

SOUTHEAST ALASKA/YAKUTAT  
ANNUAL HERRING RESEARCH REPORT, 1992



By  
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and  
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This report is a compilation of information concerning population assessment, stock status and commercial fisheries for herring in Southeast Alaska during the 1991-92 season. Most management staff throughout the region participated in fisheries management, aerial surveys or scuba surveys. Amy Holm, FWT III in Ketchikan, provided the age weight and length data; Tim Minicucci assisted in drafting the tables and text; Andy Kittams assisted in final report preparation; Dave Carlile, herring biometrician in Juneau, provided biometric support; Jackie Tyson and Heather Swearingen in Petersburg and Ketchikan proofed the rough draft; Doug Woodby edited the manuscript and Cori Cashen produced the final document.

## TABLE OF CONTENTS

	<u>Page</u>
AUTHORS .....	ii
ACKNOWLEDGMENTS .....	ii
LIST OF TABLES .....	iv
LIST OF FIGURES .....	iv
LIST OF APPENDICES .....	iv
ABSTRACT .....	v
INTRODUCTION .....	1
COMMERCIAL FISHERIES .....	1
Methods and Procedures .....	1
Sac Roe Fisheries .....	1
Winter Bait Fisheries .....	1
Spawn-on-kelp Pound Fisheries .....	1
Results and Discussion .....	2
Sac Roe Fisheries .....	2
Sitka Sound .....	2
Kah Shakes/Cat Island .....	2
Winter Bait Fisheries .....	3
Craig/Klawock .....	3
Lisianski Inlet .....	3
Hobart Bay/Port Houghton .....	4
Fresh Herring Bait Pounds .....	4
Spawn-on-kelp Pound Fisheries .....	4
Craig/Klawock .....	4
Hoonah Sound .....	4
AGE AND GROWTH ANALYSIS .....	5
Methods and Procedures .....	5
SPAWN DEPOSITION SURVEYS .....	6
Methods and Procedures .....	6
Visual Estimate Correction .....	6
Estimates of Total Egg Deposition .....	7
Spawning Biomass Estimation .....	8
Results and Discussion .....	8
Kah Shakes/Cat Island .....	8
Craig .....	9
Ernest Sound .....	9
Hobart/Houghton .....	9
Seymour Canal .....	9
Sitka .....	10
Hoonah Sound .....	10
Lisianski Inlet .....	10
DIVER VISUAL ESTIMATION CALIBRATION .....	10
Methods and Procedures .....	10
Results and Discussion .....	11

## LIST OF TABLES

	<u>Page</u>
Table 1. Summary of 1991-1992 season herring fisheries.....	12
Table 2. Southeast Alaska herring spawn deposition surveys results, 1992.....	13
Table 3. 1991/1992 Acoustical Surveys .....	17

## LIST OF FIGURES

	<u>Page</u>
Figure 1. Major southeast Alaska herring spawning stocks, 1991-92. ....	18
Figure 2. Summary of age compositions from 1992 herring samples.....	19

## LIST OF APPENDICES

	<u>Page</u>
Appendix A. Herring AWL tables, 1992. ....	21
Appendix B. Cat Island Herring Spwan Survvey, 1992.....	27
Appendix C. Aerial and skiff herring surveys, 1992. ....	32

## ABSTRACT

The pacific herring, *clupea pallasii*, is an important food and bait fish in Southeast Alaska. The 1992 winter bait fisheries occurred in Craig, Lisianski Inlet, Hobart Bay, and Port Houghton including a Sitka test fishery the total harvest of 2,719 tons. The spring gillnet sac roe harvest from the Cat Island area totaled 1,246 tons, and the seine sac roe harvest from Sitka totaled 5,368 tons. Spawn-on-kelp fisheries occurred in Hoonah Sound and Craig. The total ex-vessel value of the region's herring fisheries was estimated at \$4,418,900. Approximately 6,000 herring were sampled for age and growth analysis from the major stocks. The 1988 year class remained dominant throughout most of the region with good recruitment of younger fish in most stocks. Spawn deposition surveys to compute spawning biomass were conducted on nine spawning stocks for a total escapement estimate of 88,949 tons. A series of aerial and skiff spawning ground surveys conducted on those, and smaller stocks, documented a total of 188.4 miles of beach receiving spawn in Southeast Alaska, and an additional 1.3 miles in Yakutat. Historical diver specific correction factors were used to calibrate individual diver visual estimates. Correction ratios by diver and substrate for all samples taken since 1982 ranged from 1.13 to 1.25 of the visual estimates.

## 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. The current program of assigning bait and sac roe fisheries to target separate stocks, monitoring the stocks through age and growth analysis to determine stock conditions, and conducting spawn deposition biomass estimation studies as a basis for establishing commercial harvest quotas are project objectives. Project personnel conduct aerial and skiff surveys throughout the region to document spawning activities and assist in the inseason management of the commercial fisheries.

## COMMERCIAL FISHERIES

### *Methods and Procedures*

#### **Sac Roe Fisheries**

Commercial sac roe fisheries were conducted at Cat Island and Sitka during the 1992 season. Harvest in the Cat Island gillnet fishing area was 1,246 tons, considerably less than the 5,368 ton seine harvest in the Sitka Sound fishery (Table 1).

#### **Winter Bait Fisheries**

Three stocks were identified as having harvestable quantities of bait herring during the 1991/92 winter season. These areas included the Craig/Klawock area, Lisianski and the Port Houghton/Hobart Bay areas. While harvests occurred in Craig and Lisianski, wintering schools of herring could not be located in the Port Houghton/Hobart Bay area, therefore no harvest occurred.

#### **Spawn-on-kelp Pound Fisheries**

Spawn-on-kelp pound fisheries were conducted in Craig and Hoonah Sound. In Craig 15% of the overall quota 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 harvest guideline of 150 tons of herring (12 tons of spawn-on-kelp).

## *Results and Discussion*

### **Sac Roe Fisheries**

#### **Sitka Sound**

In order to obtain preliminary age, weight and length samples a seiner was contracted by the state to conduct a test fishery in Sitka Sound. Three purse seine test sets were taken from a large biomass of herring located in Eastern Channel. A total of 228 tons of herring were harvested of which 178 tons was taken for personal use bait, while 50 tons were sold to Sitka Sound Seafoods and Seafood Producers Cooperative to support management and research of the Sitka Sound fishery. Herring samples analyzed showed the fish to be uniform in size and predominantly four years old. Overall, the herring averaged 81 grams in weight and 189 centimeters in length, an improvement over the previous year when samples averaged 64 grams and were predominantly three years old. On March 28 intensive purse seine sampling began; 72 samples from different areas extending from Salisbury Sound to Goddard Hot Springs were analyzed by industry to determine roe maturities. Using the Southeast Alaska standard sliding scale, a 14.3% harvest rate was applied to the 1991 spawning biomass estimate of 23,450 tons to establish a quota of 3,356 tons for the Sitka Sound herring sac roe fishery. The department announced on March 28, 1992 that the fishery would be placed on two hour notice effective 8:00 a.m., Monday, March 30. Fishermen and department personnel met on a daily basis to determine which areas showed the most promise for a harvestable product. It was determined that the Goddard Hot Springs area showed the most promise with adequate biomass and good roe maturities. On the morning of April 6 at 11:00 a.m., the department announced that the fishery would be open at noon. Fishermen were advised that the fishery would be of short duration due to the large biomass of fish in the area. The fishery was closed after one hour and twenty three minutes of fishing, making this the shortest fishery since its inception in the early 1970s. Ten companies, 52 permit holders and 67 tenders participated in the 1992 fishery. The majority of companies paid \$300/ton for 10% roe maturity and \$50 for each percentage point above 10% maturity. The total catch was 5,368 tons, exceeding the quota by 2,000 tons. The total ex-vessel value of the fishery was \$1,374,208.

#### **Kah Shakes/Cat Island**

In 1991, the spawning distribution of the Kah Shakes herring population shifted from the traditional spawning grounds to the Cat Island area, approximately ten miles west of Kah Shakes. The Board of Fisheries adopted a proposal submitted by the department to include Cat Island as part of the Kah Shakes herring population. Approximately 11.2 nautical miles of beach received spawn in the Cat Island area resulting in a biomass estimate of 9,250 tons of herring. The Kah Shakes shoreline received approximately 3.7 nautical miles of spawn resulting in a biomass estimate of 1,200 tons of mature herring. The combined spawning population of 10,450 tons resulted in a projected harvest rate for the 1991/92 season of 11.5%, for a guideline harvest level of 1,200 tons of herring. The relative abundance of herring at Kah Shakes and Cat Island during the 1992 season was evaluated by hydroacoustical and aerial surveys. Preseason management plans included the avoidance of opening both areas simultaneously. The R/V Sundance arrived at the Kah Shakes area on March 18 to begin initial evaluation of herring stocks. Initial hydroacoustic surveys in the

Kah Shakes area revealed a moderately low abundance of herring schools in the area. Aerial surveys conducted also showed relatively low populations of sea lions and bird activity. Survey emphasis was then shifted to the Cat Island shoreline where aerial surveys had revealed several schools of herring and numerous sea lions in the area. On March 30 the first spawn was observed in the Cat Island area accompanied by increasing sea lion and bird activity with no activity in the Kah Shakes area. The Kah Shakes/Cat Island area was placed on 12-hour notice effective 5:00 p.m., April 1, 1992. With spawning and roe maturities increasing for the next several days, the fishery was announced to open at 9:30 a.m., April 3, 1992. After nine hours and fifteen minutes the fishery was announced closed at 6:45 p.m. on April 3, with a one hour grace period for net removal. Eight companies were represented on the grounds with landings made by 115 boats. Roe recovery for the fishery ranged from 10 to 17%. Prices were quoted on the grounds as \$800 to \$1,000/ton for 10% roe. The final harvest for the Kah Shakes/Cat Island fishery was 1,246 tons. The total ex-vessel value for the fishery was \$1,776,796.

### *Winter Bait Fisheries*

#### **Craig/Klawock**

The 1992 harvest for the Craig/Klawock area was based on 22 miles of spawn which occurred in the spring of 1991 in the area of San Alberto Bay near Craig. Spawn deposition surveys indicated that approximately 17,800 tons of herring had spawned in the area during March and April of 1991. This resulted in an exploitation rate of 15.2% for a total guideline harvest rate of 2,684 tons. The Board of Fisheries allocated 15% of the total guideline harvest to the spawn-on-kelp fishery producing a bait harvest of 2,280 tons. The R/V Sundance arrived in the area on January 12 to access populations in the area open to commercial harvest. The area was open to commercial harvest on January 13, 1992 with harvests occurring from January 14-17 in the Boca de Finas and Tonowek Bay areas where 2,316 tons of herring were harvested. The fishery was closed on January 17 at 7:30 a.m. The total ex-vessel value of the fishery was \$629,952.

#### **Lisianski Inlet**

Based on 9.8 miles of spawn and spawn deposition surveys conducted in the spring of 1991 at Lisianski Inlet, the 1992 biomass was 2,500 tons. With the biomass estimate at the threshold level a minimum harvest rate of 10% or 250 tons of herring. The area was open to commercial harvest on January 13, 1992. By the end of the day three seine vessels harvested 353 tons of herring, exceeding the quota by 103 tons. The fishery was closed on January 13 at 10:30 p.m. The total ex-vessel value of the fishery was estimated at \$96,016.

## **Hobart Bay/Port Houghton**

Spawn deposition surveys conducted in the spring of 1991 revealed a biomass estimate of 2,000 tons of mature herring and 8.8 miles of spawn in the Hobart Bay/Port Houghton area. This biomass estimate, was equal to the threshold level of 2,000 tons. A minimum harvest rate of 10%, or 200 tons of herring, was awarded. Several vessels searched the open area periodically but could find no concentrations of herring in the area. Therefore no harvest occurred in the Hobart Bay/Port Houghton area during the 1991/92 season.

### ***Fresh Herring Bait Pounds***

There were two fresh herring bait pounds operated in Southeast Alaska during the 1991/92 season. Pounds operated in Sitka Sound and Farragut Bay near Petersburg for a combined harvest of 32.3 tons of herring with an estimated value of \$22,628.

### ***Spawn-on-kelp Pound Fisheries***

#### **Craig/Klawock**

The spawn-on-kelp fishery for the Craig area was initiated in the spring of 1992. The harvest limit was at 15% (403 tons) of the total guideline harvest level (2,684 tons) for the Craig/Klawock stock. For the 1992 season, 531 fisherman applied for permits and were eligible to participate in the fishery. On March 10, 248 herring pounds were on the grounds each receiving allocations of 310 blades of kelp and 1.6 tons of herring. Harvest of herring began at 12:00 noon on March 18, and closed at 8:00 p.m. on March 23, 1992. A total of 26.2 tons (52,400 lb.) of spawn-on-kelp, worth approximately \$283,274, was harvested by 229 participants. Final product quality was greatly reduced due to the harvest of immature herring, poor quality of kelp, and inexperienced handling of both kelp and herring.

#### **Hoonah Sound**

1992 was the third year of the spawn-on-kelp pound fishery in the Hoonah Sound area. The amount of herring allowed for the fishery is fixed by the Board of Fisheries at 150 tons. The fishery opened by emergency order on April 6, 1992 with the harvest of herring beginning on April 17 and continuing through April 26 when fishing was closed by emergency order. A total of 23.1 tons (46,200 lb.) of spawn-on-kelp valued at \$249,757 was harvested by 108 participants.

## AGE AND GROWTH ANALYSIS

### *Methods and Procedures*

Herring 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. The 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 5,963 herring were aged, sexed, weighed and measured for length. Samples were taken from Kah Shakes/Cat Island, Ernest Sound, Craig, Sitka, Hoonah Sound, Seymour Canal, and Lynn Canal. Spawning populations in the Craig, Seymour Canal, Hoonah Sound, Sitka, Lisianski Inlet, Yakutat, and Lynn Canal areas had a dominant four year old age class. Populations in Kah Shakes/Cat Island, Farragut Bay, and Ernest Sound showed good recruitment of three and four year old fish. Summaries of age, weight and length samples completed during 1992 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. 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 directly through use of an egg to biomass conversion factor.

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 m<sup>2</sup> sampling frame placed on the bottom at a fixed 5 meter distance 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 (i.e. to minimize or avoid 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 2s 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 indicate 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 can result in a smaller number of transects.

### **Visual Estimate Correction**

Since visual estimates, rather than actual counts, of eggs within the sampling frame are recorded, measurement error occurs. To minimize the influence of measurement error on final estimates of total egg deposition, diver-specific correction coefficients ( $h_i$ ) 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.

### Estimates of Total Egg Deposition

Total egg deposition for a particular spawning ground ( $t_i$ ) is estimated as:

$$t_i = a_i \bar{d}_i \quad (1)$$

where  $a_i$  is the estimated total area ( $m^2$ ) on which eggs have been deposited and  $\bar{d}_i$  is the estimated mean density of eggs (eggs/ $m^2$ ) at spawning area  $i$ . The total area on which eggs have been deposited ( $a_i$ ) is estimated as:

$$a_i = l_i \bar{w}_i \quad (2)$$

where  $l_i$  is the total meters of shoreline receiving spawn (determined from aerial and skiff surveys) and  $\bar{w}_i$  is the mean length of transects conducted at spawning area  $i$ .

The mean density of eggs/ $m^2$  at area  $i$  ( $\bar{d}_i$ ) is estimated as:

$$\bar{d}_i = \left[ \frac{\sum v_{hij} c_{hk}}{\sum m_{ji}} \right]^{-0.1} \quad (3)$$

where  $v_{hij}$  is the visual estimate of egg numbers by diver  $h$ , at area  $i$ , quadrant  $j$ . The  $c_{hk}$  term refers to a diver-specific correction coefficient to adjust visual estimates made by diver  $h$  for substrate  $k$ , and  $m_{ji}$  is the number of quadrants visually estimated at area  $i$ . Divers visually estimate egg density within 0.1 m quadrants. The -0.1 exponent expands the mean density from a 0.1  $m^2$  to a 1.0  $m^2$  unit basis. Diver-specific correction factors ( $c_h$ ) are estimated as:

$$c_h = \frac{\bar{k}_h}{\bar{v}_h} \quad (4)$$

where  $\bar{v}_h$  is the mean visual estimate of egg numbers for diver  $h$  and  $\bar{k}_h$  is the mean laboratory count of egg samples collected from substrate specific quadrants visually estimated by diver  $h$ .

## Spawning Biomass Estimation

The total number of eggs per spawning area is a key element used in forecasting herring spawning biomass. Based on the standard 100,000,000 eggs observed equals one ton of spawning herring, the biomass at each spawning location can be estimated as:

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

(5)

Where:            b = estimated total spawning biomass  
                      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 Kah Shakes/Cat Island, Craig, Ernest Sound, Seymour Canal, Sitka, Hoonah Sound and Lisianski areas in 1992. Length and width of spawn, egg density and escapement are summarized for these areas. The first survey was initiated in Kah Shakes on April 14 and the last was completed in Hobart Bay on May 11. The surveys documented a total escapement for these areas of 88,949 tons. Maps of the spawning area, transect locations, and individual transect raw 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 188.4 nautical miles, with an additional 1.3 nautical miles in Yakutat.

### **Kah Shakes/Cat Island**

Twenty-one point three (21.3) nautical miles of beach received herring spawn in the Cat Island and Kah Shakes areas between April 14 and April 17. An additional spot of spawn occurred on the east side of Annette Island. The Cat Island spawn survey was initiated April 16-17, 1992 with twenty transects selected at random. The average transect length was 167 meters with an average egg density of 115,736 eggs per square meter. The resultant escapement was 7,449 tons. The Kah Shakes spawn survey was completed on April 14-15 with eight transects being completed. The average transect length was 123 meters with an average density of 99,378 eggs per square meter. The derived escapement was 655 tons leaving the Kah Shakes/Cat Island area a total escapement of 8,103 tons

## **Craig**

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. A total of 22.6 n miles of spawn were observed in 1992 for the Craig area. Three separate spawn deposition surveys were performed, the first inclusive of Fish Egg Island, the second inclusive of Port Real Marina, and the last inclusive of Abbess Island. The first survey had five transects with an average length of 129 meters, average density of 91,955 eggs per square meter and a 1,269 ton escapement. In the second survey the average transect length (9 transects) was 91 meters with an average density of 140,699 eggs per square meter and an escapement estimate of 765 tons. The final spawn deposition survey at Abbess Island used 16 transects averaging 121 meters in length, average density of 285,770 eggs per square meter and a derived escapement of 10,339 tons. The total escapement for the Craig area was 12,373 tons.

## **Ernest Sound**

Approximately 9.1 n miles of spawn were recorded near Vixen and Union Points in 1992. Aerial reconnaissance reported spawning from April 16 through April 23. Thirteen transects were randomly selected and completed on May 2 with support provided by the R/V Sundance. The average transect length was 135 meters with an average egg density of 104,427 eggs per square meter. The resultant escapement estimate was 2,031 tons. An additional 608 tons were added to the escapement from skiff and resident surveys after the spawn deposition surveys were completed, which brought the escapement total to 2,639 tons.

## **Hobart/Houghton**

Active spawning began in Hobart Bay on May 1 and lasted intermittently through May 5. Spawn was not recorded in Port Houghton until May 2 and ended on May 8. Sixteen transects were completed on May 10-11, with an average length of 161 meters and an average density of 162,973 eggs per square meter. Spawn totaled 7.6 nautical miles of spawn with an escapement estimated at 4,094 tons.

## **Seymour Canal**

Aerial surveys were initiated on April 20 with spot spawn confirmed on April 26 in the Point Hugh area. Major spawning did not begin again until April 30 around Sorethumb Cove. On May 9-10, twenty-four randomly selected transects were examined. The spawn deposition estimate yielded a 1,780 ton escapement (9.0 n miles, 98 meter transect length and 97,747 eggs per square meter density).

## **Sitka**

Aerial surveys began on March 16 in the Sitka area. Spawning began April 28, but peaked on April 31. Spawn remained spotty until May 20. The total spawn tallied 73 n miles. The spawn deposition surveys began with thirty-six transects completed in the Sitka area on April 23-27. The average length was 88 meters and the average density was 367,490 eggs per square meter resulting in an escapement of 48,456 tons.

## **Hoonah Sound**

A total of 10.8 nautical miles of herring spawn was recorded in Hoonah Sound in 1992. The spawn occurred April 22-23 in the traditional areas of Emmons Island, Vixen Islands and the Chichagof shore between Fick Cove and Rodgers Point. Aerial surveys were conducted from April 7 to May 5 with spawn deposition surveys conducted on May 5. A total of 14 randomly selected transects were completed. The average transect length was 114 meters with a density of 227,776 eggs per square meter. The resultant escapement estimate was 5,767 tons.

