Cove. 9 sea lions on the N side of Tatoosh Is.
- 4-19 On E side of Pup Is., 3 sea lions observed. Scattered flocks of birds seen through Clover Passage, no schools of herring observed. On W side, increased bird activity observed with several rafts of scooters near Raymond Cove, in Helm Bay, and N end of Bond Bay. Also 13 sea lions observed (5 off Smugglers Cove and 8 E of Caamano Pt.) On W side of Betton Is., 5 sea lions observed and 8 sea lions on N end of Tatoosh Is. Increased bird activity also observed on N side of Tatoosh Is.
- 4-20 Activity still mainly on the W side. 22 sea lions observed between Raymond Cove and Caamano Pt. (1 sea lion E of Caamano Pt., 3 sea lions S end of Bond Bay, 8 sea lions S of Smugglers Cove, 5 sea lions N of Smugglers Cove, 4 sea lions inside Helm Pt. and 1 sea lion outside Raymond Cove. Gulls and scooters were seen on Mike Pt. and N end of the outermost island in Helm Bay. Gulls seen S of Smugglers Cove and in Bond Bay, and S of Bond Bay. On E side, 1 sea lion inside Tatoosh Is., 8 sea lions on NE side of Betton Is., 1 sea lion on N end of Betton Is., and 7 sea lions on W side of Clover Is. No schools of herring observed in W Behm Canal.
- 4-21 Observed 3 sea lions on N side of Pup Is., 2 sea lions on NW side of Tatoosh Rocks, and 4 sea lions inside (E side) Stack Is. Birds seen on S and E sides of Betton Is. and on NW side of Tatoosh Is. Appeared less fishy on E side of Canal than previously. On W side of the canal, majority of sea lion activity was from the S end of Bond Bay to Caamano Pt. (21 sea lions). 4 sea lions from N of Bond Bay to Smugglers Cove. Birds seen in Bond Bay, N entrance of Smugglers Cove, the outer island in Helm Bay, Mike Pt., the point on E side of Raymond Cove and at Pt. Francis.
- 4-22 Minor sea lion activity N of Pt. Higgins, also near Knudson Cove, and on SE side of Betton Is. On W side, birds seen S of Pt. Francis, 1 sea lion N of Raymond Cove, scooters at Mike Pt., 9 sea lions at N entrance of Smugglers Cove, 1 sea lion N of Bond Bay, 9 sea lions and scooters on N end of Bond Bay, 5 sea lions at Caamano Pt. On W side of Betton Is., 2 sea lions observed and birds on NW side of Tatoosh Rocks. Spot **spawn** in the deep NE of rock NE of Tatoosh Is. Birds on NE side of Betton Is., scooters on N end of Back Is. and between Back Is. and Betton Is. near reefs.
- 4-23 Sea lions and birds on main island shore N of Settlers Cove. Light spot **spawn** N of Settlers Cove. School of herring on S end of Moser Is. 3 schools of herring and 1 whale NE of Grant Is. 1 school of herring seen at Pt. Francis, 1 sea lion at Helm Pt., 1 school herring on N side of Helm Bay, 9 sea lions S of Smugglers Cove. Active **spawn** S of Smugglers Cove. Birds and 3 sea lions on N end of Bond Bay. 23 sea lions near Caamano Pt. 2 schools of herring on W side of Tatoosh Is. Active **spawn** in middle of Tatoosh Is. 4 schools of herring, 20 sea lions and birds on N side of Tatoosh Is. Small active **spawn** on N end of Betton Is. 4 sea lions on N side of Betton Is. Birds on S end of Back Is. and N end of Hump Is. 3 sea lions N side of Clover Is.
- 4-24 3 schools of herring and birds seen N of Knudson Cove. Active **spawn** N of

Settlers Cove and inside of Joe Is. on main island shore. Birds and scooters at Mike Pt. Birds on NW end of outer island in Helm Bay. 5 sea lions S of Smugglers Cove. Active **spawn** in two locations S of Smugglers Cove and also in S end of Bond Bay. 7 sea lions N end of Bond Bay and 7 sea lions E of Caamano Pt. Active **spawn** in middle and on W and N side of Tatoosh Is., active spot **spawns** on NW end of Betton Is. Birds S of Back Is.; school of herring on N end of Betton Is. and on SE side of Betton Is.

- 4-25 2 sea lions S of Smugglers Cove; 10 sea lions E of Bond Bay; 7 sea lions on W side of Betton Is. Active **spawn** in middle and on N shore of Tatoosh Is. and across the N shore of Betton Is. 3 schools of herring N of Settlers Cove. 1 school of herring N of Knudson Cove.
- 4-26 Birds N of Settlers Cove. 1 school of herring on main island shore E of Joe Is. Birds in Raymond Cove. Porpoises at Helm Pt. Scooters and porpoises S of Smugglers Cove. Scooters along shore in middle of Bond Bay. Small active **spawn** in S end of Bond Bay, active spot **spawn** on S end of Tatoosh Is., old **spawn** in middle of Tatoosh Is. Birds on N end of Tatoosh Is. 1 school of herring on NW side of Betton Is. Active **spawn** on N end and also on E side of Betton Is. 1 school of herring on W side of Hump Is. and 6 schools of herring on SE side of Betton Is.
- 4-27 No active spawn seen, minor sea lion activity. Birds on old spawn. No schools of herring observed.
- 4-30 2 schools of herring were observed N of Point Higgins. No active spawn observed. No other activity in the area observed.

Total spawn observed West Behm: 7.7 nautical miles

KASAAN

- 4-04 15 sea lions E of Sandy Pt. Herring S of Sandy Pt.
- 4-05 **Spawn** from Sandy Pt. S. Several schools off Sandy Pt. 16 schools from Sandy Pt. to Kasaan village.
- Spawn** from Sandy Pt. S. Schools all around Sandy Pt. and up into Karta Bay. Schools of fish off Baker Pt., Kasaan village, and W of Kasaan village. About 70 schools of fish.
- 4-07 **Spawn** W of Kasaan village and starting at Sandy Pt. S (about 3 miles). Spot **spawn** in Karta Bay. Schools of fish off spawn.
- 4-08 **Spawn** W of Kasaan village and on Sandy Pt. Schools of fish N and S of Sandy Pt.
- 4-12 No activity.

Total spawn observed Kasaan Inlet: 4.5 nautical miles

McFARLAND ISLANDS

- 4-15 No activity.

CRAIG

- 3-10 No activity.
- 3-13 Small school of herring off Sugar Pt.

