

ABUNDANCE, AGE, SEX AND SIZE STATISTICS  
FOR PACIFIC HERRING (*CLUPEA PALLASI*) IN THE TOGLIAK DISTRICT  
OF BRISTOL BAY, 1989



By

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Regional Informational Report No. 2A02-09

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Anchorage, Alaska

January 2002

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<sup>1</sup>Contribution 99-12 from the Anchorage Regional Office. The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information reports in this series may contain preliminary data.

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## **ACKNOWLEDGEMENTS**

I appreciate the assistance provided by Virginia Shook in data processing and fish ticket editing. Henry Yuen and Fred Jamsen developed and revised the programs for data entry and summarization of the age, weight, and length data. Richard Russell and Wes Bucher flew aerial surveys and documented the distribution of the biomass during the 1989 season. Contribution by Stephen Fried, Brian Bue and Linda Brannian in developing sampling strategy and documentation was also valuable.

## TABLE OF CONTENTS

|  |     |
|--|-----|
| TABLE OF CONTENTS .....                | iii |
| LIST OF TABLES .....                   | iv  |
| LIST OF FIGURES .....                  | vii |
| LIST OF APPENDICES .....               | x   |
| Appendix A .....                       | x   |
| Appendix B .....                       | xii |
| ABSTRACT .....                         | xiv |
| INTRODUCTION .....                     | 1   |
| METHODS .....                          | 2   |
| Study Area .....                       | 2   |
| Age, Weight and Length Samples .....   | 3   |
| Data Collection .....                  | 3   |
| Sample Sizes .....                     | 4   |
| Age, Weight and Length data .....      | 4   |
| Commercial Harvest .....               | 5   |
| Biomass Estimation .....               | 5   |
| RESULTS .....                          | 6   |
| Age, Length, Weight and Sex Data ..... | 6   |
| Commercial Harvest .....               | 7   |
| Biomass Estimation .....               | 8   |
| DISCUSSION .....                       | 9   |
| LITERATURE CITED .....                 | 11  |

## LIST OF TABLES

| <u>Table</u>   | <u>Page</u> |
|--|-------------|
| 1. Historical total run biomass and commercial harvests (tonnes) of Pacific herring returning to the Togiak District, Bristol Bay (1968-1989).....   | 15          |
| 2. Number of samples collected and aged by gear type during the 1989, Togiak herring season .....  | 16          |
| 3. Achieved sample sizes compared to sampling goals for data applied to the final age composition analysis of the 1989 total run biomass and commercial harvest .....  | 17          |
| 4. Temporal change in age composition (by number) of samples collected from non-selective gear in the Togiak District, 1989.....   | 18          |
| 5. Mean length (mm), weight (g), and standard deviation (sd) by age for collected herring representative of the total run biomass, and of the commercial harvest by gear type, Togiak District, 1989 .....                   | 19          |
| 6. Commercial purse seine and gillnet herring harvest (tons) by fishing section and date, Togiak District, 1989. Roe percentages are displayed in parenthesis. Total daily harvest is depicted in both tons and tonnes ..... | 20          |

## LIST OF TABLES (Continued)

| <u>Table</u>  | <u>Page</u> |
|---|-------------|
| 7. Age composition estimates by number and weight (tonnes) of the commercial harvest, escapement biomass, and total run biomass observed in the Togiak District, 1989 ..... | 21          |
| 8. Observed aerial biomass estimates of herring by index area (tons), and totals by day (tons, tonnes) during the 1989 season Togiak District, Bristol Bay .....            | 23          |
| 9. Age composition estimates of the commercial purse seine harvest weighted by the harvest biomass (tonnes), by date and fishing section, Togiak District, 1989 .....       | 25          |
| 10. Age composition estimates of the commercial gillnet harvest, weighted by the harvest biomass (tonnes), by date and fishing section Togiak District, 1989 .....          | 26          |
| 11. Age composition estimates for sampling stratum 7-9 May, weighted by 9 May aerial survey biomass (tonnes) by fishing section, Togiak District , 1989. ....               | 27          |
| 12. Age composition estimates for sampling stratum 13-15 May, weighted by 13 and 14 May aerial survey biomass (tonnes), by fishing section, Togiak District, 1989 .....     | 28          |

## LIST OF TABLES (Continued)

| <u>Table</u>   | <u>Page</u> |
|--|-------------|
| 13. Age composition estimates<br>for sampling stratum 22-25 May,<br>weighted by 24 May aerial<br>survey biomass (tonnes), by<br>fishing section, Togiak District, 1989 .....               | 29          |
| 14. Total weighted age composition<br>in numbers of fish and by weight<br>(tonnes) of aerial survey biomass<br>resulting in the total run biomass<br>estimate, Togiak District, 1989 ..... | 30          |

## LIST OF FIGURES

| <u>Figure</u>  | <u>Page</u> |
|--|-------------|
| 1. Southeastern Bering Sea .....   | 31          |
| 2. Togiak Fishing District and fishing sections<br>for management of the commercial herring fishery .....  | 32          |
| 3. Unweighted age composition, by number of<br>herring samples collected by nonselective gear,<br>by sampling period, Togiak District, 1989.....                     | 33          |
| 4. Proportion of the commercial harvest caught in<br>each fishing section by gear type,<br>Togiak District, 1989 .....   | 34          |
| 5. Age composition of the commercial purse seine fishery<br>by number (top) and by weight (bottom),<br>Togiak District, 1989 .....                                   | 35          |
| 6. Age composition of the commercial gillnet fishery<br>by number (top) and by weight (bottom),<br>Togiak District, 1989 .....                                       | 36          |
| 7. Biomass (tonnes), timing of the fishery and<br>kilometers of milt observed during aerial<br>assessment, Togiak District, 1989 .....                               | 37          |
| 8. Age composition (in numbers of fish) by<br>sampling period and fishing section<br>corresponding to aerial surveys<br>conducted 9 May, Togiak District, 1989.....  | 38          |
| 9. Age composition (by number) by sampling<br>period and fishing section corresponding<br>to aerial surveys conducted 12 and 15, May,<br>Togiak District, 1989 ..... | 39          |

## LIST OF FIGURES (Continued)

| <u>Figure</u>   | <u>Page</u> |
|---|-------------|
| 10. Age composition by sampling period and fishing section corresponding to aerial surveys 24 May, Togiak District, 1989 .....  | 40          |
| 11. Age composition by number (top) and by weight (bottom) of the Togiak District total run biomass, 1989.....                  | 41          |
| 12. Contribution of the 1989 Togiak herring total run biomass to the assessed total run biomass in the eastern Bering Sea ..... | 42          |

## LIST OF APPENDICES

| Appendix A<br><u>Table</u>   | <u>Page</u> |
|--|-------------|
| A.1. Age, sex, and size composition of Pacific herring caught by commercial purse seine Togiak Section, 12-13 May 1989.....  | 44          |
| A.2. Age, sex, and size composition of Pacific herring caught by commercial purse seine Hagemeister Section, 12-13 May 1989.....   | 45          |
| A.3. Age, sex, and size composition of Pacific herring caught by commercial purse seine Pyrite Point Section, 12-13 May 1989.....  | 46          |
| A.4. Age, sex, and size composition of Pacific herring caught by commercial purse seine Cape Newenham Section, 13 May 1989.....  | 47          |
| A.5. Age, sex, and size composition of Pacific herring caught by commercial purse seine Togiak, Hagemeister, Pyrite Point and Cape Newenham sections combined, 12-13 May 1989..... | 48          |
| A.6. Age, sex, and size composition of Pacific herring caught by commercial gillnet Kulukak Section, 9-14 May 1989.....  | 49          |
| A.7. Age, sex, and size composition of Pacific herring caught by commercial gillnet Nunavachak Section, 9-14 May 1989.....   | 50          |
| A.8. Age, sex, and size composition of Pacific herring caught by commercial gillnet Kulukak and Nunavachak sections combined, 9-14 May 1989.....                                   | 51          |
| A.9. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Kulukak Section, 7 May 1989.....  | 52          |

## LIST OF APPENDICES(Continued)

| <u>Appendix A</u><br><u>Table</u>  | <u>Page</u> |
|--|-------------|
| A.10. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine<br>Nunavachak Section, 20 May 1989 .....  | 53          |
| A.11. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine<br>Togiak Section, 5-10 May 1989 .....  | 57          |
| A.12. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine Hagemeister<br>Section, 5-20 May 1989 .....   | 59          |
| A.13. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine<br>Pyrite Point Section, 11 May 1989 .....  | 60          |
| A.14. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine<br>Cape Newenham Section, 11 May 1989 .....   | 61          |
| A.15. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine<br>Kulukak, Nunavachak, Togiak, Hagemeister,<br>Pyrite Point and Cape Newenham, 5-20 May 1989 ..... | 64          |
| A.16. Age, sex, and size composition of Pacific herring<br>caught by test variable mesh gillnet Kulukak<br>Section, 1-23 May 1989 .....  | 64          |
| A.17. Age, sex, and size composition of Pacific herring<br>caught by test variable mesh gillnet<br>Nunavachak Section, 4-19 May 1989 .....   | 72          |
| A.18. Age, sex, and size composition of Pacific herring<br>caught by test variable mesh gillnet<br>Togiak Section, 19 May 1989 .....   | 75          |

**LIST OF APPENDICES (Continued)**

Appendix A  
Table

Page

A.19. Age, sex, and size composition of Pacific herring  
caught by test variable mesh gillnet  
Hagemeister Section, 17-23 May 1989 ..... 76

A.20. Age, sex, and size composition of Pacific herring  
caught by test variable mesh gillnet  
Kulukak, Nunavachak and Hagemeister sections  
combined, 1-23 May 1989 ..... 78

## LIST OF APPENDICES (Continued)

| Appendix B<br><u>Table</u>   | <u>Page</u> |
|--|-------------|
| B.1. Age, sex, and size composition of Pacific herring<br>caught by commercial purse seine<br>Togiak Section, 12-13 May 1989.....  | 87          |
| B.2. Age, sex, and size composition of Pacific herring<br>caught by commercial purse seine<br>Hagemeister Section, 12-13 May 1989.....   | 88          |
| B.3. Age, sex, and size composition of Pacific herring<br>caught by commercial purse seine<br>Pyrite Point Section, 12-13 May 1989.....  | 89          |
| B.4. Age, sex, and size composition of Pacific herring<br>caught by commercial purse seine<br>Cape Newenham Section, 13 May 1989.....  | 90          |
| B.5. Age, sex, and size composition of Pacific herring<br>caught by commercial purse seine<br>Togiak, Hagemeister, Pyrite Point and Cape<br>Newenham sections, 12-13 May 1989..... | 91          |
| B.6. Age, sex, and size composition of Pacific herring<br>caught by commercial gillnet<br>Kulukak Section, 9-14 May 1989.....  | 92          |
| B.7. Age, sex, and size composition of Pacific herring<br>caught by commercial gillnet<br>Nunavachak Section, 9-14 May 1989.....   | 93          |
| B.8. Age, sex, and size composition of Pacific herring<br>caught by commercial gillnet Kulukak and<br>Nunavachak sections, 9-14 May 1989.....                                      | 94          |
| B.9. Age, sex, and size composition of Pacific herring<br>caught by test commercial purse seine<br>Kulukak Section, 7 May 1989.....  | 95          |

## LIST OF APPENDICES (Continued)

| Appendix B<br><u>Table</u>   | <u>Page</u> |
|--|-------------|
| B.10. Age, sex, and size composition of Pacific herring caught by test commercial purse seine<br>Nunavachak Section, 20 May 1989 .....   | 96          |
| B.11. Age, sex, and size composition of Pacific herring caught by test commercial purse seine<br>Togiak Section, 5-10 May 1989 .....   | 97          |
| B.12. Age, sex, and size composition of Pacific herring caught by test commercial purse seine<br>Hagemeister Section, 5-20 May 1989 .....  | 98          |
| B.13. Age, sex, and size composition of Pacific herring caught by test commercial purse seine<br>Pyrite Point Section, 11 May 1989 .....   | 102         |
| B.14. Age, sex, and size composition of Pacific herring caught by test commercial purse seine<br>Kulukak, Nunavachak, Togiak, Hagemeister and Pyrite Point sections, 5-20 May 1989 ..... | 103         |
| B.15. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet<br>Kulukak Section, 1-23 May 1989 .....   | 106         |
| B.16. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet<br>Togiak Section, 19 May 1989 .....  | 114         |
| B.17. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet<br>Hagemeister Section, 17-23 May 1989 .....  | 115         |
| B.18. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet<br>Kulukak Section, Togiak and Hagemeister sections combined, 1-23 May 1989 .....           | 117         |

## ABSTRACT

The total run biomass of Pacific herring *Clupea pallasii* in the Togiak District of Bristol Bay was monitored for abundance and sampled for age, size, and sex data in 1989. Abundance was assessed by Alaska Department of Fish and Game personnel flying aerial surveys from chartered aircraft. Commercial catch samples were collected from purse seine and gillnet landings. During closed fishing periods, herring samples were obtained from testfish catches made by volunteers from the commercial fleet and by department personnel using variable-mesh gillnets. A total of 8,575 samples were collected and processed during the 1989 season. From 1978 through 1988, the total run biomass ranged between 69,817 tonnes (76,960 tons) and 219,810 tonnes (242,298 tons). The 1989 run biomass totaled 89,780 tonnes (98,965 tons). Poor weather conditions hampered aerial survey conditions resulting in potential underestimation of biomass. Herring age -4-16 were present in the population. The 1977 and 1978 year classes that recruited into the fishery in 1983 appeared as age -11 and -12 herring. These two year classes represented 38.9% of the biomass and 31.5 % of the population. The commercial fishery was dominated by the 1977 and 1978 year classes, comprising 47.0% and 40.0%, by weight, of the respective purse seine and gillnet fisheries. The significance of age-6 herring, representing 11.4% of the biomass and 16.9% of the population, as recruitment or a result of sampling bias, will be determined in stock assessment of the returning biomass in future years.

KEY WORDS: Pacific herring, *Clupea pallasii*, sac roe, spawning biomass, commercial herring fishery, Bristol Bay, Togiak District, age, length, weight, sex

## INTRODUCTION

Pacific herring *Clupea pallasii* are harvested in several spawning locations along the eastern Bering Sea coast from Norton Sound south to Port Moller. The Togiak District of Bristol Bay supports the largest discrete spawning biomass of Pacific herring in the eastern Bering Sea and in Alaskan waters. Biomass estimates based on aerial surveys have been conducted since 1978. These estimates of the Togiak run biomass have ranged from 69,818 tonnes (76,960 tons) in 1980 to 219,810 tonnes (242,298 tons) in 1979 (Table 1). From 1978 through 1988, the Togiak herring run biomass has averaged 121,466 tonnes (133,891 tons) and has accounted for 67.5% of the total documented run biomass of herring assessed for the entire eastern Bering Sea coast (Lebida et.al.1985 a,b; Lebida 1987; Rowell 1995; Hamner and Kerkliviet 1994; ADF&G 1995; Lebida and Sandone 1990).

Herring spawn within the Togiak District from late April to the end of May. After spawning, the herring leave the fishing district and migrate south, in a clockwise direction along the Alaska Peninsula to feeding areas near Unalaska Island. In August and September, these fish then move from feeding areas to overwintering grounds near the Pribilof Islands (Shaboneev 1965; Wespestad 1982; Wespestad and Barton 1981; Funk 1990; Figure 1).

The largest fishery for Togiak herring occurs during the inshore spawning migration. The most valuable product from this harvest has been the ripened ovaries or egg skeins, referred to as *sac roe*. The primary market for this product has been Japan. Commercial harvest of herring for sac roe was first documented in the Togiak District in 1968. Passage of the Fisheries Conservation and Management Act in 1976 and the resulting inability of Japanese fishermen to harvest herring from U.S. waters prompted increased interest in the Togiak biomass by U.S. fishermen. This domestic harvest has since been caught by purse seine and gillnet gear. Average annual harvest through 1988 was 14,846 tonnes (16,364 tons). The greatest harvest of 22,092 tonnes (24,352 tons) was caught during the 1983 season (Table 1).

Brown algae *Fucus sp*, commonly known as rockweed, on which herring have spawned has also been harvested within the Togiak District. The wild spawn-on-kelp product has been harvested either by hand or rake. Permit holders for the spawn-on-kelp fishery have been primarily local residents. The harvest, documented since 1967 has increased in recent years (Table 1). Average annual harvest from 1978 through 1988 was 140 tonnes (154 tons).

During their post spawning migration Togiak herring have been intercepted by additional fisheries. A directed food/bait fishery has occurred during mid- to late summer months in the Unalaska Island area. Catches were first documented on these feeding herring in 1929. Harvests reached a maximum of 2,727 tonnes (3,006 tons) in 1932. The fishery declined and ended completely by 1938 due to poor market demand but was renewed in 1981. The annual harvest since 1981 has averaged 2,472 tonnes (2,724 tons; Table 1).

Incidental harvest of Togiak herring has occurred as bycatch in fisheries targeting groundfish in the southeastern Bering Sea. These groundfish fisheries were first exploited by foreign vessels but more recently have been dominated by domestic fishers. These fisheries have occurred along the migratory route of feeding herring (Funk 1990; Rowell et al. 1991). The additional harvest upon a fully exploited herring population has been a concern brought before the North Pacific Management Council and the Alaska Board of Fisheries by western Alaskan fishermen.

Togiak herring are managed as a single spawning population distinct from others in the Bering Sea. A maximum regulatory exploitation rate of 20.0% of the spawning biomass is set by the Bristol Bay Herring Management Plan, 5AAC 27.865 (ADF&G 1989). This plan provides an allocation of 1,361 tonnes (1,500 tons) to the wild spawn-on-kelp fishery and 7.0% of the remaining harvest (after subtraction of the spawn-on-kelp harvest) for the Dutch Harbor food/bait fishery. The rest of the harvestable surplus is reserved for the sac roe fishery: 25.0% for the gillnet and 75.0% for the purse seine fleet.

Stock assessment studies of the Togiak herring population began in 1976 and have been documented annually since 1978 (McBride et al. 1981; McBride and Whitmore 1981; Fried et al. 1982, 1982, 1983, and 1984; Lebida et al. 1985a, 1985b; Lebida 1987, Lebida and Sandone 1990, Rowell 1995; Sandone and Brannian 1990). As in past years the objective of this year's work was to document the age, size and sex composition, as well as maturity of the commercial harvest, and to estimate run biomass and spawning escapement of herring in the Togiak District. These data provide the basis for development of population and forecasting models used to determine harvest strategies.

## METHODS

### *Study Area*

The Togiak District is one of five fishing districts within Bristol Bay Management Area 'T'. The district consists of waters under State of Alaska jurisdiction between the longitude of the tip of Cape Constantine and the longitude of the tip of Cape Newenham, a linear distance of approximately 193.2 km (120 miles; Figure 2). Because of its large size, the Togiak Fishing District is divided into six management sections (Kulukak, Nunavachak, Togiak, Hagemeister, Pyrite Point, and Cape Newenham).

The shoreline is characterized by a wide intertidal zone and several shallow bays. Diurnal tidal range may reach 4.6 m (Selkregg 1976). Ribbon kelp *Laminaria*, rockweed *Fucus* and eelgrass *Zostera* are the primary marine vegetation observed in the Togiak District. The spawn-on-wild kelp fishery has focused on the harvest of rockweed primarily in the Togiak, Nunavachak, and Kulukak Sections. Herring have spawned throughout the fishing district particularly in areas where eelgrass and rockweed have been present. Rockweed is the most visible species because it grows on cobble substrate located within the intertidal area and upon rocky outcroppings.

Herring are harvested for sac roe by gillnet and purse seine gear. During the 1989 season, gillnet gear could only be fished in the Kulukak and Nunavachak sections, whereas purse seine gear could be only fished in the Togiak, Hagemeister, Pyrite Point and Cape Newenham Sections (5 AAC 27.830, ADF&G 1989).

### *Age, Weight, Length and Sex Data*

#### **Data Collection**

Pacific herring were collected from management sections within the fishing district during fishery openings and closures. During closed fishing periods, volunteer commercial fishers made test purse seine or gillnet sets to capture herring in each fishing section throughout the spawning migration. ADF&G crews fished variable-mesh gillnets if commercial purse seine vessels were not available to capture herring during closed periods in a given section. These gillnets were assumed to be non-selective so that catches would represent the entire size and age spectrum of the biomass. Variable-mesh gillnets were 30.4m (100 ft) in length, consisting of four 7.6m panels each, with a different mesh size. Panels were arranged by increasing order of stretch mesh size of 38mm (1.5 in), 51mm (2.0 in), 64mm (2.5in) and 76mm (3.0 in).

Herring were also sampled at the close of each commercial fishing period from tenders or individual fishing vessels for each gear type and fishing section at the close of each commercial fishing period. Crews were instructed to collect samples from a minimum of five vessels for each gear type within each management section to ensure samples were collected from more than one school.

Sex was determined and gonad maturity was observed for each herring by examination of the gonads or sex products. Maturity of both male and female herring was rated by the eight-scale guideline outlined in Barton and Steinhoff (1980). These categories were combined and reported as green, ripe and spent.

Standard length from the snout to the hypural plate at the base of the tail was measured to the nearest millimeter with an attempted accuracy of 1.0 mm. Each herring was weighed to the nearest gram. A scale for age determination was removed from the left side of each fish from approximately 2.5 cm behind the operculum and 2.5 cm below the lateral line. If scales were absent from this preferred area, secondary areas of selection were the preferred area on the right side fish and finally, anywhere a readable scale was present. Removed scales were dipped in 10.0% mucilage solution, mounted sculptured side up on glass slides, and read by annuli interpretation using a microfiche reader (magnification 60x). Herring spawning in the Bering Sea form an annulus at the end of winter (Shaboneev 1965). This timing was coincidental to the collection of samples in the spawning migration; thus, the outer edge of the scale was counted as an annulus.

## Sample Sizes

The desired sample size of a multinomial population would result in an estimate that would simultaneously fall within 5% ( $\alpha = 0.05$ ) of the true population age proportions 95.0% of the time (Thompson 1987). The sample size of 405 herring would guarantee this level of precision for the number of age classes represented, in this instance, with consideration of 10 age classes (age -3-12).

Samples from non-selective gear representing the biomass were 405 per 3 day strata or 135 fish per day based on the time required to both collect and process the herring by field camps. Time strata for the commercial harvest were 405 herring per day, area and gear type.

## Age, Weight and Length Data

Age composition of the commercial harvest and total run biomass were estimated from herring collected from the commercial and test fisheries throughout the Togiak District. Only samples captured by non-selective gear (variable-mesh gillnet, purse seine or dipnet) were used to determine age structure of the population and run biomass. The percent age composition by number for each age class  $P_a$  was estimated for samples from each gear-time-area stratum for samples from both fishery and non-fishery samples:

$$P_a = \frac{n_a}{n}, \quad (1)$$

where  $n_a$  equals the number of herring in the sample that were age  $a$  and  $n$  equals the total number of herring in the sample.

The mean weight-at-age,  $\bar{W}_a$ , for herring was estimated for each gear-time-fishery stratum by

$$\bar{W}_a = \frac{\sum_{i=1}^{n_a} W_{ai}}{n_a}, \quad (2)$$

where  $W_{ai}$  equals the individual weight of herring in the sample  $n$  that were age  $a$

The mean length-at-age was calculated by substituting the individual length  $L_{ai}$  of herring for the individual weight  $W_{ai}$ . Length- and weight-by-age data from nonselective gear types (purse seine, variable-mesh gillnet) were pooled to represent the mean length and weight of the entire population.

### *Commercial Harvest*

Fish tickets (sales receipts) were completed by processing companies and buyers for each commercial delivery of herring and for spawn on kelp. Copies of all tickets were returned to ADF&G where personnel edited and entered the information into a database. The database was verified against each fish ticket. Harvest data by product, gear type, harvest date, and fishing section were summarized for the 1989 season. Estimates of waste or discarded herring were obtained from aerial estimates of discarded herring or processor reports. Estimated waste was included in the fish ticket database.

The weight of the wild spawn on kelp harvested was converted to the equivalent number of adult herring required to deposit the quantity of eggs harvested. This information was documented in the annual management report for Bristol Bay (ADF&G 1990).

### *Biomass Estimation*

The run biomass for Togiak District was estimated using aerial survey assessment procedures outlined by Lebida and Whitmore (1985). Aerial surveys were flown daily, weather permitting, at low tide, to estimate herring abundance. Each management section was divided into index areas to facilitate survey documentation. Aerial survey estimates for each index area were summed to provide biomass estimates for each management section by day. Biomass estimates of these management sections were, in turn, summed to provide the observed districtwide biomass for each day.

The migration of herring between management sections within the Togiak District is not well understood. Residence time of herring within the district or rate of turnover for the biomass on the grounds is unknown. Age and maturity data from the herring samples collected by nonselective gear were pooled across management sections to determine any temporal trends in age composition or maturity for the entire fishing district that would indicate immigration of new herring into or emigration of spent herring out of the fishing district.

Age composition by weight of both the commercial harvest and of the appropriate daily biomass data for each age class was estimated by

$$B_a = \left[ \frac{n_a \bar{W}_a}{\sum_{a=1}^{\max_n} (n_a \bar{W}_a)} \right] B, \quad (3)$$

Where  $B_a$  equals the biomass for age  $a$ ,  $n_a$  equals the number of herring in the sample that were age  $a$ ,  $\bar{W}_a$ ,  $a=1$  equals the mean weight for herring of age  $a$ , and  $B$  is the total estimated harvest expressed as biomass or daily biomass estimate.