## **Lisianski Inlet**

Aerial surveys of Lisianski Inlet and Lisianski Strait were conducted from April 23 to May 7. Major spawn was reported on April 23 north of Sunnyside Inlet and continued until April 28. Total beach with spawn totaled 15.3 miles. Twenty-two spawn deposition surveys were completed on May 6-7. The average transect length was 54 meters with an average density of 336,572 eggs per square meter and an escapement of 5,737 tons.

## **DIVER VISUAL ESTIMATION CALIBRATION**

### ***Methods and Procedures***

Samples of substrate with eggs were collected during previous spawn deposition surveys for enumeration at the laboratory in Ketchikan to verify visual density estimates for 1992 surveys. 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. No spawn-on-kelp diver calibration samples were obtained for 1992.

### *Results and Discussion*

A summary of correction ratios by diver and substrate for all samples taken since 1982 has total correction ratios that range from 0.77 to 2.85 of the visual estimates. The 1992 diver specific average for all substrates and all numbers are:

Spawn deposition visual calibration estimates by divers for 1992.

William Bergman	1.18	Tim Koeneman	1.13
Robert Larson	1.25	Tim Minicucci	1.13
Bob DeJong	1.17	Bill Davidson	1.17
Brian Lynch	1.17	Phil Doherty	1.17
Scott Walker	1.24		

These 1992 correction factors are an average for all substrates and all sample sizes for each individual diver. The presence of individual diver effects is attributed to the training and experience of the divers. 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 1991-1992 season herring fisheries.

Opening	Closing	District	Area	Assessment 1990-91 (tons)	Quota <sup>a</sup> Tons	Harvest (tons)	Target Exploitation Rate	Roe% Quota	Exvessel Value
<b>WINTER FOOD AND BAIT FISHERY</b>									
1/13/92	1/17/92	3/4	Bocas de Finas/Meares Pass	17,800	2,280	2,316	15.2		\$629,952
1/13/92	2/28/92	10	Hobart Bay/Port Houghton	2,000	200		10.0		0
1/13/92	1/13/92	13	Lisianski Inlet	2,500	250	353	10.0		\$96,016
1/20/92	1/23/92	13	Sitka Test Fishery			50			\$13,600
Total				22,300	2,730	2,719			Bait Value \$739,568
<b>SAC ROE FISHERY</b>									
4/06-4/06/92		13	Sitka (Seine)	23,450	3,356	5,368	14.3	9.4	\$1,374,208
4/03-4/03/92		01	Cat Island (Gillnet)	10,450	1,200	1,246	11.5	14.0	\$1,776,796
Total				33,900	4,556	6,614			Sac Roe Total \$3,151,004
<b>SPAWN-ON-KELP FISHERY</b>									
3/18-3/23/92		103-60	Craig	17,800	403	26.2 <sup>c</sup>	15.0		\$283,274
4/17-4/26/92		113-55	Hoonah Sound	5,750	150 <sup>b</sup>	23.1 <sup>c</sup>			\$249,757
Total				23,550	553	50.2			Spawn-on-Kelp \$533,031
<b>BAIT POUND FISHERY</b>									
4/92		13	Sitka		60	<sup>d</sup>			<sup>d</sup>
4/92		110	Petersburg		100	<sup>d</sup>			<sup>d</sup>
Total					160				Bait Pound \$22,628

<sup>a</sup> Quota based on previous year's escapement estimate.

<sup>b</sup> Pound quota set by Board of Fisheries at 150 tons of herring.

<sup>c</sup> Harvest in tons of spawn on kelp.

<sup>d</sup> When number of participants is two or less, information is considered confidential.

Table 2. Southeast Alaska herring spawn deposition surveys results, 1992.

REVILLA CHANNEL STOCK ASSESSMENT						
CAT ISLAND ESTIMATE ONLY						
Number of estimates	669	WB	PD	TK	RL	TM
Unadjusted sum of estimates by diver		4,156	435	1,404	480	127
Corrected sum of estimates by diver		4,904	509	1,586	600	144
Total number of eggs/.1meter quadrant (1,000s)	7,743					
Average length of transects in meters	167					
Lineal meters of shoreline receiving spawn	34,632					
Area of survey in square meters	5,792,269					
Average density of quadrant samples (1,000s)	12					
Average density of eggs per square meter	115,736					
Unadjusted escapement estimate in tons	6,704					
Corrected escapement using 10% egg loss	7,449					
KAH SHAKES ESTIMATE ONLY						
Number of estimates	197					
Unadjusted sum of estimates by diver		290	63	1,360		
Corrected sum of estimates by diver		342	79	1,537		
Total number of eggs/.1meter quadrant (1,000s)	1,958					
Average length of transects in meters	123					
Lineal meters of shoreline receiving spawn	4,815					
Area of survey in square meters	592,872					
Average density of quadrant samples (1,000s)	10					
Average density of eggs per square meter	99,378					
Unadjusted escapement estimate in tons	589					
Corrected escapement using 10% egg loss	655					
COMBINED ESCAPEMENTS FOR CAT IS. AND KAH SHAKES						
Corrected escapement in tons for Kah Shakes	655					
Corrected escapement in tons for Cat Island	7,449					
Total escapement in tons for area	8,103					
Escapement threshold for fishery in tons.	6,000					
Projected total percent harvest rate for entire area	10.7					
Projected quota for 1992/1993 season in tons	867					
Total miles of spawn on Duke and Cat Island shores	18.7					
Total miles of spawn on the Kah Shakes shore	2.6					
Total miles of spawn for the entire area	21.3					
CRAIG AREA SPAWN DEPOSITION SUMMARY 1992						
STRATIFIED WITH FISH EGG IS. SEPARATE						
Total number of all estimates made	129	WB	BDJ	PD	TK	RL
Unadjusted sum of estimates by diver						412
Corrected sum of estimates by diver						515
Total number of eggs in quadrant samples	1,186					
Average width of transects	129					
Lineal meters of shoreline receiving spawn	9,630					
Total area of spawn in square meters	1,242,322					
Average density per quadrant	9					
Average density of eggs per square meter	91,955					
Uncorrected escapement in tons for Fish Egg Is.	1,142					
Total tons escapement corrected by 10% egg loss	1,269					

Table 2. (page 2 of 4)

STRATIFIED WITH PORT REAL MARINA TO ST. PHILLIPS SEPARATE				
Total number of all estimates made	164			
Unadjusted sum of estimates by diver				
Corrected sum of estimates by diver				
Total number of eggs in quadrant samples	2,307			
Average width of transects	91			163 estimates * 5 meters/9 transects)
Lineal meters of shoreline receiving spawn	5,371			(2.9 n miles of spawn * 1852 meters/mi
Total area of spawn in square meters	489,340			
Average density per quadrant	14			
Average density of eggs per square meter	140,699			
Uncorrected esc. in tons for Real Marina to St. Phillips	688			
Total tons escapement corrected by 10% egg loss	765			
STRATIFIED WITH ST. JOHN TO ABBESS IS. SEPARATE				
Total number of all estimates made	388			
Unadjusted sum of estimates by diver	4,561	2,789	554	506
Corrected sum of estimates by diver	5,382	3,263	626	633
Total number of eggs in quadrant samples	11,088			
Average width of transects	121			(388 estimates * 5 meters/16 transects
Lineal meters of shoreline receiving spawn	26,854			(14.5 n miles of spawn * 1852 meters/m
Total area of spawn in square meters	3,256,048			
Average density per quadrant	29			
Average density of eggs per square meter	285,770			
Uncorrected escapement in tons for St John to Abbess Is.	9,305			
Total tons escapement corrected by 10% egg loss	10,339			
CRAIG AREA ESCAPEMENT USING STRATIFIED ESCAPEMENT METHOD				
Escapement in tons for stratified Fish Egg Is. estimate	1,269			
Escapement in tons for stratified Real Marina to St. Phillips estimate	765			
Escapement in tons for stratified St. John to Abbess Is. estimate	10,339			
Total escapement in tons for Craig using stratified method	12,373			
Escapement threshold for Craig area is 5,000 tons.				
Projected harvest rate in percent of estimate	12.9			
Total 1992/1993 harvest quota in tons	1,602			
Winter bait allocation in tons of herring	1,362			
Spawn-on-kelp allocation in tons of herring	240			
Total n miles of beach receiving spawn	22.6			
Total number of transects	30.0			
UNION BAY AND VIXEN INLET				
Number of estimates	351	WB	BDJ	SW
Unadjusted sum of estimates by diver		680	865	726
Corrected sum of estimates by diver		796	1,012	900
Total number of eggs counted/.1meter quadrant	3,665			
Average density of quadrant samples (1,000s)	10			
Average density of eggs per square meter	104,427			
Average length of transects in meters (13 total transects)	135			
Lineal meters of shoreline receiving spawn in Union and Vixen nm)	12,964			(7.0 n miles of spawn*1852 meters per
Area of survey in square meters for Vixen and Union	1,750,140			
Unadjusted escapement estimate in tons for Vixen and Union	1,828			
Corrected escapement in tons using 10% egg loss	2,031			
Escapement threshold for fishery is 2,500 tons				
Total percent harvest rate using only Vixen and Union	0			

Table 2. (page 3 of 4)

Due to spawn from Brownson Is. and Meyers Chuck a 200-ton quota was established for Ernest Sound					
Projected quota for 1992/1993 season in tons	200				
Total miles of spawn in Union Bay and Vixen Inlet				7.0	Aerial and skiff surveys
Total miles of spawn in Brownson Is.				0.8	Skiff, 1.6 aerial survey
Total miles of spawn in Meyers Chuck				1.3	Not observed, reported by residents
Grand total miles of spawn	9.1				

ERNEST SOUND (DISTRICT 2, 6 AND 7) TOTAL SPAWN SUMMARY

Lineal miles of shore receiving spawn including Vixen, Union, Meyers Chuck and Brownson	9.1
Escapement estimate for Vixen, Union and Brownson using 290 tons/mile	2,262
Escapement estimate for Vixen, Union, Brownson and Meyers using 290 tons/mile	2,639

HOBART BAY AND PORT HOUGHTON

Number of diver quadrant estimates	514	WB	BD	RL	BL
Unadjusted sum of estimates by diver		2,618		4,251	
Corrected sum of estimates by diver		3,063		5,314	
Total number of eggs counted/.1 meter quadrant	8,377				
Average density of quadrant samples (1,000s)	16				
Average density of eggs per square meter	162,973				
Average length of transects (16 total transects)	161				
	(514*5/16)				
Lineal meters of shoreline receiving spawn in Hobart Bay and Port Houghton	14,075				
Total miles of spawn in Hobart/Houghton area	7.6				
Area of survey in square meters for Hobart/Houghton	2,260,829				
Unadjusted escapement estimate in tons	3,685				
Corrected escapement in tons using 10% egg loss	4,094				
Escapement threshold for Hobart/Houghton is 2,000 tons					
Projected total percent harvest rate	12.1				
Harvest rate computation=					$8 + ((4,094/2,000) * 2)$
Projected quota for 1992/1993 season in tons	495				

SEYMOUR CANAL

Number of estimates	472	WB	BD	BL	RL
Unadjusted sum of estimates by diver		1,962	322	131	1,431
Corrected sum of estimates by diver		2,296	377	153	1,788
Total number of eggs/.1 meter quadrant (1,000s)	4,614				
Average length of transects in meters	98				
Lineal meters of shoreline receiving spawn	16,668				
Area of survey in square meters	1,639,020				
Average density of quadrant samples (1,000s)	10				
Average density of eggs per square meter	97,747				
Unadjusted escapement estimate in tons	1,602				
Corrected escapement using 10% egg loss	1,780				
Escapement threshold for fishery in tons	3,000				

Total percent harvest rate is zero because threshold is greater than escapement  
 Projected quota for 1992/1993 season in tons 0

Total miles of spawn in Seymour Canal 10.3 statute or 9.0 nautical

Table 2. (page 4 of 4)

SITKA HERRING					
Number of estimates	601	WB	PD	RL	TM
Unadjusted sum of estimates by diver		8,296	4,099	4,973	1,137
Corrected sum of estimates by diver		9,789	4,796	6,216	1,285
Total number of eggs/.1meter quadrant (1,000s)	22,086				
Average length of transects in meters	88				
Lineal meters of shoreline receiving spawn	134,270				
Area of survey in square meters	11,867,099				
Average density of quadrant samples (1,000s)	37				
Average density of eggs per square meter	367,490				
Unadjusted escapement estimate in tons	43,610				
Corrected escapement using 10% egg loss	48,456				
Escapement threshold for the Sitka area	7,500 tons				
Total percent harvest rate	20 percent				
Projected quota for 1993 season in tons	9,691				
Total miles of spawn in Sitka area	73				
HOONAH SOUND					
Number of diver quadrant estimates	319	WB	BDJ	RL	
Unadjusted sum of estimates by diver		2,277	585	3,134	
Corrected sum of estimates by diver		2,664	684	3,918	
Total number of eggs counted/.1meter quadrant	7,266				
Average density of quadrant samples (1,000s)	23				
Average density of eggs per square meter	227,776				
Average length of transects (14 total transects)	114				
	(319*5/14)				
Lineal meters of shoreline receiving spawn in Hoonah Sound	20,002				
	(10.8 miles*1852 meters/mile)				
Area of survey in square meters for Hoonah Sound	2,278,754				
Unadjusted escapement estimate in tons	5,190				
Corrected escapement in tons using 10% egg loss	5,767				
The Escapement Threshold for Hoonah Sound is set at 1,000 tons					
The pound fishery quota is established at 150 tons of herring by regulation					
Total percent harvest rate	2.6				
Harvest rate computation=150 tons/5,767 tons escapement					
Total miles of spawn in Hoonah Sound area	10.8				
LISIANSKI INLET					
Number of diver quadrant estimates	239	WB	BDJ	RL	
Unadjusted sum of estimates by diver		2,948	626	3,090	
Corrected sum of estimates by diver		3,449	732	3,863	
Total number of eggs counted/.1meter quadrant	8,044				
Average density of quadrant samples (1,000s)	34				
Average density of eggs per square meter	336,572				
Average length of transects (22 total transects)	54				
	(239*5/22)				
Lineal meters of shoreline receiving spawn in Lisianski Inlet	28,243				
	(15.25 miles*1852 meters/mile)				
Area of survey in square meters for Lisianski	1,534,108				
Unadjusted escapement estimate in tons	5,163				
Corrected escapement in tons using 10% egg loss	5,737				
Escapement threshold in Lisianski is 2,500 tons					
Total percent harvest rate	12.6				
Harvest rate computation=8+((5,737/2,500)*2)					
Projected quota for 1992/1993 season in tons	722				
Total miles of spawn in Lisianski area	15.25				

Table 3. 1991/1992 Acoustical Surveys

Area	Date	Run #	lb/m <sup>2</sup>	Area (m <sup>2</sup> )	Total Biomass (lb)
Whitney Is.	1/11/92	1	0.55	1,832,254	1,007,740
Whitney Is.	1/11/92	2	0.69	2,121,286	1,463,687
Average					1,235,714
Trocadero Bay	1/13/92	1	14.65	1,527,739	22,381,376
Bocas de Finas	1/16/92	1	2.03	5,925,149	12,028,053
Total					34,409,429
Fritz Cove	2/10/92	1	0.56*	2,821,786	1,580,200
Fritz Cove	2/10/92	2	1.48*	2,483,827	3,676,131
Average					2,628,165

\*For the Fritz Cove estimates Don I. visually estimated 5 million pounds while Joe estimated 7.5 million.



Figure 1. Major southeast Alaska herring spawning stocks, 1991-92.

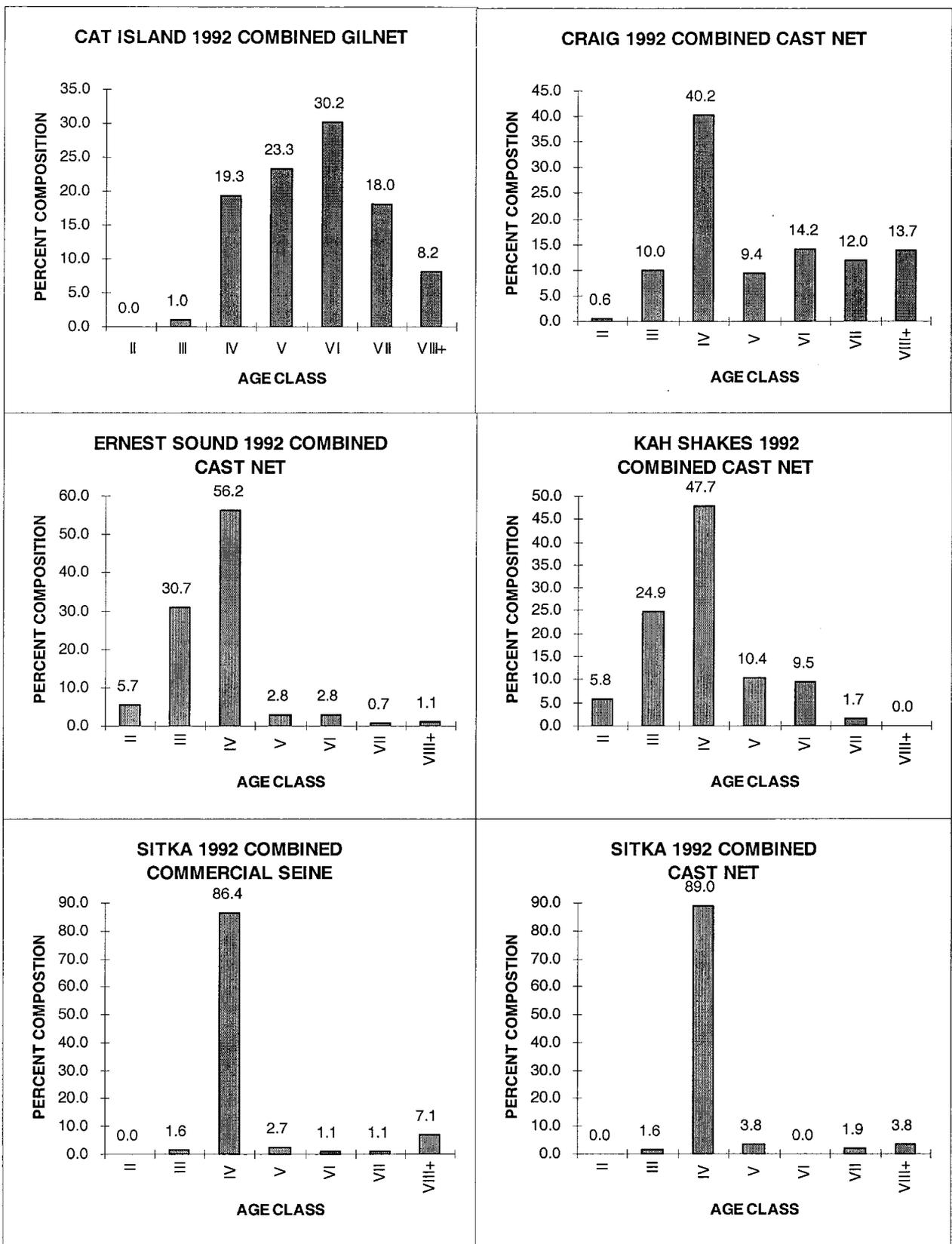


Figure 2. Summary of age compositions from 1992 herring samples.