- 3-14 No activity.
- 3-22 Small schools of fish W of Fish Egg Is. Small amount of fish N of Alberto Is. Fish N of San Juan Bautista.
- 3-23 Light **spawn** on N end of Fish Egg Is. Birds SW of Fish Egg Is.
- 2-24 54 sea lions and birds N of Fish Egg Is. 15 sea lions and birds E of Cole Is. 8 sea lions N of Klawock Reef. 9 sea lions W of San Juan Bautista. Fish S of Abbess Is.
- 3-25 Herring S of Entrance Pt. Fish S of Klawock Reef.
- 3-27 4 sea lions W of San Juan Bautista. 6 sea lions N of Klawock Reef. 114 sea lions S of the Ballena Is.
- 3-30 Birds off Sugar Pt. 60 sea lions S of Wadleigh Is. 9 sea lions around Cole Is. 60 sea lions N of Klawock Reef. 160 sea lions and schools of fish in Klawock Inlet.
- 3-31 Herring off Survey Pt. 45 sea lions S of Wadleigh Is. Herring N of Klawock Reef. Herring and sea lions in Klawock Inlet.
- 4-02 100 sea lions S of Clam Is.
- 4-02 Herring S of Clam Is.
- 4-03 Birds, seals and sea lions S of Fish Egg Is.
- 4-03 100 yards of **spawn** on E Ballena Is.
- 4-04 **Spawn** on S end of E Ballena Is. Spot **spawn** on W Ballena Is. Spot **spawn** S of Wadleigh Is. Spot **spawn** on NE side of Portillo Channel. 210 sea lions S of Fish Egg Is. 50 sea lions S of Clam Is. Herring N of Clam Is. 7 schools of herring around Pt. Ildefonso. 40 sea lions N of Cole Is.
- 4-05 **Spawn** around S end of E Ballena Is. 120 sea lions S and W of Fish Egg Is.
- 4-06 117 sea lions and birds S of Fish Egg Is. and around Ballena Is. Herring N of Entrance Pt. Herring inside Alberto Is. (where the pounds were).
- 4-06 **Spawn** on reef SW of Fish Egg Is.
- 4-07 **Spawn** on W side of Fish Egg Is. Herring around Ballena Is.
- 4-08 **Spawn** around Ballena Is., **spawn** S, W, and N of Fish Egg Is. **Spawn** on SW side of Wadleigh Is. and on Wadleigh Rocks.
- 4-09 **Spawn** S of Craig, around Ballena Is., on W, N, and S side of Fish Egg Is., E of Wadleigh Rocks, and N of Wadleigh Rocks on E Alberto Is.
- 4-11 Skiff survey. Eggs seen N of Cape Suspiro. **Spawn** on E Alberto Is., on W of Wadleigh Is. N of Alberto Is.
- 4-12 30 sea lions S of Abbess Is. **Spawn** on W Wadleigh Is. N of Alberto Is.
- 4-15 Birds around Ballena Is. 6 sea lions at Wadleigh Is.
- Total spawn observed Craig area: 8.0 nautical miles

SEA OTTER SOUND

- 4-15 No activity. 1 school of herring S of Marble Is.

AFFLECK CANAL

5-03 No spawn, 10 tons near head of canal; 200 sea otters.
5-05 No spawn, 50 tons near head of canal; 2 sea lions.
5-07 No activity.
5-10 No activity.

Total spawn: None observed.

PORT BEAUCLERC

5-03 No spawn, 5 tons near head of bay.
5-05 No activity.
5-07 No spawn, 20 tons in several schools near head of bay.
5-10 No activity.

Total spawn: None observed.

REID BAY

5-01 No activity.
5-03 No spawn, no fish; 2 whales.
5-05 No activity.
5-07 No activity.
5-10 No activity.

NO NAME BAY

5-01 No activity.
5-03 No spawn, 2 large schools at mouth of bay.
5-05 No spawn, schools leading beach.
5-07 Spot **spawn**, schools leading beach.
5-10 Active **spawn**; 0.5 n. miles, no schools.

Total spawn observed: 0.5 n. miles

ALVIN BAY

5-01 No activity.
5-03 No activity.
5-07 No activity.
5-10 No activity.

THREEMILE ARM

4-24 No activity.
4-30 No activity.
5-01 No activity.
5-03 Active **spawn**; Spot at head of bay.
5-05 No activity.
5-07 No activity.
5-10 Active **spawn**; 0.1 n. miles at E side of bay.
5-16 No activity.

ERNEST SOUND

4-15 No spawn or fish; 35 sea lions at Vixen.

- 4-18 No spawn; 2 schools in Union; 67 sea lions at Vixen.
4-20 No spawn; 1 school in Vixen; 42 sea lions at Vixen.

Ketchikan personnel flew Vixen and Union Bay (via Spacious Bay where no activity was observed). In Vixen sizable school of herring was being worked by several sea lions. 32 sea lions; Vixen Inlet. No herring; 10 sea lions in Union Bay.

- 4-22 No spawn; 5 schools in Vixen; 79 sea lions.
4-24 **Milt**; 0.7 n. miles.
4-25 **Milt**; 1.2 miles old, light; 12 schools on beach.
4-26 Active **spawn**; 1.5 n. miles.
4-27 Active **spawn**; spot.
4-28 No spawn or fish.
5-05 Skiff survey; 3.1 n. miles added.

Total spawn observed: 8.4 n. miles

ZIMOVIA STRAIT

- 4-15 No activity.
4-18 No spawn; 2 schools on beach at Pats Cr.
4-22 No spawn; 3 large and 2 small schools on beach at Pat's Cr.
4-24 Old **milt**; 0.4 n. miles (probably from 4/23).
4-25 No activity.

Total spawn observed: 0.4 n. miles

TEBENKOF BAY

- 5-03 No spawn; 10 tons in 2 schools in Elena Bay.
5-12 No spawn; 1 school (pre-spawning) at mouth of Creek #24 in Petrof Bay.

Total spawn: None observed.

BAY OF PILLARS

- 5-03 No activity.

ROWAN BAY

- 5-03 No activity.

PYBUS BAY

- 4-29 No spawn; 90 tons in 3 schools.
5-01 No spawn; 40 tons in 15 schools.
5-02 No spawn; 35 tons in 6 schools.
5-07 No spawn; several schools in Main Arm.
5-10 No spawn; several schools in Main Arm.
5-14 No spawn; fish leading beach in Main Arm.
5-16 Light **spawn** in Cannery Cove, may be clam spawn; schools all around Cove.

Total spawn: .25 n. miles.

PORT CAMDEN

- 4-24 No spawn; 5 schools; 1 sea lions.
4-26 Active **spawn**; 0.5 n. miles at mouth of Kadake Bay. 5 schools.

- 4-27 Old milt; 0.2 n. miles N of Kadake Bay.
- 4-28 No fish; 25 tons in 3 schools.
- 5-10 No spawn; small balls of fish near S end.
- 5-16 No spawn; 2 small balls on E shore. Large schools of small fish at "The Neck".

Total spawn observed: 0.7 n. miles (all at Kadake Bay)

FARRAGUT BAY

- 4-18 No spawn; 13 schools in Francis and Main Arm; 31 sea lions.
- 4-20 No spawn; 12 schools moved slightly W; 13 sea lions.
- 4-22 No spawn; 9 schools leading beach N of Flock Rk.; 5 sea lions.
- 4-22 No fish leading beach, 23 sea lions.
- 4-24 Active spawn; 0.1 n. miles (1-1.5 mi. reported by 7 p.m.)
- 4-25 No spawn (old milt at mouth of N Arm.
- 4-26 Skiff survey. Light layers of eggs on both shores of N Arm, probably deposited on April 24.
- 4-28 No activity.
- 4-29 No spawn; 105 tons in 6 schools in S Arm.
- 5-10 No spawn or fish.
- 5-16 No spawn; schools toward Bay Pt.