Age composition of the waste or deadloss (i.e. herring caught, but not sold) was represented by the

age composition for the same gear type in the commercial fishery.

The composition by age and in numbers of fish,  $N_a$ , for each component was then calculated by

$$N_a = \frac{B_a}{\bar{W}_a}, \quad (4)$$

Where  $N_a$  equals the total number of herring in age class  $a$ ,  $B_a$  is the biomass for herring age  $a$  and  $\bar{W}_a$  is the mean weight of the fish at age  $a$ .

The run biomass,  $B_{tot}$ , was calculated from the daily biomass estimates by summing the biomass by each age class and management section from the selected daily aerial surveys that corresponded with changes in the age composition and gonad maturity data. To prevent double counting of herring, the biomass by age of herring age -6 and older observed during the first peak survey biomass estimate  $B_{a1}$  was added to the age-5 and younger component of the second peak estimate  $B_{a2}$ ,

$$B_{tot} = B_{a1} + B_{a2}. \quad (5)$$

The inshore escapement biomass  $E_{tot}$  is the summation of the difference between the run biomass  $B_a$  for each age, and the combined purse seine and gillnet harvest for each age  $C_a$ :

$$E_{tot} = \sum (B_a - C_a). \quad (6)$$

## RESULTS

### *Age, Weight and Length and Sex Data*

Biological data from 8,575 herring were collected in the Togiak Fishing District (Table 2) by purse seine, commercial gillnet, and variable mesh gillnet. Data were collected from 1 May through 23 May. Regenerated or unreadable scales composed 13.3% of all scale samples. The percentage of unreadable scales from commercial purse seine samples was highest at 16.1%. Unreadable scales comprised 15.6% of the commercial gillnet samples and 13.3% of the test purse seine samples. Variable-mesh gillnet samples had the smallest percentage of unreadable scales (12.5%). Readability of herring scales is dependent on the location of the body from which the scales have been removed as well as regeneration caused by scale loss. Because the opportunity for injury or scale loss would probably increase as herring grow older, the proportion of unreadable scales would be expected to increase with increasing age and size. However, mean lengths for unaged samples were similar to those for the aged samples (NSC), indicating that readable scales were

representative of the entire sample (Appendix A).

Herring aged 3-16 were collected from both the run biomass and the commercial harvest (Table 3). The temporal change in age class structure of the population was evident in the age composition of collected samples (Table 4; Figure 3). The proportion of herring age-9 and older composed 72.4% of the samples collected from nonselective gear during the early sampling period 3-9 May, decreasing to 35.2% during the period of 22-24 May. Conversely, the proportion of age -3 through -5 herring present in the samples increased from less than 2.1% during 3-9 May to 23.0% by 22-24 May. The proportion of age -6-8 herring samples from 25.5% during the 3-9 May sampling period to 41.8% for the 22-24 May period.

Length-at-age of all samples collected ranged from 193mm(age-5) to 340mm (age-12) and weight-at-age ranged from 76g (unageable) to 672g (age-14). The mean length and weight of herring from samples representing the total run biomass were 287mm and 335g, respectively (Table 5).

The ratio of males to females was variable in the daily samples for test commercial purse seine and test variable mesh gillnet. Samples from these two gear types combined with samples collected from the commercial purse seine fishery represented the biomass. The cumulative ratio of males to females from all samples collected by test commercial purse seine was 1.0:1.3, and for variable mesh gillnet, 1.0:0.8 (Appendices A, B).

### ***Commercial Harvest***

A total harvest of 11,121 tonnes (12,259 tons) was landed within the Togiak District (Table 6). The purse seine fleet caught 8,541 tonnes (9,415 tons), or 76.8% of the inshore harvest. The gillnet fleet caught 2,580 tonnes (2,844 tons), representing 26.2% of the season's total catch. Deadloss of 82 tonnes (90 tons) was included in the gillnet harvest.

The Hagemeister fishing section accounted for the greatest portion of the season's purse seine catch (55.4%). Lesser harvest was documented in the Togiak (29.8%), Pyrite Point (3.7%) and Cape Newenham (0.3%) fishing sections. The gillnet fishery was restricted to the Kulukak and Nunavachak fishing sections by regulation. Total gillnet harvest was similar for both sections with respective catches contributing 57.0% and 39.6% of the catch (Table 6; Figure 4).

The combined roe percent of herring caught by both gear types was 8.4%. The cumulative sex ratio of males to females in the purse seine fishery was 1.0:0.99 and in the gillnet fishery, 1.0:0.71. Mean weight for purse seine caught herring was 378g. The weight of gillnet caught fish averaged 368g (Table 5).

Sample sizes of herring collected for age composition analysis of the purse seine and gillnet catches were consistently below the desired goals (Table 3). Herring age-9 and older composed 65.4% of the commercial purse seine harvest by number and 73.6% by weight (Table 7). Age groups 7-8 contributed 19.1% by number and 16.7% by weight. Herring age-6 and younger represented 16.5% by number and 9.7% by weight of the purse seine harvest (Table 7; Figure 5).

Herring age-9 and older represented 60.3% of the gillnet harvest by number and 68.4% by weight. The age 7-8 component composed 30.2% of the harvest by number and 25.7% by weight (Table 7; Figure 6). Herring in the age-6 and younger category of gillnet catch samples was 9.5% of the harvest by number and 5.8% by weight.

### *Biomass Estimation*

The first herring of the season was caught in ADF&G test gillnets 1 May, but fish schools were not observed from the air until 5 May. Significant biomass first appeared in the Togiak and Hagemeister fishing sections (Tog, Hag, Tng survey index areas; Table 8, Figure 7). The biomass accumulated into the fishing district gradually. Peak biomass observation of 60,138 tonnes (66,290 tons) was documented 9 May. A second peak in abundance totaling 44,369 tonnes (48,908 tons) was observed 13 May. Inclement weather prevented aerial assessment of the herring biomass after 14 May. A biomass of 23,277 tonnes (25,658 tons) was observed during a final and districtwide aerial survey 24 May.

Miles of spawn observed during the 1989 season totaled 32.6km (52.5mi) for all fishing sections. Poor visibility due to increasingly poor weather conditions limited documentation of spawning activity. The peak daily observation of spawn (8.0km,12.9mi) was documented 10 May (Table 8, Figure 7).

It was apparent to the ADF&G management staff that the 1989 aerial assessment of the herring biomass would be an underestimate of the spawning migration into the Togiak District. Poor weather inhibited the opportunity to fly surveys, and created agitated water conditions, preventing observation of herring schools from the air, when flights could occur. Test fish crews at ADF&G field camps were able to catch herring despite poor weather. Continuous presence of herring in the test gillnets during these bad weather periods indicated that fish were moving through the district but were not being documented. At the management staff's request, age and sexual maturity data were examined for trends in population structure during the spawning migration into the Togiak District, to improve the illustration of herring abundance.

Changes in gonad maturity and age composition (Table 4, Figure 3, Appendices A, B) indicated shifts in population structure between aerial surveys conducted 9 May, 13-14 May and 24 May. ADF&G staff performing aerial surveys determined that herring observed on the east side of the fishing district on 13 May were distinct from those observed on the west side of the District, 14 May. These individuals also determined that these two surveys could be summed to represent one districtwide assessment of herring abundance for this two day period.

Residence time of the fish once they amass into the fishing district has been poorly understood. It would be possible that herring observed 9 May were still in the fishing district 13 May and therefore double counted when adding peak survey observations. This problem was addressed by breaking the biomass into age components and summing together the biomass for herring age-9 and older for the 9 May aerial survey biomass with the age -4-8 biomass for the 15 May aerial survey (Tables 8-14; Figures 8-10).

The revised estimate of total run biomass was therefore the sum of three components: 1) aerial

survey biomass for 9 May weighted by age composition data for herring age –8 and older from 7-9 May (55,488 tonnes, 61,156 tons); 2) aerial survey biomass for 13-14 May weighted by age composition data for herring age 4-7 from 13-15 May (11,023 tonnes, 12,151 tons); and 3) entire aerial survey biomass for 24 May weighted by age composition data from 22-24 May (23,277 tonnes, 25,658 tons; Tables 11-14, Figures 8-10).

The revised run biomass estimate totaled 89,780 tonnes (98,965 tons), representing 258.5 million herring (Table 7). Herring age-9 and older comprised 65.3% of the biomass and 54.5% of the population (Table 13, Figure 11). The 1977 and 1978 year classes appearing as age -12 and -11 herring represented a major portion of this older biomass, contributing 38.9% of the total run biomass and 31.5% of the total population (Figure 11).

Appearance of the 1979, 1981 and 1983 year classes in the 1989 biomass was also notable. The 1979 year class as age –10 herring represented 18.1% of the biomass and 16.0% of the population. The 1981 year class as age-8 herring followed in magnitude representing 14.5% of the biomass and 14.8% of the population. The 1983 year class as age –6 herring represented 11.4% of the biomass and 16.9% of the population.

## DISCUSSION

The Togiak herring run biomass totaled 89,780 tonnes (98,965 tons). The estimated biomass for all herring districts monitored in the eastern Bering Sea was 130,331 tonnes (143,664 tons; ADF&G 1995, Hamner and Kerkvliet 1994). Togiak herring comprised the largest component (67.5%) of the entire eastern Bering Sea biomass (Figure 12) during the 1989 season. Herring age –9 and older dominated the Togiak biomass (65.3%). Herring age-6 and younger represented 16.7% of the biomass. Poor weather conditions inhibited aerial surveillance of the herring migration during the 1989 season. It is highly probable that the total run biomass for the Togiak population was underestimated

The 1977 and 1978 year classes have been supporting the commercial fishery since recruitment into the biomass in 1983. Contribution of these age-classes continues to be significant to the population and to the fishery. Combined, these year classes represented 38.9% of the total run biomass and 45.5% of the commercial harvest. Focusing the fishery on the older, larger herring is a desirable policy because older herring experience decreasing survival rates due to increased age (Fried and Weststad 1985; Baker 1991) and would otherwise be eliminated from the biomass by natural mortality. Secondly, older herring have greater roe recovery due to their larger size (Brannian and Rowell 1991), technically benefiting the industry with a better quality product .

Adding components of aerial survey biomass to create a total run biomass estimate based on migratory patterns observed during aerial assessment has occurred in past years. Adding components of the aerial survey data, based on post season analysis of age composition and sexual maturity data was attempted for the first time in 1989. This more recent methodology increased the estimate of total run biomass 33.0% above peak aerial survey biomass estimate of 60,138 tons (66,290 tons). The importance of the field camps was emphasized during the 1989 season. Field crews were able to catch herring that provided a good sequence of age data and verified the

presence of herring in the fishing district during the lengthy periods of poor weather. Weather conditions prevented the fishing fleet from testfishing and providing equivalent samples as an alternative.

Temporal changes in age composition were significant for samples collected from non-selective gear during the 1989 season and were consistent with changes observed in previous years (McBride et.al.1981, Fried et.al., 1982, 1983, 1984). In apportioning aerial survey biomass data with age composition information for the purpose of revising the total run biomass estimate, herring samples should be collected simultaneously (as logistically feasible) with the aerial survey information in consideration. Attention to this detail best assures the age composition of the biomass be appropriately represented for a specific time period.

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Table 1. Historical total run biomass and commercial harvests (tonnes) of Pacific herring returning to the Togiak District, Bristol Bay (1968-1989).

| Year | Total Run Biomass (tonnes) <sup>a,b</sup> | Togiak Sac Roe Harvest (tonnes) <sup>c</sup> | Spawn-on-Kelp Harvest (tonnes) <sup>c</sup> | Dutch Harbor Food/Bait Harvest (tonnes) <sup>d</sup> |
|------|---|--|---|--|
| 1968 |   | 73   |   |  |
| 1969 |   | 43   | 5   |  |
| 1970 |   | 25   | 18  |  |
| 1971 |   | <sup>e</sup>                                 | 23  |  |
| 1972 |   | 73   | 29  |  |
| 1973 |   | 46   | 5   |  |
| 1974 |   | 112  | 57  |  |
| 1975 |   | 51   | 50  |  |
| 1976 |   | <sup>e</sup>                                 | 134   |  |
| 1977 |   | 2,536  | 125   |  |
| 1978 | 173,761                                   | 7,016  | 150   |  |
| 1979 | 219,810                                   | 10,485                                       | 188   |  |
| 1980 | 69,818                                    | 20,219                                       | 86  |  |
| 1981 | 144,117                                   | 10,300                                       | 172   | 639  |
| 1982 | 88,925                                    | 17,996                                       | 107   | 3,234  |
| 1983 | 127,962                                   | 22,092                                       | 125   | 3,236  |
| 1984 | 102,940                                   | 16,015                                       | 184   | 3,246  |
| 1985 | 120,131                                   | 21,288                                       | <sup>e</sup>                                | 3,157  |
| 1986 | 85,630                                    | 13,423                                       | 170   | 2,172  |
| 1987 | 80,818                                    | 12,807                                       | 139   | 2,271  |
| 1988 | 122,214                                   | 11,661                                       | 222   | 1,818  |
| Mean | 121,466                                   | 14,846                                       | 140   | 2,472  |
| 1989 | 89,780                                    | 11,120                                       | 254   | 2,795  |

<sup>a</sup> Data not available prior to 1978

<sup>b</sup> Source: Brannian and Rowell 1989,

<sup>c</sup> Source: Sandone and Brannian 1990., 1980-1987; ADF&G 1990, 1968-79; fish ticket receipts, 1988, 1989.

<sup>d</sup> Source: ADF&G 1995; catches documented since 1929. Fishery did not occur between 1946 and 1980.

<sup>e</sup> No fishery conducted

<sup>f</sup> Mean calculated for total run biomass; sac roe and spawn-on-kelp harvests are years 1978-1992 Dutch Harbor food/bait harvests for years 1983-1992.

Table 2. Number of samples collected and aged, by gear type during the 1989 Togiak herring season.

| Geartype                    | No.<br>Readable<br>Samples | No.<br>Unreadable<br>Samples | Total | Percent<br>Unreadable |
|-----------------------------|----------------------------|------------------------------|-------|-----------------------|
| Commercial Purse Seine      | 1,862                      | 273                          | 2,135 | 12.8                  |
| Commercial Gillnet          | 1,304                      | 265                          | 1,569 | 16.9                  |
| Test Commercial Purse Seine | 1,541                      | 207                          | 1,748 | 11.8                  |
| Test Variable-Mesh Gillnet  | 2,727                      | 396                          | 3,123 | 12.7                  |
| Total                       | 7,434                      | 1,143                        | 8,575 | 13.3                  |

Table 3. Achieved sample sizes compared to sampling goals for data applied to the final age composition analysis of the 1989 total run biomass and commercial harvest.

| Date                           | Fishing Section    | Sample Size | Percent Goal<br>(Thompson 1987,<br>405/strata) <sup>a</sup> | Age Range |
|--------------------------------|--------------------|-------------|---|-----------|
| <b>Aerial Survey Estimates</b> |                    |             |   |           |
| 09-May                         | Kulukak            | 285         | 0.70  | 4-16      |
|                                | Nunavachak         | 126         | 0.31  | 4-13      |
|                                | Togiak             | 473         | 1.17  | 5-15      |
|                                | Hagemeister        | 269         | 0.66  | 5-15      |
| 13-May                         | Kulukak            | 214         | 0.53  | 4-16      |
|                                | Nunavachak         | 41          | 0.10  | 5-15      |
|                                | Togiak             | 342         | 0.84  | 5-13      |
|                                | Hagemeister        | 1,164       | 1.66  | 5-14      |
|                                | Pyrite Point       | 371         | 0.92  | 6-14      |
|                                | Cape Newenham      | 120         | 0.30  | 5-15      |
| 24-May                         | Kulukak            | 170         | 0.42  | 4-12      |
|                                | Togiak/Hagemeister | 152         | 0.38  | 5-15      |
| <b>Commercial Fishery</b>      |                    |             |   |           |
| 12 May                         | Purse Seine        |             |   |           |
|                                | Togiak             | 354         | 0.87  | 4-15      |
|                                | Hagemeister        | 332         | 0.82  | 5-14      |
|                                | Pyrite Point       | 263         | 0.65  | 5-14      |
| 13 May                         | Purse Seine        |             |   |           |
|                                | Togiak             | 344         | 0.85  | 4-14      |
|                                | Hagemeister        | 341         | 0.84  | 5-15      |
|                                | Pyrite Point       | 108         | 0.27  | 6-14      |
|                                | Cape Newenham      | 120         | 0.30  | 5-15      |
| 9 May                          | Gill Net           |             |   |           |
|                                | Kulukak            | 339         | 0.84  | 5-14      |
|                                | Nunavachak         | 287         | 0.70  | 5-16      |
| 14 May                         | Gillnet            |             |   |           |
|                                | Kulukak            | 331         | 0.82  | 5-15      |
|                                | Nunavachak         | 347         | 0.86  | 5-15      |

<sup>a</sup> Time strata for age data weighted by aerial survey data for estimation of total run biomass was three days and by fishing period for the commercial harvest analysis.

<sup>b</sup> Sample sizes may differ slightly for the preliminary data used in biomass estimates.

Table 4. Temporal change in age composition (by number) of samples collected from non-selective gear in the Togiak District, 1989.

|        |         | Age Group |       |                  |
|--------|---------|-----------|-------|------------------|
| Sample |         |           |       |                  |
| Size   | Date    | 3-5       | 6-8   | 9 + <sup>a</sup> |
| 1,168  | 5/03-09 | 2.1%      | 25.5% | 72.4%            |
| 2,003  | 5/10-12 | 4.8%      | 27.8% | 67.4%            |
| 1,229  | 5/13-15 | 7.4%      | 31.9% | 60.7%            |
| 373    | 5/16-18 | 15.8%     | 46.9% | 37.3%            |
| 1,156  | 5/19-21 | 20.8%     | 45.6% | 33.7%            |
| 196    | 5/22-24 | 23.0%     | 41.8% | 35.2%            |
| Total  | 6,125   |           |       |                  |

<sup>a</sup> Includes age 9 through 16.

Table 5. Mean length (mm), weight (g), and standard deviation (sd) by age for collected herring representative of the total run biomass, and of the commercial harvest by gear type, Togiak District, 1989.

| Age   | Total Run Biomass |                |               | Age | Commercial Purse Seine |                |               | Age | Commercial Gillnet |                |               |
|-------|-------------------|----------------|---------------|-----|------------------------|----------------|---------------|-----|--------------------|----------------|---------------|
|       | No. of Samples    | Length (mm) sd | Weight (g) sd |     | No. of Samples         | Length (mm) sd | Weight (g) sd |     | No. of Samples     | Length (mm) sd | Weight (g) sd |
| 3     |                   |                |               | 3   |                        |                |               | 3   |                    |                |               |
| 4     | 3                 | 227 12.8       | 130 22.1      | 4   | 2                      | 229 21.9       | 141 27.6      | 4   |                    |                |               |
| 5     | 542               | 239 10.1       | 180 38.8      | 5   | 140                    | 241 10.4       | 197 44.9      | 5   | 5                  | 237 48.7       |               |
| 6     | 251               | 257 11.1       | 233 43.7      | 6   | 167                    | 257 10.9       | 244 10.5      | 6   | 105                | 264 9.3        |               |
| 7     | 256               | 272 12.4       | 289 49.7      | 7   | 68                     | 272 13.9       | 299 49.8      | 7   | 61                 | 276 9.5        |               |
| 8     | 1,241             | 283 11.4       | 332 54.3      | 8   | 288                    | 282 12.6       | 346 57.6      | 8   | 278                | 284 10.0       |               |
| 9     | 434               | 291 11.5       | 366 58.4      | 9   | 106                    | 290 15.0       | 375 57.6      | 9   | 107                | 290 9.5        |               |
| 10    | 1,137             | 297 11.3       | 397 61.4      | 10  | 302                    | 296 12.2       | 410 53.7      | 10  | 211                | 297 9.2        |               |
| 11    | 1,575             | 302 10.8       | 419 62.5      | 11  | 432                    | 302 11.7       | 438 58.7      | 11  | 323                | 302 9.5        |               |
| 12    | 905               | 306 11.4       | 440 63.7      | 12  | 312                    | 306 13.0       | 455 57.9      | 12  | 172                | 305 9.8        |               |
| 13    | 71                | 313 10.8       | 445 74.6      | 13  | 21                     | 312 10.5       | 456 61.3      | 13  | 18                 | 314 9.1        |               |
| 14    | 50                | 313 8.8        | 456 84.5      | 14  | 18                     | 317 8.3        | 473 92.1      | 14  | 18                 | 309 8.7        |               |
| 15    | 22                | 317 9.9        | 484 72.5      | 15  | 6                      | 320 7.8        | 482 34.1      | 15  | 5                  | 317 8.1        |               |
| 16    | 5                 | 313 9.1        | 443 26.8      | 16  |                        |                |               | 16  | 1                  | 322 467        |               |
| Total | 6,492             | 287 23.4       | 355 99.8      |     | 1,862                  | 289 23.6       | 378 98.6      |     | 1,304              | 295 15.8       | 368 73.2      |

Table 6 . Commercial purse seine and gillnet herring harvest (tons) by fishing section and date, Togiak District, 1989. Roe percentages are displayed in parenthesis. Total daily harvest is depicted in both tons and tonnes

| Period                      | Time (hours) | Fishing Section |             |             |             |              |               | Daily Harvest |                |             |
|-----------------------------|--------------|-----------------|-------------|-------------|-------------|--------------|---------------|---------------|----------------|-------------|
|                             |              | Kulukak         | Nunavachak  | Togiak      | Hagemeister | Pyrite Point | Cape Newenham | Total (tons)  | Total (tonnes) | Roe Percent |
| <u>Gillnet (tons)</u>       |              |                 |             |             |             |              |               |               |                |             |
| 5/09                        | 4.0          | 1,229 (8.0)     | 1,411 (7.7) |             |             |              |               | 2,640         | 2,395          | (7.9)       |
| 5/09 <sup>a</sup>           |              |                 | 90          |             |             |              |               | 90            | 82             |             |
| 5/14                        | 1.0          | 99 (8.1)        | 15 (6.0)    |             |             |              |               | 114           | 103            | (7.8)       |
| Total                       | 5.0          | 1,328 (9.4)     | 1,516 (7.2) |             |             |              |               | 2,844         | 2,580          | (7.8)       |
| <u>Purse Seine (tons)</u>   |              |                 |             |             |             |              |               |               |                |             |
| 5/12 <sup>a</sup>           | 2.0          |                 |             | 1,295 (7.9) | 4,106 (8.5) | 217 (8.7)    | 8 (10.9)      | 5,626         | 5,104          | (8.4)       |
| 5/13 <sup>a</sup>           | 1.0          |                 |             | 1,514 (9.2) | 2,126 (8.3) | 129 (9.4)    | 20 (8.4)      | 3,789         | 3,437          | (8.7)       |
| Total                       | 3.0          |                 |             | 2,809 (8.6) | 6,232 (8.4) | 346 (9.0)    | 28 (9.1)      | 9,415         | 8,541          | (8.5)       |
| <u>Combined Gear (tons)</u> |              |                 |             |             |             |              |               |               |                |             |
| 5/09                        | 4.0          | 1,229 (8.0)     | 1,501 (7.7) |             |             |              |               | 2,730         | 2,477          | (7.7)       |
| 5/12                        | 2.0          |                 |             | 1,295 (7.9) | 4,106 (8.5) | 217 (8.7)    | 8 (10.9)      | 5,626         | 5,104          | (8.4)       |
| 5/13                        | 1.0          |                 |             | 1,514 (9.2) | 2,126 (8.3) | 129 (9.4)    | 20 (8.4)      | 3,789         | 3,437          | (8.7)       |
| 5/14                        | 1.0          | 99 (8.1)        | 15 (6.0)    |             |             |              |               | 114           | 103            | (7.8)       |
| Total                       | 8.0          | 1,328 (8.0)     | 1,516 (7.7) | 2,809 (8.6) | 6,232 (8.4) | 346 (9.0)    | 28 (9.1)      | 12,259        | 11,121         | (8.4)       |

<sup>a</sup> Estimated deadloss from 18 gill nets at 5 tons per net.

<sup>b</sup> Harvest from calibration (point) estimate.