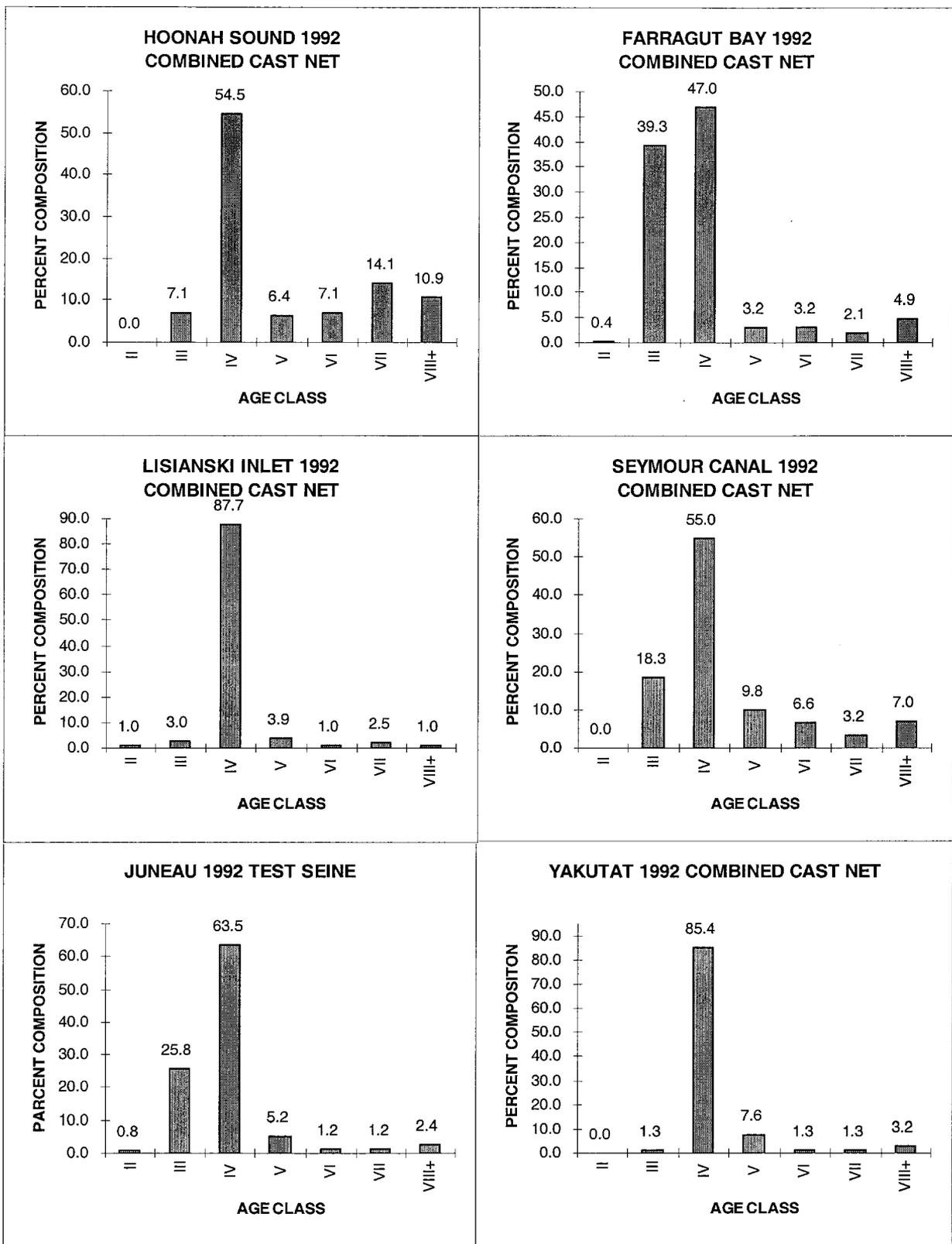


Figure 2. (page 2 of 2)

## Appendix A. 1992 Herring AWL Tables

Boca de Finas Commercial Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	30.0	83.0	5.0	7.0	5.0	3.0	133.0
Percent Age Composition	0.0	22.6	62.4	3.8	5.3	3.8	2.3	100.0
Total Average of Length (mm)	0.0	173.3	186.9	196.0	207.4	213.4	226.7	187.2
Total Average of Weight (g)	0.0	60.2	76.7	91.2	110.4	123.4	140.3	78.5
Percent Male	0.0	50.0	48.2	80.0	28.6	60.0	33.3	48.9

Craig Combined Commercial Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	5.0	56.0	191.0	18.0	28.0	57.0	37.0	392.0
Percent Age Composition	1.3	14.3	48.7	4.6	7.1	14.5	9.4	100.0
Total Average of Length (mm)	151.2	175.0	191.3	194.5	208.4	216.2	223.9	196.5
Total Average of Weight (g)	36.4	64.0	86.0	92.3	113.1	133.9	148.9	97.4
Percent Male	20.0	50.0	55.5	83.3	60.7	73.7	70.3	59.9

Trocadero Bay Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	3.0	16.0	55.0	3.0	5.0	9.0	7.0	98.0
Percent Age Composition	3.1	16.3	56.1	3.1	5.1	9.2	7.1	100.0
Total Average of Length (mm)	156.7	179.6	196.5	202.3	218.4	224.9	230.1	198.8
Total Average of Weight (g)	44.3	69.3	92.7	96.3	129.2	146.9	148.9	98.4
Percent Male	66.7	50.0	41.8	33.3	40.0	77.8	85.7	50.0

Trocadero Bay Combined Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	12.0	51.0	139.0	12.0	23.0	43.0	40.0	320.0
Percent Age Composition	3.8	15.9	43.4	3.8	7.2	13.4	12.5	100.0
Total Average of Length (mm)	148.7	176.7	195.9	202.8	216.7	224.3	224.9	200.2
Total Average of Weight (g)	35.0	65.3	92.9	99.3	129.2	148.3	150.6	103.8
Percent Male	33.3	45.1	43.2	33.3	30.4	53.5	70.0	46.6

Palisades Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	29.0	42.0	6.0	6.0	13.0	14.0	111.0
Percent Age Composition	0.9	26.1	37.8	5.4	5.4	11.7	12.6	100.0
Total Average of Length (mm)	158.0	172.1	191.9	202.3	210.7	217.4	224.7	195.1
Total Average of Weight (g)	40.0	54.8	79.1	90.5	104.3	119.7	132.7	85.9
Percent Male	100.0	44.8	66.7	66.7	50.0	61.5	64.3	59.5

Klawock Reef Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	6.0	29.0	8.0	11.0	13.0	9.0	76.0
Percent Age Composition	0.0	7.9	38.2	10.5	14.5	17.1	11.8	100.0
Total Average of Length (mm)	0.0	170.3	195.5	201.5	209.0	211.5	220.6	201.8
Total Average of Weight (g)	0.0	53.7	89.3	100.0	108.1	111.4	145.4	100.8
Percent Male	0.0	66.7	65.5	50.0	63.6	92.3	88.9	69.7

Boca de Finas Commercial Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	5.0	26.0	108.0	13.0	21.0	52.0	34.0	259.0
Percent Age Composition	1.9	10.0	41.7	5.0	8.1	20.1	13.1	100.0
Total Average of Length (mm)	151.2	177.1	194.6	193.9	208.7	216.5	223.7	201.3
Total Average of Weight (g)	36.4	68.4	93.1	92.8	114.0	134.9	149.7	107.0
Percent Male	20.0	50.0	61.1	84.6	71.4	75.0	73.5	65.6

Trocadero Bay Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	4	20.0	42.0	2.0	12.0	21.0	13.0	114.0
Percent Age Composition	3.5088	17.5	36.8	1.8	10.5	18.4	11.4	100.0
Total Average of Length (mm)	147.75	174.7	199.0	209.0	217.3	227.7	225.6	203.3
Total Average of Weight (g)	32.5	61.3	96.1	100.0	130.2	153.1	147.5	107.8
Percent Male	25	40.0	26.2	50.0	33.3	47.6	30.8	34.2

Trocadero Bay Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	5.0	15.0	42.0	7.0	6.0	13.0	20.0	108.0
Percent Age Composition	4.6	13.9	38.9	6.5	5.6	12.0	18.5	100.0
Total Average of Length (mm)	144.6	176.3	192.0	201.1	214.3	218.3	222.5	198.3
Total Average of Weight (g)	31.4	66.5	90.0	100.4	127.2	141.4	153.3	104.7
Percent Male	20.0	46.7	61.9	28.6	16.7	46.2	75.0	53.7

Wadleigh Island Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	11.0	49.0	93.0	11.0	14.0	12.0	13.0	203.0
Percent Age Composition	5.4	24.1	45.8	5.4	6.9	5.9	6.4	100.0
Total Average of Length (mm)	146.4	173.1	190.6	195.2	206.9	212.3	223.4	188.7
Total Average of Weight (g)	30.0	57.3	79.3	87.5	110.9	122.0	140.3	80.4
Percent Male	18.2	38.8	62.4	54.5	28.6	41.7	38.5	48.8

San Juan Bautista Is. Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	2.0	9.0	43.0	4.0	2.0	4.0	7.0	71.0
Percent Age Composition	1.8	12.7	60.6	5.6	2.8	5.6	9.9	100.0
Total Average of Length (mm)	148.5	176.8	192.0	193.0	200.5	226.5	220.9	195.1
Total Average of Weight (g)	38.5	61.0	81.6	80.0	87.5	123.3	125.3	105.2
Percent Male	100.0	88.9	62.8	25.0	50.0	100.0	85.7	66.7

Balandra Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	6.0	25.0	7.0	5.0	17.0	20.0	81.0
Percent Age Composition	1.2	7.4	30.9	8.6	6.2	21.0	24.7	100.0
Total Average of Length (mm)	168.0	180.3	188.1	196.9	213.6	213.6	219.6	202.7
Total Average of Weight (g)	57.0	69.2	77.7	94.0	120.0	123.9	137.0	105.2
Percent Male	100.0	83.3	72.0	57.1	40.0	70.6	60.0	66.7

Appendix A. (page 2 of 6)

Ballena Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	9.0	49.0	31.0	52.0	5.0	0.0	146.0
Percent Age Composition	0.0	6.2	33.6	21.2	35.6	3.4	0.0	100.0
Total Average of Length (mm)	0.0	173.6	194.6	208.1	217.1	221.8	0.0	205.1
Total Average of Weight (g)	0.0	59.6	93.7	112.0	131.4	135.2	0.0	110.3
Percent Male	0.0	33.3	65.3	54.8	57.7	100.0	0.0	58.2

Fish Egg Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	3.0	31.0	3.0	7.0	12.0	16.0	72.0
Percent Age Composition	0.0	4.2	43.1	4.2	9.7	16.7	22.2	100.0
Total Average of Length (mm)	0.0	179.3	194.4	201.7	216.4	221.6	222.5	207.0
Total Average of Weight (g)	0.0	62.3	81.5	86.7	112.6	133.2	131.1	103.6
Percent Male	0.0	100.0	74.2	66.7	57.1	75.0	68.8	72.2

Fish Egg Island Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	10.0	90.0	9.0	22.0	31.0	45.0	207.0
Percent Age Composition	0.0	4.8	43.5	4.3	10.6	15.0	21.7	100.0
Total Average of Length (mm)	0.0	181.8	193.7	199.0	216.1	222.0	225.5	206.9
Total Average of Weight (g)	0.0	67.5	84.2	90.1	121.1	135.0	145.4	108.5
Percent Male	0.0	40.0	64.4	44.4	63.6	74.2	57.8	62.3

N. Cat Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	3.0	25.0	63.0	5.0	1.0	1.0	0.0	98.0
Percent Age Composition	3.1	25.5	64.3	5.1	1.0	1.0	0.0	100.0
Total Average of Length (mm)	156.0	177.0	184.3	187.4	223.0	225.0	0.0	182.5
Total Average of Weight (g)	41.0	62.8	72.8	73.4	136.0	136.0	0.0	70.6
Percent Male	33.3	60.0	54.0	100.0	0.0	0.0	0.0	56.1

Double Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	21.0	66.0	8.0	2.0	3.0	3.0	104.0
Percent Age Composition	1.0	20.2	63.5	7.7	1.9	2.9	2.9	100.0
Total Average of Length (mm)	152.0	175.2	188.3	198.6	215.5	226.3	222.0	188.7
Total Average of Weight (g)	38.0	57.7	71.3	85.3	102.5	150.7	126.3	73.8
Percent Male	100.0	61.9	60.6	62.5	100.0	66.7	66.7	62.5

Cat Island Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	11.0	86.0	236.0	36.0	13.0	10.0	8.0	400.0
Percent Age Composition	2.8	21.5	59.0	9.0	3.3	2.5	2.0	100.0
Total Average of Length (mm)	150.1	174.8	187.4	196.8	216.2	226.7	223.0	187.2
Total Average of Weight (g)	37.4	58.3	73.7	84.7	112.7	142.5	129.3	74.5
Percent Male	72.7	64.0	62.3	63.9	84.6	50.0	75.0	63.8

Craig Combined Cast Net Summary

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	4.0	59.0	188.0	56.0	76.0	52.0	50.0	485.0
Percent Age Composition	0.8	12.2	38.8	11.5	15.7	10.7	10.3	100.0
Total Average of Length (mm)	155.8	173.7	192.7	204.0	214.8	215.8	221.4	200.3
Total Average of Weight (g)	43.5	57.8	84.9	103.4	124.0	120.8	135.7	98.6
Percent Male	100.0	55.9	66.0	53.6	56.6	75.0	70.0	63.5

N. Fish Egg Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	7.0	59.0	6.0	15.0	19.0	29.0	135.0
Percent Age Composition	0.0	5.2	43.7	4.4	11.1	14.1	21.5	100.0
Total Average of Length (mm)	0.0	182.9	193.3	197.7	215.9	222.3	227.2	206.8
Total Average of Weight (g)	0.0	69.7	85.6	91.8	125.1	136.2	153.3	111.1
Percent Male	0.0	14.3	59.3	33.3	66.7	73.7	51.7	57.0

Craig & Fish Egg Is. Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	4.0	69.0	278.0	65.0	98.0	83.0	95.0	692.0
Percent Age Composition	0.6	10.0	40.2	9.4	14.2	12.0	13.7	100.0
Total Average of Length (mm)	155.8	174.9	193.0	203.3	215.1	218.1	223.3	202.2
Total Average of Weight (g)	43.5	59.2	84.6	101.6	123.3	126.1	140.3	101.5
Percent Male	100.0	53.6	65.5	52.3	58.2	74.7	64.2	63.2

Grave Point Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	4.0	20.0	48.0	11.0	5.0	3.0	0.0	91.0
Percent Age Composition	4.4	22.0	52.7	12.1	5.5	3.3	0.0	100.0
Total Average of Length (mm)	145.5	173.3	189.8	195.7	213.6	229.3	0.0	187.6
Total Average of Weight (g)	34.0	54.1	76.9	82.9	101.6	136.7	0.0	74.1
Percent Male	75.0	75.0	68.8	54.5	80.0	66.7	0.0	69.2

Village Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	3.0	20.0	59.0	12.0	5.0	3.0	5.0	107.0
Percent Age Composition	2.8	18.7	55.1	11.2	4.7	2.8	4.7	100.0
Total Average of Length (mm)	149.7	173.0	187.9	200.4	217.6	225.0	223.6	189.6
Total Average of Weight (g)	38.0	57.6	74.7	90.6	123.2	142.3	131.0	79.0
Percent Male	100.0	60.0	67.8	58.3	100.0	33.3	80.0	67.3

Double Island Test Gillnet

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	3.0	34.0	55.0	10.0	2.0	0.0	1.0	105.0
Percent Age Composition	2.9	32.4	52.4	9.5	1.9	0.0	1.0	100.0
Total Average of Length (mm)	147.0	173.2	187.6	203.2	219.5	0.0	237.0	184.3
Total Average of Weight (g)	43.3	64.0	81.0	106.9	115.5	0.0	148.0	78.2
Percent Male	33.3	67.6	65.5	80.0	0.0	0.0	0.0	65.7

Appendix A. (page 3 of 6)

Cat Island Commercial Gillnet

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	0.0	11.0	11.0	23.0	20.0	7.0	72.0
Percent Age Composition	0.0	0.0	15.3	15.3	31.9	27.8	9.7	100.0
Total Average of Length (mm)	0.0	0.0	213.7	217.5	221.1	225.2	228.1	221.2
Total Average of Weight (g)	0.0	0.0	131.6	141.3	145.5	151.7	157.0	145.6
Percent Male	0.0	0.0	36.4	45.5	34.8	55.0	57.1	44.4

Cat Island Commercial Gillnet

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	0.0	7.0	20.0	25.0	16.0	5.0	73.0
Percent Age Composition	0.0	0.0	9.6	27.4	34.2	21.9	6.8	100.0
Total Average of Length (mm)	0.0	0.0	211.1	218.1	220.6	224.6	225.8	220.2
Total Average of Weight (g)	0.0	0.0	126.9	134.3	143.4	146.5	145.6	140.2
Percent Male	0.0	0.0	71.4	60.0	44.0	68.8	80.0	58.9

Cat Island Commercial Gillnet

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	3.0	26.0	22.0	20.0	7.0	5.0	83.0
Percent Age Composition	0.0	3.6	31.3	26.5	24.1	8.4	6.0	100.0
Total Average of Length (mm)	0.0	180.0	207.3	211.4	220.9	224.7	223.8	213.2
Total Average of Weight (g)	0.0	65.7	116.6	122.2	144.3	143.6	151.2	127.3
Percent Male	0.0	100.0	34.6	50.0	55.0	85.7	60.0	51.8

Cat Island Commercial Gillnet

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	0.0	15.0	18.0	24.0	12.0	8.0	77.0
Percent Age Composition	0.0	0.0	19.5	23.4	31.2	15.6	10.4	100.0
Total Average of Length (mm)	0.0	0.0	214.2	216.9	219.0	224.1	226.9	219.2
Total Average of Weight (g)	0.0	0.0	131.5	135.9	139.2	149.4	151.8	139.8
Percent Male	0.0	0.0	26.7	50.0	58.3	41.7	62.5	48.1

Cat Island Combined Gillnet

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	3.0	59.0	71.0	92.0	55.0	25.0	305.0
Percent Age Composition	0.0	1.0	19.3	23.3	30.2	18.0	8.2	100.0
Total Average of Length (mm)	0.0	180.0	210.7	215.6	220.4	224.7	226.4	218.3
Total Average of Weight (g)	0.0	65.7	124.4	132.0	143.0	148.6	151.9	137.8
Percent Male	0.0	100.0	37.3	52.1	47.8	60.0	64.0	50.8

Grant Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	6.0	16.0	25.0	7.0	11.0	2.0	0.0	67.0
Percent Age Composition	9.0	23.9	37.3	10.4	16.4	3.0	0.0	100.0
Total Average of Length (mm)	123.2	166.3	185.4	198.4	211.5	215.5	0.0	181.8
Total Average of Weight (g)	30.3	51.1	69.5	87.3	104.0	105.5	0.0	70.2
Percent Male	50.0	81.3	80.0	57.1	81.8	100.0	0.0	76.1

Bond Bay Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	8.0	44.0	90.0	18.0	12.0	2.0	0.0	174.0
Percent Age Composition	4.6	25.3	51.7	10.3	6.9	1.1	0.0	100.0
Total Average of Length (mm)	147.5	168.1	181.3	194.1	207.3	214.0	0.0	179.9
Total Average of Weight (g)	32.4	47.0	57.6	72.2	98.8	86.0	0.0	58.4
Percent Male	62.5	54.5	61.1	83.3	50.0	50.0	0.0	60.9

Ketchikan Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	14.0	60.0	115.0	25.0	23.0	4.0	0.0	241.0
Percent Age Composition	5.8	24.9	47.7	10.4	9.5	1.7	0.0	100.0
Total Average of Length (mm)	137.1	167.6	182.2	195.3	209.3	214.8	0.0	180.4
Total Average of Weight (g)	31.5	48.1	60.2	76.4	101.3	95.8	0.0	61.7
Percent Male	57.1	61.7	65.2	76.0	65.2	75.0	0.0	65.1

Nadzaheen Cove Purse Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	15.0	23.0	27.0	2.0	3.0	2.0	0.0	72.0
Percent Age Composition	20.8	31.9	37.5	2.8	4.2	2.8	0.0	100.0
Total Average of Length (mm)	150.3	167.9	188.9	212.5	212.3	221.0	0.0	176.7
Total Average of Weight (g)	35.1	54.2	78.3	127.0	120.3	125.0	0.0	66.0
Percent Male	73.3	47.8	51.9	50.0	33.3	100.0	0.0	55.6

Canoe Cove Purse Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	13.0	22.0	1.0	1.0	1.0	0.0	39.0
Percent Age Composition	2.6	33.3	56.4	2.6	2.6	2.6	0.0	100.0
Total Average of Length (mm)	164.0	163.8	191.4	226.0	203.0	218.0	0.0	183.4
Total Average of Weight (g)	40.0	58.5	82.9	137.0	99.0	157.0	0.0	77.4
Percent Male	0.0	38.5	54.5	0.0	100.0	0.0	0.0	46.2

Annette Island Combined Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	16.0	36.0	49.0	3.0	4.0	3.0	0.0	111.0
Percent Age Composition	14.4	32.4	44.1	2.7	3.6	2.7	0.0	100.0
Total Average of Length (mm)	151.1	166.4	190.0	217.0	210.0	220.0	0.0	179.0
Total Average of Weight (g)	35.4	55.8	80.4	130.3	115.0	135.7	0.0	70.0
Percent Male	68.8	44.4	53.1	33.3	50.0	66.7	0.0	52.3

Santa Anna Inlet Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	2.0	43.0	98.0	11.0	14.0	5.0	5.0	178.0
Percent Age Composition	1.1	24.2	55.1	6.2	7.9	2.8	2.8	100.0
Total Average of Length (mm)	155.0	172.1	180.9	199.9	205.7	207.8	210.0	183.2
Total Average of Weight (g)	42.0	56.6	66.9	96.2	100.4	103.8	115.2	71.0
Percent Male	50.0	69.8	52.0	18.2	57.1	100.0	20.0	55.1