Total spawn observed: 1.6 nautical miles

HOBART BAY

- 4-18 No fish or spawn; 51 sea lions.
- 4-20 No fish or spawn; 110 sea lions.
- 4-22 No fish or spawn; 101 sea lions.
- 4-24 No fish or spawn; 66 sea lions.
- 4-25 5 large schools; 2 areas of light milt. 0.2 n. miles; 65 sea lions, 3 whales.
- 4-26 No spawn; 37+ schools, approximately 500 tons.
- 4-27 Active spawn. 0.2 n. miles of milt at Pt. Hobart.
- 4-28 Spot spawn on S shore, approximately 0.5 n. miles at Pt. Hobart.
- 4-29 Active spawn. 1.2 n. miles, 4 schools, approximately 20 tons.
- 4-30 Active spawn. Approximately 1.9 n. miles.
- 5-01 No activity.
- 5-02 No activity.
- 5-07 Skiff survey at low tide; unmarked areas with spawn observed SCUBA survey; 5 transects; 1,494K eggs counted, 2.8 n. miles
- 5-10 No spawn; 1 large school on beach NW of Entrance Is.
- 5-12 No fish or spawn; 19,000 scoters; 11 sea lions.
- 5-14 No fish or spawn; 16,000 scoters; 13 sea lions.

Total spawn observed: 2.8 n. miles

PORT HOUGHTON

- 4-18 No spawn, 1 school W of Bluffs; 45 sea lions.
- 4-20 No spawn, 2 schools at Little Lagoon, 12 sea lions.
- 4-22 No fish or spawn; 34 sea lions.
- 4-24 Active spawn; spot; no schools; 10 sea lions.
- 4-25 Active spawn; 1.3 n. miles, numerous schools N shore.
- 4-26 Active spawn; 2.5 n. miles (light spawn), lots of fish at Pt. Hobart.
- 4-27 No spawn. 3 large stringers on beach.
- 4-28 Active spawn; 2.2 n. miles, no fish observed.
- 4-29 Old milt; 250 tons in 11 schools (150 tons above Narrows).
- 4-30 Old milt; 90 tons in 13 schools (30 tons above Narrows).
- 5-01 No spawn; 185 tons in 14 schools (150 tons above Narrows).

- 5-08 Skiff survey; added 0.3 n. miles of eggs. SCUBA survey; 9 transects, 2,273 eggs counted, 4.2 n. miles total eggs.
- 5-10 No spawn; 15,000 scoters, 8,200 gulls,; 4 large schools E of Bluffs.
- 5-12 No spawn; 8,000 gulls; 4 large schools E of Bluffs; 1 whale; 4 sea lions.
- 5-14 No spawn; 7 schools E of Bluffs (probably not spawning fish).
- 5-16 No spawn; 4 very large schools of small fish S of Walter Is.

Total spawn observed: 4.2 nautical miles

SEYMOUR CANAL

- 4-21 First survey of Seymour Canal, no fish seen.
- 4-23 First fish seen, 3 schools between Black Jack and Pt. Hugh. Three pods of sea lions located at Sore Thumb, Swimming Pool, and by Pt. Hugh. 4 whales along Twin Islands and 1 at Pt. Hugh.
- 4-25 First fish on beach. Cast net sample taken on the beach in Sore Finger Cove. Roe percentage was 13.7%, sex ratio was 50/50; none of the fish were immature.
- 4-26 Skiff survey. Continuous herring from Pt. Hugh to Black Jack Cove with skiff fathometer in shallows.
- 4-27 First **spawn** S of Sore Finger. Fish on beach from Black Jack to Pt. Hugh. Gillnet sample from the spawn. Average weight 150 grams. Roe percentage was 16.7%. Sample below Black Jack on non-spawning fish was 11.4%.
- 4-28 Gillnet sample below Black Jack and the Swimming Pool. Roe % and average weights were 14.85%, 113-122 grams, and 15.8%, 129-132 grams. Both samples were predominantly females. Small spot **spawn** beginning by Swimming Pool in evening.
- 4-29 Spot **spawn** by Swimming Pool and beginning S of the District 10/11 Marker. At 9:15 a.m. the fishery was announced to open at 11:30 a.m. An announcement was made to close the fishery at 1:30 p.m. with nets out of the water by 2:30 p.m. The last hail from the processors came at 8:50 p.m. with a total catch of 382 tons.
- 4-30 Skiff survey. No additional spawn today.
- 5/1 Small fish on the beach from Black Jack to Pt. Hugh. No spawn observed.
- 5/2 Small fish on the beach from Black Jack to Pt. Hugh. No spawn observed.
- 5/3 Small fish on the beach from Black Jack to Pt. Hugh. No spawn observed.
- 5/4 Small fish on the beach from Black Jack to Pt. Hugh. No spawn observed.
- 5/5 Small fish on the beach from Black Jack to Pt. Hugh. No spawn observed.
- 5-6 No spawn seen, saw a school of large fish in the Rock Garden. Small fish on the beach below Black Jack to Pt. Hugh. Sea lions concentrated just N of Black Jack, the Rock Garden, and Pt. Hugh. Whales seen off shore of Sore Finger and one below Black Jack.
- 5-7 No spawn.
- 5-8 Spawn on S shore of Black Jack Cove. Schools of unknown maturity N of Black Jack to Rock Garden. Many sea lions spread throughout the area from Sore Finger to Pt. Hugh.
- 5-9 No spawn.

- 5-10 No spawn.
- 5-11 Skiff survey during low tide of the shoreline above Sore Finger Cove in the evening, no additional spawn was observed.
- 5-12 Intertidal skiff survey. Only 25 yards of old spawn was observed near Black Jack, otherwise skiff observations matched previous spawn mapped by aerial surveying. Eleven transects completed on 2.2 miles of spawn, a transect every .25 miles. Spawn deposition was very light and some hatching noticed.
- 5-13 Aerial and skiff survey. Active **spawn** along the south shore of Mole Harbor. 1 mile of active **spawn** by Pt. Hugh. Fish on beach from #9 rock to Pt. Hugh. One quarter mile of active **spawn** observed below Twin Is. and one mile of active **spawn** seen by Pt. Hugh.
- 5-14 1.5 miles of continuous **spawn** along the Rock Garden (sample taken) and another 2 miles of intermittent active **spawn** from Twin Is. to the Swimming Pool.
- 5-15 Active **spawn** inside Sore Thumb, below Rock Garden and very light residual **spawn** noted by the Swimming Pool. All signs of yesterday's spawn by the Rock Garden had dissipated.
- 5-16 Four small areas of active **spawn** totalling about .5 mile from the head of Sore Thumb Cove to the Stone Wall. 25 yards of light **spawn** seen along the N shore of Mole Harbor.
- 5-17 Two small spot **spawns** along Stone Wall and above Sore Thumb.
- 5-18 No **spawn**.
- 5-19 No **spawn**. 111 schools of small herring were observed along the W shore of Glass Peninsula, and 14 schools of small herring were counted on the E shore. Total miles of **spawn** noted from April 27 to April 29 is 2.4 nautical miles.
- 5/20-21 Staff mapped an additional 8.9 nautical miles of spawn, in addition to the 2.2 nautical miles mapped during the previous Sundance survey. Eighteen transects were made with varying densities. Many schools of 1 year old herring were still around.