Table 7. Age composition estimates by number and weight (tonnes) of the commercial harvest, escapement biomass, and total run biomass, Togiak District 1989.

| Total Run Biomass |                  |                   |                      |                | Commercial Purse Seine Harvest |                  |                   |                      | Commercial Gillnet Harvest |     |                  |                   |                      |                |
|-------------------|------------------|-------------------|----------------------|----------------|--------------------------------|------------------|-------------------|----------------------|----------------------------|-----|------------------|-------------------|----------------------|----------------|
| Age               | Biomass (tonnes) | Percent by Weight | No. of Fish (x1,000) | Percent by No. | Age                            | Biomass (tonnes) | Percent by Weight | No. of Fish (x1,000) | Percent by No.             | Age | Biomass (tonnes) | Percent by Weight | No. of Fish (x1,000) | Percent by No. |
| 1                 | 0                | 0.0%              | 0                    | 0.0%           | 1                              | 0                | 0.0%              | 0                    | 0.0%                       | 1   | 0                | 0.0%              | 0                    | 0.0%           |
| 2                 | 0                | 0.0%              | 0                    | 0.0%           | 2                              | 0                | 0.0%              | 0                    | 0.0%                       | 2   | 0                | 0.0%              | 0                    | 0.0%           |
| 3                 | 0                | 0.0%              | 0                    | 0.0%           | 3                              | 0                | 0.0%              | 0                    | 0.0%                       | 3   | 0                | 0.0%              | 0                    | 0.0%           |
| 4                 | 27               | 0.0%              | 236                  | 0.1%           | 4                              | 5                | 0.1%              | 34                   | 0.2%                       | 4   | 0                | 0.0%              | 0                    | 0.0%           |
| 5                 | 4,682            | 5.2%              | 24,872               | 9.6%           | 5                              | 348              | 4.1%              | 1,716                | 7.6%                       | 5   | 7                | 0.3%              | 37                   | 0.5%           |
| 6                 | 10,242           | 11.4%             | 43,642               | 16.9%          | 6                              | 476              | 5.6%              | 1,993                | 8.8%                       | 6   | 143              | 5.5%              | 618                  | 9.0%           |
| 7                 | 3,165            | 3.5%              | 10,671               | 4.1%           | 7                              | 240              | 2.8%              | 820                  | 3.6%                       | 7   | 108              | 4.2%              | 387                  | 5.6%           |
| 8                 | 13,026           | 14.5%             | 38,308               | 14.8%          | 8                              | 1,187            | 13.9%             | 3,507                | 15.4%                      | 8   | 556              | 21.6%             | 1,693                | 24.6%          |
| 9                 | 4,820            | 5.4%              | 12,733               | 4.9%           | 9                              | 502              | 5.9%              | 1,354                | 6.0%                       | 9   | 208              | 8.1%              | 557                  | 8.1%           |
| 10                | 16,287           | 18.1%             | 41,391               | 16.0%          | 10                             | 1,513            | 17.7%             | 3,689                | 16.2%                      | 10  | 440              | 17.1%             | 1,066                | 15.5%          |
| 11                | 21,044           | 23.4%             | 50,465               | 19.5%          | 11                             | 2,273            | 26.6%             | 5,241                | 23.1%                      | 11  | 646              | 25.0%             | 1,496                | 21.7%          |
| 12                | 13,922           | 15.5%             | 30,905               | 12.0%          | 12                             | 1,744            | 20.4%             | 3,822                | 16.8%                      | 12  | 396              | 15.3%             | 872                  | 12.7%          |
| 13                | 1,320            | 1.5%              | 2,849                | 1.1%           | 13                             | 112              | 1.3%              | 249                  | 1.1%                       | 13  | 20               | 0.8%              | 45                   | 0.7%           |
| 14                | 946              | 1.1%              | 1,743                | 0.7%           | 14                             | 108              | 1.3%              | 222                  | 1.0%                       | 14  | 39               | 1.5%              | 76                   | 1.1%           |
| 15+               | 299              | 0.3%              | 665                  | 0.3%           | 15+                            | 31               | 0.4%              | 65                   | 0.3%                       | 15+ | 17               | 0.6%              | 34                   | 0.5%           |
| Total             | 89,780           | 100.0%            | 258,480              | 100.0%         |                                | 8,540            | 100.0%            | 22,713               | 100.0%                     |     | 2,580            | 100.0%            | 6,881                | 100.0%         |

(Continued)

Table 7. (Continued)

| Total Commercial Harvest Biomass |                     |                      |                        |                   | Escapement Biomass |                     |                      |                        |                   |
|----------------------------------|---------------------|----------------------|------------------------|-------------------|--------------------|---------------------|----------------------|------------------------|-------------------|
| Age                              | Biomass<br>(Tonnes) | Percent<br>by Weight | No.of Fish<br>(x1,000) | Percent<br>by No. | Age                | Biomass<br>(Tonnes) | Percent<br>by Weight | No.of Fish<br>(x1,000) | Percent<br>by No. |
| 1                                | 0                   | 0.0%                 | 0                      | 0.0%              | 1                  | 0                   | 0.0%                 | 0                      | 0.0%              |
| 2                                | 0                   | 0.0%                 | 0                      | 0.0%              | 2                  | 0                   | 0.0%                 | 0                      | 0.0%              |
| 3                                | 0                   | 0.0%                 | 0                      | 0.0%              | 3                  | 0                   | 0.0%                 | 0                      | 0.0%              |
| 4                                | 5                   | 0.0%                 | 34                     | 0.1%              | 4                  | 22                  | 0.0%                 | 202                    | 0.1%              |
| 5                                | 355                 | 3.2%                 | 1,753                  | 5.9%              | 5                  | 4,327               | 5.5%                 | 23,119                 | 10.1%             |
| 6                                | 618                 | 5.6%                 | 2,611                  | 8.8%              | 6                  | 9,624               | 12.2%                | 41,030                 | 17.9%             |
| 7                                | 348                 | 3.1%                 | 1,208                  | 4.1%              | 7                  | 2,817               | 3.6%                 | 9,463                  | 4.1%              |
| 8                                | 1,744               | 15.7%                | 5,200                  | 17.6%             | 8                  | 11,283              | 14.3%                | 33,108                 | 14.5%             |
| 9                                | 710                 | 6.4%                 | 1,911                  | 6.5%              | 9                  | 4,110               | 5.2%                 | 10,822                 | 4.7%              |
| 10                               | 1,953               | 17.6%                | 4,755                  | 16.1%             | 10                 | 14,334              | 18.2%                | 36,636                 | 16.0%             |
| 11                               | 2,919               | 26.2%                | 6,737                  | 22.8%             | 11                 | 18,125              | 23.0%                | 43,728                 | 19.1%             |
| 12                               | 2,140               | 19.2%                | 4,693                  | 15.9%             | 12                 | 11,781              | 15.0%                | 26,212                 | 11.5%             |
| 13                               | 132                 | 1.2%                 | 294                    | 1.0%              | 13                 | 1,188               | 1.5%                 | 2,555                  | 1.1%              |
| 14                               | 147                 | 1.3%                 | 299                    | 1.0%              | 14                 | 799                 | 1.0%                 | 1,444                  | 0.6%              |
| 15+                              | 48                  | 0.4%                 | 99                     | 0.3%              | 15+                | 251                 | 0.3%                 | 566                    | 0.2%              |
| Total                            | 11,120              | 100.0%               | 29,594                 | 100.0%            |                    | 78,660              | 100.0%               | 228,886                | 100.0%            |

Table 8. Observed aerial biomass estimates of herring by index area (tons), and totals by day (tons, tonnes) during the 1989 season, Togiak District, Bristol Bay.<sup>a</sup>

| Date                   | Survey Conditions | Time Surveyed | Mile Observations |        | Estimated Biomass by Index Area (short tons) <sup>b</sup> |       |        |       |       |                     |                    |        |       |        |       |       |    | Daily Total |          |
|------------------------|-------------------|---------------|-------------------|--------|---|-------|--------|-------|-------|---------------------|--------------------|--------|-------|--------|-------|-------|----|-------------|----------|
|                        |                   |               | No.               | Length |   | NUS   | KUK    | MET   | NUK   | UGL                 | TOG                | TNG    | MTG   | HAG    | OSK   | PYR   | CN | (tons)      | (tonnes) |
|                        |                   |               |                   | Miles  | Kilometers  |       |        |       |       |                     |                    |        |       |        |       |       |    |             |          |
| 4/20-5/04 <sup>c</sup> | Fair-Excel        |               | 0                 | 0.0    | 0.0   | 0     | 0      | 0     | 0     | 0                   | 0                  | 0      | 0     | 0      | 0     | 0     | 0  | 0           | 0        |
| 5/05 <sup>d</sup>      | Fair              | 1530          | 0                 | 0.0    | 0.0   |       |        |       |       |                     | 2,535              | 43     |       | 465    |       |       |    | 3,043       | 2,761    |
| 5/06                   | Fair              | 2000          | 0                 | 0.0    | 0.0   |       |        | 2     | 14    | 85                  | 7,812              | 29     |       | 144    |       |       |    | 8,329       | 7,556    |
| 5/07                   | Fair-Good         | 930           | 0                 | 0.0    | 0.0   | 378   | 1,240  | 1,023 | 3     | 468                 | 33,425             | 11,764 | 283   | 1,064  | 112   | 0     |    | 49,760      | 45,142   |
| 5/08                   | Fair-Poor         | 1308          | 4                 | 4.2    | 2.6   | 85    | 4,031  | 629   | 8     | 1,503               | 23,360             | 4,487  |       |        |       |       |    | 34,933      | 31,691   |
| 5/09 <sup>e</sup>      | Fair-Good         | 1230          | 11                | 11.9   | 7.4   | 14    | 261    | 184   | 374   | 2,967               | 45,821             | 14,466 | 892   |        | 268   | 0     | 0  | 66,290      | 60,138   |
| 5/10                   | Poor-Fair         | 1710          | 15                | 12.9   | 8.0   |       | 181    | 23    | 1,713 | 2,975               | 32,095             | 4,172  | 5,864 | 56.00  | 5,340 |       |    | 32,419      | 47,534   |
| 5/11                   | Fog               | 2015          | 7                 | 10.0   | 6.2   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/12                   | Poor              | 2140          | 9                 | 3.6    | 2.2   | 29    | 4,452  | 3,786 | 1,737 |                     |                    |        |       |        |       |       |    | 10,004      | 9,076    |
| 5/13                   | Fair              | 950           | 4                 | 3.2    | 2.0   |       | 11,301 | 3,023 | 2,063 | 25,314 <sup>f</sup> | 2,570 <sup>g</sup> | 4,412  |       |        |       |       |    | 48,908      | 44,369   |
| 5/14                   |                   | 1835          | 0                 | 0.0    | 0.0   | 2,063 | 9,401  | 2,788 | 1,117 | 11,833              | 4,032              | 929    | 2,616 | 375.00 | 555   | 2,760 | 0  | 38,689      | 35,098   |
| 5/15                   |                   |               |                   |        |   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/16                   |                   |               | 1                 | 0.8    | 0.5   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/17                   |                   |               |                   |        |   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/18                   | Poor              | 1030          |                   |        |   |       | 226    |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/19                   |                   |               |                   |        |   |       |        |       |       |                     |                    | 56     | 2     |        |       | 71    |    | 335         | 322      |
| 5/20                   |                   |               |                   |        |   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/21                   |                   |               |                   |        |   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/22                   |                   |               |                   |        |   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/23                   |                   |               |                   |        |   |       |        |       |       |                     |                    |        |       |        |       |       |    | 0           | 0        |
| 5/24                   | Good              | 1410          | 18                | 5.9    | 3.7   | 7,097 | 275    | 1,497 | 185   | 640                 | 15,159             | 456    | 40    | 0      | 201   | 108   | 0  | 25,658      | 23,277   |
| Total                  |                   |               | 69                | 52.5   | 32.6  |       |        |       |       |                     |                    |        |       |        |       |       |    |             |          |

(Continued)

Table 8. (Continued).

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- <sup>a</sup> Togiak District Pacific herring biomass was estimated at 98,965 short tons (89,780 tonnes) for the 1989 season.
  - <sup>b</sup> Index areas: NUN - Nushagak Peninsula; KUK- Kulukak; MET- Metervik; NUK - Nunavachak; UGL - Ungathluk/Togiak; TOG - Togiak; TNG- TNG-Tongue Point; MTG-Matogak; HAG-Hagemeister; OSK - Osviak; PYT- Pyrite Point;CN- Cape Newenham.
  - <sup>c</sup> Surveys conducted intermittently from 20 April to 4 May, and flown regularly 12 May through 22 May.
  - <sup>d</sup> Survey from UGL west to CN began at 1610.
  - <sup>e</sup> Peak estimate.
  - <sup>f</sup> Survey from UGL west to TNG was incomplete and occurred at 1600.
  - <sup>g</sup> Partial survey. An additional 13,608 tonnes were observed between HAG and CN during the commercial fishery.

Table 9. Age composition estimates of the commercial purse seine harvest weighted by the harvest biomass (tonnes), by date and fishing section, Togiak District, 1989.

| Sampling Dates: 12 May<br>Section: C.Nham, Tog, Hag C.Purse Seine<br>Biomass: 5,103 tonnes |                |                |                     | Sampling Dates: 13 May<br>Section: Tog, Hag, Pyrite Pt. C.Nham C.P.S.<br>Biomass: 3,437 tonnes |                |                |                     | Total Purse Seine Harvest<br>Combined Areas and Dates<br>Biomass: 8,540 tonnes |                |                |                     |
|--|----------------|----------------|---------------------|--|----------------|----------------|---------------------|--|----------------|----------------|---------------------|
| Age  | No. of Samples | Percent by No. | No. of Fish (X1000) | Age  | No. of Samples | Percent by No. | No. of Fish (X1000) | Age  | No. of Samples | Percent by No. | No. of Fish (X1000) |
| 1  | 0              | 0.0%           | 0                   | 1  | 0              | 0.0%           | 0                   | 1  | 0              | 0.0%           | 0                   |
| 2  | 0              | 0.0%           | 0                   | 2  | 0              | 0.0%           | 0                   | 2  | 0              | 0.0%           | 0                   |
| 3  | 0              | 0.0%           | 0                   | 3  | 0              | 0.0%           | 0                   | 3  | 0              | 0.0%           | 0                   |
| 4  | 1              | 0.1%           | 14                  | 4  | 2              | 0.2%           | 20                  | 4  | 3              | 0.2%           | 34                  |
| 5  | 67             | 7.0%           | 944                 | 5  | 76             | 8.3%           | 772                 | 5  | 143            | 7.7%           | 1,716               |
| 6  | 73             | 7.7%           | 1,029               | 6  | 95             | 10.4%          | 965                 | 6  | 168            | 9.0%           | 1,993               |
| 7  | 33             | 3.5%           | 465                 | 7  | 35             | 3.8%           | 355                 | 7  | 68             | 3.6%           | 820                 |
| 8  | 148            | 15.6%          | 2,085               | 8  | 140            | 15.3%          | 1,422               | 8  | 288            | 15.4%          | 3,507               |
| 9  | 68             | 7.2%           | 958                 | 9  | 39             | 4.3%           | 396                 | 9  | 107            | 5.7%           | 1,354               |
| 10   | 158            | 16.6%          | 2,226               | 10   | 144            | 15.7%          | 1,462               | 10   | 302            | 16.2%          | 3,689               |
| 11   | 217            | 22.8%          | 3,058               | 11   | 215            | 23.4%          | 2,184               | 11   | 432            | 23.1%          | 5,241               |
| 12   | 166            | 17.5%          | 2,339               | 12   | 146            | 15.9%          | 1,483               | 12   | 312            | 16.7%          | 3,822               |
| 13   | 9              | 0.9%           | 127                 | 13   | 12             | 1.3%           | 122                 | 13   | 21             | 1.1%           | 249                 |
| 14   | 10             | 1.1%           | 141                 | 14   | 8              | 0.9%           | 81                  | 14   | 18             | 1.0%           | 222                 |
| 15+  | 1              | 0.1%           | 14                  | 15+  | 5              | 0.5%           | 51                  | 15+  | 6              | 0.3%           | 65                  |
| Total  | 951            | 100.0%         | 13,400              |  | 917            | 100.0%         | 9,313               |  | 1,868          | 100.0%         | 22,713              |

| Age   | Percent by |        |         | Age | Percent by |        |         | Age | Percent by |        |         |
|-------|------------|--------|---------|-----|------------|--------|---------|-----|------------|--------|---------|
|       | Weight     | Weight | Biomass |     | Weight     | Weight | Biomass |     | Weight     | Weight | Biomass |
| 1     | 0          | 0.0%   | 0       | 1   | 0          | 0.0%   | 0       | 1   | 0          | 0.0%   | 0       |
| 2     | 0          | 0.0%   | 0       | 2   | 0          | 0.0%   | 0       | 2   | 0          | 0.0%   | 0       |
| 3     | 0          | 0.0%   | 0       | 3   | 0          | 0.0%   | 0       | 3   | 0          | 0.0%   | 0       |
| 4     | 145        | 0.0%   | 2       | 4   | 276        | 0.1%   | 3       | 4   | 421        | 0.1%   | 5       |
| 5     | 12,294     | 3.7%   | 191     | 5   | 14,013     | 4.6%   | 157     | 5   | 26,307     | 4.1%   | 348     |
| 6     | 16,276     | 5.0%   | 253     | 6   | 19,900     | 6.5%   | 223     | 6   | 36,176     | 5.7%   | 476     |
| 7     | 9,116      | 2.8%   | 142     | 7   | 8,832      | 2.9%   | 99      | 7   | 17,948     | 2.8%   | 240     |
| 8     | 46,379     | 14.1%  | 720     | 8   | 41,723     | 13.6%  | 467     | 8   | 88,102     | 13.9%  | 1,187   |
| 9     | 22,799     | 6.9%   | 354     | 9   | 13,216     | 4.3%   | 148     | 9   | 36,015     | 5.7%   | 502     |
| 10    | 58,542     | 17.8%  | 909     | 10  | 53,944     | 17.6%  | 604     | 10  | 112,487    | 17.7%  | 1,513   |
| 11    | 85,577     | 26.0%  | 1329    | 11  | 84,267     | 27.4%  | 943     | 11  | 169,844    | 26.7%  | 2,273   |
| 12    | 68,930     | 21.0%  | 1071    | 12  | 60,183     | 19.6%  | 674     | 12  | 129,114    | 20.3%  | 1,744   |
| 13    | 3,798      | 1.2%   | 59      | 13  | 4,768      | 1.6%   | 53      | 13  | 8,566      | 1.3%   | 112     |
| 14    | 4,259      | 1.3%   | 66      | 14  | 3,729      | 1.2%   | 42      | 14  | 7,989      | 1.3%   | 108     |
| 15    | 423        | 0.1%   | 7       | 15  | 2,199      | 0.7%   | 25      | 15  | 2,622      | 0.4%   | 31      |
| Total | 328,539    | 100.0% | 5,103   |     | 307,050    | 100.0% | 3,437   |     | 635,589    | 100.0% | 8,540   |

Table 10. Age composition estimates of the commercial gillnet harvest weighted by the harvest biomass (tonnes), by date and fishing section Togiak District, 1989.

| Sampling Dates: 9 May<br>Section: Kul. Nun. C.Gillnet<br>Biomass: 2.477 tonnes |                |                |                     | Sampling Dates: 13 May<br>Section: Nunavachak and Kulukak C.Gnet<br>Biomass: 103 tonnes |                |                |                     | Total Gillnet Harvest<br>Combined Areas and Dates<br>Biomass: 2.580 tonnes |                |                |                     |
|--|----------------|----------------|---------------------|---|----------------|----------------|---------------------|--|----------------|----------------|---------------------|
| Age  | No. of Samples | Percent by No. | No. of Fish (X1000) | Age   | No. of Samples | Percent by No. | No. of Fish (X1000) | Age  | No. of Samples | Percent by No. | No. of Fish (X1000) |
| 1  | 0              | 0.0%           | 0                   | 1   | 0              | 0.0%           | 0                   | 1  | 0              | 0.0%           | 0                   |
| 2  | 0              | 0.0%           | 0                   | 2   | 0              | 0.0%           | 0                   | 2  | 0              | 0.0%           | 0                   |
| 3  | 0              | 0.0%           | 0                   | 3   | 0              | 0.0%           | 0                   | 3  | 0              | 0.0%           | 0                   |
| 4  | 0              | 0.0%           | 0                   | 4   | 0              | 0.0%           | 0                   | 4  | 0              | 0.0%           | 0                   |
| 5  | 3              | 0.5%           | 36                  | 5   | 2              | 0.3%           | 1                   | 5  | 5              | 0.4%           | 37                  |
| 6  | 50             | 7.9%           | 592                 | 6   | 55             | 8.1%           | 26                  | 6  | 105            | 8.0%           | 618                 |
| 7  | 32             | 5.1%           | 373                 | 7   | 31             | 4.6%           | 14                  | 7  | 63             | 4.8%           | 387                 |
| 8  | 151            | 24.0%          | 1,640               | 8   | 128            | 18.9%          | 53                  | 8  | 279            | 21.3%          | 1,693               |
| 9  | 53             | 8.4%           | 536                 | 9   | 55             | 8.1%           | 21                  | 9  | 108            | 8.3%           | 557                 |
| 10   | 101            | 16.0%          | 1,024               | 10  | 111            | 16.3%          | 42                  | 10   | 212            | 16.2%          | 1,066               |
| 11   | 139            | 22.1%          | 1,424               | 11  | 184            | 27.1%          | 72                  | 11   | 323            | 24.7%          | 1,496               |
| 12   | 86             | 13.7%          | 839                 | 12  | 86             | 12.7%          | 33                  | 12   | 172            | 13.1%          | 872                 |
| 13   | 4              | 0.6%           | 40                  | 13  | 14             | 2.1%           | 6                   | 13   | 18             | 1.4%           | 45                  |
| 14   | 8              | 1.3%           | 73                  | 14  | 10             | 1.5%           | 3                   | 14   | 18             | 1.4%           | 76                  |
| 15   | 3              | 0.5%           | 33                  | 15  | 3              | 0.4%           | 1                   | 15   | 6              | 0.5%           | 34                  |
| Total  | 630            | 100.0%         | 6,609               |   | 679            | 100.0%         | 272                 |  | 1,309          | 100.0%         | 6,881               |

| Age   | Weight  | Percent by Weight | Biomass | Age | Weight  | Percent by Weight | Biomass | Age | Weight  | Percent by Weight | Biomass |
|-------|---------|-------------------|---------|-----|---------|-------------------|---------|-----|---------|-------------------|---------|
| 1     | 0       | 0.0%              | 0       | 1   | 0       | 0.0%              | 0       | 1   | 0       | 0.0%              | 0       |
| 2     | 0       | 0.0%              | 0       | 2   | 0       | 0.0%              | 0       | 2   | 0       | 0.0%              | 0       |
| 3     | 0       | 0.0%              | 0       | 3   | 0       | 0.0%              | 0       | 3   | 0       | 0.0%              | 0       |
| 4     | 0       | 0.0%              | 0       | 4   | 0       | 0.0%              | 0       | 4   | 0       | 0.0%              | 0       |
| 5     | 653     | 0.3%              | 7       | 5   | 421     | 0.2%              | 0       | 5   | 1,074   | 0.2%              | 7       |
| 6     | 12,254  | 5.5%              | 137     | 6   | 12,487  | 5.8%              | 6       | 6   | 24,741  | 5.6%              | 143     |
| 7     | 9,307   | 4.2%              | 104     | 7   | 8,226   | 3.8%              | 4       | 7   | 17,532  | 4.0%              | 108     |
| 8     | 48,302  | 21.8%             | 539     | 8   | 36,262  | 16.8%             | 17      | 8   | 84,564  | 19.3%             | 556     |
| 9     | 17,937  | 8.1%              | 200     | 9   | 16,586  | 7.7%              | 8       | 9   | 34,523  | 7.9%              | 208     |
| 10    | 37,913  | 17.1%             | 423     | 10  | 36,116  | 16.7%             | 17      | 10  | 74,030  | 16.9%             | 440     |
| 11    | 55,163  | 24.8%             | 615     | 11  | 64,516  | 29.9%             | 31      | 11  | 119,679 | 27.3%             | 646     |
| 12    | 34,160  | 15.4%             | 381     | 12  | 31,272  | 14.5%             | 15      | 12  | 65,432  | 14.9%             | 396     |
| 13    | 1,553   | 0.7%              | 17      | 13  | 5,338   | 2.5%              | 3       | 13  | 6,891   | 1.6%              | 20      |
| 14    | 3,368   | 1.5%              | 38      | 14  | 3,511   | 1.6%              | 2       | 14  | 6,878   | 1.6%              | 39      |
| 15+   | 1,434   | 0.6%              | 16      | 15+ | 1,123   | 0.5%              | 1       | 15+ | 2,557   | 0.6%              | 17      |
| Total | 222,045 | 100.0%            | 2,477   |     | 215,858 | 100.0%            | 103     |     | 437,903 | 100.0%            | 2,580   |

Table 11. Age composition estimates for sampling stratum 7-9 May, weighted by 9 May aerial survey biomass (tonnes), by fishing section, Togiak District, 1989.