Appendix A. (page 4 of 6)

Whitney Island February 1, 1994  
Winter Bait Fishery

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Average of Length (mm)	11.0	58.0	84.0	6.0	5.0	1.0	1.0	166.0
Total Average of Weight (g)	6.6	34.9	50.6	3.6	3.0	0.6	0.6	100.0
Total Count of Age Category	147.5	161.4	177.1	192.7	206.4	194.0	214.0	171.4
Percent Age Composition	34.4	46.1	57.7	72.8	90.4	80.0	102.0	54.0
Percent Male	72.7	69.0	76.2	66.7	60.0	100.0	100.0	72.9

Ernest Sound Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	16.0	87.0	159.0	8.0	8.0	2.0	3.0	283.0
Percent Age Composition	5.7	30.7	56.2	2.8	2.8	0.7	1.1	100.0
Total Average of Length (mm)	147.4	163.5	179.3	192.5	204.4	198.0	218.7	174.3
Total Average of Weight (g)	35.0	47.5	61.0	73.9	90.0	87.0	105.3	57.2
Percent Male	75.0	67.8	74.8	62.5	50.0	100.0	100.0	72.1

Pound Cove Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	53.0	68.0	3.0	5.0	1.0	6.0	137.0
Percent Age Composition	0.7	38.7	49.6	2.2	3.6	0.7	4.4	100.0
Total Average of Length (mm)	145.0	156.1	184.7	212.0	205.6	237.0	228.8	177.0
Total Average of Weight (g)	30.0	41.5	64.1	94.3	87.8	139.0	132.0	60.1
Percent Male	100.0	56.6	75.0	33.3	60.0	100.0	33.3	65.0

Salisbury Sound Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Average of Length (mm)	1.0	4.0	158.0	2.0	0.0	5.0	0.0	170.0
Total Average of Weight (g)	0.6	2.4	92.9	1.2	0.0	2.9	0.0	100.0
Total Count of Age Category	148.0	182.5	189.5	192.5	0.0	215.4	0.0	189.9
Percent Age Composition	34.0	63.8	74.8	84.0	0.0	111.6	0.0	75.5
Percent Male	100.0	50.0	57.6	50.0	0.0	40.0	0.0	57.1

Eastern Channel Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	3.0	90.0	2.0	0.0	3.0	4.0	103.0
Percent Age Composition	1.0	2.9	87.4	1.9	0.0	2.9	3.9	100.0
Total Average of Length (mm)	174.0	197.0	191.8	202.5	0.0	225.3	222.5	194.2
Total Average of Weight (g)	50.0	77.7	77.1	89.0	0.0	137.3	137.0	81.1
Percent Male	100.0	100.0	64.4	50.0	0.0	33.3	25.0	63.1

Eastern Channel Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	4.0	84.0	4.0	0.0	2.0	2.0	96.0
Percent Age Composition	0.0	4.2	87.5	4.2	0.0	2.1	2.1	100.0
Total Average of Length (mm)	0.0	172.8	186.6	199.5	0.0	214.0	215.5	187.7
Total Average of Weight (g)	0.0	64.8	83.6	102.0	0.0	128.5	146.0	85.8
Percent Male	0.0	50.0	48.8	25.0	0.0	100.0	0.0	47.9

Combined Sample Summary Whitney Island 1994

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	5.0	29.0	75.0	2.0	3.0	1.0	2.0	117.0
Percent Age Composition	4.3	24.8	64.1	1.7	2.6	0.9	1.7	100.0
Total Average of Length (mm)	147.4	167.8	181.9	192.0	201.0	202.0	221.0	178.4
Total Average of Weight (g)	36.4	50.4	64.6	77.0	89.3	94.0	107.0	61.7
Percent Male	80.0	65.5	73.3	50.0	33.3	100.0	100.0	70.9

Pound Cove Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	59.0	66.0	6.0	4.0	5.0	8.0	148.0
Percent Age Composition	0.0	39.9	44.6	4.1	2.7	3.4	5.4	100.0
Total Average of Length (mm)	0.0	163.8	187.5	190.5	201.0	225.6	243.5	182.9
Total Average of Weight (g)	0.0	47.2	76.5	87.3	98.3	151.4	187.0	74.3
Percent Male	0.0	37.3	37.9	66.7	50.0	40.0	37.5	39.2

Farragut Bay Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	112.0	134.0	9.0	9.0	6.0	14.0	285.0
Percent Age Composition	0.4	39.3	47.0	3.2	3.2	2.1	4.9	100.0
Total Average of Length (mm)	145.0	160.2	186.1	197.7	203.6	227.5	237.2	180.1
Total Average of Weight (g)	30.0	44.5	70.2	89.7	92.4	149.3	163.4	67.5
Percent Male	100.0	46.4	56.7	55.6	55.6	50.0	35.7	51.6

Eastern Channel Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	1.0	2.0	108.0	1.0	2.0	3.0	2.0	119.0
Percent Age Composition	0.8	1.7	90.8	0.8	1.7	2.5	1.7	100.0
Total Average of Length (mm)	142.0	180.5	192.5	198.0	202.0	214.0	218.0	193.0
Total Average of Weight (g)	31.0	60.0	80.3	96.0	86.5	111.7	122.5	81.3
Percent Male	100.0	50.0	61.1	100.0	50.0	100.0	100.0	63.0

Sitka Combined Winter Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	3.0	9.0	356.0	5.0	2.0	11.0	6.0	392.0
Percent Age Composition	0.8	2.3	90.8	1.3	0.5	2.8	1.5	100.0
Total Average of Length (mm)	154.7	186.9	191.0	197.6	202.0	217.7	221.0	192.0
Total Average of Weight (g)	38.3	67.6	77.0	88.4	86.5	118.6	132.2	78.7
Percent Male	100.0	66.7	60.4	60.0	50.0	54.5	50.0	60.5

Sitka Combined Winter Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	1.0	106.0	1.0	1.0	0.0	0.0	109.0
Percent Age Composition	0.0	0.9	97.2	0.9	0.9	0.0	0.0	100.0
Total Average of Length (mm)	0.0	162.0	182.5	197.0	198.0	0.0	0.0	182.6
Total Average of Weight (g)	0.0	66.0	82.7	101.0	100.0	0.0	0.0	82.9
Percent Male	0.0	100.0	43.4	0.0	100.0	0.0	0.0	43.1

Appendix A. (page 5 of 6)

Sitka Combined Spring Test Seine

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	5.0	190.0	5.0	1.0	2.0	2.0	205.0
Percent Age Composition	0.0	2.4	92.7	2.4	0.5	1.0	1.0	100.0
Total Average of Length (mm)	0.0	170.6	184.3	199.0	198.0	214.0	215.5	185.0
Total Average of Weight (g)	0.0	65.0	83.1	101.8	100.0	128.5	146.0	84.2
Percent Male	0.0	40.0	45.8	20.0	100.0	100.0	0.0	45.4

Kasiana Island Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	1.0	94.0	6.0	0.0	3.0	4.0	108.0
Percent Age Composition	0.0	0.9	87.0	5.6	0.0	2.8	3.7	100.0
Total Average of Length (mm)	0.0	188.0	189.6	196.5	0.0	226.0	210.0	191.7
Total Average of Weight (g)	0.0	81.0	76.9	82.7	0.0	128.3	97.8	79.5
Percent Male	0.0	100.0	100.0	83.3	0.0	66.7	100.0	72.2

Pirate's Cove Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	1.0	71.0	1.0	0.0	1.0	7.0	81.0
Percent Age Composition	0.0	1.2	87.7	1.2	0.0	1.2	8.6	100.0
Total Average of Length (mm)	0.0	183.0	189.6	193.0	0.0	223.0	221.9	192.7
Total Average of Weight (g)	0.0	70.0	81.3	85.0	0.0	156.0	133.0	86.6
Percent Male	0.0	100.0	56.3	100.0	0.0	0.0	71.4	58.0

Sitka Commercial Seine Fishery

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	3.0	159.0	5.0	2.0	2.0	13.0	184.0
Percent Age Composition	0.0	1.6	86.4	2.7	1.1	1.1	7.1	100.0
Total Average of Length (mm)	0.0	184.3	190.4	197.6	193.5	224.0	222.7	193.1
Total Average of Weight (g)	0.0	69.0	82.5	94.8	95.0	151.0	143.8	87.9
Percent Male	0.0	100.0	56.0	40.0	0.0	50.0	46.2	54.9

Below Stonewall Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	24.0	71.0	5.0	9.0	1.0	4.0	114.0
Percent Age Composition	0.0	21.1	62.3	4.4	7.9	0.9	3.5	100.0
Total Average of Length (mm)	0.0	160.7	168.4	179.6	190.6	206.0	215.8	171.0
Total Average of Weight (g)	0.0	45.9	51.5	64.0	76.8	115.0	119.3	55.8
Percent Male	0.0	58.3	52.1	60.0	66.7	100.0	25.0	54.4

Swimming Pool Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	11.0	28.0	14.0	3.0	2.0	5.0	63.0
Percent Age Composition	0.0	17.5	44.4	22.2	4.8	3.2	7.9	100.0
Total Average of Length (mm)	0.0	158.5	177.0	183.8	203.7	227.5	199.0	179.9
Total Average of Weight (g)	0.0	40.2	56.9	69.5	85.7	118.0	91.2	62.8
Percent Male	0.0	63.6	75.0	78.6	33.3	100.0	60.0	71.4

Sandy Cove Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	2.0	90.0	5.0	0.0	0.0	2.0	99.0
Percent Age Composition	0.0	2.0	90.9	5.1	0.0	0.0	2.0	100.0
Total Average of Length (mm)	0.0	174.0	186.0	185.4	0.0	0.0	216.5	186.3
Total Average of Weight (g)	0.0	62.0	71.1	66.2	0.0	0.0	123.0	71.7
Percent Male	0.0	0.0	68.9	40.0	0.0	0.0	100.0	66.7

Halibut Point Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	2.0	77.0	2.0	0.0	3.0	1.0	85.0
Percent Age Composition	0.0	2.4	90.6	2.4	0.0	3.5	1.2	100.0
Total Average of Length (mm)	0.0	168.5	187.3	198.5	0.0	208.7	219.0	188.2
Total Average of Weight (g)	0.0	46.5	70.5	91.5	0.0	106.0	115.0	72.2
Percent Male	0.0	100.0	63.6	0.0	0.0	100.0	100.0	64.7

Sitka Combined Spring Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	6.0	332.0	14.0	0.0	7.0	14.0	373.0
Percent Age Composition	0.0	1.6	89.0	3.8	0.0	1.9	3.8	100.0
Total Average of Length (mm)	0.0	176.0	188.1	192.6	0.0	218.1	217.5	189.7
Total Average of Weight (g)	0.0	61.3	74.8	78.2	0.0	122.7	120.2	77.3
Percent Male	0.0	66.7	65.4	57.1	0.0	71.4	85.7	66.0

Rock Garden Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	28.0	112.0	15.0	13.0	6.0	22.0	196.0
Percent Age Composition	0.0	14.3	57.1	7.7	6.6	3.1	11.2	100.0
Total Average of Length (mm)	0.0	158.7	173.0	187.1	193.2	201.3	206.0	177.9
Total Average of Weight (g)	0.0	43.5	56.8	77.6	80.4	88.3	103.0	64.2
Percent Male	0.0	50.0	74.1	53.3	69.2	66.7	63.6	67.3

Sore Thumb Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	28.0	63.0	15.0	8.0	7.0	4.0	125.0
Percent Age Composition	0.0	22.4	50.4	12.0	6.4	5.6	3.2	100.0
Total Average of Length (mm)	0.0	156.9	167.3	184.2	198.3	202.4	213.5	172.4
Total Average of Weight (g)	0.0	43.7	54.1	76.1	94.1	99.3	113.3	61.4
Percent Male	0.0	25.0	27.0	66.7	87.5	71.4	75.0	64.8

Seymour Canal Combined Cast Net

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	91.0	274.0	49.0	33.0	16.0	35.0	498.0
Percent Age Composition	0.0	18.3	55.0	9.8	6.6	3.2	7.0	100.0
Total Average of Length (mm)	0.0	158.6	170.9	184.5	194.7	205.4	206.9	175.2
Total Average of Weight (g)	0.0	43.8	54.8	73.4	83.2	98.5	104.3	61.4
Percent Male	0.0	59.3	65.7	65.3	69.7	75.0	60.0	64.7

Appendix A. (page 6 of 6)

**Lisianski Inlet Commercial Seine**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	7.0	7.0	136.0	4.0	1.0	2.0	3.0	160.0
Percent Age Composition	4.4	4.4	85.0	2.5	0.6	1.3	1.9	100.0
Total Average of Length (mm)	155.9	180.6	186.9	202.0	194.0	230.5	209.0	186.7
Total Average of Weight (g)	41.6	69.0	75.3	98.0	84.0	156.5	117.7	76.0
Percent Male	14.3	42.9	49.3	75.0	100.0	50.0	66.7	48.8

**Hoonah Sound Purse Seine**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	8.0	87.0	13.0	6.0	20.0	17.0	151.0
Percent Age Composition	0.0	5.3	57.6	8.6	4.0	13.2	11.3	100.0
Total Average of Length (mm)	0.0	176.1	188.1	201.6	207.5	221.8	226.1	198.1
Total Average of Weight (g)	0.0	66.1	84.3	105.2	113.2	144.1	149.2	101.5
Percent Male	0.0	37.5	50.6	30.8	50.0	25.0	47.1	44.4

**Juneau Test Seine**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	2.0	65.0	160.0	13.0	3.0	3.0	6.0	252.0
Percent Age Composition	0.8	25.8	63.5	5.2	1.2	1.2	2.4	100.0
Total Average of Length (mm)	150.5	162.9	172.8	190.7	202.0	201.7	221.2	172.8
Total Average of Weight (g)	36.5	49.1	58.5	81.4	93.7	95.7	132.5	59.7
Percent Male	100.0	49.2	51.3	38.5	66.7	66.7	66.7	51.2

**Gonakadeseat Bay Cast Net**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	1.0	23.0	6.0	1.0	1.0	2.0	34.0
Percent Age Composition	0.0	2.9	67.6	17.6	2.9	2.9	5.9	100.0
Total Average of Length (mm)	0.0	170.0	189.1	180.7	181.0	188.0	221.0	188.6
Total Average of Weight (g)	0.0	57.0	76.4	70.3	73.0	78.0	109.5	76.6
Percent Male	0.0	100.0	78.3	83.3	100.0	0.0	100.0	79.4

**Yakutat Combined Cast Net**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	2.0	134.0	12.0	2.0	2.0	5.0	157.0
Percent Age Composition	0.0	1.3	85.4	7.6	1.3	1.3	3.2	100.0
Total Average of Length (mm)	0.0	164.0	190.3	186.5	188.0	205.0	210.6	190.5
Total Average of Weight (g)	0.0	53.5	81.2	79.2	89.5	103.0	108.6	81.9
Percent Male	0.0	50.0	53.7	75.0	50.0	50.0	100.0	56.7

**Lisianski Inlet Cast Net**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	2.0	6.0	178.0	8.0	2.0	5.0	2.0	203.0
Percent Age Composition	1.0	3.0	87.7	3.9	1.0	2.5	1.0	100.0
Total Average of Length (mm)	156.5	164.2	176.3	179.8	197.5	209.2	211.0	177.2
Total Average of Weight (g)	38.0	48.2	60.1	60.0	92.0	102.8	101.0	61.3
Percent Male	100.0	100.0	70.2	87.5	50.0	60.0	50.0	71.4

**Hoonah Sound Cast Net**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	11.0	85.0	10.0	11.0	22.0	17.0	156.0
Percent Age Composition	0.0	7.1	54.5	6.4	7.1	14.1	10.9	100.0
Total Average of Length (mm)	0.0	175.0	187.8	182.6	212.4	213.4	220.0	195.4
Total Average of Weight (g)	0.0	56.1	72.1	80.4	112.0	112.1	122.1	85.4
Percent Male	0.0	72.7	62.4	70.0	63.6	50.0	64.7	62.2

**Canoe Pass Cast Net**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	0.0	41.0	0.0	1.0	0.0	1.0	43.0
Percent Age Composition	0.0	0.0	95.3	0.0	2.3	0.0	2.3	100.0
Total Average of Length (mm)	0.0	0.0	193.9	0.0	195.0	0.0	233.0	194.8
Total Average of Weight (g)	0.0	0.0	85.2	0.0	106.0	0.0	172.0	87.7
Percent Male	0.0	0.0	39.0	0.0	0.0	0.0	100.0	39.5

**Long Bay Cast Net**

Age Category	II	III	IV	V	VI	VII	VIII+	Totals:
Total Count of Age Category	0.0	1.0	70.0	6.0	0.0	1.0	2.0	80.0
Percent Age Composition	0.0	1.3	87.5	7.5	0.0	1.3	2.5	100.0
Total Average of Length (mm)	0.0	158.0	188.7	192.3	0.0	222.0	189.0	189.0
Total Average of Weight (g)	0.0	50.0	80.4	88.0	0.0	128.0	76.0	81.0
Percent Male	0.0	0.0	54.3	66.7	0.0	100.0	100.0	56.3

Appendix B. CAT ISLAND HERRING SPAWN SURVEY 1992

Survey Dates: April 15, 16 and 17, 1992

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

Bottom Type: boulder=bld, cobble=cbl, fir=fir, gravel=gvl, mud=mud, mussels=mus, rock=rck, sand=snd, shell or shell hash=shl, woody debris=wdy

Veg. Type: alaria=ala, agarum=agm, coralline algae=cor, eelgrass=elg, filamentous=fil, fucus=fuc, hairkelp=hir, laminaria=lam, large brown kelp=lbk, leafy red=red, loose=los, macrocystis=mac ulva=ulv

Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual
1	3	cbl	fuc				0		3	11	snd	fuc	35					4	26	cbl	agm	0				
1	10	cbl	fuc				0		3	11	snd	fir	70					4	27	cbl		0				
1	10	cbl	fuc				0		3	14	rck	lbk	0					4	20	snd	fir	0				
1	12	cbl					0		3	16	rck	lbk	0					4	20	snd	fir	0				
1	12	cbl					0		3	16	rck	lbk	0					4	20	snd	fir	0				
1	15	cbl	fil				0		3	21	rck	lbk	0					4	20	snd	fir	0				
1	15	cbl	fuc				0		3	21	rck	lbk	0					4	20	snd	fir	0				
1	17	cbl	uva				0		3	21	rck	lbk	0					4	20	snd	fir	0				
1	17	gvl	lbk				0		3	21	rck	lbk	0					4	20	snd	fir	0				
1	19	gvl	lbk				3		3	26	rck	lbk	0					4	20	snd	fir	0				
1	20	gvl	lbk				28		3	26	rck	lbk	0					4	20	snd	fir	0				
1	21	cbl	lbk				1		3	32	snd		0					4	20	snd	fir	0				
1	22	cbl	lbk				0		3	32	snd		0					4	20	snd	fir	0				
1	22	cbl	lbk				0		3	32	snd		0					4	20	snd	fir	0				
1	23	cbl	hir				0		3	32	snd		0					4	20	snd	fir	0				
1	25	cbl	lbk				2		3	35	snd		0					4	10	rck	hir	2				
1	25	cbl	lbk				1		3	35	snd		0					4	5	rck	lbk	0				
1	26	cbl	lbk				1		3	35	snd		0					4	5	rck	hir	3				
1	27	cbl	lbk				0		3	35	snd		0					4	8	rck	fir	40				
1	27	rck	lbk				0		4	3	rck	fuc	0					4	16	rck		0				
1	27	rck	lbk				0		4	8	rck	fir	50					4	17	rck	agm	0				
1	29	rck	lbk				0		4	10	snd	fir	35					4	20	rck		0				
1	29	rck	lbk				60		4	14	snd	los	5					4	23	rck		0				
1	35	rck	lbk				45		4	15	snd		1					4	28	rck		0				
1	38	gvl	lbk				4		4	15	snd	hir	8					4	30	rck		0				
1	39	gvl	lbk				12		4	15	cbl	hir	300					4	33	rck		0				
1	40	gvl	lbk				4		4	16	cbl	lbk	0					4	37	rck		0				
1	42	snd	lbk				3		4	16	cbl	lbk	2					4	37	rck		0				
1	46	snd	lbk				0		4	16	cbl	lbk	1					4	37	rck		0				
1	50	snd	lbk				0		4	16	cbl	lbk	1					5	-3	rck	fuc				0	
2	4	rck	fuc			0			4	17	mud	elg	0					5	4	rck	fir				0	
2	11	rck	fuc			0			4	17	gvl		0					5	7	rck	lbk				0	
2	12	rck	fir			28			4	17	gvl		0					5	9	rck	lbk				0	
2	16	rck	lbk			0			4	17	gvl		0					5	13	slh	lbk				0	
2	17	rck	hir			225			4	16	gvl		1					5	15	rck	lbk				7	
2	21	rck	hir			200			4	16	gvl	lbk	1					5	18	rck	lbk				6	
2	21	rck	lbk			1			4	17	gvl		2					5	22	cbl	lbk				12	
2	21	rck	lbk			0			4	17	gvl	agm	7					5	26	cbl	lbk				3	
2	20	rck	lbk			0			4	18	gvl	lbk	0					5	31	gvl	lbk				25	
2	23	rck	lbk			0			4	19	gvl	hir	12					5	36	gvl	lbk				20	
2	23	rck	lbk			0			4	18	gvl		1					5	38	gvl	lbk				5	
2	22	rck	lbk			0			4	16	rck	los	5					5	42	gvl					0	
2	33	rck	agm			0			4	14	rck	los	1					5	45	gvl					0	
2	36	rck	agm			0			4	12	rck	los	2					6	1	rck	fuc			0		
2	39	rck	agm			0			4	12	rck		0					6	3	rck	lbk			0		
2	44	rck	agm			0			4	13	rck		0					6	8	rck	lbk			0		
3	3	rck		3					4	14	rck		0					6	11	snd	lbk			0		
3	5	rck		9					4	15	rck	lbk	0					6	12	snd	lbk			0		
3	8	cbl		1					4	19	rck	lbk	0					6	12	cbl	lbk			0		
3	12	cbl		0					4	23	rck	agm	0					6	12	cbl	lbk			0		
3	12	cbl		0					4	26	rck	agm	0					6	15	cbl	lbk			0		
3	12	cbl		0					4	26	rck	agm	0					6	15	cbl	lbk			0		
3	13	rck		15					4	26	rck	agm	0					6	16	cbl	lbk			0		