Total spawn = 11.1 nautical miles

GAMBIER BAY

- 4-29 No spawn; 100 tons N Chock Is.
- 5-01 No spawn; 700 tons in 9 schools.
- 5-02 No spawn; 430 tons in 20 schools.
- 5-03 No spawn; 230 tons in 20 schools; small fish (1 year-old herring captured).
- 5-07 No spawn; stringers N and S shores.
- 5-10 No spawn; 1000 tons leading N and S shores.
- 5-12 No spawn; 500 tons leading N and S shores.
- 5-14 No spawn; more schools on S shore.
- 5-16 No spawn; more schools, probably mostly immature fish.
- 5-19 Skiff survey; no milt or eggs, no birds on beach; 1 year-old herring captured.

Total spawn: None observed.

TAKU HARBOR

- 5-5 Two small spot **spawns** south of the dock that might account for 1/4 mile. Too windy to go into bay to look for fish.
- 5-6 Four small schools leading the beach on the north shore; appears more spawn may be coming.
- 5-7 Three schools in harbor as yesterday, plus five more north of Pt. Graves. No spawn seen.

Total spawn: 0.25 Nautical miles

OLIVERS INLET

- 4-21 through 5-6 (12 flights) No fish or spawn observed.
 - 5-7 First fish observed. Herring schools in middle and along W shore of inlet.
 - 5-8 More fish moved in and schools are starting to string along head of inlet.
 - 5-9 Herring appearing on outside of outlet stream and boiling on the surface to the N side. Fish on S side of shore, inside Olivers, staying away from mud.
 - 5-10 Fish observed, but no spawn.
 - 5/11-14 (3 flights) Fish observed in and out of Oliver's Inlet, but no spawn observed.
 - 5-15 1.5 nautical miles of light **spawn** observed on the outside of Oliver's Inlet between Falls Creek to Stink Creek. Twelve schools of herring still inside Olivers Inlet.
 - 5-16 Seventeen schools of herring inside Olivers Inlet, and 4 schools outside along the northern beach. No additional spawn. Spawn from previous day was not noticeable, and scooters, birds and sea lions were absent.
 - 5-17 Eight schools outside, 3 schools inside. No spawn.
 - 5-18 One school in Greens Cove on the outside, 3 small schools on the inside.
 - 5-19 Two small schools inside, nothing on the outside. No additional spawn.
- Total spawn: 1.5 nautical miles

TENAKEE INLET

- 4-20 No fish observed. Sea lions observed in Corner Bay (3), Trap Bay (20) and along South Passage Pt. (8).
- 4-22 No fish observed. Sea lion pods located by Corner Pt. and South Passage Pt. Two whales by South Passage Pt.
- 4-24 Light **spawn** observed by Crab Bay Pt. with seals and birds in area. No herring observed anywhere in Tenakee Inlet. Sea lions were observed at Corner Pt. and west of Trap Bay. No whales.
- 4-26 Mid-tide, excellent visibility. Landed and verified spawn at Crab Pt. Lots of birds between Crab and Saltery Bay indicating spawn may have extended inside the inlet (check later at low tide). One large school of herring between East Pt. and Don's Creek, and another smaller school observed in Corner Bay.

Total spawn: .25 Nautical miles of spawn

SITKA

- 3-16 No sign of life to indicate any herring in the area.
- 3-17 Skiff survey Eastern Channel to Nakwasina Sound with sounder on the 28' whaler; no herring seen.
- 3-19 From Nakwasina to Burunof, no herring or herring predators seen.
- 3-21 Northend - sea lions near Halibut Pt., Cove and mouth of Nakwasina Sound and off Sea Mart.
Southend - Herring flipping on the surface and a whale feeding in Aleutkina Bay. Few sea lions in Dorothy Narrows.
- 3-22 Northend - looks very quiet; sea lions disappeared.
Southend - big changes in Eastern Channel; large concentration of sea lions and gulls and 4 whales. Several pods of sea lions in Aleutkina Bay.
- 3-23 Northend - no change. Very quiet.
Southend - no change. Large concentration of gulls and sea lions in Eastern Channel. Fewer sea lions in SamSing/Aleutkina area.
Skiff survey - fish are moving out of Eastern Channel.
- 3-24 Northend - very quiet, few sea lions off Cove.
Southend - considerably less birds in Eastern Channel. Large pod of sea lions off Cape Burunof.
Skiff survey - north to south, nothing seen.
- 3-25 Southend - one whale and large pod (150) sea lions off Cape Burunof.
Northend - Continues to be very quiet. Few sea lions off Old Sitka Rocks.
- 3-26 Northend - very foggy. No activity.
Southend - big change. Many large pods of sea lions have moved into Eastern Channel toward Silver Bay. Whales and birds have also moved into this area.
First **spawn** of the season in Leesofskaia Bay (1/2 - 1 mile). First fish on the beach. Several large schools observed in the shallows here also.

R/V Sundance surveyed south including Aleutkina/SamSing Cove and Eastern Channel. Very little seen during survey; appears that fish have moved out again.
- 3-27 Northend - no change, still very quiet.
Southend - much less predator activity in Eastern Channel and Aleutkina Bay than seen yesterday. Spawn in Leesofskaia Bay has completely dissipated. No spawn seen anywhere. Large concentration of sea lions in Camp Coogan.
- 3-28 Southend - approximately 1/4 miles of active **spawn** outside Sandy Cove. Several large schools seen in Sandy Cove and Aleutkina Bay in the shallows. Large concentration of sea lions in Camp Coogan. Nothing seen between 3 Entrance Bay and Goddard.
Northend - First fish on the beach on north. Approximately 2 miles of fish heavily schooled up shallow at Halibut Pt., all mostly around Middle Is., Crow Is. and Kasiana Is. Large concentrations of gulls in Parker Is. Sundance survey north reported scattered schools on the surface in the Sitka Channel (moving north from Eastern Channel) and off Halibut Pt.
- 3-29 Southend - active **spawn** on Indian River Flats and Leesofskaia and Aleutkina Bay. Lots of fish up shallow in bight in Aleutkina; nothing seen W of Sandy Cove to SamSing.
Northend - major **spawn** from Watson Pt. to Halibut Pt. and around Kasiana

Is. Spot **spawn** at the head of Katlian Bay, Big Gavanski and around Middle Is. Sundance reported no schools were seen deep and only small schools in the shallows in the northend. Fish heavily banded at Halibut Pt. and throughout Katlian Bay.

3-30 Southend - major spawning from bridge to Dangel's Is. Spot **spawns** in Jamestown Bay to Entrance Pt. Several large schools in Silver Bay. Large pods of sea lions in Camp Coogan, spot **spawn** in Leesofskaia Bay, lots of fish in the bay. Major **spawn** in Aleutkina Bay. Several 30 to 100 tons schools along the beach in Deep Inlet. Nothing seen south of Cape Burunof to Goddard.

4 miles of spawn south to date.

Northend - major **spawn** along HPR from Thompsen Harbor to Halibut Pt., around Middle, Kasiana Is., and Whiting Harbor.