| Sampling Dates: 7-9 May<br>Section: Kulukak<br>Biomass: 416 tonnes |                |                   |                     | Sampling Dates: 7-9 May<br>Section: Nunavachak<br>Biomass: 3,031 tonnes |                |                   |                     | Sampling Dates: 7-9 May<br>Section: Togiak<br>Biomass: 41,569 tonnes |                |                   |                     | Sampling Dates: 7-9 May<br>Section: Hagemeister<br>Biomass: 15,122 tonnes |                |                   |                     |
|--|----------------|-------------------|---------------------|---|----------------|-------------------|---------------------|--|----------------|-------------------|---------------------|---|----------------|-------------------|---------------------|
| Age  | No. of Samples | Percent by No.    | No. of Fish (X1000) | Age   | No. of Samples | Percent by No.    | No. of Fish (X1000) | Age  | No. of Samples | Percent by No.    | No. of Fish (X1000) | Age   | No. of Samples | Percent by No.    | No. of Fish (X1000) |
| 1  | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   | 1  | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   |
| 2  | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   | 2  | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   |
| 3  | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   | 3  | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   |
| 4  | 0              | 0.0%              | 0                   | 4   | 0              | 0.0%              | 0                   | 4  | 0              | 0.0%              | 0                   | 4   | 0              | 0.0%              | 0                   |
| 5  | 8              | 2.8%              | 30                  | 5   | 0              | 0.0%              | 0                   | 5  | 12             | 2.5%              | 2,800               | 5   | 4              | 1.5%              | 563                 |
| 6  | 14             | 4.9%              | 53                  | 6   | 2              | 1.6%              | 110                 | 6  | 45             | 9.5%              | 10,500              | 6   | 14             | 5.2%              | 1,971               |
| 7  | 2              | 0.7%              | 8                   | 7   | 0              | 0.0%              | 0                   | 7  | 11             | 2.3%              | 2,567               | 7   | 8              | 3.0%              | 1,126               |
| 8  | 58             | 20.4%             | 219                 | 8   | 16             | 12.7%             | 882                 | 8  | 84             | 17.8%             | 19,600              | 8   | 45             | 16.7%             | 6,334               |
| 9  | 21             | 7.4%              | 79                  | 9   | 7              | 5.6%              | 386                 | 9  | 24             | 5.1%              | 5,600               | 9   | 22             | 8.2%              | 3,097               |
| 10   | 51             | 17.9%             | 193                 | 10  | 20             | 15.9%             | 1,102               | 10   | 88             | 18.6%             | 20,533              | 10  | 72             | 26.8%             | 10,134              |
| 11   | 81             | 28.4%             | 306                 | 11  | 54             | 42.9%             | 2,975               | 11   | 117            | 24.7%             | 27,300              | 11  | 64             | 23.8%             | 9,008               |
| 12   | 37             | 13.0%             | 140                 | 12  | 25             | 19.8%             | 1,377               | 12   | 80             | 16.9%             | 18,666              | 12  | 33             | 12.3%             | 4,645               |
| 13   | 6              | 2.1%              | 23                  | 13  | 2              | 1.6%              | 110                 | 13   | 6              | 1.3%              | 1,400               | 13  | 4              | 1.5%              | 563                 |
| 14   | 4              | 1.4%              | 15                  | 14  | 0              | 0.0%              | 0                   | 14   | 5              | 1.1%              | 1,167               | 14  | 2              | 0.7%              | 282                 |
| 15+  | 3              | 1.1%              | 11                  | 15+   | 0              | 0.0%              | 0                   | 15+  | 1              | 0.2%              | 233                 | 15+   | 1              | 0.4%              | 141                 |
| Total  | 285            | 100.0%            | 1,077               | 126   | 100.0%         | 6,942             | 6,942               | 473  | 100.0%         | 110,365           | 110,365             | Total   | 269            | 100.0%            | 37,863              |
| Age  | Weight         | Percent by Weight | Biomass             | Age   | Weight         | Percent by Weight | Biomass             | Age  | Weight         | Percent by Weight | Biomass             | Age   | Weight         | Percent by Weight | Biomass             |
| 1  | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   | 1  | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   |
| 2  | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   | 2  | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   |
| 3  | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   | 3  | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   |
| 4  | 0              | 0.0%              | 0                   | 4   | 0              | 0.0%              | 0                   | 4  | 0              | 0.0%              | 0                   | 4   | 0              | 0.0%              | 0                   |
| 5  | 1,419          | 1.4%              | 6                   | 5   | 0              | 0.0%              | 0                   | 5  | 1,824          | 1.1%              | 469                 | 5   | 785            | 0.8%              | 122                 |
| 6  | 3,137          | 3.1%              | 13                  | 6   | 588            | 1.2%              | 36                  | 6  | 9,613          | 5.9%              | 2,472               | 6   | 3,172          | 3.3%              | 492                 |
| 7  | 513            | 0.5%              | 2                   | 7   | 0              | 0.0%              | 0                   | 7  | 2,941          | 1.8%              | 756                 | 7   | 1,863          | 1.9%              | 289                 |
| 8  | 18,342         | 18.3%             | 76                  | 8   | 5,588          | 11.2%             | 339                 | 8  | 25,545         | 15.8%             | 6,570               | 8   | 14,367         | 14.7%             | 2,229               |
| 9  | 6,300          | 6.3%              | 26                  | 9   | 2,610          | 5.2%              | 159                 | 9  | 8,329          | 5.2%              | 2,142               | 9   | 7,713          | 7.9%              | 1,197               |
| 10   | 18,530         | 18.5%             | 77                  | 10  | 7,711          | 15.5%             | 468                 | 10   | 30,797         | 19.1%             | 7,921               | 10  | 27,376         | 28.1%             | 4,248               |
| 11   | 31,353         | 31.4%             | 131                 | 11  | 21,947         | 44.0%             | 1,333               | 11   | 44,147         | 27.3%             | 11,355              | 11  | 24,874         | 25.5%             | 3,859               |
| 12   | 15,039         | 15.0%             | 63                  | 12  | 10,523         | 21.1%             | 639                 | 12   | 32,920         | 20.4%             | 8,467               | 12  | 14,099         | 14.5%             | 2,187               |
| 13   | 2,300          | 2.3%              | 10                  | 13  | 940            | 1.9%              | 57                  | 13   | 2,650          | 1.6%              | 682                 | 13  | 1,696          | 1.7%              | 263                 |
| 14   | 1,680          | 1.7%              | 7                   | 14  | 0              | 0.0%              | 0                   | 14   | 2,461          | 1.5%              | 633                 | 14  | 1,101          | 1.1%              | 171                 |
| 15+  | 1,373          | 1.4%              | 6                   | 15+   | 0              | 0.0%              | 0                   | 15+  | 394            | 0.2%              | 101                 | 15+   | 419            | 0.4%              | 65                  |
| Total  | 99,986         | 100.0%            | 416                 | 49,907  | 100.0%         | 3,031             | 3,031               | 161,620  | 100.0%         | 41,569            | 41,569              | 97,465  | 100.0%         | 15,122            |                     |

Table 12. Age composition estimates for sampling stratum 13-15 May, weighted by 13 and 14 May aerial survey biomass (tonnes), by fishing section, Togiak District , 1989.

| Sampling Dates: 13-15 May<br>Section: Kulukak<br>Biomass: 12,995 tonnes |                |                   |                     | Sampling Dates: 13-15 May<br>Section: Nunavachak<br>Biomass: 24,836 tonnes |                |                   |                     | Sampling Dates: 13-15 May<br>Section: Togiak<br>Biomass: 2,331 tonnes |                |                   |                     | Sampling Dates: 13-15 May <sup>a</sup><br>Section: Hagemeister, C.N'ham, Fyrite Pt.<br>Biomass: 19,674 tonnes |                |                   |                     |
|---|----------------|-------------------|---------------------|--|----------------|-------------------|---------------------|---|----------------|-------------------|---------------------|---|----------------|-------------------|---------------------|
| Age   | No. of Samples | Percent by No.    | No. of Fish (X1000) | Age  | No. of Samples | Percent by No.    | No. of Fish (X1000) | Age   | No. of Samples | Percent by No.    | No. of Fish (X1000) | Age   | No. of Samples | Percent by No.    | No. of Fish (X1000) |
| 1   | 0              | 0.0%              | 0                   | 1  | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   |
| 2   | 0              | 0.0%              | 0                   | 2  | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   |
| 3   | 0              | 0.0%              | 0                   | 3  | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   |
| 4   | 0              | 0.0%              | 0                   | 4  | 0              | 0.0%              | 0                   | 4   | 2              | 0.6%              | 42                  | 4   | 0              | 0.0%              | 0                   |
| 5   | 9              | 4.2%              | 1,589               | 5  | 5              | 12.2%             | 9,025               | 5   | 60             | 17.5%             | 1,246               | 5   | 26             | 2.2%              | 1,095               |
| 6   | 37             | 17.3%             | 6,533               | 6  | 10             | 24.4%             | 18,051              | 6   | 64             | 18.7%             | 1,329               | 6   | 52             | 4.5%              | 2,190               |
| 7   | 10             | 4.7%              | 1,766               | 7  | 1              | 2.4%              | 1,805               | 7   | 19             | 5.6%              | 395                 | 7   | 32             | 2.7%              | 1,348               |
| 8   | 36             | 16.8%             | 6,356               | 8  | 6              | 14.6%             | 10,831              | 8   | 55             | 16.1%             | 1,142               | 8   | 187            | 16.1%             | 7,875               |
| 9   | 11             | 5.1%              | 1,942               | 9  | 1              | 2.4%              | 1,805               | 9   | 14             | 4.1%              | 291                 | 9   | 65             | 5.6%              | 2,737               |
| 10  | 35             | 16.4%             | 6,180               | 10   | 3              | 7.3%              | 5,415               | 10  | 35             | 10.2%             | 727                 | 10  | 214            | 18.4%             | 9,012               |
| 11  | 48             | 22.4%             | 8,475               | 11   | 8              | 19.5%             | 14,441              | 11  | 64             | 18.7%             | 1,329               | 11  | 293            | 25.2%             | 12,339              |
| 12  | 24             | 11.2%             | 4,237               | 12   | 6              | 14.6%             | 10,831              | 12  | 25             | 7.3%              | 519                 | 12  | 261            | 22.4%             | 10,991              |
| 13  | 1              | 0.5%              | 177                 | 13   | 0              | 0.0%              | 0                   | 13  | 3              | 0.9%              | 62                  | 13  | 16             | 1.4%              | 674                 |
| 14  | 1              | 0.5%              | 177                 | 14   | 0              | 0.0%              | 0                   | 14  | 1              | 0.3%              | 21                  | 14  | 13             | 1.1%              | 547                 |
| 15+   | 2              | 0.9%              | 353                 | 15+  | 1              | 2.4%              | 1,805               | 15+   | 0              | 0.0%              | 0                   | 15+   | 5              | 0.4%              | 211                 |
| Total   | 214            | 100.0%            | 37,783              | 41   | 100.0%         | 74,009            | 342                 | 100.0%  | 7,103          | Total             | 1,164               | 100.0%  | 49,018         |                   |                     |
| Age   | Weight         | Percent by Weight | Biomass             | Age  | Weight         | Percent by Weight | Biomass             | Age   | Weight         | Percent by Weight | Biomass             | Age   | Weight         | Percent by Weight | Biomass             |
| 1   | 0              | 0.0%              | 0                   | 1  | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   | 1   | 0              | 0.0%              | 0                   |
| 2   | 0              | 0.0%              | 0                   | 2  | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   | 2   | 0              | 0.0%              | 0                   |
| 3   | 0              | 0.0%              | 0                   | 3  | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   | 3   | 0              | 0.0%              | 0                   |
| 4   | 0              | 0.0%              | 0                   | 4  | 0              | 0.0%              | 0                   | 4   | 276            | 0.3%              | 6                   | 4   | 0              | 0.0%              | 0                   |
| 5   | 1,413          | 2.1%              | 275                 | 5  | 880            | 7.0%              | 1,751               | 5   | 11,169         | 11.0%             | 256                 | 5   | 5,868          | 1.4%              | 272                 |
| 6   | 7,765          | 11.6%             | 1,511               | 6  | 2,223          | 17.8%             | 4,422               | 6   | 13,759         | 13.5%             | 315                 | 6   | 11,464         | 2.7%              | 532                 |
| 7   | 2,770          | 4.1%              | 539                 | 7  | 247            | 2.0%              | 491                 | 7   | 5,049          | 5.0%              | 116                 | 7   | 11,564         | 2.7%              | 537                 |
| 8   | 10,386         | 15.6%             | 2,021               | 8  | 1,883          | 15.1%             | 3,747               | 8   | 17,172         | 16.9%             | 393                 | 8   | 55,065         | 13.0%             | 2,556               |
| 9   | 3,659          | 5.5%              | 712                 | 9  | 231            | 1.9%              | 460                 | 9   | 4,993          | 4.9%              | 114                 | 9   | 34,398         | 8.1%              | 1,597               |
| 10  | 12,360         | 18.5%             | 2,405               | 10   | 1,149          | 9.2%              | 2,285               | 10  | 12,679         | 12.5%             | 290                 | 10  | 78,414         | 18.5%             | 3,640               |
| 11  | 17,520         | 26.2%             | 3,410               | 11   | 3,164          | 25.4%             | 6,296               | 11  | 25,527         | 25.1%             | 584                 | 11  | 112,079        | 26.4%             | 5,203               |
| 12  | 9,373          | 14.0%             | 1,824               | 12   | 2,259          | 18.1%             | 4,495               | 12  | 9,927          | 9.7%              | 227                 | 12  | 100,696        | 23.8%             | 4,674               |
| 13  | 386            | 0.6%              | 75                  | 13   | 0              | 0.0%              | 0                   | 13  | 1,118          | 1.1%              | 26                  | 13  | 6,756          | 1.6%              | 314                 |
| 14  | 339            | 0.5%              | 66                  | 14   | 0              | 0.0%              | 0                   | 14  | 170            | 0.2%              | 4                   | 14  | 5,287          | 1.2%              | 245                 |
| 15+   | 800            | 1.2%              | 156                 | 15+  | 446            | 3.6%              | 888                 | 15+   | 0              | 0.0%              | 0                   | 15+   | 2,244          | 0.5%              | 104                 |
| Total   | 66,769         | 100.0%            | 12,995              | 12,482   | 100.0%         | 24,836            | 101,839             | 100.0%  | 2,331          | 423,836           | 100.0%              | 19,674  |                |                   |                     |

<sup>a</sup> Weighted by 13 and 14 May aerial survey estimates for Hagemeister, Pyrite Point and Cape Newenham sections per perspective of the aerial surveyor that these herring appeared to be new biomass entering the fishing district. Commercial harvest from the 14 May commercial purse seine fishery and 184 tonnes ( 204) tons of herring miscoded to the purse seine fishery in preliminary assessment included.

Table 13. Age composition estimates for sampling stratum 22-25 May, weighted by 24 May aerial survey biomass (tonnes), by fishing section, Togiak District, 1989.

| Sampling Dates: 22-25 May |                |                |                     | Sampling Dates: 22-25 May       |                |                |                     |
|---------------------------|----------------|----------------|---------------------|---------------------------------|----------------|----------------|---------------------|
| Section: Kulukak          |                |                |                     | Section: Togiak and Hagemeister |                |                |                     |
| Biomass: 8,794 tonnes     |                |                |                     | Biomass: 14,482 tonnes          |                |                |                     |
| Age                       | No. of Samples | Percent by No. | No. of Fish (X1000) | Age                             | No. of Samples | Percent by No. | No. of Fish (X1000) |
| 1                         | 0              | 0.0%           | 0                   | 1                               | 0              | 0.0%           | 0                   |
| 2                         | 0              | 0.0%           | 0                   | 2                               | 0              | 0.0%           | 0                   |
| 3                         | 0              | 0.0%           | 0                   | 3                               | 0              | 0.0%           | 0                   |
| 4                         | 1              | 0.6%           | 195                 | 4                               | 0              | 0.0%           | 0                   |
| 5                         | 44             | 25.9%          | 8,565               | 5                               | 12             | 7.9%           | 3,352               |
| 6                         | 54             | 31.8%          | 10,511              | 6                               | 18             | 11.8%          | 5,028               |
| 7                         | 6              | 3.5%           | 1,168               | 7                               | 15             | 9.9%           | 4,190               |
| 8                         | 12             | 7.1%           | 2,336               | 8                               | 32             | 21.1%          | 8,938               |
| 9                         | 4              | 2.4%           | 779                 | 9                               | 10             | 6.6%           | 2,793               |
| 10                        | 14             | 8.2%           | 2,725               | 10                              | 24             | 15.8%          | 6,704               |
| 11                        | 20             | 11.8%          | 3,893               | 11                              | 25             | 16.4%          | 6,983               |
| 12                        | 14             | 8.2%           | 2,725               | 12                              | 12             | 7.9%           | 3,352               |
| 13                        | 1              | 0.6%           | 195                 | 13                              | 2              | 1.3%           | 559                 |
| 14                        | 0              | 0.0%           | 0                   | 14                              | 1              | 0.7%           | 279                 |
| 15+                       | 0              | 0.0%           | 0                   | 15+                             | 1              | 0.7%           | 279                 |
| <b>Total</b>              | <b>170</b>     | <b>100.0%</b>  | <b>33,091</b>       |                                 | <b>152</b>     | <b>100.0%</b>  | <b>42,457</b>       |

| Age          | Percent by    |               |              | Age | Percent by    |               |               |
|--------------|---------------|---------------|--------------|-----|---------------|---------------|---------------|
|              | Weight        | Weight        | Biomass      |     | Weight        | Weight        | Biomass       |
| 1            | 0             | 0.0%          | 0            | 1   | 0             | 0.0%          | 0             |
| 2            | 0             | 0.0%          | 0            | 2   | 0             | 0.0%          | 0             |
| 3            | 0             | 0.0%          | 0            | 3   | 0             | 0.0%          | 0             |
| 4            | 98            | 0.2%          | 21           | 4   | 0             | 0.0%          | 0             |
| 5            | 7,148         | 17.4%         | 1,534        | 5   | 1,931         | 4.1%          | 595           |
| 6            | 10,718        | 26.1%         | 2,360        | 6   | 3,772         | 8.0%          | 1,161         |
| 7            | 1,369         | 3.3%          | 294          | 7   | 3,862         | 8.2%          | 1,189         |
| 8            | 3,557         | 8.7%          | 763          | 8   | 9,899         | 21.0%         | 3,048         |
| 9            | 1,129         | 2.8%          | 242          | 9   | 3,424         | 7.3%          | 1,054         |
| 10           | 4,088         | 10.0%         | 877          | 10  | 8,756         | 18.6%         | 2,696         |
| 11           | 7,326         | 17.9%         | 1,572        | 11  | 9,076         | 19.3%         | 2,795         |
| 12           | 5,294         | 12.9%         | 1,156        | 12  | 4,643         | 9.9%          | 1,430         |
| 13           | 259           | 0.6%          | 56           | 13  | 822           | 1.7%          | 253           |
| 14           | 0             | 0.0%          | 0            | 14  | 439           | 0.9%          | 135           |
| 15           | 0             | 0.0%          | 0            | 15  | 412           | 0.9%          | 127           |
| <b>Total</b> | <b>40,986</b> | <b>100.0%</b> | <b>8,794</b> |     | <b>47,037</b> | <b>100.0%</b> | <b>14,482</b> |

Table 14. Total weighted age composition in numbers of fish and by weight (tonnes) of aerial survey biomass resulting in the total run biomass estimate, Togiak District, 1989.<sup>a,b</sup>

| Togiak District Total Aerial Estimate<br>for the 9 May survey |                     |                      |                        |                   | Togiak District Total Aerial Estimate<br>for the 13 and 14 May survey |                     |                      |                        |                   | Togiak District Total Aerial Estimate<br>for the 15 May survey |                     |                      |                        |                   | Total Run Biomass Estimate |                     |                      |                        |                   |
|---|---------------------|----------------------|------------------------|-------------------|---|---------------------|----------------------|------------------------|-------------------|--|---------------------|----------------------|------------------------|-------------------|----------------------------|---------------------|----------------------|------------------------|-------------------|
| Age   | Biomass<br>(tonnes) | Percent<br>by Weight | No.of Fish<br>(x1,000) | Percent<br>by No. | Age   | Biomass<br>(tonnes) | Percent<br>by Weight | No.of fish<br>(x1,000) | Percent<br>by No. | Age  | Biomass<br>(tonnes) | Percent<br>by Weight | No.of fish<br>(x1,000) | Percent<br>by No. | Age                        | Biomass<br>(tonnes) | Percent<br>by Weight | No.of fish<br>(x1,000) | Percent<br>by No. |
| 1   | 0                   | 0.0%                 | 0                      | 0.0%              | 1   | 0                   | 0.0%                 | 0                      | 0.0%              | 1  | 0                   | 0.0%                 | 0                      | 0.0%              | 1                          | 0                   | 0.0%                 | 0                      | 0.0%              |
| 2   | 0                   | 0.0%                 | 0                      | 0.0%              | 2   | 0                   | 0.0%                 | 0                      | 0.0%              | 2  | 0                   | 0.0%                 | 0                      | 0.0%              | 2                          | 0                   | 0.0%                 | 0                      | 0.0%              |
| 3   | 0                   | 0.0%                 | 0                      | 0.0%              | 3   | 0                   | 0.0%                 | 0                      | 0.0%              | 3  | 0                   | 0.0%                 | 0                      | 0.0%              | 3                          | 0                   | 0.0%                 | 0                      | 0.0%              |
| 4   | 0                   | 0.0%                 | 0                      | 0.0%              | 4   | 6                   | 0.0%                 | 42                     | 0.0%              | 4  | 21                  | 0.1%                 | 195                    | 0.3%              | 4                          | 27                  | 0.0%                 | 236                    | 0.1%              |
| 5   | 597                 | 1.0%                 | 3,393                  | 2.2%              | 5   | 2,554               | 4.3%                 | 12,956                 | 7.7%              | 5  | 2,128               | 9.1%                 | 11,917                 | 15.8%             | 5                          | 4,682               | 5.2%                 | 24,872                 | 9.6%              |
| 6   | 3,013               | 5.0%                 | 12,633                 | 8.1%              | 6   | 6,781               | 11.3%                | 38,103                 | 16.7%             | 6  | 3,461               | 14.9%                | 15,539                 | 20.6%             | 6                          | 10,242              | 11.4%                | 43,642                 | 16.9%             |
| 7   | 1,048               | 1.7%                 | 3,700                  | 2.4%              | 7   | 1,682               | 2.8%                 | 5,313                  | 3.2%              | 7  | 1,483               | 6.4%                 | 5,358                  | 7.1%              | 7                          | 3,165               | 3.5%                 | 10,671                 | 4.1%              |
| 8   | 9,215               | 15.3%                | 27,034                 | 17.3%             | 8   | 8,718               | 14.6%                | 26,204                 | 15.6%             | 8  | 3,811               | 16.4%                | 11,274                 | 14.9%             | 8                          | 13,026              | 14.5%                | 38,308                 | 14.8%             |
| 9   | 3,524               | 5.9%                 | 9,161                  | 5.9%              | 9   | 2,883               | 4.8%                 | 6,775                  | 4.0%              | 9  | 1,296               | 5.6%                 | 3,572                  | 4.7%              | 9                          | 4,820               | 5.4%                 | 12,733                 | 4.9%              |
| 10  | 12,714              | 21.1%                | 31,962                 | 20.5%             | 10  | 8,621               | 14.4%                | 21,334                 | 12.7%             | 10   | 3,573               | 15.4%                | 9,429                  | 12.5%             | 10                         | 16,287              | 18.1%                | 41,391                 | 16.0%             |
| 11  | 16,677              | 27.7%                | 39,589                 | 25.3%             | 11  | 15,493              | 25.9%                | 36,583                 | 21.8%             | 11   | 4,367               | 18.8%                | 10,876                 | 14.4%             | 11                         | 21,044              | 23.4%                | 50,465                 | 19.5%             |
| 12  | 11,356              | 18.9%                | 24,828                 | 15.9%             | 12  | 11,220              | 18.8%                | 26,578                 | 15.8%             | 12   | 2,566               | 11.0%                | 6,077                  | 8.0%              | 12                         | 13,922              | 15.5%                | 30,905                 | 12.0%             |
| 13  | 1,011               | 1.7%                 | 2,096                  | 1.3%              | 13  | 414                 | 0.7%                 | 913                    | 0.5%              | 13   | 309                 | 1.3%                 | 753                    | 1.0%              | 13                         | 1,320               | 1.5%                 | 2,849                  | 1.1%              |
| 14  | 811                 | 1.3%                 | 1,463                  | 0.9%              | 14  | 315                 | 0.5%                 | 745                    | 0.4%              | 14   | 135                 | 0.6%                 | 279                    | 0.4%              | 14                         | 946                 | 1.1%                 | 1,743                  | 0.7%              |
| 15+   | 172                 | 0.3%                 | 385                    | 0.2%              | 15+   | 1,148               | 1.9%                 | 2,369                  | 1.4%              | 15+  | 127                 | 0.5%                 | 279                    | 0.4%              | 15+                        | 299                 | 0.3%                 | 665                    | 0.3%              |
| Total   | 60,138              | 100.0%               | 156,246                | 100.0%            |   | 59,837              | 100.0%               | 167,913                | 100.0%            |  | 23,277              | 100.0%               | 75,548                 | 100.0%            |                            | 89,780              | 100.0%               | 258,480                | 100.0%            |

<sup>a</sup> The Togiak total run biomass estimate was 89,780 tonnes (98,965 tons).

<sup>b</sup> The estimate was derived from all herring age-9 and older observed during the 9 May survey, ages 4-8 from the 13 May survey summed with the entire biomass observed 24 May.