-Continued-

Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual
6	17	cbl	lbk	4					8	21	cbl	lbk	15					9	8	gvl	ulv				0	
6	17	cbl	lbk	8					8	20	cbl	lbk	50					9	8	gvl	ulv				0	
6	18	snd	lbk	12					8	22	cbl	lbk	35					9	6	cbl	fuc				0	
6	20	cbl	lbk	30					8	23	cbl	lbk	30					9	6	cbl	fuc				0	
6	21	snd	lbk	1					8	24	cbl	lbk	10					9	6	cbl	fuc				0	
6	22	snd	lbk	8					8	26	cbl	lbk	15					9	6	cbl	fuc				0	
6	21	snd	lbk	3					8	25	cbl	lbk	30					10	0	cbl	fuc				0	0
6	24	snd	lbk	1					8	27	cbl	lbk	30					10	3	cbl	fuc				0	0
6	23	snd	lbk	5					8	28	cbl	lbk	0					10	3	rck	ala				0	0
6	25	snd	lbk	0					8	28	snd		40					10	4	rck	fir				0	0
6	25	snd	lbk	4					8	30	snd	lbk	1					10	10	rck	lbk				0	0
6	27	snd	lbk	1					8	31	snd	lbk	0					10	13	cbl	lbk				0	0
6	28	snd	lbk	2					8	30	cbl		15					10	14	rck	lbk				0	0
6	28	snd	lbk	0					8	31	cbl	lbk	3					10	16	snd	lbk				0	0
6	30	snd	lbk	0					8	33	cbl	lbk	5					10	16	snd	lbk				1	1
6	30	snd		0					8	32	cbl	lbk	40					10	18	snd	lbk				1	1
6	31	snd	lbk	0					8	32	cbl	lbk	0					10	19	cbl	lbk				0	0
6	31	snd	lbk	0					8	33	cbl		3					10	22	cbl	lbk				0	0
6	34	snd		0					8	34	cbl		10					10	23	cbl	ala				3	3
6	34	snd		0					8	34	cbl	lbk	0					10	24	cbl	lbk				0	0
6	35	snd		0					8	34	cbl		6					10	26	cbl	lbk				1	1
6	35	snd	lbk	0					8	34	cbl	lbk	5					10	27	cbl	lbk				0	0
6	35	snd	lbk	0					8	33	cbl	lbk	0					10	28	cbl	lbk				50	50
6	36	snd	lbk	0					8	33	cbl	lbk	1					10	27	cbl	ala				60	60
6	36	snd	lbk	0					8	33	cbl	lbk	6					10	29	cbl	ala				2	2
6	38	snd	lbk	0					8	34	cbl	lbk	0					10	31	cbl	ala				1	1
6	38	snd	lbk	0					8	34	cbl	lbk	6					10	33	cbl	ala				8	8
6	40	snd	lbk	0					8	33	cbl	lbk	0					10	33	cbl	lbk				0	0
6	40	snd	lbk	0					9	0	cbl				0			10	38	cbl	lbk				0	0
6	42	snd	lbk	0					9	2	gvl	fuc	0		0			10	38	cbl	lbk				0	0
6	42	snd	lbk	0					9	5	gvl	fuc	0		0			10	38	cbl	lbk				0	0
6	41	snd	lbk	0					9	5	gvl	fuc	0		0			10	38	cbl	lbk				0	0
6	41	snd	lbk	0					9	5	gvl	fuc	0		0			10	39	cbl	lbk				0	0
7	-2	rck	fuc				0		9	5	gvl	fuc	0		0			11	0	bld	fuc				0	0
7	4	cbl	fuc				0		9	11	gvl		0		0			11	2	gvl	fuc				0	0
7	7	cbl	fil				0		9	11	gvl		0		0			11	4	gvl					0	0
7	8	cbl	fil				0		9	11	gvl		0		0			11	6	gvl					0	0
7	12	cbl	lbk				0		9	11	gvl		0		0			11	6	gvl					0	0
7	13	cbl	lbk				5		9	14	gvl	ulv	0		0			11	6	gvl					0	0
7	14	cbl	lbk				90		9	14	gvl	ulv	0		0			11	10	gvl					0	0
7	16	gvl	lbk				30		9	14	gvl	ulv	0		0			11	10	gvl					0	0
7	17	snd	lbk				18		9	14	gvl	ulv	0		0			11	10	gvl					0	0
7	19	snd	elg				5		9	15	gvl		0		0			11	11	gvl	elg				2	2
7	22	snd					1		9	16	mud	elg	2		2			11	15		elg				35	35
7	25	snd					0		9	17		elg	1		1			11	17	snd	elg				30	30
7	28	snd	lbk				1		9	21	snd		1		1			11	20	snd					0	0
7	35	snd					0		9	21	gvl		0		0			11	23	snd					0	0
7	35	snd					0		9	22		hir	0		0			11	26	snd					0	0
7	44	snd					0		9	24		lbk	3		3			11	32	los					0	0
7	44	snd					0		9	26		hir	5		5			11	38	snd					0	0
8	6	snd	fir	0					9	25	snd	lbk	2		2			12	3	gvl	ulv				0	0
8	7	snd	fir	0					9	22	gvl	lbk	4		4			12	3	gvl	ulv				0	0
8	7	snd	fir	0					9	22	gvl	lbk	4		4			12	3	gvl	ulv				0	0
8	7	snd	fir	0					9	22	gvl	lbk	0		0			12	3	gvl	ulv				0	0
8	7	snd	fir	0					9	21	gvl	lbk	0		0			12	3	gvl	ulv				0	0
8	7	snd	fir	0					9	17	gvl	lbk	0		0			12	3	gvl	ulv				0	0
8	9	cbl	fir	0					9	16	gvl	lbk	0		0			12	3	gvl	ulv				0	0
8	9	cbl	fir	0					9	16	gvl	lbk	0		0			12	3	gvl	ulv				0	0
8	12	cbl	fir	0					9	12	rck	fuc	0		0			12	3	gvl	ulv				0	0
8	12	cbl	fir	0					9	12	rck	fuc	0		0			12	5	gvl	ulv				0	0
8	14	cbl	fir	0					9	10	gvl	ulv	0		0			12	5	gvl	ulv				0	0

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Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual
8	14	cbl	fir	0					9	10	gvl	ulv						12	5	gvl	ulv					
8	14	cbl	fir	0					9	10	gvl	ulv						12	5	gvl	ulv					
8	14	cbl	fir	0					9	10	gvl	ulv						12	5	gvl	ulv					
8	18	cbl	agm		0				9	8	gvl	ulv						12	7	gvl	lbk					0
8	18	cbl	agm		0				9	8	gvl	ulv						12	7	gvl	lbk					0
12	7	gvl	lbk						14	25	cbl	hir						16	25	rck						
12	7	gvl	lbk			0			14	26	cbl	hir	90					16	25	rck						0
12	9	gvl	lbk			4			14	26	cbl	hir	250					16	25	rck						0
12	9	gvl	hir			140			14	27	cbl	hir	220					16	25	rck						0
12	10	gvl	hir			180			14	27	cbl	hir	50					16	29	gvl						0
12	11	gvl	lbk			45			14	28	cbl	hir	120					16	29	gvl						0
12	12	gvl	hir			120			14	29	cbl	hir	140					16	29	gvl						0
12	14	gvl	hir			200			14	29	cbl	hir	140					16	29	gvl						0
12	15	gvl	hir			60			14	30	snd	hir	4					17	3	snd						0
12	16	snd	hir			90			14	30	snd		0					17	8	cbl						0
12	17	snd	hir			1			14	31	snd		0					17	8	cbl						0
12	18	snd	hir			18			14	31	snd	lbk	0					17	8	cbl						0
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12	21	snd	hir			0			14	31	snd	lbk	1					17	13	cbl	lbk					0
12	23	snd	hir			1			14	31	snd	lbk	0					17	13	cbl	lbk					0
12	27	snd	hir			0			14	31	snd	lbk	0					17	13	cbl	lbk					0
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12	27	snd	hir			0			14	31	snd	lbk	1					17	13	cbl	lbk					0
12	27	snd	hir			0			14	29	gvl	lbk	0					17	13	cbl	lbk					0
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12	35	snd	mud			0			15	4	rck	fuc	0					17	18	cbl	lbk					0
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13	3	rck	fuc	0					15	2	rck	fuc	0					17	20	cbl	lbk					0
13	5	rck	fuc	0					15	4	rck	fuc	1					17	20	cbl	lbk					0
13	7	rck	fuc	1					15	3	rck	fuc	4					17	27	cbl	lbk					0
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13	13	cbl	fuc	4					15	4	rck	fir	60					17	27	cbl	lbk					0
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13	17	snd	elg	0					15	25	rck	lbk	25					17	34	cbl	lbk					0
13	17	snd	elg	2					15	27	gvl	lbk	60					17	34	cbl	lbk					0
13	19	snd	elg	1					15	27	gvl	lbk	25					17	40	cbl	lbk					0
13	20	snd	elg	3					15	28	gvl	agm	60					17	40	cbl	lbk					0
13	20	snd	elg	0					15	29	gvl	agm	25					17	40	cbl	lbk					0
13	21	snd	elg	1					15	31	gvl	agm	35					17	40	cbl	lbk					0
13	21	snd	elg	0					15	32	gvl		0					18	4	rck						0
13	22	snd	hir	3					15	32	gvl	agm	40					18	9	rck	fuc					0
13	26	snd		0					15	35	gvl	lbk	25					18	9	rck	fuc					0
13	26	snd		0					15	37	gvl	agm	7					18	9	rck	fuc					0
13	26	snd		0					15	40	gvl	lbk	0					18	9	rck	fuc					0
13	26	snd		0					15	40	gvl	lbk	1					18	11	cbl						0
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13	31	snd		0					15	46	gvl	lbk	0					18	15	snd						0
13	36	snd		0					16	6	rck	fir	35					18	15	snd						0

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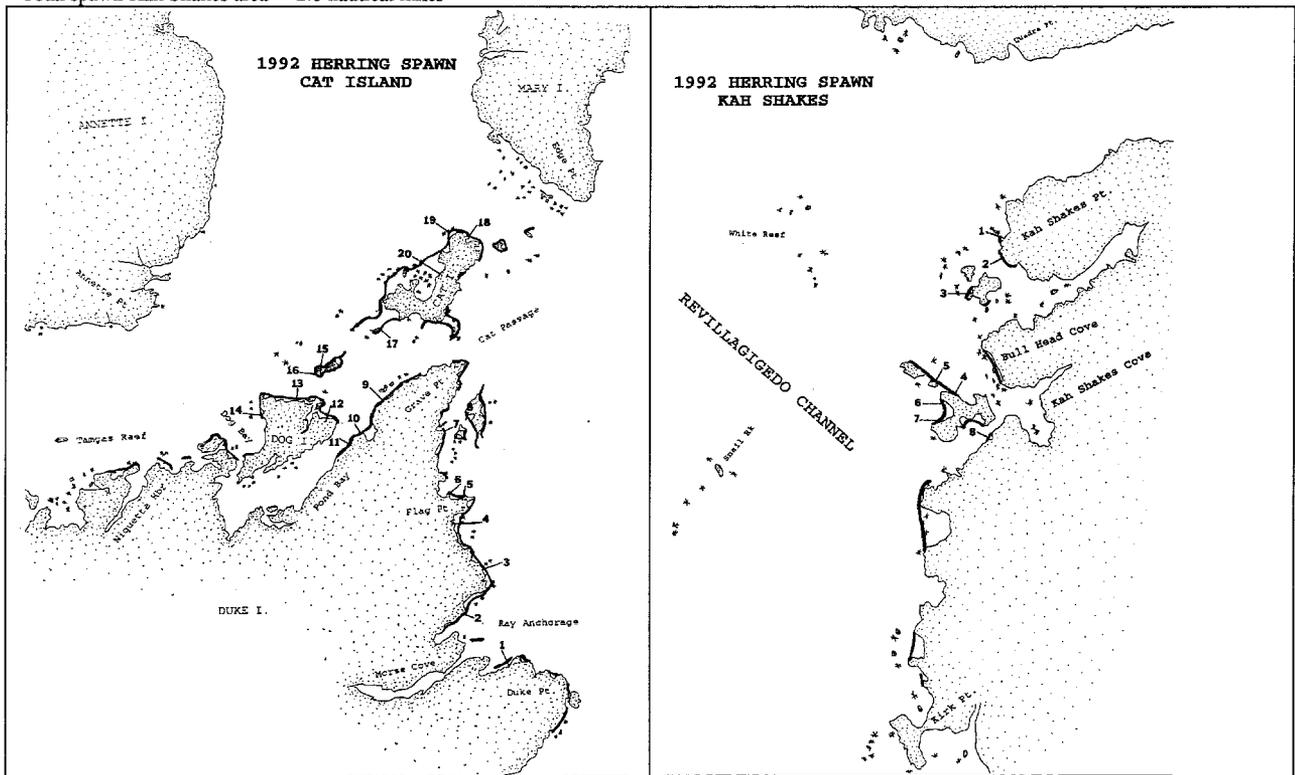
Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual	Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual	PD Visual	TK Visual	RL Visual	TM Visual
13	36	snd		0					16	11	rck	fir	8					18	16	snd	elg		0			
13	36	snd		0					16	12	rck	lbk	2					18	16	snd	elg		0			
13	36	snd		0					16	13	rck	lbk	6					18	17	snd	elg		4			
14	9	rck	fuc	1					16	14	rck	lbk	45					18	19	snd	elg		1			
14	15	rck	fir	1					16	14	rck	lbk	35					18	19	snd	elg		25			
14	19	rck	agm	18					16	16	rck	lbk	17					18	19	snd	elg		15			
14	21	rck	agm	60					16	16	rck	lbk	0					18	20	snd	elg		20			
14	23	rck	agm	50					16	17	cbl	lbk	0					18	21	snd	elg		15			
14	24	rck	agm	85					16	20	cbl	agm	2					18	22	snd	elg		5			
14	25	cbl	hir	180					16	22	rck		0					18	23	snd	elg		4			
18	24	snd	elg			1			20	10	rck	fir	0													
18	25	snd	elg			1			20	10	rck	fir	0													
18	26	snd	elg			0			20	10	rck	fuc	1													
18	26	snd	elg			0			20	10	rck	fuc	1													
18	27	snd	elg			0			20	12	rck	fir	3													
18	37	snd				0			20	13	rck	ulv	0													
18	37	snd				0			20	14	rck	lbk	0													
18	37	snd				0			20	15	rck	lbk	0													
18	37	snd				0			20	16	rck	lbk	0													
18	37	snd				0			20	17	rck	hir	80													
18	37	snd				0			20	17	rck	agm	3													
18	37	snd				0			20	16	rck	hir	65													
18	37	snd				0			20	17	rck	hir	25													
18	45	snd				0			20	18	gvl	hir	240													
18	45	snd				0			20	18	gvl	hir	7													
19	4	cbl	fuc	1					20	19	gvl	hir	180													
19	10	cbl	fir	0					20	19	gvl	hir	5													
19	10	cbl	fir	0					20	20	gvl	hir	160													
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19	10	cbl	fir	0					20	21	gvl	hir	7													
19	10	cbl	fir	0					20	21	gvl	hir	20													
19	11	gvl	fir	1					20	21	gvl	hir	80													
19	10	cbl	lbk	0					20	21	gvl	hir	100													
19	10	cbl	lbk	0					20	22	gvl	hir	12													
19	10	cbl	lbk	0					20	23	gvl	hir	17													
19	11	rck	fuc	0					20	24	gvl	lbk	20													
19	12	rck		0					20	24	gvl	lbk	8													
19	13	cbl	ulv	0					20	24	gvl	lbk	5													
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19	13	cbl	ulv	0					20	25	gvl	lbk	20													
19	13	cbl	ulv	0					20	25	gvl	lbk	0													
19	13	rck	fuc	0					20	26	mud	lbk	0													
19	13	rck	fuc	0					20	29	mud	lbk	0													
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19	13	rck	fuc	0					20	29	mud	lbk	0													
19	13	rck	fuc	0					20	29	mud	lbk	0													
19	13	rck	fuc	0					20	29	mud	lbk	0													
19	13	rck	fuc	0					20	30	mud	lbk	0													
19	13	rck	fuc	0					20	30	mud	lbk	0													
19	14	rck	fir	2					20	30	mud	lbk	0													
19	9	rck	fuc	0					20	30	mud	lbk	0													
19	15	rck	fuc	2					20	33	mud	lbk	0													
19	16	rck	fuc	0					20	33	mud	lbk	0													
19	15	rck	fuc	5					20	33	mud	lbk	0													
19	17	rck	fir	12					20	33	mud	lbk	0													
19	21	rck	agm	2					20	34	mud	lbk	0													
19	21	rck	agm	10					20	34	mud	lbk	0													
19	21	rck	agm	5					20	34	mud	lbk	0													
19	23	rck	agm	1					20	34	mud	lbk	0													
19	26	rck	agm	5					20	34	mud	lbk	0													
19	27	rck	agm	15																						
19	30	rck	agm	12																						

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Transect No.	Depth	Bottom Type	Vegetation Type	WB Visual
19	34	rck	agm	14
19	34	gvl		0
19	35	cbl	agm	7
19	36	cbl		0
19	37	cbl		1
19	38	snd	cbl	0
19	40	snd	cbl	0
19	40	snd	cbl	0
19	43	snd	cbl	0
19	43	snd	cbl	0
19	43	snd	cbl	0
20	4	rck	fuc	0
20	11	gvl	ulv	0
20	10	cbl	ulv	0
20	10	cbl	ulv	0