14 miles of spawn north to date.

Katlian looks bleak; Sundance reported very little fish. Fish heavily banded in the shallow from Lisianski Pt. to Dog Pt. Many large schools and ribbons up toward the head of Nakwasina Sound, mostly above Allan Pt. and in the pass. Some schools at the head of Nakwasina Passage.

Southend - a lot less fish seen in Deep Inlet this afternoon compared to this morning when several large schools were seen. Solid thick band in Leesofskaia and Aleutkina Bays to Silver Pt. Fish have moved out of Silver Bay.

3-31 Northend - major spawn in Katlian Bay, Kasiana Is., Whiting Harbor. **Spawn** along road system but is beginning to disappear; a lot of herring still at the head of Nakwasina Sound.

Southend - major **spawn** from bridge through Jamestown Bay and Thimbleberry Bay to Entrance Pt., Aleutkina Bay and Deep Bay.

4-1 Southend - major **spawn** in Aleutkina Bay and Deep Inlet, nothing W of Sandy Cove yet. Spawning has subsided between bridge and Entrance Pt.

Northend - Spawning almost done in the northend. Some **spawn**, 2 miles, in Nakwasina and Signaka Is. No herring seen in Nakwasina.

Approximately 50 miles of spawn; 30 north and 20 south.

4-2 Southend - good **spawning** in Sandy Cove and Deep Bay. Some spots in Aleutkina. Nothing in Goddard or Redoubt.

Northend - few spot **spawns** in Nakwasina Sound, Signaka Is. and west Middle Is.; other than that the spawn on northend is done. Nothing seen in Salisbury Sound.

4-3 Bill Burgess flew and reported only about 1/4 miles of **spawn**.

4-4 Three spots north for 1/2 mile of active **spawn** in Katlian and Nakwasina.

4-5 To West Crawfish. No herring or spawn.

4-7 Flew south to Whale Bay, Crawfish, mouth of Necker. Fifty to sixty sea gulls at Dorothy Narrows otherwise nothing in small and great arms of Whale, nothing at mouth of Necker. One hundred sea otters at Viesokoi Rock.

4-11 Flew Goddard and reported no spawn and only a few sea lions.

4-16 Five small spot **spawns** in Goddard area.

4-17 **Spawn** in Goddard completely dissipated.

Total spawn: 58.1 n. miles

HOONAH SOUND

- 4-11 No herring seen.
- 4-15 No herring or spawn; two groups of sea lions at Rodgers Pt. and Emmons Is. Spit.
- 4-17 No fish or spawn but lots of sea lions and two whales in the area.
- 4-19 No spawn or herring seen but lots of sea lions. Fishermen still reporting schools in the deep between Fick Cove and Vixen Is.
- 4-21 First **spawn** in Hoonah Sound for one half mile east of Finger River. Many large schools on NE side of Emmons Is. and between Fick Cove and Rodgers Pt.
- 4-22 One half mile of **spawn** on outside of Emmons Is. Fish heavily leading between Fick Cove and Rodgers Pt. and outside of Emmons Is.
- 4-23 Good **spawning** outside of Emmons Is. and portions of Vixen Is., between Fick Cove and Rodgers Pt., inside of Emmons Is. and east of Finger River. Major **spawning** later in the day along the shoreline from Fick Cove Is. to a large alluvial fan across from Vixen Is.
- 4-24 **Spawn** is about completely done except for one quarter mile of light **spawn** at Rodgers Pt. Fishermen reported that there are no herring left in the area.
- 4-25 No herring or spawn.
- 4-26 No spawn.
- Total spawn: 9 n. miles in Hoonah Sound.

LISIANSKI INLET

- 4-19 Spot **spawn** at Pelican Creek and near Lost Cove in the Straits. No herring seen. Sea lions throughout Strait (30) and between Pelican and Junction to Strait along NE shore of Inlet; possible old **spawn** on east of Miner Is.
- 4-21 No herring or spawn in the Inlet but lots of birds between Pelican and Junction Is. Two small spot **spawns** one mile W of Stag Bay. One fairly large school in the shallows near mining dock. Good numbers of sea lions throughout the Straits.
- 4-22 No survey.
- 4-23 No spawn in the Inlet. One half mile **spawn** in Straits near Lost Cove.
- 4-24 Light **spawn** for approximately 1.5 miles N of Nose Head. Some schools in area and Sunny Cove. Fish leading approximately 2 miles S of Column Pt.
- 4-25 One quarter mile active **spawn** in front of Pelican. No other spawn observed or herring seen in the Inlet or Straits.
- 4-26 No herring or spawn seen.
- 5-1 Skiff survey at low tide to document missed spawn. Added 5 miles of light **spawn**.
- Total spawn: 9.85 miles. (5.7 Straits; 4.15 Inlet)

PORT FREDERICK

- 4-20 One school in Boat Harbor, another on outside of Long Is. Four whales working on several schools near shore in Salt Lake Bay inside narrows.
- 4-22 Five nice schools by Midway Is., three whales in Salt Lake. One large school on beach on the inside.
- 4-24 Three whales and lots of birds in Salt Lake Bay, no herring seen. Twelve nice schools from log boom in 8 Fathom Bight.
- 4-26 Small schools at 8 Fathom Bight, no whales seen although lots of birds. Six larger schools from Seagull Creek to Game Creek.
- Total spawn: None observed

LOWER LYNN CANAL

- 4-20 Herring in balls along the Breadline (3), Rockwall (1), and south of Sawmill Creek (3). Sea lions: Breadline (2), West Tours dock (3), Berners Bay (60), mouth of Berner's River (50), and along St. Mary's shore (40).
- 4-21 Herring and sea lions still scattered. Small schools located in Tee Harbor (1), Breadline (1), south of BSA camp (3), south of Sawmill (2). Sea lions distributed below Bridget Pt. (5), S of Sawmill (6), N of Sawmill (70), in front of Berner's River (15), and along St. Mary's (10). New herring appeared to moving N around Pt. Lena.
- 4-22 Fish still scattered from Auke Bay to Berners Bay, but the majority of schools were observed N (6) and S (18) of Sawmill Creek. All fish were off-shore with nothing visible in the shallows. Thirteen sea lions were seen between Mab Is. to Bridget Pt.
- 4-23 More fish showing up inside Benjamin Is. (8) and below Sunset Cove (12). Clam spawn observed N of the Shrine.
- 4-24 20 sea lions observed at Pt. St. Mary's
- 4-25 Small spot **spawn** in Admiralty Cove, W side of island, and opposite shore, E shore at mouth of creek. Seventeen schools of small herring observed in Stephens Passage and scattered from Breadline to Amalga Harbor. Sea lions along Pt. Bridget and Reefs (16), St. Mary (10), and north of Mab Is. (8).
- 4-26 Twenty small schools (small fish) between Coghlan to Lena Pt., and 50 schools from Lena Pt. to the Shrine. Schools of larger fish distributed in lower densities from Sunshine Cove to Mab Is. and inside Berners Bay.
- 4-27 Small balls of fish in the area appear to be grouping up. Larger but fewer schools of herring in the same area as yesterday. Spawning may occur later today or tomorrow at the N end of Mab Is.; lots of birds and sea lions in the Pt. Bridget area.
- 4-28 Spawn in Pt. Bridget area. Must have spawned on April 27.
- 4-29 Berner's Bay herring concentrated from Sawmill Creek to Berner's Bay flats. Over 100 sea lions in the area plus one whale.
- 4-30 Herring still off shore, along the Breadline (10) and along rock wall inside Benjamin Is. (9). Fish on the beach from Bridget Cove to Pt. Bridget and along Sawmill shoreline.