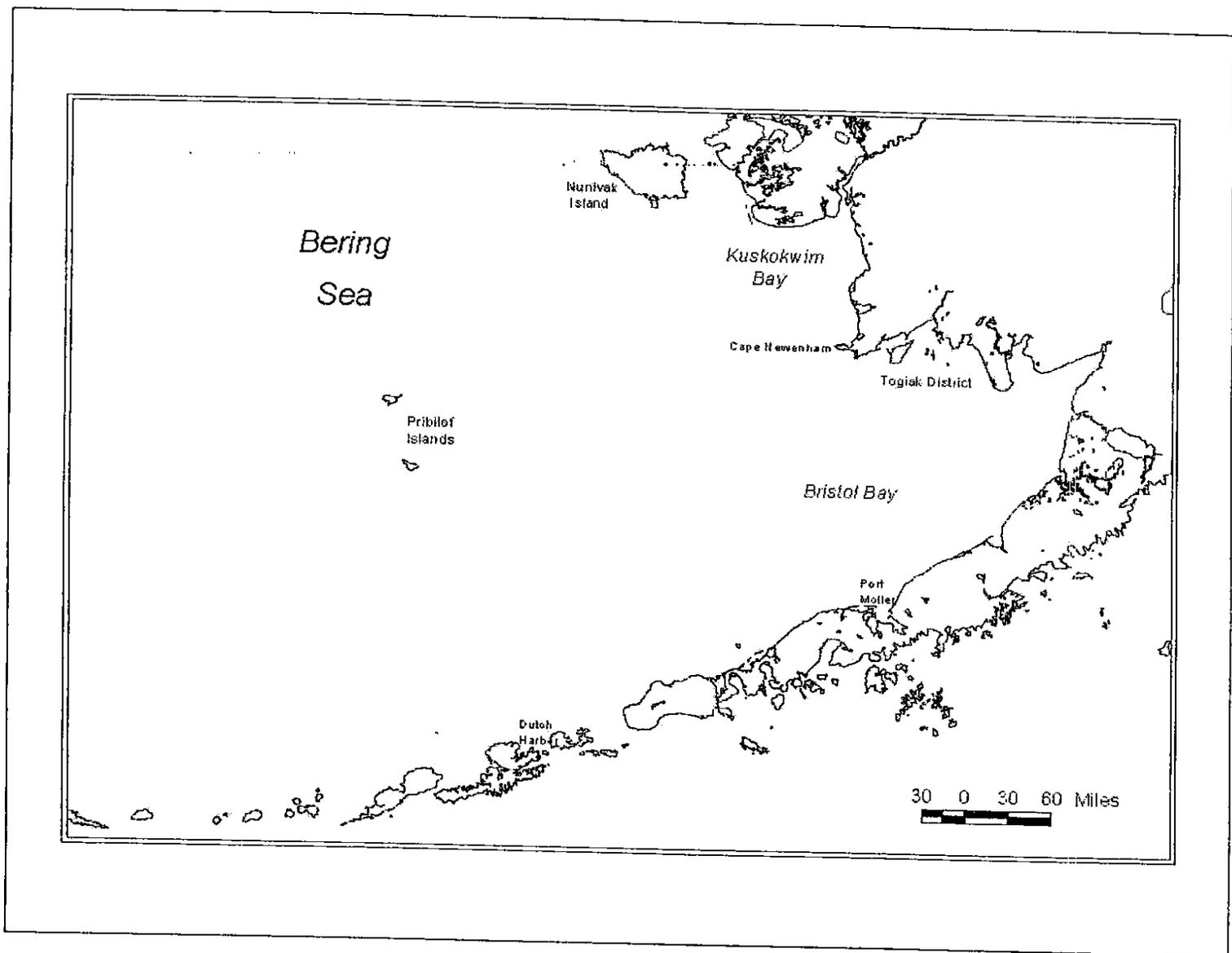


Figure 1. Southeastern Bering Sea.

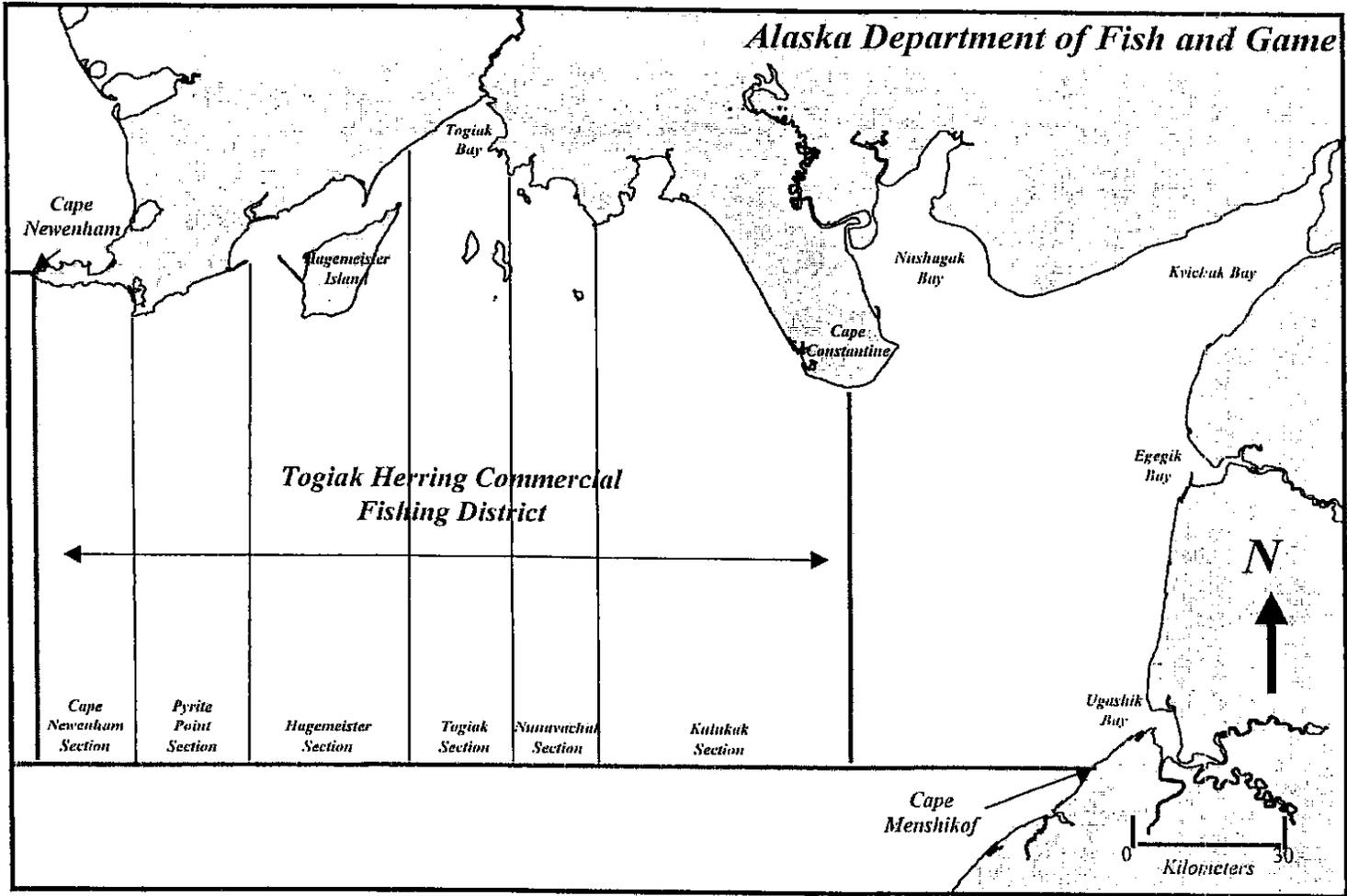


Figure 2. Togiak Fishing District and fishing sections for management of the commercial herring fishery.

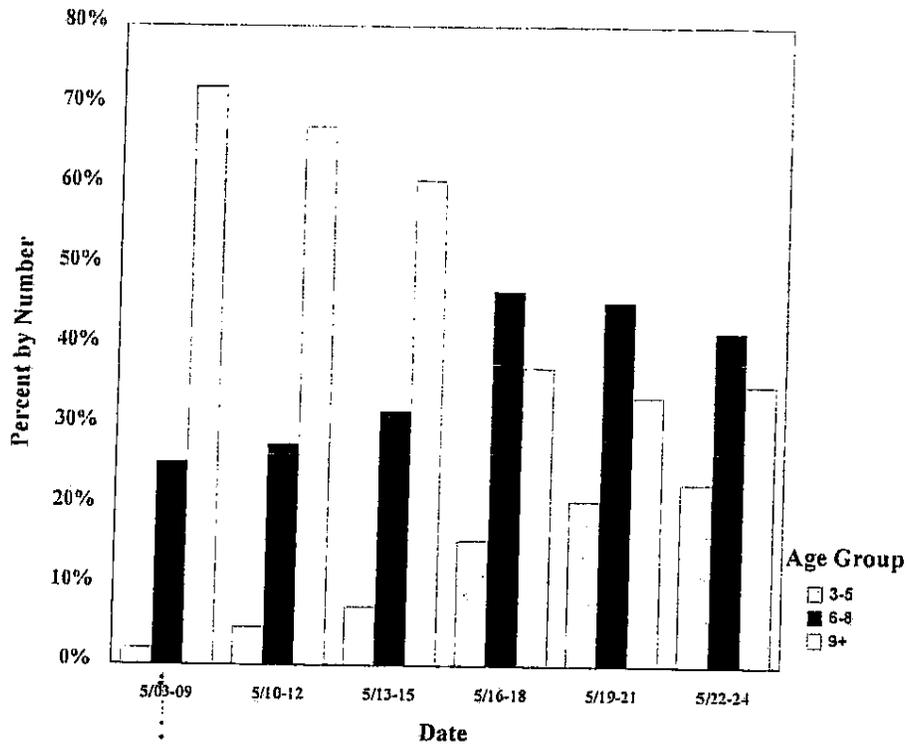


Figure 3. Unweighted age composition, by number of herring samples collected by nonselective gear, by sampling period, Togiak District, 1989.

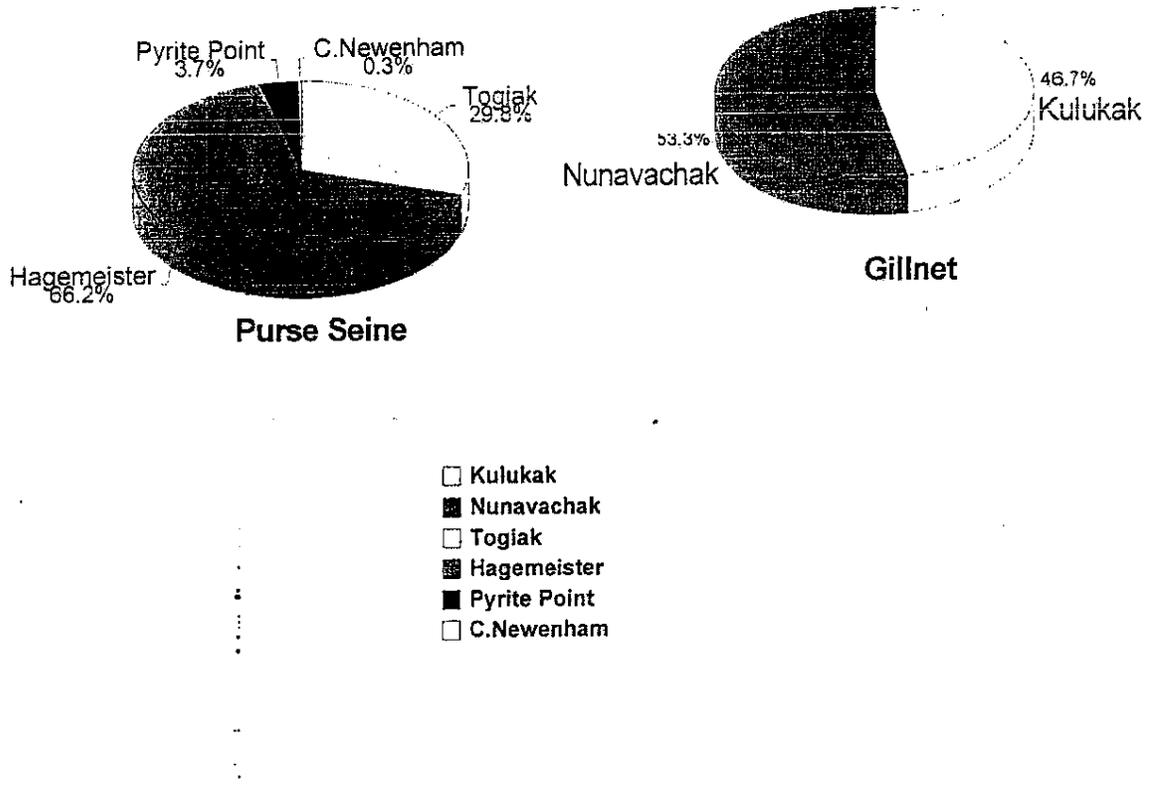


Figure 4. Proportion of the commercial harvest caught in each fishing section by gear type, Togiak District, 1989.

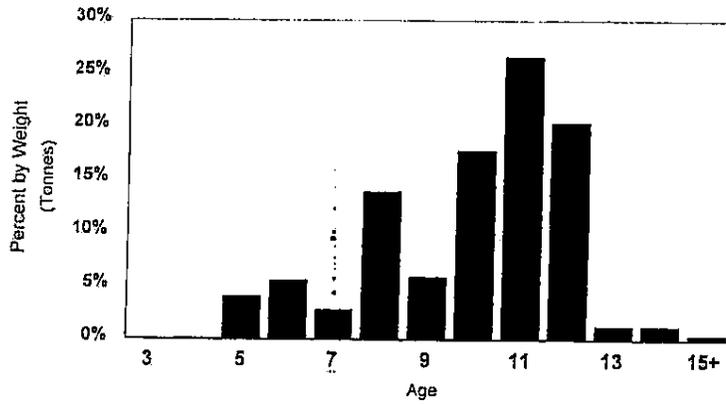
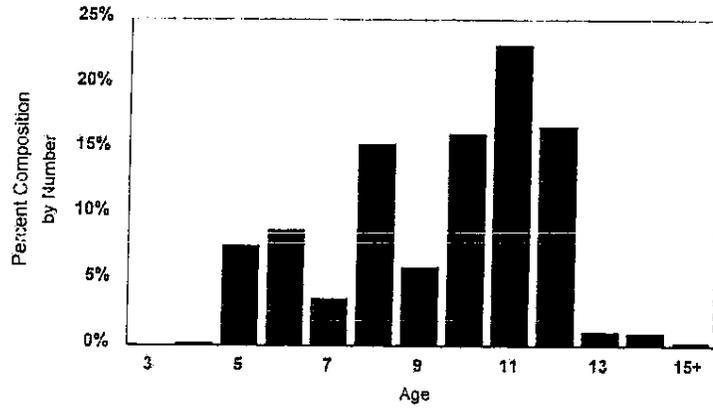


Figure 5. Age composition of the commercial purse seine fishery by number (top) and by weight (bottom), Togiak District, 1989.

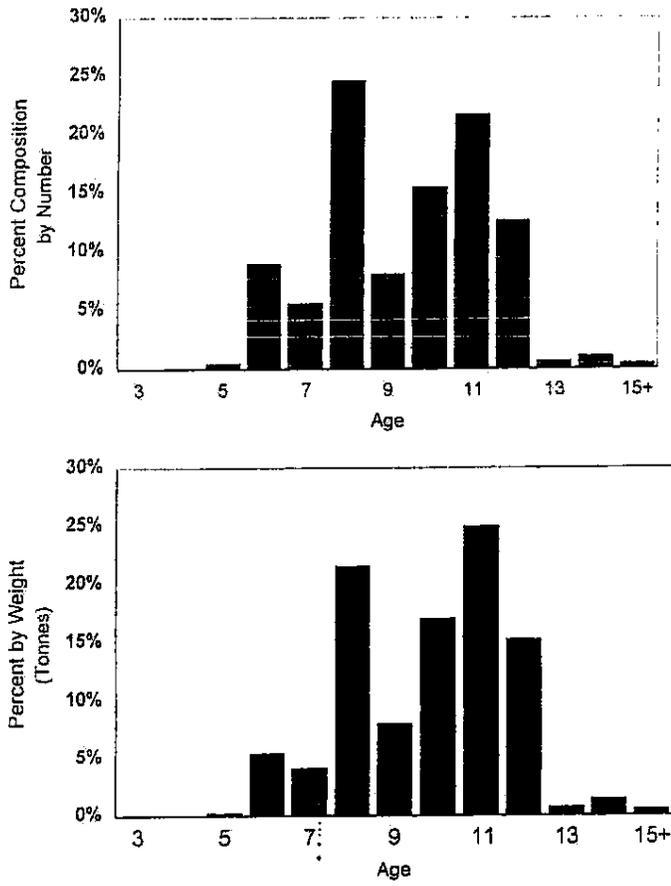


Figure 6. Age composition of the commercial gillnet fishery by number (top) and by weight (bottom), Togiak District, 1989.

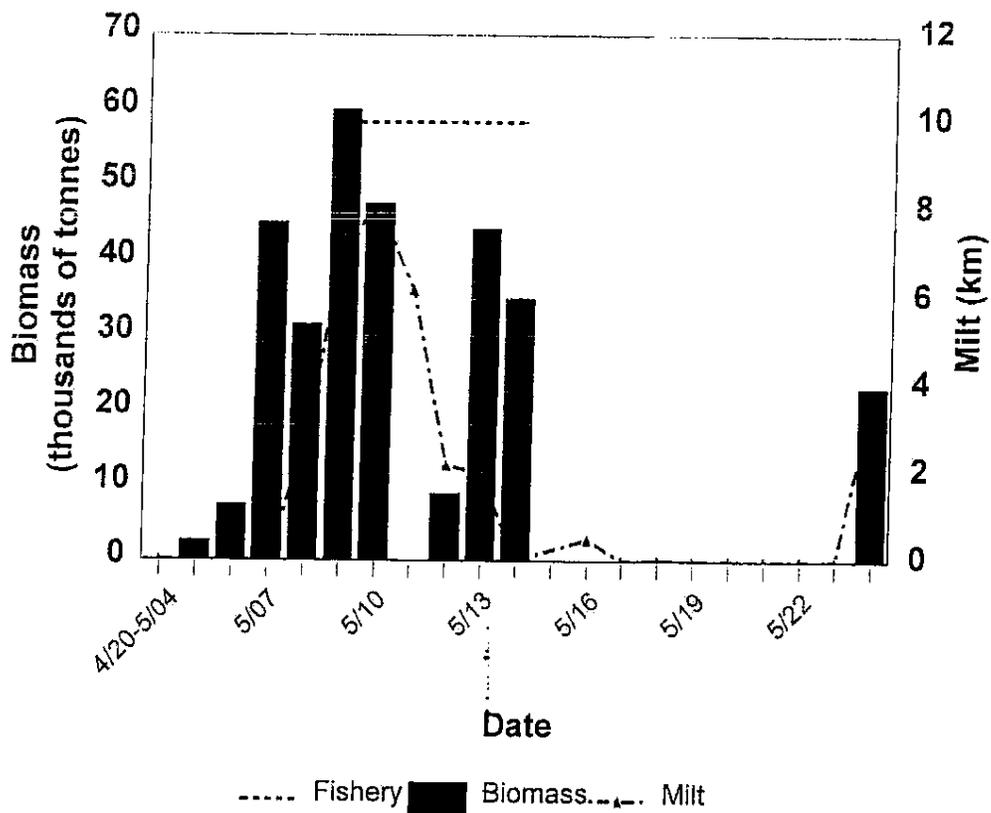


Figure 7. Biomass (tonnes), timing of the fishery and kilometers of milt observed during aerial assessment, Togiak District, 1989.

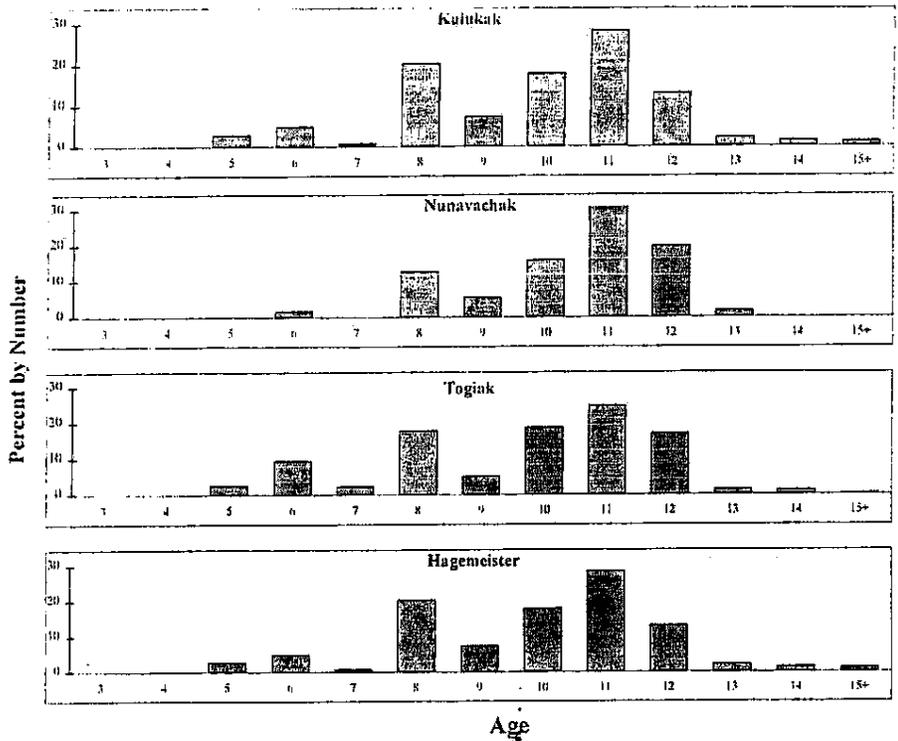


Figure 8. Age composition (in numbers of fish) by sampling period and fishing section corresponding to aerial surveys conducted 9 May, Togiak District, 1989.

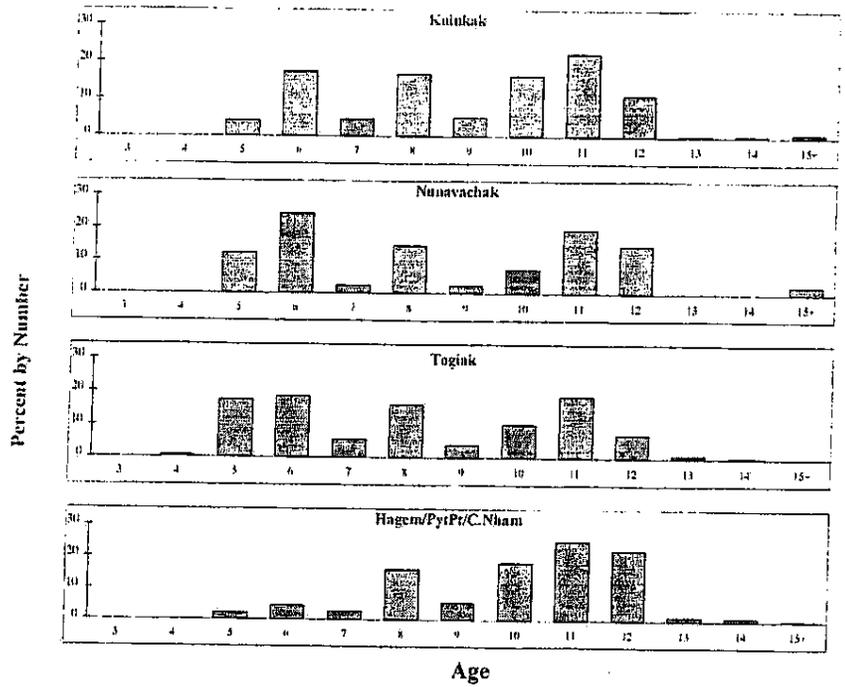


Figure 9. Age composition (by number) by sampling period and fishing section corresponding to aerial surveys conducted 12 and 15 May, Togiak District, 1989.

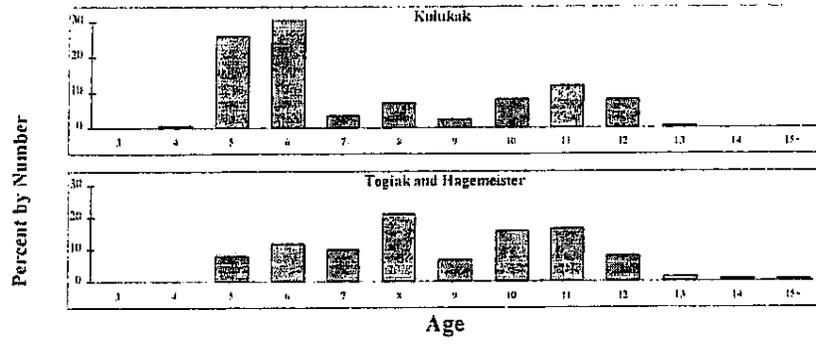


Figure 10. Age composition by sampling period and fishing section corresponding to aerial surveys 24 May, Togiak District, 1989.