ANNETTE ISLAND, KAH SHAKES AND CAT ISLAND

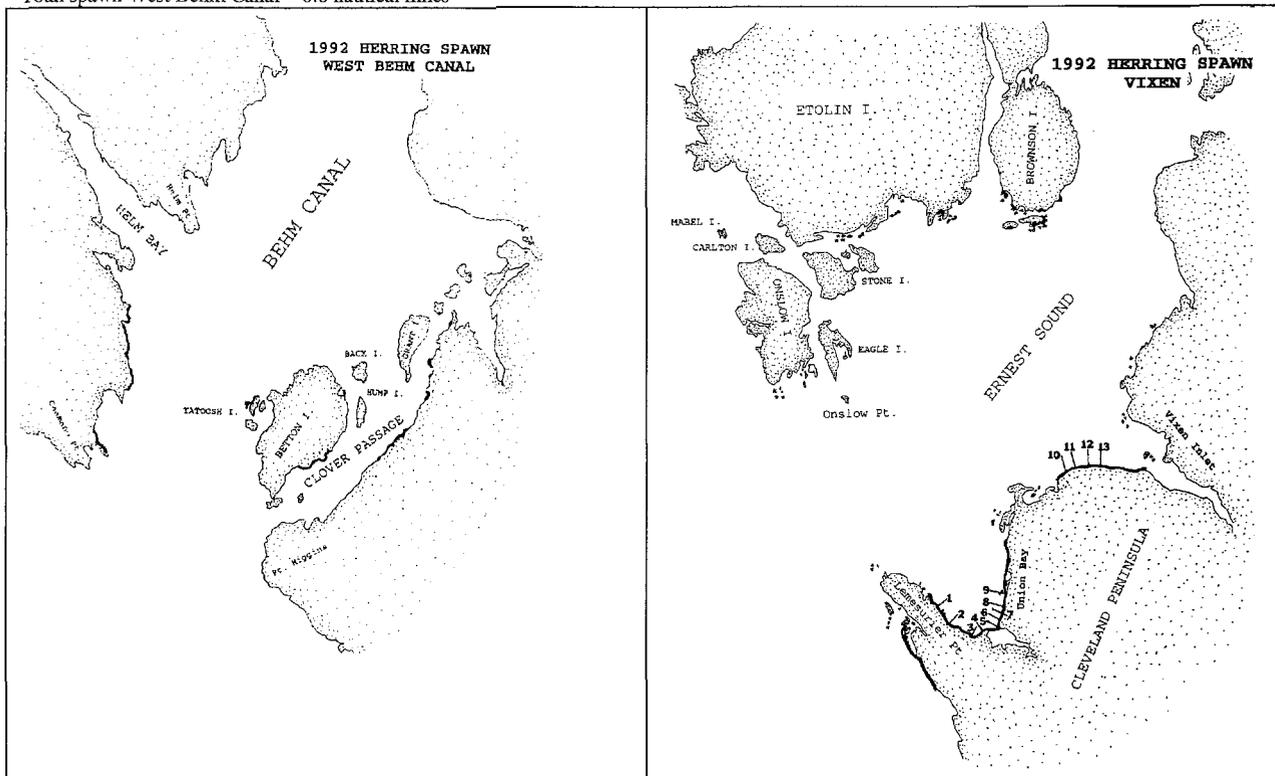
- 3-04 Annette Island, Dog and Cat Island. No activity. 4 sea lions N of Black Island. 1 sea lion in the Delongs.
- 3-11 Annette Island, Dog and Cat Island. No activity. Kah Shakes **SPOT SPAWN**, little bird activity. 12 sea lions at Slate Island.
- 3-15 Annette Island, Cat Island. Birds SW Cat Island. Birds off Kirk Point, 3 sea lions off Kah Shakes Pt. 2 sea lions around Slate Islands.
- 3-20 Annette Island, Dog and Cat Island. No activity. 10 sea lions N of Kah Shakes Point. Killer whales N of White Reef. No Activity.
- 3-22 Slate Island, Kah Shakes. No activity. Cat and Dog Island. Birds, 15 sea lions. Small school of herring S of Village Island. Birds W of Village Island.
- 3-24 Annette Island, Dog Island, Cat Island. No spawn. 3 good schools of herring at Cat Island; not much bird activity. 2 sea lions at Black Island; 4 sea lions at Slate Island. 10 sea lions outside of Bullhead Cove. Sea lions at the Delongs and small school of herring in Foggy Bay.
- 3-25 Annette Island, Dog and Cat Island. **SPOT SPAWN** and 25 sea lions N Crab Bay; 25 sea lions S of Kwain Bay. 2 sea lions NW Dog Island. Fish leading beach; bird and sea lion activity NW Cat Island (300 yards). School of fish and 12 sea lions outside of Bullhead Cove (12.5 tons). 12 sea lions S of Kah Shakes Cove.
- 3-28 Survey on Kah Shakes; no active spawn.
- 3-29 No active spawn at Kah Shakes. School of herring N of Cat Island. 40 sea lions and a school of herring in N Crab Bay.
- 3-30 Annette Island, Cat Island. **FIRST SPAWN** seen on NW Village Island. 102 sea lions and lots of birds around Cat Island. 24 sea lions N of Dog Island. No active spawn at Kah Shakes.
- 4-01 Skiff survey Cat Island. **ACTIVE SPAWN** on Double and Village Islands.
- 4-02 **ACTIVE SPAWN** on N Duck Island.
- 4-02 **SPAWN** on Double and Village Islands.
- 4-03 **SPAWN** on N Dog Island, Double and Village Islands. SW Cat Island, Grave Point, Duck Island, S Flag Point, and Reef Harbor. 3 schools of herring around Cat Island. 100 yards of **SPAWN** outside of Kah Shakes Cove. Very **INTENSE SPAWN** NW Dog Island. **SPAWN** around Double and Village Islands. **SPOT SPAWNS** at Reef Harbor and Flag Point. 2 schools of herring in front of Grave Point. **SPAWN** N Dog Island, around Double Island, SW Cat Island, Duck Island, Reef Harbor, Grave Point, NE of Pond Bay. **SPOT SPAWN** S of Flag Point. **ACTIVE SPAWN** outside of Kah Shakes Cove.
- 4-04 **SPAWN** from Ray Anchorage to Pond Bay, including Duck Island. **SPAWN** on N Dog Island and around Double Island. **SPAWN** all around Cat and Fripo Islands; **ACTIVE SPAWN** on Duke Point. Large amount of birds S of Kah Shakes Cove. **ACTIVE SPAWN** N of Kirk Point, outside of Kah Shakes Cove, and Bullhead Cove.
- 4-06 **LIGHT SPAWN** on Duke Point and N shore of Ray Anchorage. Birds on Fripo Island; birds and **SPAWN** W of Dog Bay. 3 sea lions W of Dog Island. Kah Shakes. No spawn. Birds seen at Kah Shakes Cove.
- 4-10 No herring activity and some birds on NW Cat Island. Kah Shakes. Nothing observed, great visibility.
- Total spawn Cat Island area = 18.7 nautical miles  
Total spawn Kah Shakes area = 2.6 nautical miles



WEST BEHM CANAL

- 4-16 **ACTIVE SPAWN** on SE Betton Island.
- 4-17 \*Ernest Sound. **ACTIVE SPAWN** around island S of Bronson Island. 3 sea lions on Vixen Point, birds in Vixen Inlet.\* Cleveland Peninsula and Clover Pass. **ACTIVE SPAWN** on Tatoosh Island. **ACTIVE SPAWN** at Settlers Cove. **ACTIVE SPAWN** from Bond Bay to Smugglers Cove.
- 4-18 **ACTIVE SPAWN** in S Bond Bay. Groups of birds from Bond Bay to Smugglers Cove. **SPOT SPAWN** at Tatoosh, **SPOT SPAWN** W of Joe Island. **SPOT SPAWN** W of Grant Island. Birds at Settlers Cove and S.
- 4-20 Skiff survey. **ACTIVE SPAWN** in S Bond Bay. Groups of birds from Bond Bay to Smugglers Cove. Birds at Tatoosh, two areas of **SPOT SPAWN** N of Joe Island. Birds at Settlers Cove and N of Settlers Cove. Birds SE of Betton Island.
- 4-21 Birds at Tatoosh, Bond Bay and scattered groups to Smugglers Cove. Birds E of Grant Island, at Settlers Cove and SE of Betton Island. No active spawn seen.

Total spawn West Behm Canal = 6.6 nautical miles



HYDABURG

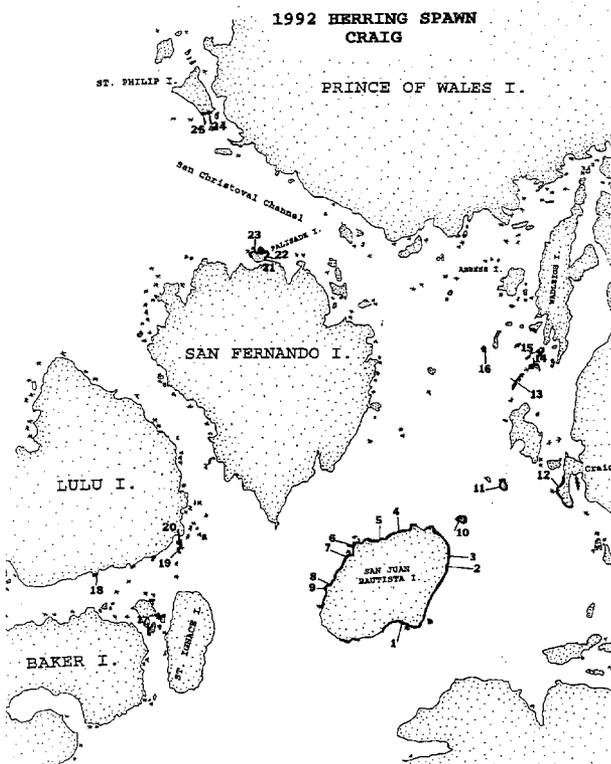
- 4-04 Aerial survey of McFarland Islands. Good visibility but no activity observed.
- Total spawn Hydaburg area = None observed

CRAIG

- 3-15 Skiff survey around Fish Egg Island. **ACTIVE SPAWN** W side of Fish Egg Island. Herring NE and S of Fish Egg. **SPAWN** on S Fish Egg.
- 3-16 **ACTIVE SPAWN** on W Fish Egg, schools of herring NE Fish Egg. 85 sea lions around Fish Egg. 15 sea lions at Klawock Reef. 40 sea lions around the Albertos. 1 school of herring SW of Wadleigh Island. 10 sea lions and 1 school of herring N of the Witnesses. 25 sea lions N of Fern Point. McFarlands. No active spawn.
- 3-17 Trocadero to St. Philip and Portillo Channel. **ACTIVE SPAWN** NW Fish Egg Island. 115 sea lions around Fish Egg Island. 35 sea lions around W Alberto Islands. 5 sea lions E of the Witnesses.
- 3-19 Doyle Bay to San Christoval Channel. **ACTIVE SPAWN** around Fish Egg Island and Reef. 40 sea lions NE Fish Egg, 130 sea lions W Fish Egg Island. Herring N of Clam Island.
- 3/20 Skiff survey Craig area. **SPAWN** on Fish Egg Reef.
- 3-21 Fish Egg and Alberto Island. No active spawn, birds and sea lions W of Fish Egg.
- 3/22 Trocadero to N San Christoval Channel. **ACTIVE SPAWN** around Fish Egg Island. 185 sea lions around Fish Egg; schools of herring SE Fish Egg. 40 sea lions on W Clam Island. Schools of herring SW of Wadleigh Island and around Clam Island. 30 sea lions W of Abbess.
- 3-23 Trocadero, Port Real Marina, Portillo Channel, Fish Egg Island, Alberto Islands. **ACTIVE SPAWN** around Fish Egg Island. 40 sea lions around Fish Egg. **ACTIVE SPAWN** in SW Albertos. Several schools of herring SW of Wadleigh Island. 85 sea lions around Abbess Island.

- 3/24 Fish Egg, Alberto Islands, San Christoval Channel. **LIGHT SPAWN** around Fish Egg, schools of herring on E Fish Egg. **ACTIVE SPAWN** NE of Wadleigh Island. Schools of herring around the Alberto Islands. 40 sea lions W of Abbess, two schools of herring by Rosary Island.
- 3/25 Skiff survey - Fish Egg, Alberto Islands. **ACTIVE SPAWN** on NW Fish Egg Island, 125 sea lions around Fish Egg. 30 sea lions at Klawock Reef. 50 sea lions E of Abbess Island.
- 3-28 Skiff survey - Point Mirabelles to Nossuk Island. **ACTIVE SPAWN** on E Ballena Island. Sea lions and eagles at St. Philip Island.
- 3/29 Skiff survey - Port Bagial, Ballena Island, Fish Egg, Clam and Wadleigh Island. No active spawn.
- 3/30 Trocadero Bay, Fish Egg, St. Philip, Warm Chuck, Heceta Island, S. Tuxekan, Portillo Channel, San Juan Bautista. 140 sea lions around Fish Egg Island. 15 sea lions S of Alberto Island. 0 sea lions S of Abbess Island, no spawn activity.
- 4/30 Trocadero, Fish Egg Island, Palisade Island, Portillo Channel, San Juan Bautista. **GOOD SPAWN** on N and NE San Juan Bautista. Good herring school S of San Juan Bautista, birds NW San Juan. 5 sea lions N of Clam Island, 10 sea lions on NW Fish Egg.
- 4-05 Skiff survey - Fish Egg, St. Philip, Portillo Channel, San Juan Bautista. **ACTIVE SPAWN** N of Clam Island. Birds in Crab Bay and W of Palisade Island. Birds and 40 sea lions N of San Juan Bautista.
- 4/06 Skiff survey - Fish Egg, St. Philip, Portillo Channel, San Juan Bautista. **ACTIVE SPAWN** on Alberto Reef, **SPAWN** on Wadleigh Rock, **LIGHT SPAWN** and birds on N San Juan Bautista.
- 4-07 Skiff survey - Fish Egg, St. Philip, Palisade Island, Fern Point, San Juan Bautista. **SPAWN** on Klawock Reef and N of Clam Island. **SPAWN** on N Palisade Island, **SPAWN** on NW San Juan Bautista. **SPAWN** around Port Bagial.
- 4-08 Fish Egg, St. Philip Island, Portillo Channel, San Juan Bautista. 20 sea lions N of Clam Island, **SPAWN** on three reefs N of Clam Island. **SPAWN** around Palisade Island, **SPAWN** on N San Juan Bautista. **SPAWN** and 15 sea lions around Port Bagial. **SPAWN** on Balandra Island.
- 4-09 Skiff survey - Fish Egg, Palisade Island, Portillo, San Juan Bautista. **SPAWN** around Port Bagial, birds around Clam Island and Wadleigh Rock. Birds on Klawock and Alberto Reef. **ACTIVE SPAWN** on NW Palisade Island. **SPOT SPAWN** on NW San Juan Bautista, **SPAWN** on Balandra Island.
- 4/10 Trocadero Bay, Fish Egg, St. Philip Island, Portillo Channel, San Juan Bautista. **SPAWN** in Portillo Channel - Pt. St. Thomas. **SPOT SPAWN** S of Reef Point and N Santa Rita Island. **ACTIVE SPAWN** SE and SW San Juan Bautista.
- 4-11 Fish Egg, St. Philip, Portillo Channel, San Juan Bautista. **SPAWN** on S St. Philip Island, **SPAWN** on Pt. Garcia. **SPAWN** NW Ignace Island.
- 4-14 Fish Egg, Albertos, St. Philip, Cruz Pass, Palisades, Portillo, Real Marina, San Juan Bautista, Cape Suspiro. Birds S of Clam Island and Wadleigh Rock. 5 sea lions N Abbess Island, 5 sea lions N Culebra. Birds at Palisade Island and 10 sea lions at Pt. Santa Rosalia. Lots of birds on N San Juan Bautista.
- 4-17 Port St. Nicholas, Fish Egg, Wadleigh, Cruz Pass, Fern Pt., San Juan Bautista, Portillo Channel, St Philip, Port Alice, Edna Bay. Birds around Cape Suspiro. Birds at Wadleigh Rock, Klawock Reef and NE Fish Egg. Birds at Fern Point, Point Cuerbo, all around San Juan Bautista. Birds at Palisade Island.

Total spawn Craig = 22.6 nautical miles



SEA OTTER SOUND

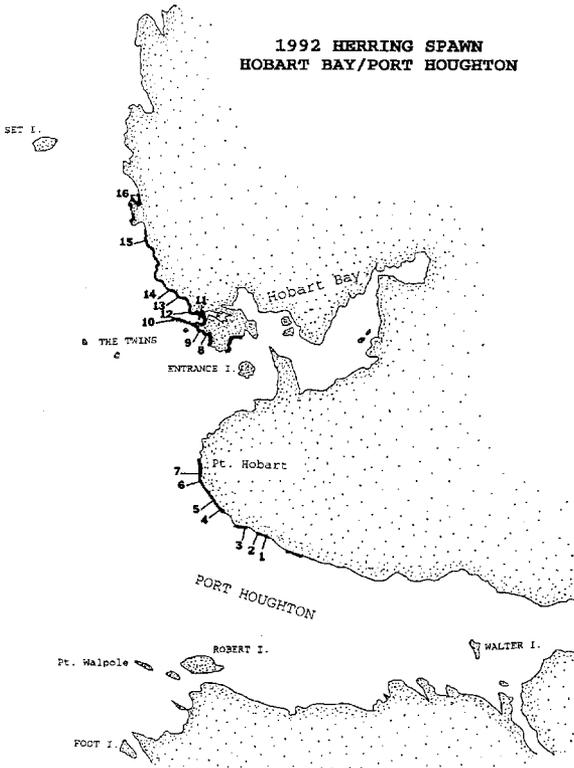
4-4 Aerial survey of Sea Otter Sound. Good visibility but no activity observed.

HOBART BAY

- 4-22 32 sea lions off wooded island, 10 sea lions in S Bay.
  - 4-24 2 sea lions off wooded island, 12 sea lions N of lagoon
  - 4-29 Numerous schools leading beach from Pt. Hobart N. 1,950 ton estimated biomass. 65 sea lions.
  - 4-30 Schools leading beach in and outside of lagoon. 20 sea lions
  - 5-01 Too windy to fly. **HEAVY SPAWN** reported.
  - 5-02 **ACTIVE SPAWN**: 0.3 nautical miles. 30 tons. 30 sea lions.
  - 5-05 **ACTIVE SPAWN**: 2.0 nautical miles.
  - 5-06 8 ton school, 2-3,000 birds, 15 sea lions.
  - 5-07 No herring, 2-4,000 birds, 3 sea lions.
  - 5-08 No herring, 3,000 birds, 4 sea lions.
  - 5-10 Skiff survey, 0.7 nautical miles at Sunset Cove.
  - 5-11 No herring, 4-6,000 birds, 8 sea lions.
- Total spawn observed = 5.3 N. miles

PORT HOUGHTON

- 4-22 200 ton school on N shore, 7 sea lions.
  - 4-24 5 balls along N shore.
  - 4-29 Numerous schools leading beach N shore, estimated 450 tons.
  - 4-30 No spawn activity, 3 schools along N shore.
  - 5-02 **LIGHT SPAWN** on N shore, 2 sea lions.
  - 5-05 **LIGHT SPAWN** on N shore, 2 sea lions, 400 birds.
  - 5-06 No spawn activity, 4 sea lions.
  - 5-07 No spawn activity, 4 sea lions, 400 birds.
  - 5-08 **LIGHT SPAWN** (clam?) on N shore, 17 sea lions.
  - 5-09 No spawn activity, 6 sea lions, 3-500 birds
- Total spawn observed = 2.3 nautical miles

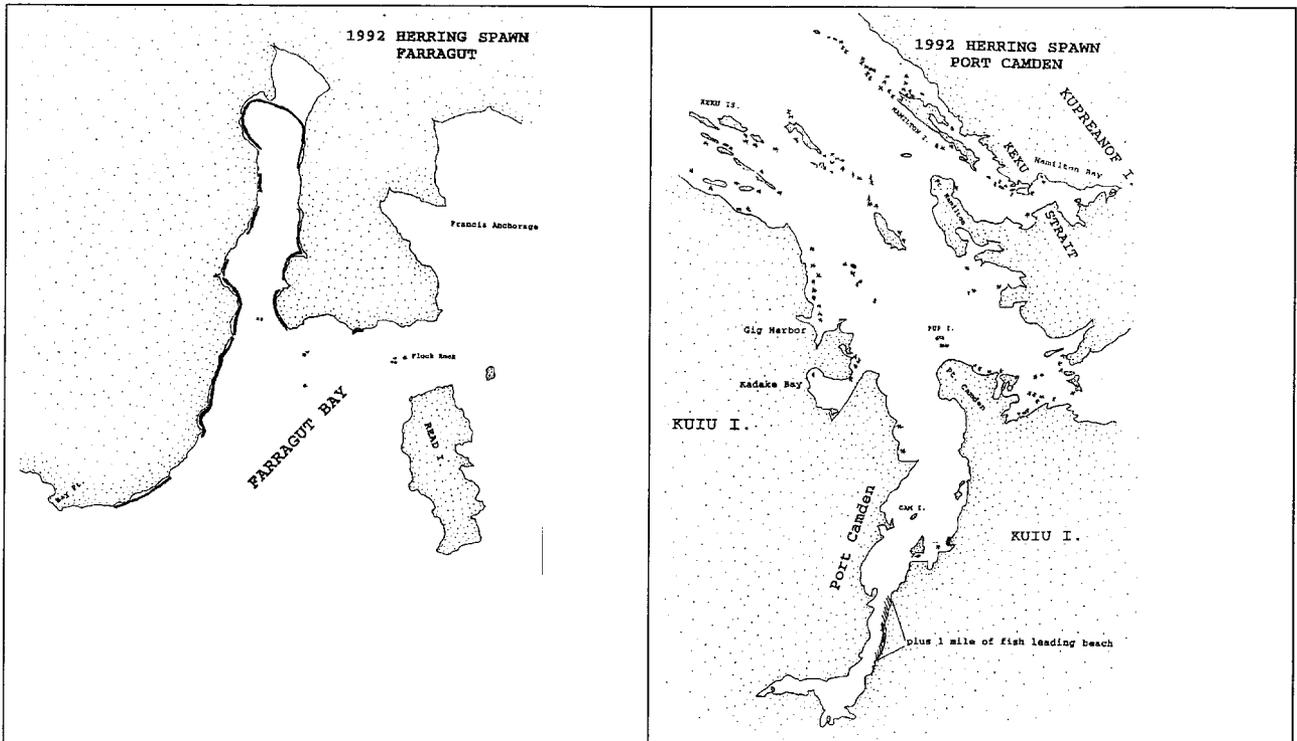


FARRAGUT BAY

- 4-22 4 balls along W shore, 2 balls in Pound Cove, 58 sea lions.
  - 4-24 **ACTIVE SPAWN** at head of N Arm, 1.7 nautical miles.
  - 4-26 **ACTIVE SPAWN** W shore and in Pound Cove, 1.2 nautical miles. Eggs along W shore and along outer N Arm, 0.7 nautical miles.
  - 4-29 No active spawn, 15 sea lions, 4,000 birds.
  - 4-30 No active spawn.
  - 5-02 No active spawn. 2-3,000 birds in N Arm.
  - 5-05 No active spawn. 3,000 birds in N Arm.
  - 5-08 No active spawn. 3-4,000 birds in N Arm.
- Total spawn observed = 3.6 nautical miles

PORT CAMDEN

- 4-29 **SPOT SPAWN** and five schools at upper Rocky Pass outside Hamilton Bay. Three areas of possible spawn, fish leading beach, and eight small schools in Narrows.
- Total spawn observed = 0.25 nautical miles



THREE MILE ARM

- 4-29 No spawning activity, birds or sea lions

ERNEST SOUND

- 4-16 **FIRST SPAWN** reported by charter pilot at S tip of Bronson Island.
  - 4-17 Three **SPOTS OF SPAWN** at S tip Bronson, birds on old spawn.
  - 4-20 Birds feeding on old spawn. No new spawn.
  - 4-21 **ACTIVE SPOT SPAWN** in Vixen and Union Bay approximately .8 miles. Lots of birds on old spawn.
  - 4-23 6.2 miles of eggs in Vixen Inlet and Union Bay. **SPOT SPAWNS** along existing eggs. 10 sea lions, 5,000 birds.
- Total spawn observed Union Bay and Vixen Inlet = 7.0 nautical miles  
 Total spawn observed Bronson Island = .8 nautical miles  
 Total spawn observed Meyers Chuck = 1.3 nautical miles  
 Total Ernest Sound 9.1 nautical miles

ZIMOVIA STRAIT

4-17 Approx. 0.25 miles of SPAWN near Pats Creek.