- 5-1 Small spot **spawn** N of Sawmill Creek, otherwise fish still scattered from Breadline to Berner's Bay, but largest schools are on the beach from Echo Cove to Sawmill Creek. Fifty sea lions, and 300 seals observed at Berner's River mouth feeding on the eulachon at the river mouth.
- 5-2 Over one mile of **spawn** on beach above Sawmill Cove in Berner's Bay. (sample taken). Another light **spawn** off Berner's Reef.
- 5-3 Many scattered off shore schools of fish still located between Auke Bay and Bridget Cove. Schools on beach along Berner's Reef and on Sawmill shoreline with **spawn** continuing above Sawmill Creek. Spawning occurred over a mile of beach covering the same area as observed on May 2 plus another 100 yards farther south.
- 5-4 Number of small herring schools increasing in the general Juneau area. Hundreds of balls of herring between Auke Cove and Berner's Bay, many are believed to be small herring of the year (0+). Herring schools which appear to be close to spawning were located on the beach from Echo Cove to Sawmill Creek. Spawning expanded N of Sawmill Creek for 3.5 miles, including same areas spawning occurred on May 2 and 3 (sample taken).
- 5-5 Approximately 3 miles of **spawn** continues in same area above Sawmill Creek to USFS cabin. Schools of herring seen inside Benjamin Is., inside Bridget Cove, and N of Mab Is.
- 5-6 Approximately one mile of new **spawn** observed S of Sawmill Creek with additional fish leading the beach.
- 5-7 Fish on beach below Sawmill Creek with 25 yards of very light **spawn**. Water above Sawmill is completely glacial with very poor visibility. No sea lions or eagles along Sawmill shoreline, but 70 sea lions were on Benjamin Is. rookery. Small fish very prevalent inside Benjamin and below Indian Cove.
- 5-8 Survey conditions poor. 25 m.p.h. northerly; waters very rough. Another small spot of light **spawn** observed below Sawmill Creek in Berner's Bay. Considered diving on spawn this year to assess spawning biomass. It does not appear that a threshold of 10 million is possible with the density and length of this year's spawn.

Total spawn: 4.3 n. miles.

HOOD BAY, IDAHO INLET, AND PORT ALTHORP Not surveyed.

YAKUTAT

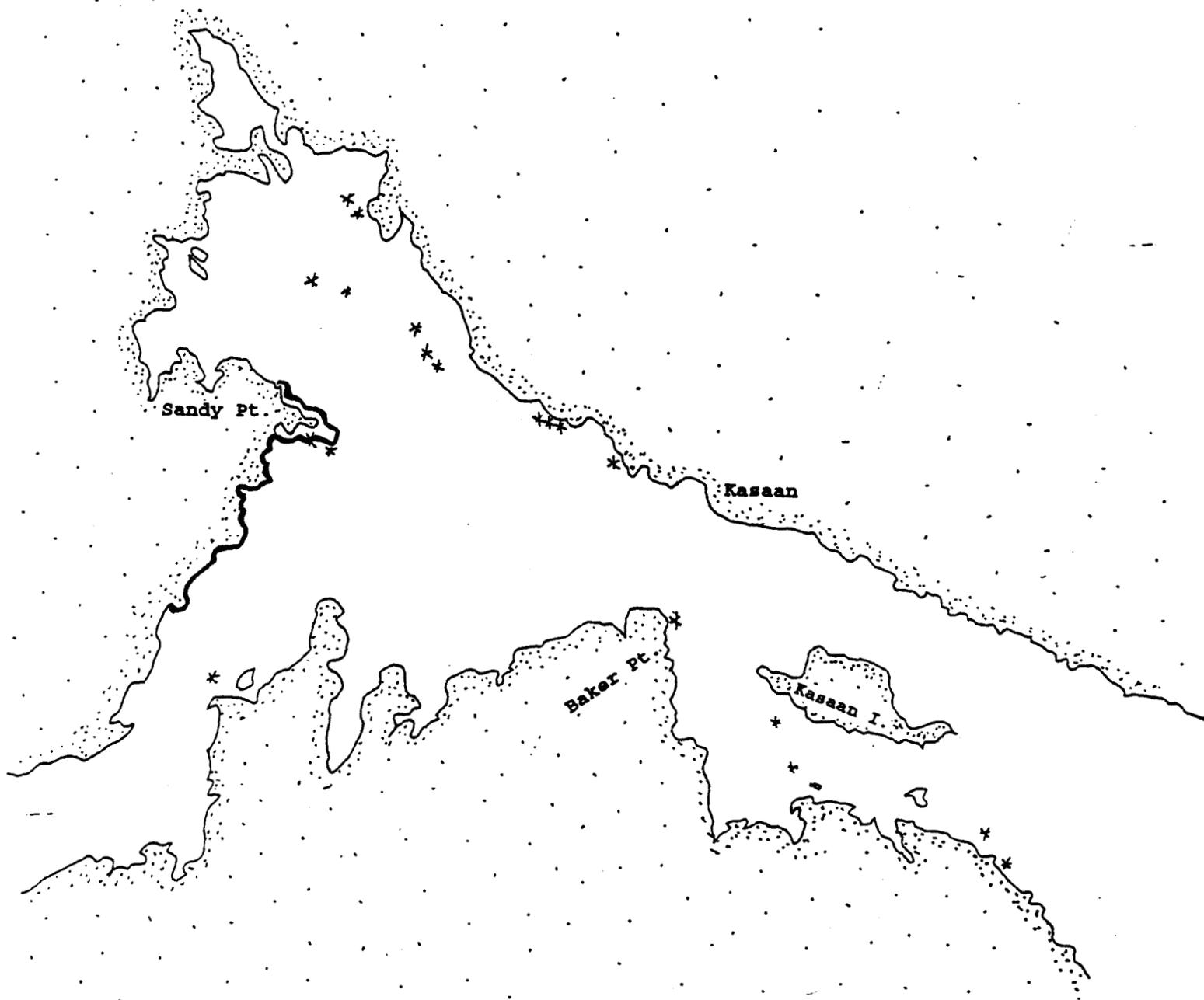
- 04-07 Chicago Harbor to Monti Bay: Small schools of small herring seen at Chicago Harbor. Small school seen at entrance to Puget Cove. No other signs seen.
- 04-19 Chicago Harbor to Monti Bay. No spawn seen. One school, approximately 10 tons, was seen near "Broken Oar Cove". One school, approximately 10 tons, was seen at "Chicago Harbor". One school, approximately 3 tons total, was seen at "Shaws Cove".
- 04-19 Boat survey on April 19 (Chicago Harbor to Monti Bay). Gravid samples collected at "Chicago Harbor". No signs of spawning.
- 04-21 Chicago Harbor to Monti Bay. One school, approximately 5 tons total, seen in the vicinity of "Broken Oar Cove". Two schools (approximately 10 tons each) seen at "Chicago Harbor". No signs of spawning.