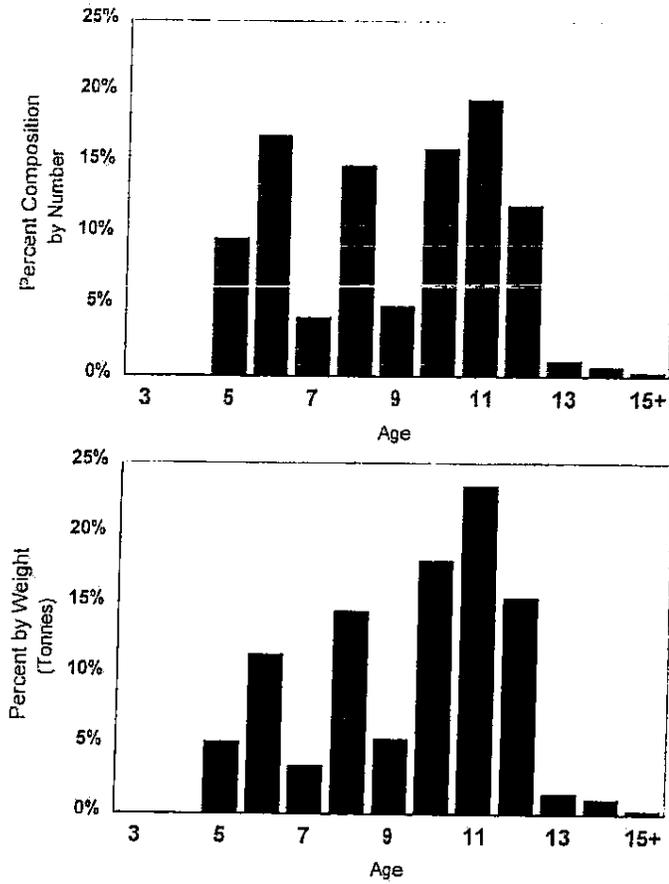


Figure 11. Age composition by number (top) and by weight (bottom) of the Togiak District total run biomass, 1989.

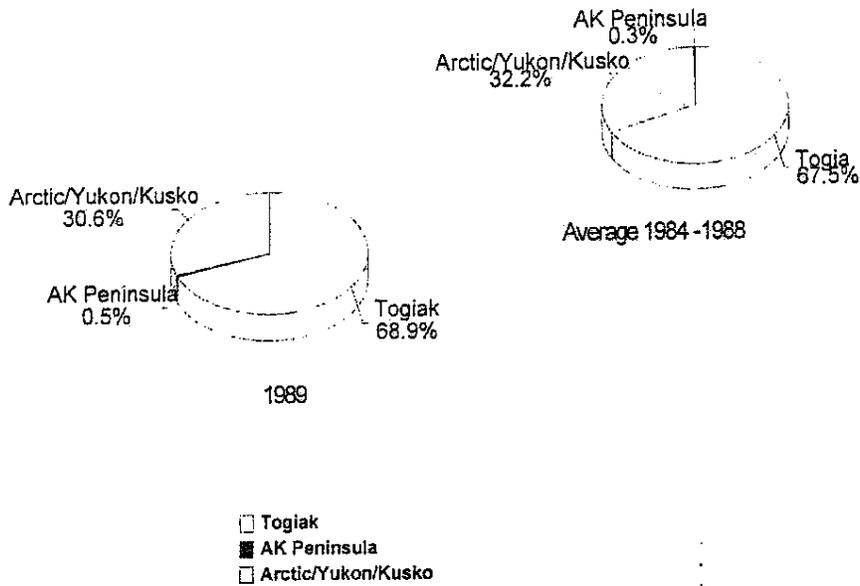


Figure 12. Contribution of the 1989 Togiak herring total run biomass to the assessed total run biomass in the eastern Bering Sea.

**Appendix A**

Appendix A.1. Age, sex, and size composition of Pacific herring caught by commercial purse seine Togiak Section, 12-13 May 1989.

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       | Length         |           |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
| 12 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   | 0            | 1      | 0       | 1     | 0.3              | 160      |       | 1              | 244       |      | 1               |
|                      | 5   | 25           | 25     | 0       | 50    | 14.1             | 190      | 28.9  | 50             | 240       | 9.6  | 50              |
|                      | 6   | 21           | 31     | 0       | 52    | 14.7             | 248      | 46.1  | 52             | 256       | 10.9 | 52              |
|                      | 7   | 6            | 11     | 0       | 17    | 4.8              | 295      | 41.8  | 17             | 268       | 12.6 | 17              |
|                      | 8   | 24           | 22     | 0       | 46    | 13.0             | 343      | 61.5  | 46             | 273       | 17.0 | 46              |
|                      | 9   | 14           | 13     | 0       | 27    | 7.6              | 346      | 76.9  | 27             | 281       | 22.1 | 27              |
|                      | 10  | 30           | 23     | 0       | 53    | 15.0             | 404      | 65.6  | 53             | 295       | 18.5 | 53              |
|                      | 11  | 33           | 42     | 0       | 75    | 21.2             | 432      | 64.0  | 75             | 298       | 18.5 | 75              |
|                      | 12  | 10           | 16     | 0       | 26    | 7.3              | 453      | 61.1  | 26             | 296       | 29.6 | 26              |
|                      | 13  | 0            | 2      | 0       | 2     | 0.6              | 461      | 157.0 | 2              | 309       | 16.3 | 2               |
|                      | 14  | 2            | 2      | 0       | 4     | 1.1              | 481      | 22.6  | 4              | 318       | 5.3  | 4               |
|                      | 15  | 1            | 0      | 0       | 1     | 0.3              | 466      |       | 1              | 316       |      | 1               |
| 16                   |     |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 166          | 188    | 0       | 354   | 100.0            | 343      | 107.5 | 354            | 277       | 27.6 | 354             |
| 13 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   | 1            | 0      | 0       | 1     | 0.3              | 121      |       | 1              | 213       |      | 1               |
|                      | 5   | 34           | 30     | 0       | 64    | 18.6             | 197      | 28.7  | 64             | 242       | 9.9  | 64              |
|                      | 6   | 24           | 39     | 0       | 63    | 18.3             | 235      | 31.3  | 63             | 254       | 9.2  | 63              |
|                      | 7   | 8            | 11     | 0       | 19    | 5.5              | 293      | 57.6  | 19             | 271       | 16.9 | 19              |
|                      | 8   | 20           | 35     | 0       | 55    | 16.0             | 344      | 61.0  | 55             | 280       | 13.6 | 55              |
|                      | 9   | 5            | 9      | 0       | 14    | 4.1              | 393      | 38.5  | 14             | 294       | 9.4  | 14              |
|                      | 10  | 17           | 18     | 0       | 35    | 10.2             | 400      | 56.4  | 35             | 296       | 11.5 | 35              |
|                      | 11  | 31           | 33     | 0       | 64    | 18.6             | 440      | 60.2  | 64             | 304       | 10.3 | 64              |
|                      | 12  | 12           | 13     | 0       | 25    | 7.3              | 438      | 61.4  | 25             | 304       | 10.5 | 25              |
|                      | 13  | 0            | 3      | 0       | 3     | 0.9              | 411      | 120.7 | 3              | 318       | 4.6  | 3               |
|                      | 14  | 1            | 0      | 0       | 1     | 0.3              | 187      |       | 1              | 334       |      | 1               |
|                      | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
| 16                   |     |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 153          | 191    | 0       | 344   | 100.0            | 326      | 107.1 | 344            | 276       | 27.0 | 344             |
| 12-13 May            | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   | 1            | 1      | 0       | 2     | 0.3              | 141      | 27.6  | 2              | 229       | 21.9 | 2               |
|                      | 5   | 59           | 55     | 0       | 114   | 16.3             | 194      | 28.9  | 114            | 241       | 9.8  | 114             |
|                      | 6   | 45           | 70     | 0       | 115   | 16.5             | 241      | 39.0  | 115            | 255       | 10.0 | 115             |
|                      | 7   | 14           | 22     | 0       | 36    | 5.2              | 294      | 50.1  | 36             | 270       | 14.9 | 36              |
|                      | 8   | 44           | 57     | 0       | 101   | 14.5             | 344      | 60.9  | 101            | 277       | 15.5 | 101             |
|                      | 9   | 19           | 22     | 0       | 41    | 5.9              | 362      | 69.5  | 41             | 286       | 19.5 | 41              |
|                      | 10  | 47           | 41     | 0       | 88    | 12.6             | 402      | 61.8  | 88             | 295       | 16.0 | 88              |
|                      | 11  | 64           | 75     | 0       | 139   | 19.9             | 435      | 62.2  | 139            | 301       | 15.5 | 139             |
|                      | 12  | 22           | 29     | 0       | 51    | 7.3              | 445      | 61.1  | 51             | 300       | 22.5 | 51              |
|                      | 13  | 0            | 5      | 0       | 5     | 0.7              | 431      | 119.2 | 5              | 314       | 10.2 | 5               |
|                      | 14  | 3            | 2      | 0       | 5     | 0.7              | 422      | 133.0 | 5              | 321       | 8.6  | 5               |
|                      | 15  | 1            | 0      | 0       | 1     | 0.1              | 466      |       | 1              | 316       |      | 1               |
| 16                   |     |              |        |         |       |                  |          |       |                |           |      |                 |
| All Samples Combined |     | 319          | 379    | 0       | 698   | 100.0            | 335      | 107.6 | 698            | 277       | 27.3 | 698             |
| Sex Composition      |     | 45.7         | 54.3   |         |       |                  |          |       |                |           |      |                 |
| Unaged               |     | 25           | 54     | 0       | 79    | 11.3             | 367      | 103.3 | 79             | 282       | 23.8 | 79              |
| Sex Composition      |     | 31.6         | 68.4   |         |       |                  |          |       |                |           |      |                 |

**Appendix A.2. Age, sex, and size composition of Pacific herring caught by commercial purse seine Hagemeister Section, 12-13 May 1989.**

| Sample Dates         | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |     |                   | Length       |     |                    |     |
|----------------------|-----|--------------|--------|---------|------------------------|-------------|-----|-------------------|--------------|-----|--------------------|-----|
|                      |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD  | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |     |
| 12 May               | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 5   | 4            | 8      | 0       | 12                     | 3.6         | 241 | 112.9             | 12           | 248 | 11.9               | 12  |
|                      | 6   | 9            | 8      | 0       | 17                     | 5.1         | 241 | 40.8              | 17           | 265 | 12.5               | 17  |
|                      | 7   | 3            | 6      | 0       | 9                      | 2.7         | 305 | 52.6              | 9            | 277 | 15.2               | 9   |
|                      | 8   | 36           | 24     | 0       | 60                     | 18.1        | 335 | 61.1              | 60           | 285 | 11.5               | 60  |
|                      | 9   | 13           | 4      | 0       | 17                     | 5.1         | 356 | 44.7              | 17           | 291 | 11.7               | 17  |
|                      | 10  | 22           | 25     | 0       | 47                     | 14.2        | 409 | 60.8              | 47           | 298 | 11.0               | 47  |
|                      | 11  | 38           | 38     | 0       | 76                     | 22.9        | 438 | 71.0              | 76           | 303 | 9.1                | 76  |
|                      | 12  | 41           | 45     | 0       | 86                     | 25.9        | 464 | 64.3              | 86           | 311 | 9.4                | 86  |
|                      | 13  | 0            | 3      | 0       | 3                      | 0.9         | 484 | 43.3              | 3            | 311 | 7.8                | 3   |
|                      | 14  | 3            | 2      | 0       | 5                      | 1.5         | 471 | 52.7              | 5            | 313 | 7.6                | 5   |
|                      | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16                   |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total         |     | 169          | 163    | 0       | 332                    | 100.0       | 398 | 94.7              | 332          | 296 | 18.6               | 332 |
| 13 May               | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 5   | 7            | 2      | 0       | 9                      | 2.6         | 200 | 43.3              | 9            | 242 | 11.1               | 9   |
|                      | 6   | 12           | 13     | 0       | 25                     | 7.3         | 256 | 44.7              | 25           | 259 | 11.2               | 25  |
|                      | 7   | 6            | 3      | 0       | 9                      | 2.6         | 297 | 56.3              | 9            | 271 | 10.0               | 9   |
|                      | 8   | 29           | 27     | 0       | 56                     | 16.4        | 337 | 45.7              | 56           | 282 | 8.5                | 56  |
|                      | 9   | 7            | 8      | 0       | 15                     | 4.4         | 379 | 39.3              | 15           | 291 | 7.7                | 15  |
|                      | 10  | 30           | 27     | 0       | 57                     | 16.7        | 410 | 48.4              | 57           | 296 | 10.1               | 57  |
|                      | 11  | 46           | 41     | 0       | 87                     | 25.5        | 431 | 46.5              | 87           | 302 | 8.5                | 87  |
|                      | 12  | 32           | 38     | 0       | 70                     | 20.5        | 461 | 48.0              | 70           | 307 | 8.4                | 70  |
|                      | 13  | 2            | 3      | 0       | 5                      | 1.5         | 467 | 34.2              | 5            | 314 | 11.2               | 5   |
|                      | 14  | 2            | 3      | 0       | 5                      | 1.5         | 522 | 85.2              | 5            | 315 | 9.0                | 5   |
|                      | 15  | 1            | 2      | 0       | 3                      | 0.9         | 462 | 28.2              | 3            | 317 | 9.6                | 3   |
| 16                   |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total         |     | 174          | 167    | 0       | 341                    | 100.0       | 395 | 83.9              | 341          | 293 | 18.7               | 341 |
| 12-13 May            | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 5   | 11           | 10     | 0       | 21                     | 3.1         | 223 | 90.5              | 21           | 246 | 11.7               | 21  |
|                      | 6   | 21           | 21     | 0       | 42                     | 6.2         | 250 | 43.3              | 42           | 261 | 12.0               | 42  |
|                      | 7   | 9            | 9      | 0       | 18                     | 2.7         | 301 | 53.0              | 18           | 274 | 12.9               | 18  |
|                      | 8   | 65           | 51     | 0       | 116                    | 17.2        | 336 | 54.0              | 116          | 284 | 10.2               | 116 |
|                      | 9   | 20           | 12     | 0       | 32                     | 4.8         | 367 | 43.3              | 32           | 291 | 9.9                | 32  |
|                      | 10  | 52           | 52     | 0       | 104                    | 15.5        | 410 | 54.1              | 104          | 297 | 10.5               | 104 |
|                      | 11  | 84           | 79     | 0       | 163                    | 24.2        | 434 | 59.1              | 163          | 303 | 8.8                | 163 |
|                      | 12  | 73           | 83     | 0       | 156                    | 23.2        | 463 | 57.4              | 156          | 309 | 9.2                | 156 |
|                      | 13  | 2            | 6      | 0       | 8                      | 1.2         | 473 | 35.8              | 8            | 313 | 9.6                | 8   |
|                      | 14  | 5            | 5      | 0       | 10                     | 1.5         | 497 | 72.0              | 10           | 314 | 7.9                | 10  |
|                      | 15  | 1            | 2      | 0       | 3                      | 0.4         | 462 | 28.2              | 3            | 317 | 9.6                | 3   |
| 16                   |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| All Samples Combined |     | 343          | 330    | 0       | 673                    | 100.0       | 397 | 89.4              | 673          | 295 | 18.7               | 673 |
| Sex Composition      |     | 51.0         | 49.0   |         |                        |             |     |                   |              |     |                    |     |
| Unaged               |     | 69           | 64     | 0       | 133                    | 19.8        | 408 | 80.6              | 133          | 298 | 18.0               | 133 |
| Sex Composition      |     | 51.9         | 48.1   |         |                        |             |     |                   |              |     |                    |     |

Appendix A.3. Age, sex, and size composition of Pacific herring caught by commercial purse seine Pyrite Point Section, 12-13 May 1989.

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 12 May               | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 3            | 1      | 0       | 4     | 1.5              | 166      | 13.7 | 4              | 229       | 5.7  | 4               |
|                      | 6   | 2            | 2      | 0       | 4     | 1.5              | 237      | 49.7 | 4              | 253       | 11.7 | 4               |
|                      | 7   | 2            | 5      | 0       | 7     | 2.7              | 327      | 41.5 | 7              | 277       | 10.3 | 7               |
|                      | 8   | 21           | 21     | 0       | 42    | 16.0             | 363      | 57.3 | 42             | 284       | 10.8 | 42              |
|                      | 9   | 9            | 14     | 0       | 23    | 8.7              | 401      | 43.3 | 23             | 295       | 11.5 | 23              |
|                      | 10  | 41           | 17     | 0       | 58    | 22.1             | 412      | 42.6 | 58             | 294       | 9.6  | 58              |
|                      | 11  | 37           | 29     | 0       | 66    | 25.1             | 434      | 51.8 | 66             | 301       | 9.4  | 66              |
|                      | 12  | 27           | 27     | 0       | 54    | 20.5             | 450      | 57.3 | 54             | 305       | 11.2 | 54              |
|                      | 13  | 2            | 2      | 0       | 4     | 1.5              | 453      | 17.4 | 4              | 308       | 4.9  | 4               |
|                      | 14  | 0            | 1      | 0       | 1     | 0.4              | 416      |      | 1              | 310       |      | 1               |
|                      | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total         |     | 144          | 119    | 0       | 263   | 100.0            | 409      | 69.9 | 263            | 295       | 16.1 | 263             |
| 13 May               | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 6   | 3            | 1      | 0       | 4     | 3.7              | 278      | 40.3 | 4              | 264       | 11.1 | 4               |
|                      | 7   | 1            | 2      | 0       | 3     | 2.8              | 296      | 35.9 | 3              | 269       | 9.5  | 3               |
|                      | 8   | 4            | 8      | 0       | 12    | 11.1             | 348      | 32.9 | 12             | 284       | 8.7  | 12              |
|                      | 9   | 3            | 1      | 0       | 4     | 3.7              | 362      | 14.7 | 4              | 287       | 9.3  | 4               |
|                      | 10  | 23           | 12     | 0       | 35    | 32.4             | 419      | 45.2 | 35             | 300       | 9.3  | 35              |
|                      | 11  | 15           | 13     | 0       | 28    | 25.9             | 458      | 52.7 | 28             | 308       | 10.0 | 28              |
|                      | 12  | 13           | 7      | 0       | 20    | 18.5             | 430      | 49.4 | 20             | 305       | 11.0 | 20              |
|                      | 13  | 0            | 1      | 0       | 1     | 0.9              | 480      |      | 1              | 316       |      | 1               |
|                      | 14  | 1            | 0      | 0       | 1     | 0.9              | 480      |      | 1              | 316       |      | 1               |
|                      | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total         |     | 63           | 45     | 0       | 108   | 100.0            | 414      | 65.4 | 108            | 299       | 15.0 | 108             |
| 12-13 May            | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 3            | 1      | 0       | 4     | 1.1              | 166      | 13.7 | 4              | 229       | 5.7  | 4               |
|                      | 6   | 5            | 3      | 0       | 8     | 2.2              | 257      | 47.4 | 8              | 258       | 12.3 | 8               |
|                      | 7   | 3            | 7      | 0       | 10    | 2.7              | 318      | 40.6 | 10             | 275       | 10.3 | 10              |
|                      | 8   | 25           | 29     | 0       | 54    | 14.6             | 360      | 53.0 | 54             | 284       | 10.3 | 54              |
|                      | 9   | 12           | 15     | 0       | 27    | 7.3              | 395      | 42.5 | 27             | 293       | 11.4 | 27              |
|                      | 10  | 64           | 29     | 0       | 93    | 25.1             | 415      | 43.5 | 93             | 296       | 9.8  | 93              |
|                      | 11  | 52           | 42     | 0       | 94    | 25.3             | 441      | 52.8 | 94             | 303       | 10.0 | 94              |
|                      | 12  | 40           | 34     | 0       | 74    | 19.9             | 445      | 55.7 | 74             | 305       | 11.1 | 74              |
|                      | 13  | 2            | 3      | 0       | 5     | 1.3              | 459      | 19.2 | 5              | 310       | 5.5  | 5               |
|                      | 14  | 1            | 1      | 0       | 2     | 0.5              | 448      | 45.3 | 2              | 313       | 4.2  | 2               |
|                      | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| All Samples Combined |     | 207          | 164    | 0       | 371   | 100.0            | 410      | 68.5 | 371            | 296       | 15.9 | 371             |
| Sex Composition      |     | 55.8         | 44.2   |         |       |                  |          |      |                |           |      |                 |
| Unaged               |     | 29           | 17     | 0       | 46    | 12.4             | 415      | 69.1 | 46             | 296       | 13.2 | 46              |
| Sex Composition      |     | 63.0         | 37.0   |         |       |                  |          |      |                |           |      |                 |

**Appendix A.4. Age, sex, and size composition of Pacific herring caught by commercial purse seine Cape Newenham Section, 13 May 1989.**

| Sample Dates    | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |     |                   | Length       |     |                    |     |
|-----------------|-----|--------------|--------|---------|------------------------|-------------|-----|-------------------|--------------|-----|--------------------|-----|
|                 |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD  | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |     |
| 13 May          | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                 | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                 | 5   | 1            | 0      | 0       | 1                      | 0.8         | 152 |                   | 1            | 225 |                    | 1   |
|                 | 6   | 2            | 0      | 0       | 2                      | 1.7         | 216 | 39.6              | 2            | 247 | 7.1                | 2   |
|                 | 7   | 1            | 3      | 0       | 4                      | 3.3         | 296 | 61.0              | 4            | 274 | 19.5               | 4   |
|                 | 8   | 8            | 9      | 0       | 17                     | 14.2        | 382 | 56.9              | 17           | 286 | 7.5                | 17  |
|                 | 9   | 3            | 3      | 0       | 6                      | 5.0         | 419 | 60.6              | 6            | 296 | 11.1               | 6   |
|                 | 10  | 11           | 6      | 0       | 17                     | 14.2        | 431 | 52.7              | 17           | 302 | 10.5               | 17  |
|                 | 11  | 19           | 17     | 0       | 36                     | 30.0        | 453 | 56.6              | 36           | 305 | 9.5                | 36  |
|                 | 12  | 17           | 14     | 0       | 31                     | 25.8        | 456 | 56.6              | 31           | 306 | 8.5                | 31  |
|                 | 13  | 3            | 0      | 0       | 3                      | 2.5         | 447 | 31.0              | 3            | 309 | 21.4               | 3   |
|                 | 14  | 0            | 1      | 0       | 1                      | 0.8         | 544 |                   | 1            | 327 |                    | 1   |
|                 | 15  | 0            | 2      | 0       | 2                      | 1.7         | 519 | 4.2               | 2            | 326 | 4.9                | 2   |
| 16              |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total    |     | 65           | 55     | 0       | 120                    | 100.0       | 429 | 76.1              | 120          | 300 | 16.5               | 120 |
| Sex Composition |     | 54.2         | 45.8   |         |                        |             |     |                   |              |     |                    |     |
| Unaged          |     | 10           | 5      | 0       | 15                     | 12.5        | 435 | 76.7              | 15           | 301 | 17.7               | 15  |
| Sex Composition |     | 66.7         | 33.3   |         |                        |             |     |                   |              |     |                    |     |

**Appendix A.5. Age, sex, and size composition of Pacific herring caught by commercial purse seine Togiak, Hagemester, Pyrite Point and Cape Newenham sections combined, 12-13 May 1989.**