4-20 **SPOT SPAWN** at Eight Mile Beach.

Total spawn observed = 0.25 nautical miles

LOWER LYNN CANAL

4-20 50 sea lions at Bridget Point, 20 along the wall, and 10 at the mouth of Berner's River. One whale at Bridget Point. No herring activity noted.

4-22 Surveyed from Auke Bay to Sawmill. Fish located in scattered schools from Sunshine Cove northward. A solid 5-fathom band of herring located on the edge between Mab Island and Bridget Point. Two schools located in Berner's Bay off the reef, 15 sea lions.

4-23 A few scattered schools observed on the beach inside Mab Island. Larger more massive schools located by Bridget Point and along Berners Reefs. Many gulls seen by the drop off S of Point Bridget.

4-24 Herring schools located in Echo Cove and Bridget Point.

4-26 Birds located on the inside of the N end of Mab Island, and scooters off Point St. Mary's, possibly indicating the presence of old spawn. 25 sea lions on the rookery, 62 on the grounds, 50 in the Berners River/Slate Cove area, remaining 12 spread between Sawmill Cove to Berners Reefs.

4-27 **SPOT SPAWN** along Berners Reefs, schools on the beach. Scooters on old spawn at Reefs and St. Mary's. Four sea lions opposite Slate Cove. No sea lions on the rookery, Eleven found elsewhere: S Bridget Cove (2), N Bridget Cove (2), Point Bridget (2), and the Rock Wall (5).

4-28 **LIGHT SPAWN** on Berners Reefs. From to St. James S to Couverden and to Port Frederick, occasional sea lions. No sea lions opposite Berners River. Questionable schools located N of Robinson Creek.

4-29 Scooters eating spawn off Berners Reefs, many more in Berners Bay not on spawn. Hooligan in lower Berners River. More birds than fish. 20 sea lions on the rookery; only a few (3) off Point Bridget.

4-30 **SPOT SPAWN** in Berners Reefs and a few schools in the shallows. Hooligan in Berners River not visible in schools as before. Birds mostly on flats by the river mouth.

5-01 No spawn or fish from Auke Bay to Saint Mary's. Lots of birds on Reefs, mostly scooters. Sea lions fewer in number: Eagle Beach (5), Slate Creek (2), and 12 on rookery. Brown algae bloom is fading.

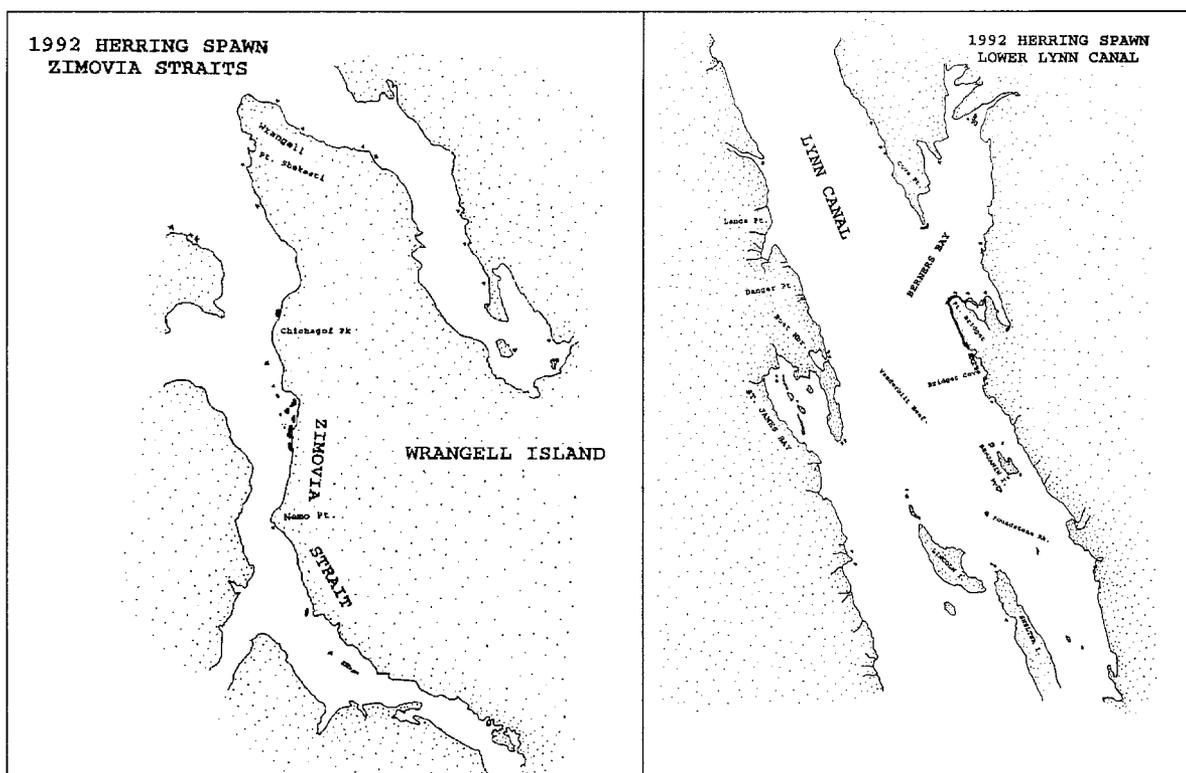
5-02 No herring seen but birds were on the spawn; 16 sea lions on the rookery.

5-05 No spawn observed. Many birds seen in the water and on the beach from Point Bridget to Bridget Cove. They must have spawned on May 4.

5-08 Skiff survey from the Boy's Scout Camp to Sawmill Cove. Dove on Berner's Reefs and outside Sawmill. Spawn was light, and torn up by birds. Unable to dive on the outside where birds were observed on May 5.

5-12 Dove off the Monark from the Rock Wall to N Bridget Cove. Spawn densities much better than previously found off Berners Reefs or Seymour Canal. Densities up to 200K with an average of 80K, and 25-30 meters of vegetation to 40' depth.

Total spawn Lower Lynn Canal = 4.0 nautical miles

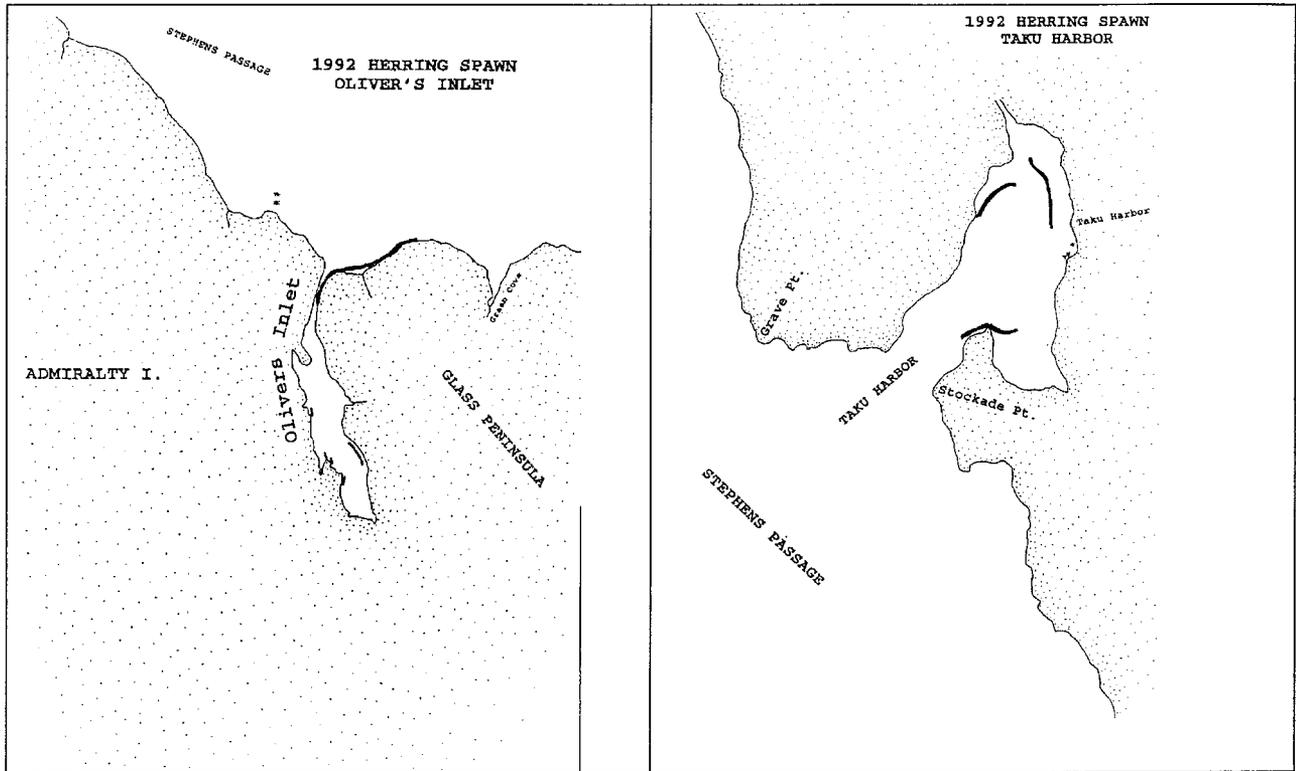


OLIVER INLET

- 4-27 Four small balls of herring at the head and along the N shore.
  - 4-28 Five balls of herring in Oliver Inlet.
  - 4-30 **SPAWN** in Oliver Inlet.
  - 5-01 **SMALL** area of **SPAWN** and fish seen on beach outside Inlet. Sample taken in Oliver Inlet; small fish.
  - 5-03 Several balls of herring seen in the Inlet.
  - 5-06 Skiff survey, spotty light spawn inside inlet; good outside on fucus.
- Total spawn Oliver Inlet = 2.4 nautical miles

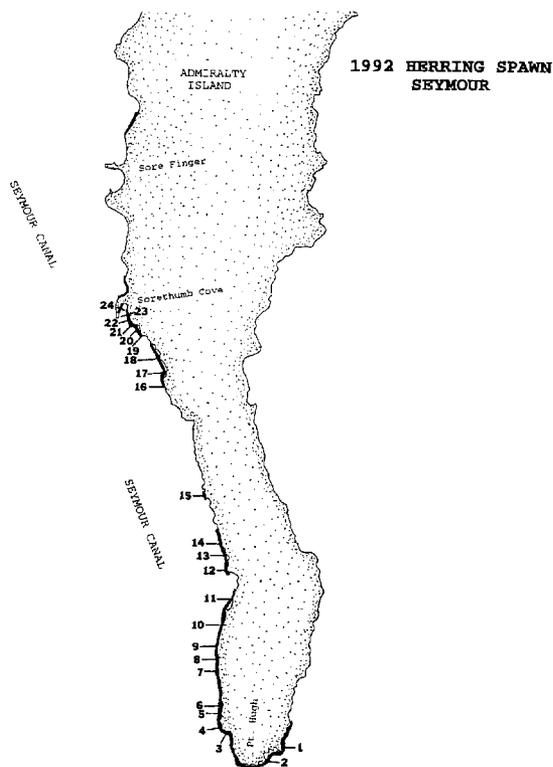
TAKU HARBOR

- 4-28 Herring samples with gillnet. Herring ripe but no spawn on beaches.
  - 5-06 Skiff survey, very light spawn around most of bay.
- Total spawn Taku Inlet = 1.2 nautical miles



SEYMOUR CANAL

- 4-20 Sea lions spotted at Rock Garden (25), Swimming Pool (6), Sore Finger (2) and Cypress Rock (20).
  - 4-24 No fish seen. 33 sea lions observed with largest concentration at Point Hugh (15) and 4 whales spotted inside Point Hugh but off shore.
  - 4-26 Aerial Survey: Spot of **LIGHT SPAWN** along the Point Hugh area.
  - 4-27 **SPAWN** observed by Point Hugh Light. Birds and 5 sea lions observed above Sore Thumb.
  - 4-28 **Spot spawn** observed by Point Hugh. 3 schools of herring located above Point Hugh on the inside. Two whales found off the Rock Wall and the Rock Garden, and an assortment of sea lions were scattered elsewhere; Point Hugh (30), and Twin Islands (10).
  - 4-29 Light **spawn** observed from Black Jack to Point Hugh.
  - 4-30 **Spawn** in Sore Thumb Cove. All previous spawn from Black Jack to Point Hugh had dissipated, leaving only a slight foam on the water.
  - 5-01 Small area of **spawn** in Sore Thumb Cove and to the N of the cove.
  - 5-03 Blowing Southeast 30+. No spawn was seen from the air.
  - 5-04 No fish or spawn seen from the air.
  - 5-05 Saw nothing except water from the air.
  - 5-09 Seymour dive surveys commenced off the R/V Polaris.
  - 5-10 Found additional spawn on the outside of Point Hugh and by #9 Rock.
- Total spawn Seymour Canal = 9.0 nautical miles



TENAKEE INLET

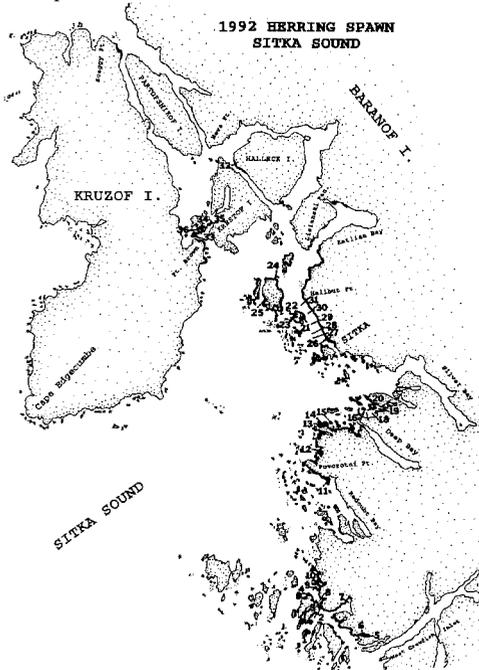
- 4-18 Basket Bay shoreline not flown. Nothing seen in Tenakee except sea lions at Corner Bay Point.
- 4-22 No fish or spawn.
- 4-24 Aerial survey from Wachusett's Cove up N shore, past Tenakee, out S shore, and around corner to Basket Bay. No fish or spawn observed. Sea lions seen by Rockeye(?) Point (25) and Corner Bay Point (3). One whale in the inlet.
- 4-26 No herring or spawn observed. Six sea lions observed traveling N outside of Tenakee Inlet.
- 4-28 Entered Tenakee from Port Frederick. Birds observed across from Long Bay possibly indicating spawn (under logged area); 35 sea lions adjacent to the Tenakee rookery. Flew to Kennel Creek in Freshwater Bay; 10 sea lions by South Passage Point.
- 4-30 Entered Tenakee Inlet from Port Frederick. One herring school was observed off Goose Creek, and birds were seen on what appeared to be old spawn on the N shore above Long Bay (above Creek Delta). Three sea lions seen by Corner Bay Point and 14 inside South Passage Point.
- 5-05 Birds on old spawn.