- 04-26 Boat survey Chicago Harbor to Monti Bay. No signs of spawning.
- 04-28 Russell Fiord to Monti Bay. No sign in Yakutat Bay although lots of birds in "Chicago Harbor". One school, approximately 25 tons total, at "Shelter Cove". Two schools, approximately 7 tons each, near "Ahduck Bay". One 7-ton school near "Dolgoi Is.". Two schools, approximately 3 and 5 tons, near "Johnstone Passage". Three schools, approximately 3 to 5 tons each, in "Shaws Cove". Two schools, approximately 10 tons each, in Chicago Harbor.
- 04-29 Boat survey, Chicago Harbor to Monti Bay. No signs of spawning.
- 05-02 Russell Fiord to Monti Bay. One school seen at "Redfield Cove", approximately 20 tons. Two schools, approximately 5 tons each, seen near "Broken Oar Cove". One 10-ton school seen at "Shaws Cove". One 10-ton school seen near "Shipyard Cove". One 15-ton school seen at "Chicago Harbor". One 3-ton school and approximately 150 yards of spawn seen in Russell Fiord.
- 05-03 Boat survey, Chicago Harbor to Monti Bay. Approximately 100 yards of spawn near "Shaws Cove".
- 05-04 Russell Fiord to Monti Bay. Approximately 225 yards of spawning at "Hatchet Pass". One 5-ton school seen near "Broken Oar Cove". One 7-ton school seen near "Chicago Harbor".
- 05-07 Chicago Harbor to Monti Bay. Approximately 100 yards of spawning at "Eleanor Cove".
- 05-10 Boat survey, Chicago Harbor to Monti Bay. No spawn nor herring observed.

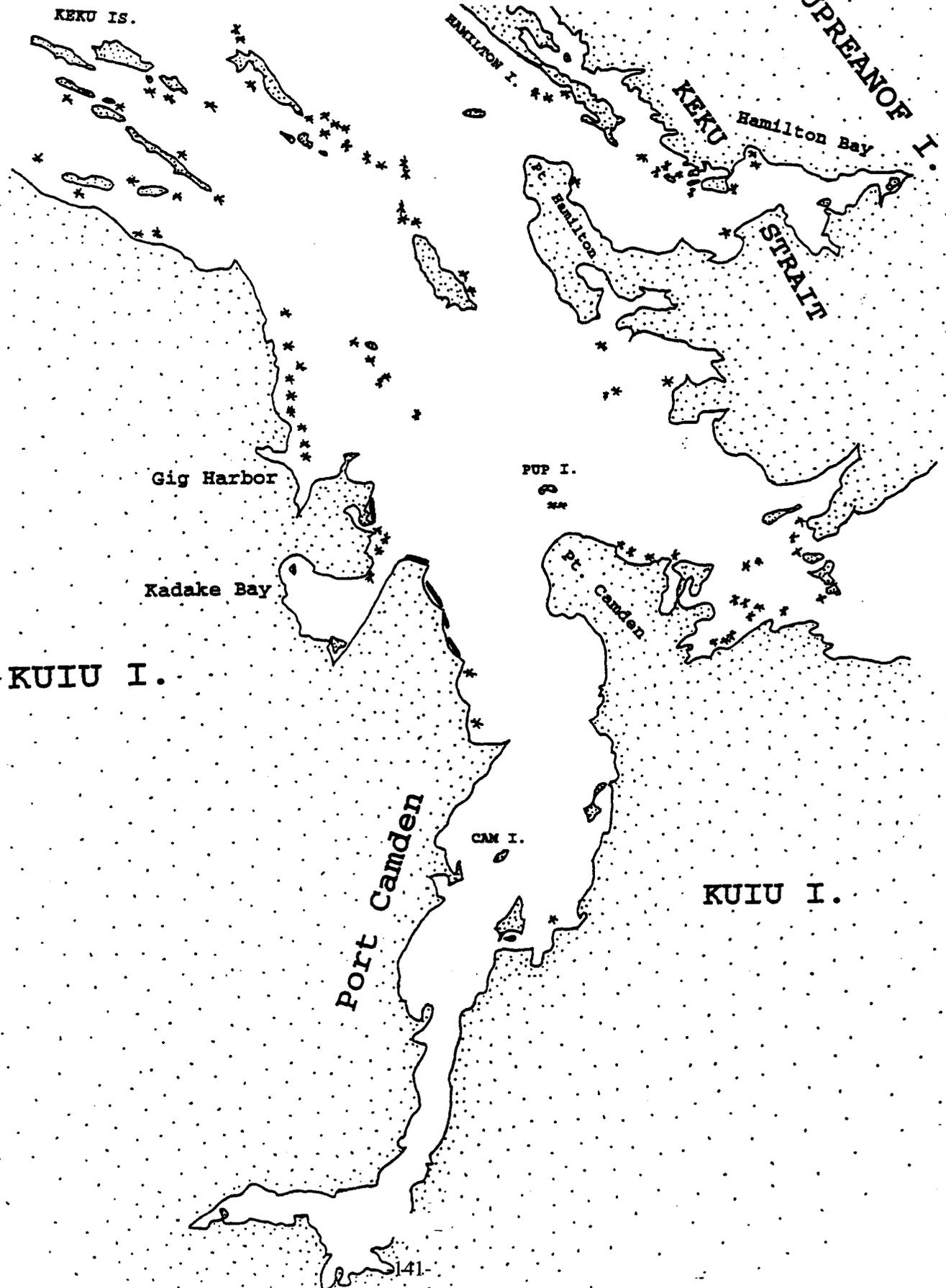
CONCLUSION:

A total of approximately 575 yards of spawning was seen this year in Yakutat Bay and Russell Fiord. No spawn was actually ever seen. Both the number of herring schools and the amount of spawning witnessed this year was considerably less than the amount seen in the previous two years. Based on these observations, opening the winter bait fishery is not warranted for the coming season.