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       |                | Length    |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
| 12 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   | 0            | 1      | 0       | 1     | 0.1              | 160      |       | 1              | 244       |      | 1               |
|                      | 5   | 32           | 34     | 0       | 66    | 7.0              | 198      | 57.0  | 66             | 241       | 10.7 | 66              |
|                      | 6   | 32           | 41     | 0       | 73    | 7.7              | 246      | 44.6  | 73             | 258       | 11.9 | 73              |
|                      | 7   | 11           | 22     | 0       | 33    | 3.5              | 304      | 45.2  | 33             | 272       | 13.3 | 33              |
|                      | 8   | 81           | 67     | 0       | 148   | 15.6             | 346      | 60.9  | 148            | 281       | 14.2 | 148             |
|                      | 9   | 36           | 31     | 0       | 67    | 7.1              | 367      | 63.6  | 67             | 288       | 17.4 | 67              |
|                      | 10  | 93           | 65     | 0       | 158   | 16.6             | 408      | 56.4  | 158            | 295       | 13.6 | 158             |
|                      | 11  | 108          | 109    | 0       | 217   | 22.9             | 435      | 63.0  | 217            | 301       | 13.3 | 217             |
|                      | 12  | 78           | 88     | 0       | 166   | 17.5             | 458      | 61.6  | 166            | 307       | 15.6 | 166             |
|                      | 13  | 2            | 7      | 0       | 9     | 0.9              | 465      | 62.2  | 9              | 309       | 7.7  | 9               |
|                      | 14  | 5            | 5      | 0       | 10    | 1.1              | 470      | 42.2  | 10             | 315       | 6.5  | 10              |
|                      | 15  | 1            | 0      | 0       | 1     | 0.1              | 466      |       | 1              | 316       |      | 1               |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 479          | 470    | 0       | 949   | 100.0            | 381      | 98.1  | 949            | 289       | 23.5 | 949             |
| 13 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   | 1            | 0      | 0       | 1     | 0.1              | 121      |       | 1              | 213       |      | 1               |
|                      | 5   | 42           | 32     | 0       | 74    | 8.1              | 197      | 30.7  | 74             | 242       | 10.1 | 74              |
|                      | 6   | 41           | 53     | 0       | 94    | 10.3             | 242      | 37.3  | 94             | 256       | 10.1 | 94              |
|                      | 7   | 16           | 19     | 0       | 35    | 3.8              | 295      | 53.9  | 35             | 271       | 14.7 | 35              |
|                      | 8   | 61           | 79     | 0       | 140   | 15.3             | 346      | 54.1  | 140            | 282       | 10.8 | 140             |
|                      | 9   | 18           | 21     | 0       | 39    | 4.3              | 388      | 42.8  | 39             | 292       | 9.1  | 39              |
|                      | 10  | 81           | 63     | 0       | 144   | 15.8             | 412      | 50.7  | 144            | 298       | 10.4 | 144             |
|                      | 11  | 111          | 104    | 0       | 215   | 23.5             | 441      | 54.0  | 215            | 304       | 9.6  | 215             |
|                      | 12  | 74           | 72     | 0       | 146   | 16.0             | 452      | 53.4  | 146            | 306       | 9.2  | 146             |
|                      | 13  | 5            | 7      | 0       | 12    | 1.3              | 449      | 62.3  | 12             | 314       | 12.0 | 12              |
|                      | 14  | 4            | 4      | 0       | 8     | 0.9              | 478      | 135.1 | 8              | 319       | 10.0 | 8               |
|                      | 15  | 1            | 4      | 0       | 5     | 0.5              | 485      | 37.1  | 5              | 321       | 8.5  | 5               |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 455          | 458    | 0       | 913   | 100.0            | 376      | 99.1  | 913            | 288       | 23.6 | 913             |
| 12-13 May            | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   | 1            | 1      | 0       | 2     | 0.1              | 141      | 27.6  | 2              | 229       | 21.9 | 2               |
|                      | 5   | 74           | 66     | 0       | 140   | 7.5              | 197      | 44.9  | 140            | 241       | 10.4 | 140             |
|                      | 6   | 73           | 94     | 0       | 167   | 9.0              | 244      | 40.5  | 167            | 257       | 10.9 | 167             |
|                      | 7   | 27           | 41     | 0       | 68    | 3.7              | 299      | 49.8  | 68             | 272       | 13.9 | 68              |
|                      | 8   | 142          | 146    | 0       | 288   | 15.5             | 346      | 57.6  | 288            | 282       | 12.6 | 288             |
|                      | 9   | 54           | 52     | 0       | 106   | 5.7              | 375      | 57.6  | 106            | 290       | 15.0 | 106             |
|                      | 10  | 174          | 128    | 0       | 302   | 16.2             | 410      | 53.7  | 302            | 296       | 12.2 | 302             |
|                      | 11  | 219          | 213    | 0       | 432   | 23.2             | 438      | 58.7  | 432            | 302       | 11.7 | 432             |
|                      | 12  | 152          | 160    | 0       | 312   | 16.8             | 455      | 57.9  | 312            | 306       | 13.0 | 312             |
|                      | 13  | 7            | 14     | 0       | 21    | 1.1              | 456      | 61.3  | 21             | 312       | 10.5 | 21              |
|                      | 14  | 9            | 9      | 0       | 18    | 1.0              | 473      | 92.1  | 18             | 317       | 8.3  | 18              |
|                      | 15  | 2            | 4      | 0       | 6     | 0.3              | 482      | 34.1  | 6              | 320       | 7.8  | 6               |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| All Samples Combined |     | 934          | 928    | 0       | 1862  | 100.0            | 378      | 98.6  | 1862           | 289       | 23.6 | 1862            |
| Sex Composition      |     | 50.2         | 49.8   |         |       |                  |          |       |                |           |      |                 |
| Unaged               |     | 133          | 140    | 0       | 273   | 14.7             | 399      | 88.1  | 273            | 293       | 20.4 | 273             |
| Sex Composition      |     | 48.7         | 51.3   |         |       |                  |          |       |                |           |      |                 |

Appendix A.6. Age, sex, and size composition of Pacific herring caught by commercial gillnet  
Kulukak Section, 9-14 May 1989.

| Sample Dates         | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |     |                   | Length       |     |                    |     |
|----------------------|-----|--------------|--------|---------|------------------------|-------------|-----|-------------------|--------------|-----|--------------------|-----|
|                      |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD  | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |     |
| 9 May                | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 5   | 1            | 1      | 0       | 2                      | 0.6         | 201 | 9.9               | 2            | 245 | 2.8                | 2   |
|                      | 6   | 19           | 17     | 0       | 36                     | 10.6        | 257 | 39.8              | 36           | 264 | 10.2               | 36  |
|                      | 7   | 12           | 8      | 0       | 20                     | 5.9         | 304 | 44.8              | 20           | 276 | 8.8                | 20  |
|                      | 8   | 43           | 35     | 0       | 78                     | 23.0        | 341 | 41.8              | 78           | 282 | 11.1               | 78  |
|                      | 9   | 12           | 19     | 0       | 31                     | 9.1         | 366 | 53.8              | 31           | 290 | 8.1                | 31  |
|                      | 10  | 21           | 22     | 0       | 43                     | 12.7        | 400 | 53.4              | 43           | 297 | 8.6                | 43  |
|                      | 11  | 40           | 29     | 1       | 70                     | 20.6        | 431 | 47.6              | 70           | 303 | 8.7                | 70  |
|                      | 12  | 25           | 26     | 0       | 51                     | 15.0        | 435 | 51.4              | 51           | 305 | 10.2               | 51  |
|                      | 13  | 3            | 1      | 0       | 4                      | 1.2         | 428 | 33.7              | 4            | 305 | 12.1               | 4   |
|                      | 14  | 2            | 2      | 0       | 4                      | 1.2         | 464 | 71.6              | 4            | 308 | 12.4               | 4   |
|                      | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16                   |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total         |     | 178          | 160    | 1       | 339                    | 100.0       | 374 | 76.4              | 339          | 291 | 16.8               | 339 |
| 14 May               | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 5   | 1            | 0      | 0       | 1                      | 0.3         | 242 |                   | 1            | 266 |                    | 1   |
|                      | 6   | 17           | 9      | 0       | 26                     | 7.9         | 226 | 47.7              | 26           | 260 | 8.4                | 26  |
|                      | 7   | 5            | 5      | 0       | 10                     | 3.0         | 283 | 69.4              | 10           | 275 | 12.5               | 10  |
|                      | 8   | 48           | 15     | 0       | 63                     | 19.0        | 294 | 45.5              | 63           | 281 | 9.1                | 63  |
|                      | 9   | 25           | 9      | 0       | 34                     | 10.3        | 316 | 62.3              | 34           | 287 | 10.9               | 34  |
|                      | 10  | 33           | 22     | 0       | 55                     | 16.6        | 341 | 54.1              | 55           | 295 | 7.8                | 55  |
|                      | 11  | 64           | 28     | 0       | 92                     | 27.8        | 378 | 61.1              | 92           | 300 | 9.5                | 92  |
|                      | 12  | 23           | 14     | 0       | 37                     | 11.2        | 390 | 60.5              | 37           | 301 | 9.2                | 37  |
|                      | 13  | 4            | 2      | 0       | 6                      | 1.8         | 390 | 70.4              | 6            | 311 | 5.8                | 6   |
|                      | 14  | 4            | 1      | 0       | 5                      | 1.5         | 353 | 83.5              | 5            | 304 | 8.6                | 5   |
|                      | 15  | 1            | 1      | 0       | 2                      | 0.6         | 380 | 22.6              | 2            | 314 | 14.8               | 2   |
| 16                   |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total         |     | 225          | 106    | 0       | 331                    | 100.0       | 336 | 74.1              | 331          | 291 | 15.4               | 331 |
| 9-14 May             | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|                      | 5   | 2            | 1      | 0       | 3                      | 0.4         | 215 | 24.7              | 3            | 252 | 12.3               | 3   |
|                      | 6   | 36           | 26     | 0       | 62                     | 9.3         | 244 | 45.6              | 62           | 262 | 9.5                | 62  |
|                      | 7   | 17           | 13     | 0       | 30                     | 4.5         | 297 | 54.0              | 30           | 276 | 10.0               | 30  |
|                      | 8   | 91           | 50     | 0       | 141                    | 21.0        | 320 | 49.2              | 141          | 282 | 10.2               | 141 |
|                      | 9   | 37           | 28     | 0       | 65                     | 9.7         | 340 | 63.2              | 65           | 288 | 9.7                | 65  |
|                      | 10  | 54           | 44     | 0       | 98                     | 14.6        | 367 | 61.1              | 98           | 296 | 8.2                | 98  |
|                      | 11  | 104          | 57     | 1       | 162                    | 24.2        | 401 | 61.4              | 162          | 301 | 9.2                | 162 |
|                      | 12  | 48           | 40     | 0       | 88                     | 13.1        | 416 | 59.4              | 88           | 303 | 10.0               | 88  |
|                      | 13  | 7            | 3      | 0       | 10                     | 1.5         | 405 | 59.2              | 10           | 309 | 8.8                | 10  |
|                      | 14  | 6            | 3      | 0       | 9                      | 1.3         | 402 | 94.0              | 9            | 306 | 9.9                | 9   |
|                      | 15  | 1            | 1      | 0       | 2                      | 0.3         | 380 | 22.6              | 2            | 314 | 14.8               | 2   |
| 16                   |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| All Samples Combined |     | 403          | 266    | 1       | 670                    | 100.0       | 355 | 77.7              | 670          | 291 | 16.1               | 670 |
| Sex Composition      |     | 60.2         | 39.8   |         |                        |             |     |                   |              |     |                    |     |
| Unaged               |     | 74           | 59     | 2       | 135                    | 20.1        | 358 | 76.4              | 135          | 292 | 16.8               | 135 |
| Sex Composition      |     | 55.6         | 44.4   |         |                        |             |     |                   |              |     |                    |     |

Appendix A.7. Age, sex, and size composition of Pacific herring caught by commercial gillnet Nunavachak Section, 9-14 May 1989.

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 9 May                | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 1            | 0      | 0       | 1     | 0.3              | 318      |      | 1              | 277       |      | 1               |
|                      | 6   | 5            | 9      | 0       | 14    | 4.9              | 304      | 24.4 | 14             | 268       | 6.7  | 14              |
|                      | 7   | 6            | 4      | 0       | 10    | 3.5              | 332      | 42.3 | 10             | 275       | 9.0  | 10              |
|                      | 8   | 40           | 32     | 0       | 72    | 25.1             | 363      | 41.7 | 72             | 286       | 9.2  | 72              |
|                      | 9   | 15           | 6      | 0       | 21    | 7.3              | 377      | 35.4 | 21             | 290       | 9.7  | 21              |
|                      | 10  | 31           | 27     | 0       | 58    | 20.2             | 424      | 47.9 | 58             | 297       | 11.1 | 58              |
|                      | 11  | 41           | 28     | 0       | 69    | 24.0             | 444      | 50.8 | 69             | 303       | 10.6 | 69              |
|                      | 12  | 21           | 14     | 0       | 35    | 12.2             | 442      | 55.2 | 35             | 305       | 8.0  | 35              |
|                      | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 14  | 2            | 2      | 0       | 4     | 1.4              | 464      | 57.7 | 4              | 311       | 8.3  | 4               |
|                      | 15  | 0            | 2      | 0       | 2     | 0.7              | 557      | 13.4 | 2              | 320       | 0.0  | 2               |
|                      | 16  | 0            | 1      | 0       | 1     | 0.3              | 467      |      | 1              | 322       |      | 1               |
| Sample Total         |     | 162          | 125    | 0       | 287   | 100.0            | 404      | 64.2 | 287            | 294       | 14.3 | 287             |
| 14 May               | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 0            | 1      | 0       | 1     | 0.3              | 222      |      | 1              | 260       |      | 1               |
|                      | 6   | 11           | 18     | 0       | 29    | 8.4              | 272      | 34.4 | 29             | 266       | 9.1  | 29              |
|                      | 7   | 13           | 8      | 0       | 21    | 6.1              | 297      | 28.9 | 21             | 277       | 9.3  | 21              |
|                      | 8   | 41           | 24     | 0       | 65    | 18.7             | 330      | 38.2 | 65             | 288       | 8.9  | 65              |
|                      | 9   | 14           | 7      | 0       | 21    | 6.1              | 359      | 46.8 | 21             | 293       | 7.7  | 21              |
|                      | 10  | 32           | 23     | 0       | 55    | 15.9             | 374      | 34.1 | 55             | 299       | 8.4  | 55              |
|                      | 11  | 57           | 35     | 0       | 92    | 26.5             | 395      | 44.7 | 92             | 305       | 8.9  | 92              |
|                      | 12  | 25           | 24     | 0       | 49    | 14.1             | 409      | 48.3 | 49             | 309       | 9.7  | 49              |
|                      | 13  | 2            | 6      | 0       | 8     | 2.3              | 443      | 52.8 | 8              | 320       | 5.0  | 8               |
|                      | 14  | 5            | 0      | 0       | 5     | 1.4              | 421      | 27.6 | 5              | 313       | 5.0  | 5               |
|                      | 15  | 1            | 0      | 0       | 1     | 0.3              | 478      |      | 1              | 317       |      | 1               |
|                      | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total         |     | 201          | 146    | 0       | 347   | 100.0            | 364      | 60.5 | 347            | 296       | 15.8 | 347             |
| 9-14 May             | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 1            | 1      | 0       | 2     | 0.3              | 270      | 67.9 | 2              | 269       | 12.0 | 2               |
|                      | 6   | 16           | 27     | 0       | 43    | 6.8              | 283      | 34.6 | 43             | 267       | 8.4  | 43              |
|                      | 7   | 19           | 12     | 0       | 31    | 4.9              | 308      | 37.0 | 31             | 276       | 9.1  | 31              |
|                      | 8   | 81           | 56     | 0       | 137   | 21.6             | 347      | 43.1 | 137            | 287       | 9.1  | 137             |
|                      | 9   | 29           | 13     | 0       | 42    | 6.6              | 368      | 41.9 | 42             | 292       | 8.8  | 42              |
|                      | 10  | 63           | 50     | 0       | 113   | 17.8             | 400      | 48.5 | 113            | 298       | 9.9  | 113             |
|                      | 11  | 98           | 63     | 0       | 161   | 25.4             | 416      | 53.3 | 161            | 304       | 9.7  | 161             |
|                      | 12  | 46           | 38     | 0       | 84    | 13.2             | 422      | 53.5 | 84             | 307       | 9.2  | 84              |
|                      | 13  | 2            | 6      | 0       | 8     | 1.3              | 443      | 52.8 | 8              | 320       | 5.0  | 8               |
|                      | 14  | 7            | 2      | 0       | 9     | 1.4              | 440      | 46.3 | 9              | 312       | 6.4  | 9               |
|                      | 15  | 1            | 2      | 0       | 3     | 0.5              | 530      | 46.3 | 3              | 319       | 1.7  | 3               |
|                      | 16  | 0            | 1      | 0       | 1     | 0.2              | 467      |      | 1              | 322       |      | 1               |
| All Samples Combined |     | 363          | 271    | 0       | 634   | 100.0            | 382      | 65.3 | 634            | 295       | 15.1 | 634             |
| Sex Composition      |     | 57.3         | 42.7   |         |       |                  |          |      |                |           |      |                 |
| Unaged               |     | 78           | 52     | 0       | 130   | 20.5             | 407      | 60.9 | 130            | 299       | 14.8 | 130             |
| Sex Composition      |     | 60.0         | 40.0   |         |       |                  |          |      |                |           |      |                 |

**Appendix A.8. Age, sex, and size composition of Pacific herring caught by commercial gillnet Kulukak and Nunavachak sections combined, 9-14 May 1989.**

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 9 May                | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 2            | 1      | 0       | 3     | 0.5              | 240      | 67.9 | 3              | 256       | 18.6 | 3               |
|                      | 6   | 24           | 26     | 0       | 50    | 8.0              | 270      | 41.8 | 50             | 265       | 9.4  | 50              |
|                      | 7   | 18           | 12     | 0       | 30    | 4.8              | 313      | 45.2 | 30             | 276       | 8.7  | 30              |
|                      | 8   | 83           | 67     | 0       | 150   | 24.0             | 351      | 43.0 | 150            | 284       | 10.3 | 150             |
|                      | 9   | 27           | 25     | 0       | 52    | 8.3              | 370      | 47.1 | 52             | 290       | 8.7  | 52              |
|                      | 10  | 52           | 49     | 0       | 101   | 16.1             | 414      | 51.4 | 101            | 297       | 10.1 | 101             |
|                      | 11  | 81           | 57     | 1       | 139   | 22.2             | 438      | 49.5 | 139            | 303       | 9.7  | 139             |
|                      | 12  | 46           | 40     | 0       | 86    | 13.7             | 438      | 52.7 | 86             | 305       | 9.3  | 86              |
|                      | 13  | 3            | 1      | 0       | 4     | 0.6              | 428      | 33.7 | 4              | 305       | 12.1 | 4               |
|                      | 14  | 4            | 4      | 0       | 8     | 1.3              | 464      | 60.2 | 8              | 309       | 9.9  | 8               |
|                      | 15  | 0            | 2      | 0       | 2     | 0.3              | 557      | 13.4 | 2              | 320       | 0.0  | 2               |
| 16                   | 0   | 1            | 0      | 1       | 0.2   | 467              |          | 1    | 322            |           | 1    |                 |
| Sample Total         |     | 340          | 285    | 1       | 626   | 100.0            | 388      | 72.6 | 626            | 292       | 15.8 | 626             |
| 14 May               | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 1            | 1      | 0       | 2     | 0.3              | 232      | 14.1 | 2              | 263       | 4.2  | 2               |
|                      | 6   | 28           | 27     | 0       | 55    | 8.1              | 250      | 47.2 | 55             | 263       | 9.3  | 55              |
|                      | 7   | 18           | 13     | 0       | 31    | 4.6              | 292      | 45.2 | 31             | 276       | 10.3 | 31              |
|                      | 8   | 89           | 39     | 0       | 128   | 18.9             | 312      | 45.5 | 128            | 285       | 9.6  | 128             |
|                      | 9   | 39           | 16     | 0       | 55    | 8.1              | 332      | 60.3 | 55             | 289       | 10.3 | 55              |
|                      | 10  | 65           | 45     | 0       | 110   | 16.2             | 358      | 47.9 | 110            | 297       | 8.3  | 110             |
|                      | 11  | 121          | 63     | 0       | 184   | 27.1             | 386      | 54.0 | 184            | 302       | 9.4  | 184             |
|                      | 12  | 48           | 38     | 0       | 86    | 12.7             | 401      | 54.4 | 86             | 305       | 10.3 | 86              |
|                      | 13  | 6            | 8      | 0       | 14    | 2.1              | 420      | 64.4 | 14             | 316       | 6.7  | 14              |
|                      | 14  | 9            | 1      | 0       | 10    | 1.5              | 367      | 68.7 | 10             | 309       | 8.2  | 10              |
|                      | 15  | 2            | 1      | 0       | 3     | 0.4              | 413      | 58.8 | 3              | 315       | 10.7 | 3               |
| 16                   |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total         |     | 426          | 252    | 0       | 678   | 100.0            | 350      | 69.0 | 678            | 294       | 15.8 | 678             |
| 9-14 May             | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                      | 5   | 3            | 2      | 0       | 5     | 0.4              | 237      | 48.7 | 5              | 259       | 13.9 | 5               |
|                      | 6   | 52           | 53     | 0       | 105   | 8.1              | 260      | 45.5 | 105            | 264       | 9.3  | 105             |
|                      | 7   | 36           | 25     | 0       | 61    | 4.7              | 303      | 46.1 | 61             | 276       | 9.5  | 61              |
|                      | 8   | 172          | 106    | 0       | 278   | 21.3             | 333      | 48.2 | 278            | 284       | 10.0 | 278             |
|                      | 9   | 66           | 41     | 0       | 107   | 8.2              | 351      | 57.3 | 107            | 290       | 9.5  | 107             |
|                      | 10  | 117          | 94     | 0       | 211   | 16.2             | 385      | 56.9 | 211            | 297       | 9.2  | 211             |
|                      | 11  | 202          | 120    | 1       | 323   | 24.8             | 408      | 57.9 | 323            | 302       | 9.5  | 323             |
|                      | 12  | 94           | 78     | 0       | 172   | 13.2             | 419      | 56.6 | 172            | 305       | 9.8  | 172             |
|                      | 13  | 9            | 9      | 0       | 18    | 1.4              | 422      | 58.2 | 18             | 314       | 9.1  | 18              |
|                      | 14  | 13           | 5      | 0       | 18    | 1.4              | 421      | 74.4 | 18             | 309       | 8.7  | 18              |
|                      | 15  | 2            | 3      | 0       | 5     | 0.4              | 470      | 89.3 | 5              | 317       | 8.1  | 5               |
| 16                   | 0   | 1            | 0      | 1       | 0.1   | 467              |          | 1    | 322            |           | 1    |                 |
| All Samples Combined |     | 766          | 537    | 1       | 1304  | 100.0            | 368      | 73.2 | 1304           | 293       | 15.8 | 1304            |
| Sex Composition      |     | 58.8         | 41.2   |         |       |                  |          |      |                |           |      |                 |
| Unaged               |     | 152          | 111    | 2       | 265   | 20.3             | 382      | 73.3 | 265            | 295       | 16.2 | 265             |
| Sex Composition      |     | 57.8         | 42.2   |         |       |                  |          |      |                |           |      |                 |

**Appendix A.9. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Kulukak Section, 7 May 1989.**

| Sample Dates    | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       | Length         |           |      |                 |
|-----------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|                 |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
|                 | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                 | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|                 | 5   | 0            | 1      | 0       | 1     | 1.8              | 226      |       | 1              | 248       |      |                 |
|                 | 6   | 4            | 1      | 0       | 5     | 9.1              | 244      | 48.8  | 5              | 256       | 14.9 |                 |
|                 | 7   | 1            | 0      | 0       | 1     | 1.8              | 274      |       | 1              | 265       |      |                 |
|                 | 8   | 3            | 3      | 0       | 6     | 10.9             | 340      | 49.7  | 6              | 282       | 2.3  |                 |
| 7 May           | 9   | 1            | 0      | 0       | 1     | 1.8              | 384      |       | 1              | 298       |      |                 |
|                 | 10  | 5            | 4      | 0       | 9     | 16.4             | 383      | 52.4  | 9              | 296       | 8.9  |                 |
|                 | 11  | 6            | 14     | 0       | 20    | 36.4             | 431      | 46.4  | 20             | 303       | 8.5  |                 |
|                 | 12  | 5            | 2      | 0       | 7     | 12.7             | 463      | 62.2  | 7              | 311       | 5.2  |                 |
|                 | 13  | 2            | 1      | 0       | 3     | 5.5              | 423      | 90.0  | 3              | 314       | 6.0  |                 |
|                 | 14  | 0            | 2      | 0       | 2     | 3.6              | 472      | 73.5  | 2              | 309       | 6.4  |                 |
|                 | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
|                 | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total    |     | 27           | 28     | 0       | 55    | 100.0            | 394      | 83.7  | 55             | 295       | 18.8 | 55              |
| Sex Composition |     | 49.1         | 50.9   |         |       |                  |          |       |                |           |      |                 |
| Unaged          |     | 2            | 4      | 0       | 6     | 10.9             | 416      | 128.9 | 6              | 296       | 18.3 | 6               |
| Sex Composition |     | 33.3         | 66.7   |         |       |                  |          |       |                |           |      |                 |

**Appendix A.10. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Nunavachak Section, 20 May 1989.**

| Sample Dates    | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |      |                   | Length       |      |                    |
|-----------------|-----|--------------|--------|---------|-------|------------------------|-------------|------|-------------------|--------------|------|--------------------|
|                 |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD   | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
|                 | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|                 | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|                 | 5   | 43           | 53     | 0       | 96    | 55.2                   | 158         | 19.9 | 96                | 237          | 6.5  | 96                 |
|                 | 6   | 30           | 23     | 0       | 53    | 30.5                   | 193         | 26.2 | 53                | 252          | 9.4  | 53                 |
|                 | 7   | 4            | 2      | 0       | 6     | 3.4                    | 234         | 36.5 | 6                 | 266          | 12.0 | 6                  |
|                 | 8   | 4            | 5      | 0       | 9     | 5.2                    | 272         | 39.5 | 9                 | 281          | 12.4 | 9                  |
| 20 May          | 9   | 1            | 0      | 0       | 1     | 0.6                    | 342         |      | 1                 | 286          |      | 1                  |
|                 | 10  | 1            | 1      | 0       | 2     | 1.1                    | 286         | 79.9 | 2                 | 297          | 24.0 | 2                  |
|                 | 11  | 4            | 1      | 0       | 5     | 2.9                    | 395         | 42.8 | 5                 | 306          | 4.1  | 5                  |
|                 | 12  | 1            | 1      | 0       | 2     | 1.1                    | 389         | 2.8  | 2                 | 314          | 2.1  | 2                  |
|                 | 13  |              |        |         |       |                        |             |      |                   |              |      |                    |
|                 | 14  |              |        |         |       |                        |             |      |                   |              |      |                    |
|                 | 15  |              |        |         |       |                        |             |      |                   |              |      |                    |
|                 | 16  |              |        |         |       |                        |             |      |                   |              |      |                    |
| Sample Total    |     | 88           | 86     | 0       | 174   | 100.0                  | 189         | 59.2 | 174               | 249          | 19.5 | 174                |
| Sex Composition |     | 50.6         | 49.4   |         |       |                        |             |      |                   |              |      |                    |
| Unaged          |     | 17           | 13     | 0       | 30    | 17.2                   | 199         | 45.5 | 30                | 254          | 16.6 | 30                 |
| Sex Composition |     | 56.7         | 43.3   |         |       |                        |             |      |                   |              |      |                    |