## SITKA SOUND

- 3-16 Bill Burgess flew Sitka Sound and reported no herring but small herds of sea lions at Big Gavanski Island, Frosty Reef and Windy Pass.
- 3-19 Aerial survey at 10:00 a.m. No herring or spawning activity observed, however, lots of gulls and sea lions in Eastern Channel. The N end of Sitka looks very quiet. 3-21 Aerial survey at 10:00 a.m. Lots of birds and sea lion in Eastern Channel and Silver Bay. Several sea lions and birds also seen between Burunof and Three Entrance Bay and near Frosty Reef. Nothing near Goddard and West Crawfish. N side of town is very quiet.
- 3-23 Bill Burgess flew at 10:00 a.m. and observed lots of gulls and sea lions in Eastern Channel. No herring spawn or herring on the beach yet. Visibility excellent.
- 3-24 Bill Burgess flew from Nakwasina to Dorothy Narrows at 9:00 a.m.  
Northend - quiet  
Southend - Large concentrations of gulls and sea lions in Eastern Channel and Silver Bay. **Spawning** in the fresh bait pound in Leosofkaia Bay. This is the first spawn but may have been induced from capture. Lots of sea lions in Aleutkina to Cape Burunof area. 60 sea lions at Redoubt. 70 sea lions S of Dorothy Narrows. Polaris surveyed S end of town to Redoubt. Lots of fish in Eastern Channel and off Cape Burunof. Fish up shallow from 5-31 fathoms but in deep water. Nothing seen in Redoubt but lots of sea lions. Three samples taken in Eastern Channel. Two of the samples were predominately 2 year-old herring; other was larger fish averaging 79 grams and 2.8% mature roe.
- 3-25 Aerial survey at 8:30 a.m. No new spawn or herring on beach. Lots of birds and sea lions in Eastern Channel. At least 130 sea lions in Redoubt. Northend looks quiet. Polaris surveyed N of Sitka and found several schools near Halibut Pt. and Old Sitka Rocks and at the entrance to Hayward Strait.
- 3-26 Aerial survey at 8:00 a.m. Lots of fish and sea lions in Eastern Channel and inside Islands between Aleutkina and Sam Sing. At least 200 sea lions in Redoubt Bay. No new spawn except 100 yards off in pound. Northern area has increased bird activity off Old Sitka Rocks. Polaris surveyed mouth of Sitka and found only one school (300 ton) in Redoubt. Fish in Eastern Channel have changed and are no longer broken in several large schools near the surface. Today they were 60-80 fathoms deep in one continuous school several miles long by 1/4 mile. One sample taken by F/V Talon off Sandy Cove. 4.6% mature and 86 gram fish, looks like all 4-year old fish.
- 3-27 Aerial survey 2:00 p.m., no change from previous days. Saw three schools S of Sitka in Aleutkina and Povorotni Point. Polaris searched N of Sitka and observed very few schools. The only area where fish were seen was off Halibut Point and Middle Island.
- 3-28 **BIG CHANGE** Aerial survey 8:00 a.m. **First spawn** observed this morning for approximately 1 mile S of Halibut Point. Fish heavily banded and schooled on the beach from Sea Mart to Cove and completely around Kasiana Island. Lots of birds in Eastern Channel and some schools up shallow in Aleutkina Bay. The R/V Polaris searched N of Sitka and very little was seen. Four samples were taken on the N end ranging from 6% - 8.3% and an average weight ranging from 93 grams to 99 grams. First herring on beach. Announced that fishery will be on 2-hour notice effective 8:00 a.m., Monday, March 30. Meetings with fishermen will begin at 10:30 a.m., March 30.
- 3-29 Aerial survey 8:00 a.m.; **spawn** spreading south from Halibut Pt. another 1/4 mile. **Spot spawning** on Kasiana Island, Middle Island and Aleutkina. Too windy on S side to look along beaches. N end had lots of fish banded in big schools on the beaches of Middle Island, Kasiana Island and HPR from Sea Mart to Cove.
- 3-30 Three to four miles of **active spawn** occurring including Halibut Point Road from trailer court to Cove, Kasiana Island, Apple Island and Sandy Cove. Fish banded heavily on the beaches in these areas. Polaris saw big change on N end, lots of schools and mostly 5-fathom band of fish through the northern area. Two samples taken at Halibut Pt. and Middle Island had low maturities at 7.4% and 90 grams. One sample at Salisbury is most promising with a maturity at 9.3% and 106 gram fish. The Polaris searched in Salisbury later today and found six schools (100+ tons) S of Kane Island and one large school in St. John. Three samples taken late today from Salisbury. Results will be worked up tomorrow.
- 3-31 Aerial survey at 7:30 found **active spawning** at the Turn Around, Halibut Pt. to the Cove, spots on Kasiana Island and Sandy Cove. Fish leading heavily in these areas. The R/V Polaris found several large schools between Long Island and Sam Sing. Three samples taken yesterday in Salisbury averaged 9.4 mature roe and 85 grams. Four samples taken yesterday in Sitka Sound average 7.9% mature roe.
- 4-1 Morning survey showed there was approximately 4 miles of **spawn** in the Sitka area, mostly N of town from Thompson Harbor to the Cove. Spawning continued at Kasiana Island and **new spot spawning** occurred at Middle Island and Big Gavanski Island. S of town **spawning** continued at Sandy Cove and **new spawning** at Aleutkina Bay. A total of 6 miles of **spawn** has been observed to date. Due to windy conditions, aerial surveys did not include Salisbury Sound. Three samples taken yesterday afternoon in Salisbury are 9.0% average roe and 92 grams average weight. Four other samples taken in the Sitka Sound area averaged 7.5% and 85 gram fish. Plans are for continued samples, with 2 boats going to Salisbury this afternoon, 2 boats S of town and 2 boats N of town tomorrow morning. Expressed concern in the meeting that we may not want to take full 3,300 tons from Salisbury and impact the spawn in that area.
- 4-2 Aerial survey 7:30 a.m. Good **spawning** along Halibut Pt. Road from Thompson Harbor to "Cove", Kasiana Island, back side of Middle Island, Starrigavan and Sandy Cove. Eight miles to date; samples taken this morning from both the N and S ends of Sitka Sound average 8.3% and 85 gram fish. Two samples from Salisbury average 8.6% and 88 gram fish. No improvements and little chance. Two boats will sample in Salisbury Sound this evening when fish come up from deep to see if larger fish in deep schools.
- 4-3 Polaris surveyed fish in Salisbury Sound yesterday evening and found fish in the deep, not yet approaching the beach to spawn. Three samples taken in the evening in Salisbury still showed best quality; 9.4% mature and 1% immature roe, and 88 gram fish. Three samples in Sitka Sound again poor quality, 8.3% and 85 grams. Immature roe still fairly high at 1-2%. Aerial survey at 7:30 a.m. found **spawn** had subsided in the Sitka Sound; only spotty at Kasiana Island, Middle Island, Aleutkina and along Halibut Pt. Road system. **Spot spawning** also beginning in the Goddard area and lots of fish moving into the area. Fishermen were advised in the 10:30 a.m. meeting that there is not enough biomass in Salisbury to support major effort, although we could later 1000-1500 tons.
- 4-4 Aerial survey at 7:30 a.m. **Spawning** has intensified again and **major spawning** was observed along the Halibut Point Road system, Kasiana Island, W side of Middle Island and Whitting Harbor. No spawn in Salisbury Sound but one school was seen in Sukoi Inlet. The S end has changed dramatically where **major spawning** is now occurring in Aleutkina, Sandy Cove and first starting in Sam Sing. The Goddard **spawn** has subsided slightly with only spots in Dorothy Narrows, however, there is lots of fish in large schools on both sides of Dorothy Narrows. Approximately 12 miles of **active spawn** today bringing the total seen to date to 13 miles. Maturities show no improvement today. Four samples at Goddard had 8.1% mature roe, two in Sandy Cove/Sam Sing area averaged 6.7% with lots of spawnouts. One sample at Katlian Bay, 7.2%. No samples were taken in Salisbury Sound.

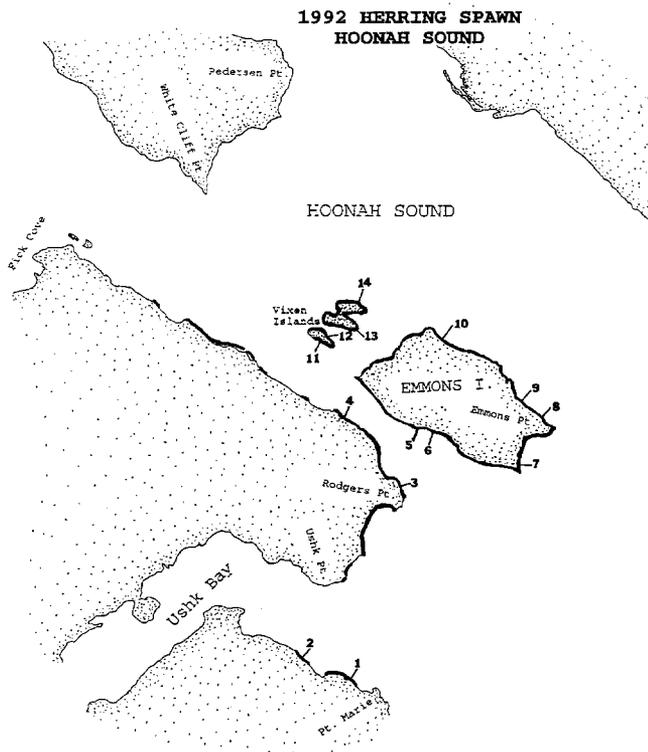
- 4-5 Twenty miles of **active spawning** today in the Aleutkina/Sam Sing area, Middle Island, Causeway, Kasiana Island. Only 1/4 mile at Goddard. Approximately 25 miles of spawn has occurred to date. Sampling in Sitka Sound, Salisbury Sound and the Goddard area has not changed. Advised fishermen that we would be prepared to fish in the Goddard area tomorrow beginning around noon. Sampling would be conducted early in the morning and would be worked up on the grounds aboard the Mitkof. The Polaris searched the Goddard area late in the afternoon and large schools were observed throughout the area.
- 4-6 Three samples S and three N of Dorothy Narrows were taken before 8:00 a.m. The three from the S averaged 9.8% mature; the three from the N averaged 9.9%. The R/V Polaris searched the Warm Springs Bay area and large volumes of fish were observed N of the narrows to Goddard Bay. The area from the day marker in the narrows to Calligan Island was opened for 1 hour and 23 minutes beginning at noon. At the time of the closure we were 700 tons short of the quota. When all the figures were in, we were 2,000 over the quota and closer to 5,500 tons. Many large sets were made with several over 200 tons and one rumored to be over 350 tons.
- 4-7 Aerial survey a.m., large numbers of schools observed in the Goddard area and some increase in spawn activity. Major spawning occurring in the Aleutkina/Sam Sing area, Middle Island, Causeway, Kasiana Island and **new spawn** inside Povorotni Pt.
- 4-8 Aerial Survey at 9:00 a.m. N end quieting down, however, **good spawning** on Middle Island and Kasiana Island, Starrigavan, lesser amounts in the Magoun Island, Causeway and Cedar Cove. **Good spawning** throughout Sandy Cove to Pirates Cove, Povorotni Pt. Approximately 1 mile in Goddard area. Lots of fish leading the beaches S of Dorothy Narrows and above Povorotni Pt. Several large schools of herring seen in the Redoubt area.
- 4-09 Aerial survey 9:00 a.m. **Good spawning** off Middle Island, Kasiana Island, Starrigavan, Hayward Strait and Big Gavanski Island. No spawn in Salisbury Sound. S of town **spawning** still intense in Aleutkina to Pirates and occurring on both sides of Povorotni Pt. for several miles and in Goddard.
- 4-10 Salisbury Sound - No spawn or herring seen yet. Northend - Quieting down considerably. **Good spawning** in Hayward Strait, W side of Middle Island, Crow Island and Cedar Cove. Southend - Going good yet between Sandy Cove and Pirates Cove. Three Entrance Bay, N of Dorothy Narrows. Lots of fish leading the beaches in Goddard area. Roughly 50 miles of spawn to date.
- 4-11 Northend - spawn is done except one mile of **active spawn** in Hayward. Lots of sea lions, birds and two whales outside Beili Rocks. Could be more fish coming in. Southend - **Spawn** going good in Pirates Cove, Three Entrance Bay and Goddard. Lots of fish still on the beaches in Goddard both S and N of narrows. Expect major spawning there yet.
- 4-12 Aerial survey 9:00 a.m. N and S end spawning appears to be done except for a few **small spots of spawn** in Hayward. The Goddard area is still going strong with 6 miles observed to date. Lots of fish on the beaches in Windy Pass and N of Goddard near Calligan Island. No spawn or herring seen in Salisbury Sound. A total of 60 nautical miles has been seen in the Sitka area to date.
- 4-13 Aerial survey 9:00 a.m. Spawning done in local area except **spots** in Magoun Islands. The **spawn** in the Goddard area is expanding to about 10 miles.
- 4-14 Goddard area is going strong and spreading considerably in the Windy Pass area. Over 15 miles of **spawn** in this area with a total of 70 miles recorded to date. Nothing in Salisbury Sound yet.
- 4-15 Aerial survey. Sitka Sound **spawn** about done in Goddard. Only a mile observed. Two to three miles of spawn reported in Necker Bay.
- 4-16 Sitka area only a few spots yet in Goddard area.
- 4-17 Aerial survey 7:00 a.m. Observed a few **spot spawns** in the Goddard area. Had an earlier report 4/13 that spawning had occurred in Necker Bay. Mapped 4.5 miles of **spawn** in Dorothy Cove.
- 4-18 Tenakee Inlet - No herring or spawn. Looked dead except for a few sea lions off Corner Bay Pt. Total spawn from Salisbury Sound to Goddard is 72 nautical miles: .5 miles in Salisbury Sound, 15 miles in Goddard and 56.5 miles in Sitka Sound. Sitka Goddard is finally done. Saw first .5 mile of **spawn** in Salisbury Sound at Sukoi Pt.
- 4-20 Aerial survey at 8:00 a.m. Salisbury - No spawn or herring.

Total spawn in Sitka Sound = 73 nautical miles



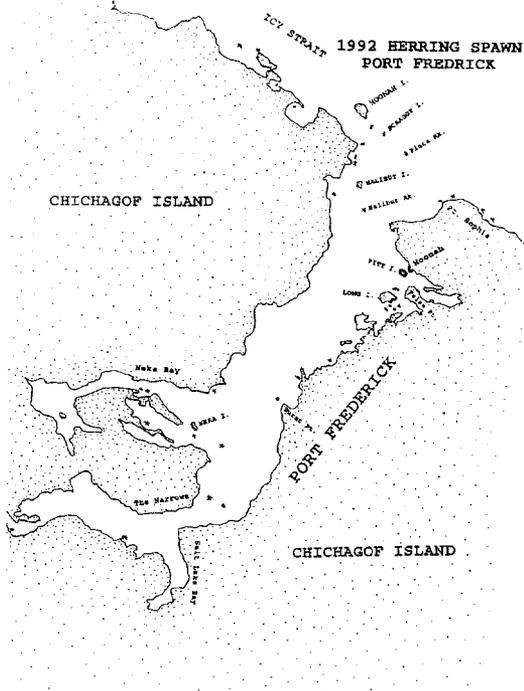
HOONAH SOUND

- 4-07 No herring or spawning activity seen.
  - 4-10 No herring or spawn. Several small pods of sea lions along N shore of Hoonah Sound between Broad Island and Finger River.
  - 4-13 Small **spot spawn** near Broad Island; several pods of sea lions and two whales along N shore of Hoonah Sound between Broad Island and Finger River.
  - 4-15 No herring or spawning seen.
  - 4-16 One school up shallow at Pederson Pt. on Moser Island. No other herring or spawning observed.
  - 4-17 First herring caught (Sig Mathisen) and put in pound.
  - 4-18 Looking fishy; lots of schools along N shore of Emmons Island and in North Arm. No spawn yet. F/V Marathon in set but I think that he will let them go.
  - 4-20 No spawn, one small school on N end of Emmons Island and several schools seen in North Arm. Several sea lions between Fick Cove and Emmons Island.
  - 4-21 Most pounders have kept in pounds and only a handful have herring. Lots of fishing going on today; mostly small sets on the W side of Emmons Island. Very windy and gusty.
  - 4-22 Weather is improving. First **spot of spawn** observed off Vixen Island. Herring lightly banded on W, E and S sides of Emmons Island, completely around Vixen Island, and from Fick Cove to Spit Cove. No big schools. Approximately 60 pounds have herring. Fishing getting difficult because fish no longer concentrated.
  - 4-23 Major **spawn** in pound area between Vixen and Emmons Island. Fishermen having difficulty finding fish. Some spawnouts in sets. Approximately 70 pounds have herring in pounds. Major **spawning** on N and W side of Emmons and Vixen Islands. Approximately 3 miles of **active spawn**. Fish on the beach between Fick Cove and spit and near White Cliff Pt.
  - 4-24 **Spawn** subsided and observed on S side of Emmons Island, Vixen Island and between Rodgers Pt. and Pt. Marie. Approximately 95 pounds have herring.
  - 4-25 100 pounds have herring and 18 have checked out with product. Few pounders still trying to capture fish but none available. No spawn or herring seen today. It appears to be done.
  - 4-26 Fishery closed to capture of herring at noon. Approximately 109 pounders have herring and 30 have checked out. No spawn or herring observed.
  - 4-27 No spawn or herring seen. No checkouts.
  - 4-28 No spawning. Bob indicated about 30 pounds harvested to date. By end of day another 41 checked out; total harvested is 73 by 6:00 p.m.
  - 4-29 35 pounders harvested and checked out.
  - 4-30 Beach observed in morning in Ushk Bay, Pt. Marie, Ushk Pt., and Rodgers Pt. Hard to see spawn with big whales. Checked out from all 6 pounders. Fishery done and left for town on the attack whaler. Total 115 harvested.
  - 5-05 Added several miles of spawn with skiff during minus tides. The total miles of spawn for Hoonah Sound is 10.8. 14 dive transects were done in the Sound and the results showed excellent densities.
- Total spawn in Hoonah Sound = 10.8 nautical miles



PORT FREDERICK

- 4-28 **LIGHT SPAWN** on Pitt Island. Schools S of Game Creek, three whales in Salt Bay.
  - 4-30 Herring schools along Pitt Island; no spawn observed in Port Frederick. Three whales still in Salt Bay.
  - 5-05 Aerial Survey. Nothing seen.
  - 5-12 **SPOTS OF SPAWN** observed from Burnt Point to Game Creek and on Long Island during the evening of May 11. Fishermen are getting bait for black cod.
  - 5-15 Last aerial survey to Port Frederick at low tide to check for spawn in areas not seen from air. None observed at a -3 foot tide.
- Total spawn in Port Frederick = 1.4 nautical miles



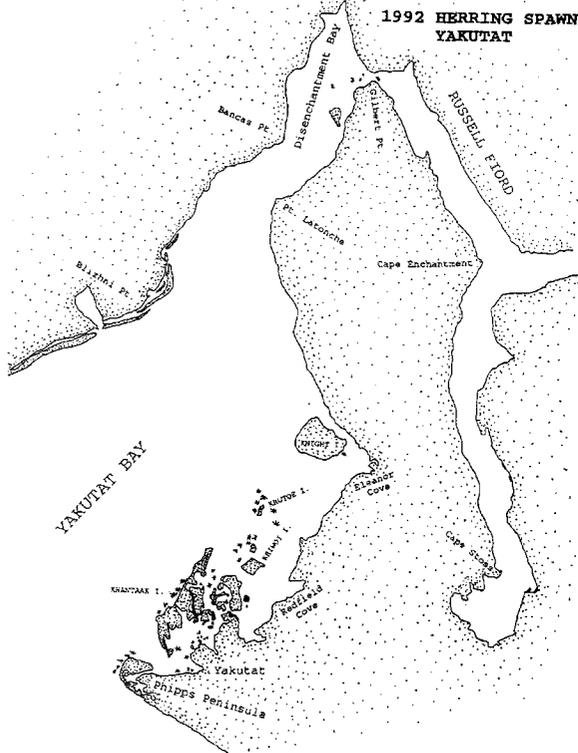
LISIANSKI SPAWN

- 4-23 First survey. **MAJOR SPAWNING** for about 3 miles at Sunnyside and the Inlet from light out toward mouth. No spawn in strait. Lots of fish leading beaches from Sunnyside toward entrance to Inlet.
  - 4-24 Spawn subsided; **SPAWN** observed at Sunnyside, Pelican and at light.
  - 4-25 **INTENSE SPAWNING** from town to about a mile N of Sunnyside. Lots of fish leading the beaches on both sides of Inlet.
  - 4-26 **MAJOR SPAWN** from Pelican out to the entrance of Inlet for approximately 10-11 miles. Some spawning on W side of Inlet S of Mite Head.
  - 4-27 **MAJOR SPAWN** from Pelican to Sunnyside. Dissipating N of Sunnyside. Spawning good for approximately 1 mile S of Mite Head. Nothing in Straits.
  - 4-28 **Spawning** is about done except 1-2 miles S of Pelican. Nothing in the straits this year.
  - 4-29 Approximately 1 mile of **SPAWN** S of Pelican.
  - 4-30 Approximately 1 mile of **SPAWN** S of Pelican.
  - 5-6 Eleven dive transects completed.
  - 5-7 Eleven dive transects completed, end of dive survey.
- Total spawn Lisianski Inlet = 15.3 nautical miles

YAKUTAT

- 4-9 Aerial Survey. 1 ton school in Johnson Passage. 100 ton school in Broken Oar Cove. 140 tons Redfield Cove. **SPOT SPAWN** opposite Fitzgerald Island. 10 tons Chicago Harbor. No herring observed Russel Fjord.
- 4-16 Aerial Survey. 1 ton Hatchett Pass, 7 ton school Johnson Passage. 110 tons Redfield Cove. No herring observed Russel Fjord. 7 tons Chicago Harbor.
- 4-18 Skiff Survey. Herring leading beach on the S side of Johnson Passage and Hatchett Passage. No active spawns or previous spawns observed.
- 4-21 Aerial Survey. 17 small schools inside Dolgoi Island. 7 schools S side Hatchett Pass. 5 schools Gonakadeseat Bay. **Active Spawn**. Small areas of spawn on the S side of Johnson Passage, Port Mulgrave, half mile of dense **ACTIVE SPAWN** in Gonakadeseat Bay. No fish Russel Fjord.
- 4-22 Skiff survey to Gonakadeseat Bay. High mortality by birds on **MEDIUM DENSITY SPAWN** in this area.
- 4-23 Aerial survey. 13 small schools between Yakutat and Dolgoi Island. **ACTIVE SPAWN** spot Fitzgerald Island. 1 mile of kelp with eggs Gonakadeseat Bay. 4 herring schools and 4 **SPOT ACTIVE SPAWN** near Beasley Creek in Russel Fjord.
- 4-28 Skiff survey. From Gonakadeseat Bay to the E entrance of Hatchett Pass, 19 sections of beach documented from previous spawns. Average width 15-40 feet of fucus and eelgrass. Total lengths slightly over 1 mile.
- 4-30 Aerial survey. No herring or spawn observed.

Observations of intertidal spawning revealed medium densities of herring spawn on fucus and eelgrass with widths from 15 to 40 feet. Heavy predation on spawn by thousands of gulls.  
 Total spawn observed 1.3 nautical miles.



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