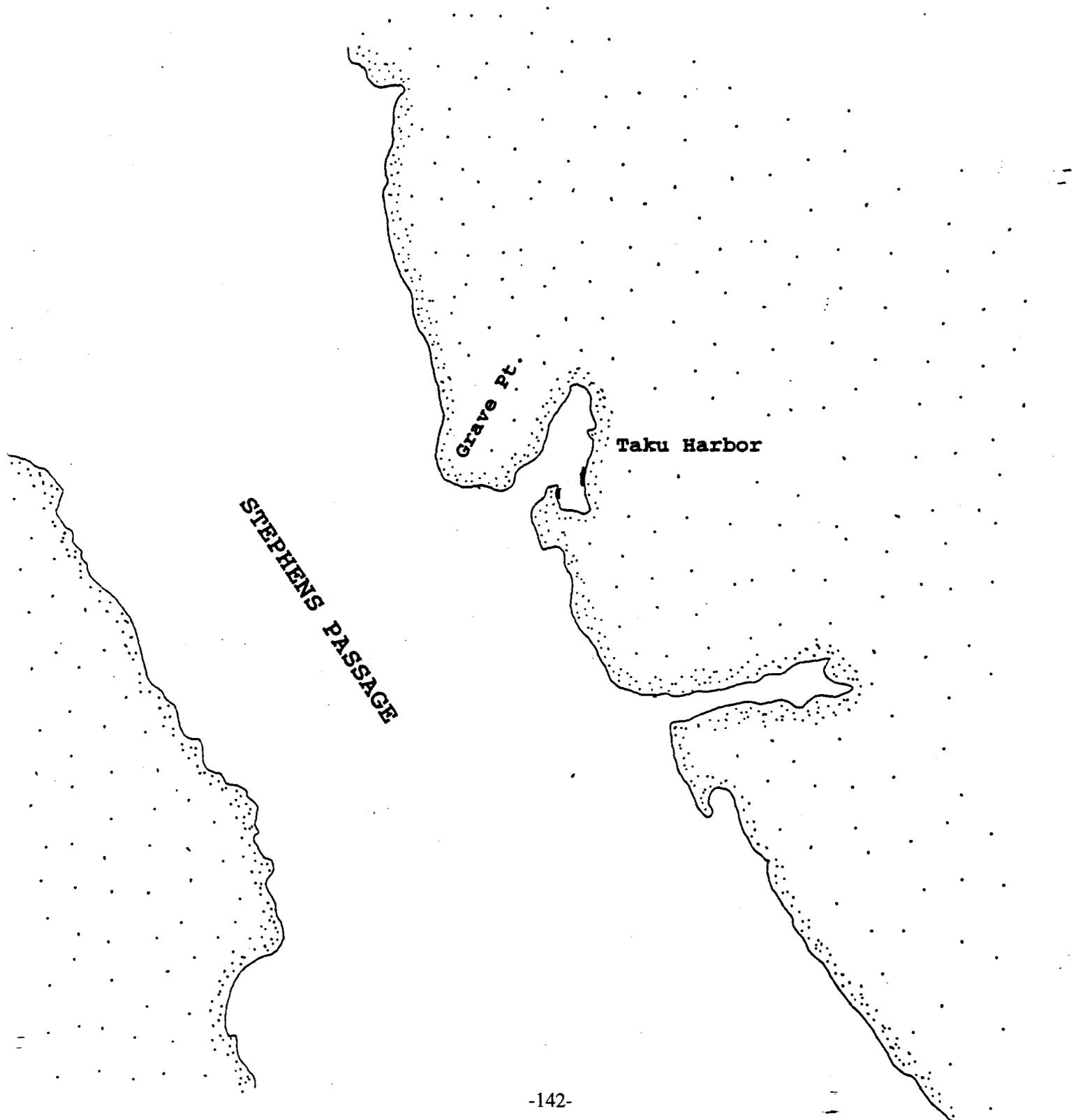
1994 HERRING SPAWN
KASAAN BAY



1994 HERRING SPAWN
PORT CAMDEN



1994 HERRING SPAWN
TAKU HARBOR



1994 HERRING SPAWN
OLIVER'S INLET

STEPHENS PASSAGE

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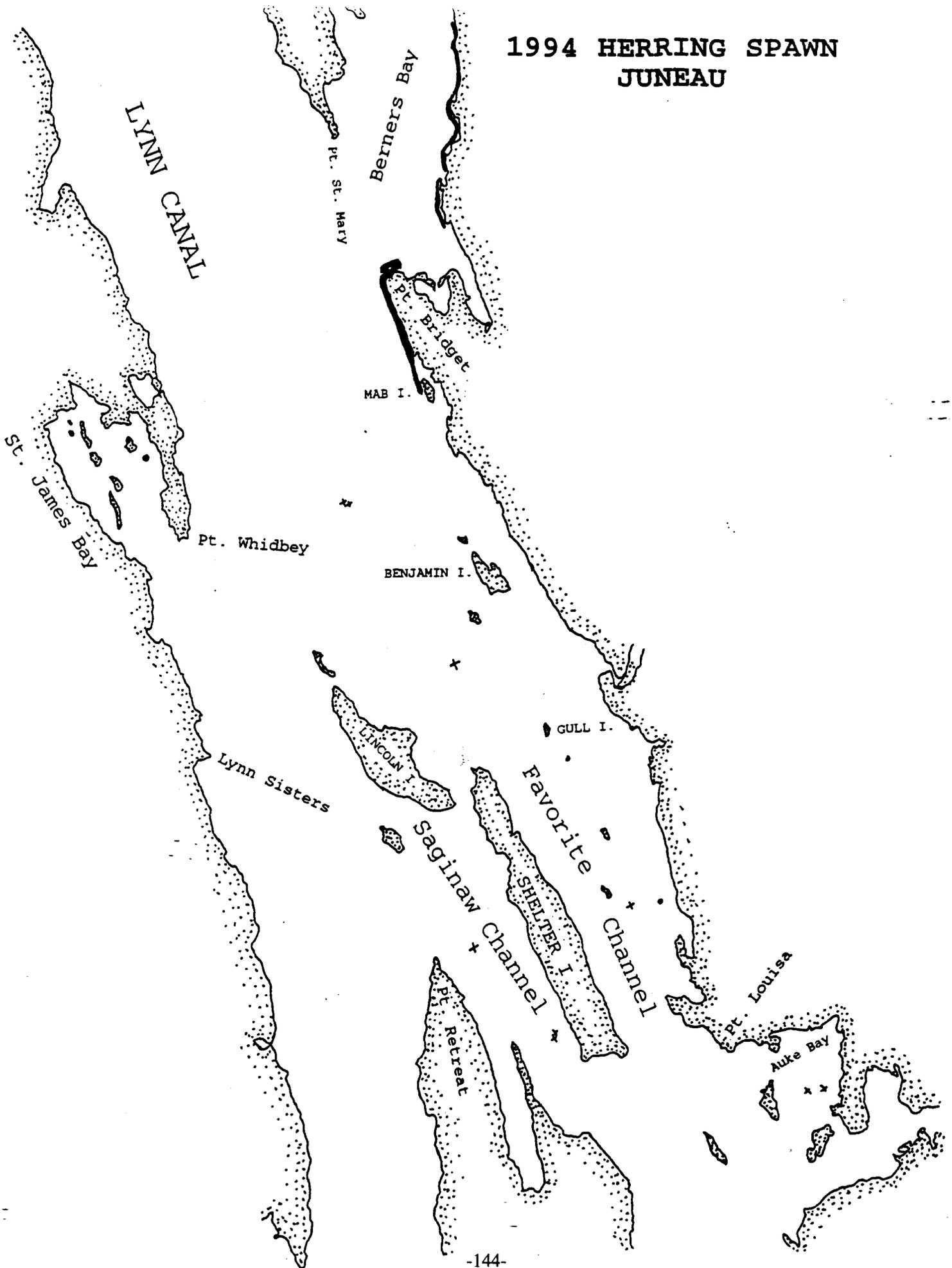
Olivers Inlet

Green Cove

GLASS PENINSULA

ADMIRALTY I.

1994 HERRING SPAWN
JUNEAU



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