Appendix A.11. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Togiak Section, 5-10 May 1989.

| Sample Dates | Age | Sex (number) |        |         | Percent of Total | Weight   |     |                | Length    |     |                 |     |
|--------------|-----|--------------|--------|---------|------------------|----------|-----|----------------|-----------|-----|-----------------|-----|
|              |     | Male         | Female | Unknown |                  | Mean (g) | SD  | Number Weighed | Mean (mm) | SD  | Number Measured |     |
| 5 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 1            | 5      | 0       | 6                | 3.7      | 149 | 34.6           | 6         | 256 | 13.6            | 6   |
|              | 6   | 6            | 13     | 0       | 19               | 11.7     | 186 | 64.2           | 19        | 272 | 10.8            | 19  |
|              | 7   | 1            | 3      | 0       | 4                | 2.5      | 244 | 35.2           | 4         | 285 | 4.1             | 4   |
|              | 8   | 13           | 21     | 0       | 34               | 20.9     | 260 | 36.3           | 34        | 295 | 9.6             | 34  |
|              | 9   | 4            | 4      | 0       | 8                | 4.9      | 309 | 45.3           | 8         | 309 | 6.9             | 8   |
|              | 10  | 19           | 14     | 0       | 33               | 20.2     | 320 | 52.4           | 33        | 312 | 7.6             | 33  |
|              | 11  | 21           | 19     | 0       | 40               | 24.5     | 349 | 46.4           | 40        | 317 | 9.2             | 40  |
|              | 12  | 3            | 14     | 0       | 17               | 10.4     | 357 | 53.6           | 17        | 324 | 10.0            | 17  |
|              | 13  | 0            | 2      | 0       | 2                | 1.2      | 420 | 14.1           | 2         | 328 | 3.5             | 2   |
|              | 14  |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 68           | 95     | 0       | 163              | 100.0    | 295 | 78.7           | 163       | 304 | 20.5            | 163 |
| 7 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 0            | 1      | 0       | 1                | 1.4      | 179 |                | 1         | 245 |                 | 1   |
|              | 6   | 2            | 4      | 0       | 6                | 8.6      | 264 | 14.3           | 6         | 263 | 8.0             | 6   |
|              | 7   | 0            | 1      | 0       | 1                | 1.4      | 403 |                | 1         | 284 |                 | 1   |
|              | 8   | 6            | 4      | 0       | 10               | 14.3     | 365 | 44.5           | 10        | 286 | 12.6            | 10  |
|              | 9   | 1            | 4      | 0       | 5                | 7.1      | 443 | 54.7           | 5         | 298 | 9.6             | 5   |
|              | 10  | 3            | 10     | 0       | 13               | 18.6     | 425 | 47.0           | 13        | 301 | 6.0             | 13  |
|              | 11  | 8            | 9      | 0       | 17               | 24.3     | 454 | 63.0           | 17        | 304 | 10.4            | 17  |
|              | 12  | 4            | 10     | 0       | 14               | 20.0     | 461 | 71.6           | 14        | 305 | 13.3            | 14  |
|              | 13  | 0            | 2      | 0       | 2                | 2.9      | 534 | 3.5            | 2         | 318 | 8.5             | 2   |
|              | 14  | 0            | 1      | 0       | 1                | 1.4      | 548 |                | 1         | 317 |                 | 1   |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 24           | 46     | 0       | 70               | 100.0    | 419 | 85.9           | 70        | 296 | 17.4            | 70  |
| 8 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 0            | 3      | 0       | 3                | 2.8      | 208 | 26.1           | 3         | 252 | 9.3             | 3   |
|              | 6   | 5            | 7      | 0       | 12               | 11.0     | 261 | 59.7           | 12        | 261 | 16.2            | 12  |
|              | 7   | 2            | 1      | 0       | 3                | 2.8      | 318 | 23.6           | 3         | 282 | 5.3             | 3   |
|              | 8   | 6            | 10     | 0       | 16               | 14.7     | 399 | 53.4           | 16        | 291 | 7.1             | 16  |
|              | 9   | 0            | 3      | 0       | 3                | 2.8      | 450 | 37.5           | 3         | 300 | 7.6             | 3   |
|              | 10  | 12           | 12     | 0       | 24               | 22.0     | 421 | 58.4           | 24        | 303 | 13.2            | 24  |
|              | 11  | 15           | 17     | 0       | 32               | 29.4     | 449 | 62.3           | 32        | 304 | 11.5            | 32  |
|              | 12  | 1            | 13     | 0       | 14               | 12.8     | 510 | 36.2           | 14        | 313 | 8.3             | 14  |
|              | 13  | 0            | 1      | 0       | 1                | 0.9      | 508 |                | 1         | 316 |                 | 1   |
|              | 14  | 1            | 0      | 0       | 1                | 0.9      | 524 |                | 1         | 325 |                 | 1   |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 42           | 67     | 0       | 109              | 100.0    | 414 | 93.2           | 109       | 296 | 19.9            | 109 |

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Appendix A. 11. (p. 2 of 2)

| Sample Dates                            | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |       |                   | Length       |      |                    |
|---|-----|--------------|--------|---------|-------|------------------------|-------------|-------|-------------------|--------------|------|--------------------|
|   |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD    | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
| 9 May                                   | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 5   | 1            | 1      | 0       | 2     | 1.6                    | 157         | 23.3  | 2                 | 224          | 0.0  | 2                  |
|   | 6   | 2            | 4      | 0       | 6     | 4.8                    | 265         | 61.7  | 6                 | 257          | 9.3  | 6                  |
|   | 7   | 1            | 2      | 0       | 3     | 2.4                    | 303         | 58.6  | 3                 | 268          | 19.0 | 3                  |
|   | 8   | 6            | 15     | 0       | 21    | 16.8                   | 366         | 36.0  | 21                | 282          | 8.9  | 21                 |
|   | 9   | 0            | 8      | 0       | 8     | 6.4                    | 393         | 55.0  | 8                 | 289          | 8.3  | 8                  |
|   | 10  | 7            | 11     | 0       | 18    | 14.4                   | 431         | 55.6  | 18                | 296          | 12.5 | 18                 |
|   | 11  | 11           | 16     | 0       | 27    | 21.6                   | 458         | 47.6  | 27                | 299          | 12.1 | 27                 |
|   | 12  | 19           | 16     | 0       | 35    | 28.0                   | 475         | 49.2  | 35                | 305          | 10.2 | 35                 |
|   | 13  | 1            | 0      | 0       | 1     | 0.8                    | 505         |       | 1                 | 305          |      | 1                  |
|   | 14  | 0            | 3      | 0       | 3     | 2.4                    | 547         | 33.5  | 3                 | 319          | 8.9  | 3                  |
|   | 15  | 1            | 0      | 0       | 1     | 0.8                    | 434         |       | 1                 | 302          |      | 1                  |
|   | 16  |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total                            |     | 49           | 76     | 0       | 125   | 100.0                  | 424         | 83.4  | 125               | 293          | 18.8 | 125                |
| 10 May                                  | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 5   | 3            | 1      | 0       | 4     | 6.6                    | 164         | 41.5  | 4                 | 240          | 7.5  | 4                  |
|   | 6   | 5            | 3      | 0       | 8     | 13.1                   | 196         | 55.1  | 8                 | 254          | 11.6 | 8                  |
|   | 7   | 2            | 4      | 0       | 6     | 9.8                    | 262         | 62.3  | 6                 | 274          | 9.3  | 6                  |
|   | 8   | 4            | 6      | 0       | 10    | 16.4                   | 267         | 77.0  | 10                | 280          | 9.4  | 10                 |
|   | 9   | 2            | 2      | 0       | 4     | 6.6                    | 283         | 93.1  | 4                 | 287          | 13.2 | 4                  |
|   | 10  | 3            | 5      | 0       | 8     | 13.1                   | 367         | 45.4  | 8                 | 297          | 8.8  | 8                  |
|   | 11  | 8            | 5      | 0       | 13    | 21.3                   | 363         | 81.6  | 13                | 303          | 6.9  | 13                 |
|   | 12  | 4            | 4      | 0       | 8     | 13.1                   | 338         | 53.6  | 8                 | 306          | 7.5  | 8                  |
|   | 13  |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 16  |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total                            |     | 31           | 30     | 0       | 61    | 100.0                  | 294         | 92.9  | 61                | 284          | 22.6 | 61                 |
| 5-10 May                                | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|   | 5   | 5            | 11     | 0       | 16    | 3.0                    | 167         | 36.9  | 16                | 246          | 14.3 | 16                 |
|   | 6   | 20           | 31     | 0       | 51    | 9.7                    | 223         | 67.0  | 51                | 264          | 13.5 | 51                 |
|   | 7   | 6            | 11     | 0       | 17    | 3.2                    | 283         | 60.8  | 17                | 277          | 11.1 | 17                 |
|   | 8   | 35           | 58     | 0       | 91    | 17.2                   | 321         | 74.3  | 91                | 289          | 11.0 | 91                 |
|   | 9   | 7            | 21     | 0       | 28    | 5.3                    | 368         | 83.2  | 28                | 297          | 12.1 | 28                 |
|   | 10  | 44           | 52     | 0       | 96    | 18.2                   | 384         | 72.0  | 96                | 304          | 11.9 | 96                 |
|   | 11  | 63           | 66     | 0       | 129   | 24.4                   | 412         | 75.3  | 129               | 307          | 12.6 | 129                |
|   | 12  | 31           | 57     | 0       | 88    | 16.7                   | 443         | 79.4  | 88                | 310          | 12.4 | 88                 |
|   | 13  | 1            | 5      | 0       | 6     | 1.1                    | 487         | 53.4  | 6                 | 319          | 9.3  | 6                  |
|   | 14  | 1            | 4      | 0       | 5     | 0.9                    | 543         | 25.8  | 5                 | 320          | 7.0  | 5                  |
|   | 15  | 1            | 0      | 0       | 1     | 0.2                    | 434         |       | 1                 | 302          |      | 1                  |
|   | 16  |              |        |         |       |                        |             |       |                   |              |      |                    |
| All Samples Combined<br>Sex Composition |     | 214          | 314    | 0       | 528   | 100.0                  | 366         | 105.0 | 528               | 297          | 20.6 | 528                |
| Unaged<br>Sex Composition               |     | 26           | 33     | 0       | 59    | 11.2                   | 374         | 109.4 | 59                | 300          | 21.8 | 59                 |

**A. 12. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Hagemester Section, 5-20 May 1989.**

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 5 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 3            | 0      | 0       | 3     | 5.9              | 221      | 28.4 | 3              | 250       | 11.9 | 3               |
|              | 6   | 3            | 2      | 0       | 5     | 9.8              | 250      | 22.9 | 5              | 259       | 8.2  | 5               |
|              | 7   | 1            | 1      | 0       | 2     | 3.9              | 247      | 24.0 | 2              | 252       | 10.6 | 2               |
|              | 8   | 5            | 3      | 0       | 8     | 15.7             | 352      | 36.1 | 8              | 283       | 8.8  | 8               |
|              | 9   | 1            | 2      | 0       | 3     | 5.9              | 405      | 26.4 | 3              | 289       | 11.0 | 3               |
|              | 10  | 6            | 4      | 0       | 10    | 19.6             | 425      | 45.4 | 10             | 297       | 9.4  | 10              |
|              | 11  | 11           | 2      | 0       | 13    | 25.5             | 433      | 56.4 | 13             | 297       | 8.0  | 13              |
|              | 12  | 2            | 5      | 0       | 7     | 13.7             | 480      | 56.1 | 7              | 306       | 5.0  | 7               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 32           | 19     | 0       | 51    | 100.0            | 386      | 91.6 | 51             | 287       | 19.5 | 51              |
| 7 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   | 0            | 3      | 0       | 3     | 7.3              | 275      | 23.1 | 3              | 255       | 10.7 | 3               |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 2            | 8      | 0       | 10    | 24.4             | 396      | 38.5 | 10             | 287       | 9.7  | 10              |
|              | 9   | 1            | 3      | 0       | 4     | 9.8              | 414      | 34.3 | 4              | 290       | 16.3 | 4               |
|              | 10  | 3            | 8      | 0       | 11    | 26.8             | 440      | 63.5 | 11             | 301       | 10.6 | 11              |
|              | 11  | 6            | 4      | 0       | 10    | 24.4             | 440      | 93.2 | 9              | 296       | 18.4 | 10              |
|              | 12  | 2            | 0      | 0       | 2     | 4.9              | 467      | 55.2 | 2              | 300       | 5.7  | 2               |
|              | 13  | 1            | 0      | 0       | 1     | 2.4              | 462      |      | 1              | 301       |      | 1               |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 15           | 26     | 0       | 41    | 100.0            | 416      | 73.9 | 40             | 292       | 17.1 | 41              |
| 8 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   | 0            | 1      | 0       | 1     | 2.5              | 256      |      | 1              | 259       |      | 1               |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 2            | 5      | 0       | 7     | 17.5             | 363      | 44.0 | 7              | 280       | 9.7  | 7               |
|              | 9   | 2            | 1      | 0       | 3     | 7.5              | 381      | 15.3 | 3              | 284       | 5.1  | 3               |
|              | 10  | 4            | 9      | 0       | 13    | 32.5             | 447      | 64.3 | 13             | 301       | 10.9 | 13              |
|              | 11  | 2            | 5      | 0       | 7     | 17.5             | 488      | 70.2 | 7              | 304       | 12.4 | 7               |
|              | 12  | 4            | 5      | 0       | 9     | 22.5             | 498      | 30.5 | 9              | 306       | 4.4  | 9               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 14           | 26     | 0       | 40    | 100.0            | 441      | 76.9 | 40             | 297       | 14.7 | 40              |

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Appendix A.12. (p. 2 of 3)

| Sample Dates | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |       |                   | Length       |      |                    |
|--------------|-----|--------------|--------|---------|-------|------------------------|-------------|-------|-------------------|--------------|------|--------------------|
|              |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD    | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
| 9 May        | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 1            | 0      | 0       | 1     | 0.7                    | 202         |       | 1                 | 244          |      | 1                  |
|              | 6   | 3            | 2      | 0       | 5     | 3.6                    | 233         | 58.4  | 5                 | 256          | 9.1  | 5                  |
|              | 7   | 5            | 1      | 0       | 6     | 4.4                    | 260         | 44.4  | 6                 | 260          | 7.3  | 6                  |
|              | 8   | 10           | 10     | 0       | 20    | 14.6                   | 326         | 81.4  | 20                | 281          | 12.9 | 20                 |
|              | 9   | 4            | 8      | 0       | 12    | 8.8                    | 374         | 72.9  | 12                | 291          | 13.1 | 12                 |
|              | 10  | 18           | 20     | 0       | 38    | 27.7                   | 402         | 97.7  | 38                | 296          | 13.4 | 38                 |
|              | 11  | 18           | 16     | 0       | 34    | 24.8                   | 411         | 92.7  | 34                | 298          | 10.9 | 34                 |
|              | 12  | 6            | 9      | 0       | 15    | 10.9                   | 451         | 77.6  | 15                | 300          | 7.5  | 15                 |
|              | 13  | 0            | 3      | 0       | 3     | 2.2                    | 469         | 170.3 | 3                 | 319          | 16.2 | 3                  |
|              | 14  | 0            | 2      | 0       | 2     | 1.5                    | 607         | 91.9  | 2                 | 323          | 0.7  | 2                  |
|              | 15  | 0            | 1      | 0       | 1     | 0.7                    | 482         |       | 1                 | 304          |      | 1                  |
|              | 16  |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 65           | 72     | 0       | 137   | 100.0                  | 387         | 106.2 | 137               | 292          | 17.5 | 137                |
| 10 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 6   | 2            | 1      | 0       | 3     | 2.5                    | 260         | 66.8  | 3                 | 261          | 14.9 | 3                  |
|              | 7   | 0            | 1      | 0       | 1     | 0.8                    | 211         |       | 1                 | 269          |      | 1                  |
|              | 8   | 6            | 5      | 0       | 11    | 9.1                    | 296         | 96.2  | 11                | 279          | 20.7 | 11                 |
|              | 9   | 3            | 3      | 0       | 6     | 5.0                    | 327         | 81.4  | 6                 | 282          | 4.8  | 6                  |
|              | 10  | 12           | 12     | 0       | 24    | 19.8                   | 392         | 105.4 | 24                | 295          | 13.6 | 24                 |
|              | 11  | 12           | 26     | 0       | 38    | 31.4                   | 410         | 105.3 | 38                | 301          | 12.1 | 38                 |
|              | 12  | 8            | 28     | 0       | 36    | 29.8                   | 432         | 97.0  | 36                | 305          | 10.8 | 36                 |
|              | 13  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  | 0            | 2      | 0       | 2     | 1.7                    | 472         | 203.6 | 2                 | 300          | 11.3 | 2                  |
|              | 16  |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 43           | 78     | 0       | 121   | 100.0                  | 394         | 110.5 | 121               | 297          | 16.2 | 121                |
| 11 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 0            | 2      | 0       | 2     | 1.8                    | 200         | 33.9  | 2                 | 242          | 12.0 | 2                  |
|              | 6   | 1            | 7      | 0       | 8     | 7.2                    | 273         | 50.1  | 8                 | 261          | 9.1  | 8                  |
|              | 7   | 5            | 4      | 0       | 9     | 8.1                    | 287         | 67.8  | 9                 | 268          | 17.9 | 9                  |
|              | 8   | 1            | 12     | 0       | 13    | 11.7                   | 354         | 33.5  | 13                | 282          | 7.1  | 13                 |
|              | 9   | 3            | 6      | 0       | 9     | 8.1                    | 397         | 55.1  | 9                 | 290          | 12.3 | 9                  |
|              | 10  | 8            | 14     | 0       | 22    | 19.8                   | 406         | 76.6  | 22                | 295          | 13.3 | 22                 |
|              | 11  | 13           | 15     | 0       | 28    | 25.2                   | 451         | 54.0  | 28                | 303          | 7.9  | 28                 |
|              | 12  | 8            | 11     | 0       | 19    | 17.1                   | 447         | 44.2  | 19                | 310          | 9.5  | 19                 |
|              | 13  | 0            | 1      | 0       | 1     | 0.9                    | 526         |       | 1                 | 322          |      | 1                  |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 16  |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 39           | 72     | 0       | 111   | 100.0                  | 396         | 85.8  | 111               | 292          | 19.5 | 111                |

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Appendix A.12. (p. 3 of 3)

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       |                | Length    |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
| 20 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 5   | 11           | 6      | 0       | 17    | 13.6             | 188      | 22.6  | 17             | 240       | 8.2  | 17              |
|                      | 6   | 17           | 12     | 0       | 29    | 23.2             | 248      | 36.7  | 29             | 261       | 10.3 | 29              |
|                      | 7   | 4            | 0      | 0       | 4     | 3.2              | 287      | 65.0  | 4              | 270       | 18.8 | 4               |
|                      | 8   | 20           | 15     | 0       | 35    | 28.0             | 329      | 43.0  | 35             | 278       | 10.3 | 35              |
|                      | 9   | 6            | 0      | 0       | 6     | 4.8              | 353      | 108.9 | 6              | 289       | 9.3  | 6               |
|                      | 10  | 8            | 4      | 0       | 12    | 9.6              | 401      | 38.6  | 12             | 292       | 10.3 | 12              |
|                      | 11  | 8            | 7      | 0       | 15    | 12.0             | 410      | 55.9  | 15             | 301       | 9.1  | 15              |
|                      | 12  | 1            | 6      | 0       | 7     | 5.6              | 463      | 37.6  | 7              | 305       | 3.8  | 7               |
|                      | 13  |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 75           | 50     | 0       | 125   | 100.0            | 315      | 92.0  | 125            | 275       | 21.9 | 125             |
| 5-20 May             | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 5   | 15           | 8      | 0       | 23    | 3.7              | 194      | 25.1  | 23             | 242       | 8.9  | 23              |
|                      | 6   | 26           | 28     | 0       | 54    | 8.6              | 253      | 40.9  | 54             | 260       | 9.7  | 54              |
|                      | 7   | 15           | 7      | 0       | 22    | 3.5              | 273      | 57.2  | 22             | 265       | 15.0 | 22              |
|                      | 8   | 46           | 58     | 0       | 104   | 16.6             | 339      | 62.1  | 104            | 281       | 11.8 | 104             |
|                      | 9   | 20           | 23     | 0       | 43    | 6.9              | 376      | 70.8  | 43             | 289       | 11.1 | 43              |
|                      | 10  | 59           | 71     | 0       | 130   | 20.8             | 410      | 83.4  | 130            | 296       | 12.5 | 130             |
|                      | 11  | 70           | 75     | 0       | 145   | 23.2             | 426      | 84.5  | 144            | 300       | 11.1 | 145             |
|                      | 12  | 31           | 64     | 0       | 95    | 15.2             | 451      | 74.9  | 95             | 306       | 9.1  | 95              |
|                      | 13  | 1            | 4      | 0       | 5     | 0.8              | 479      | 123.3 | 5              | 316       | 14.2 | 5               |
|                      | 14  | 0            | 2      | 0       | 2     | 0.3              | 607      | 91.9  | 2              | 323       | 0.7  | 2               |
|                      | 15  | 0            | 3      | 0       | 3     | 0.5              | 475      | 144.1 | 3              | 301       | 8.3  | 3               |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| All Samples Combined |     | 283          | 343    | 0       | 626   | 100.0            | 381      | 102.2 | 625            | 289       | 20.0 | 626             |
| Sex Composition      |     | 45.2         | 54.8   |         |       |                  |          |       |                |           |      |                 |
| Unaged               |     | 40           | 62     | 0       | 102   | 16.3             | 417      | 93.9  | 102            | 295       | 18.0 | 102             |
| Sex Composition      |     | 39.2         | 60.8   |         |       |                  |          |       |                |           |      |                 |

**Appendix A.13. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Pyrite Point Section, 11 May 1989.**

| Sample Dates    | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|-----------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|                 |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
|                 | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 7   | 0            | 1      | 0       | 1     | 1.4              | 347      |      | 1              | 265       |      | 1               |
|                 | 8   | 5            | 3      | 0       | 8     | 11.3             | 332      | 50.6 | 8              | 276       | 13.7 | 8               |
| 11 May          | 9   | 2            | 0      | 0       | 2     | 2.8              | 427      | 14.1 | 2              | 296       | 11.3 | 2               |
|                 | 10  | 11           | 9      | 0       | 20    | 28.2             | 423      | 57.5 | 20             | 298       | 9.6  | 20              |
|                 | 11  | 11           | 13     | 0       | 24    | 33.8             | 467      | 56.3 | 24             | 307       | 6.9  | 24              |
|                 | 12  | 6            | 7      | 0       | 13    | 18.3             | 478      | 65.7 | 13             | 307       | 10.3 | 13              |
|                 | 13  | 0            | 1      | 0       | 1     | 1.4              | 550      |      | 1              | 326       |      | 1               |
|                 | 14  | 2            | 0      | 0       | 2     | 2.8              | 445      | 9.9  | 2              | 306       | 2.1  | 2               |
|                 | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total    |     | 37           | 34     | 0       | 71    | 100.0            | 439      | 71.9 | 71             | 300       | 14.3 | 71              |
| Sex Composition |     | 52.1         | 47.9   |         |       |                  |          |      |                |           |      |                 |
| Unaged          |     | 1            | 3      | 0       | 4     | 5.6              | 443      | 64.4 | 4              | 301       | 12.4 | 4               |
| Sex Composition |     | 25.0         | 75.0   |         |       |                  |          |      |                |           |      |                 |

**Appendix A.14. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Cape Newenham Section, 11 May 1989.**

| Sample Dates    | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|-----------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|                 |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 11 May          | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 6   | 0            | 1      | 0       | 1     | 1.1              | 291      |      | 1              | 267       |      | 1               |
|                 | 7   | 0            | 1      | 0       | 1     | 1.1              | 309      |      | 1              | 270       |      | 1               |
|                 | 8   | 8            | 5      | 0       | 13    | 14.9             | 351      | 44.3 | 13             | 285       | 9.6  | 13              |
|                 | 9   | 1            | 5      | 0       | 6     | 6.9              | 439      | 58.1 | 6              | 294       | 8.7  | 6               |
|                 | 10  | 10           | 14     | 0       | 24    | 27.6             | 410      | 55.4 | 24             | 295       | 10.9 | 24              |
|                 | 11  | 13           | 8      | 0       | 21    | 24.1             | 434      | 52.8 | 21             | 302       | 11.3 | 21              |
|                 | 12  | 6            | 14     | 0       | 20    | 23.0             | 476      | 49.6 | 20             | 310       | 10.3 | 20              |
|                 | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|                 | 14  | 1            | 0      | 0       | 1     | 1.1              | 436      |      | 1              | 302       |      | 1               |
|                 | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16              |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total    |     | 39           | 48     | 0       | 87    | 100.0            | 422      | 66.1 | 87             | 298       | 13.6 | 87              |
| Sex Composition |     | 44.8         | 55.2   |         |       |                  |          |      |                |           |      |                 |
| Unaged          |     | 2            | 4      | 0       | 6     | 6.9              | 403      | 60.8 | 6              | 293       | 16.6 | 6               |
| Sex Composition |     | 33.3         | 66.7   |         |       |                  |          |      |                |           |      |                 |

Appendix A.15. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Kulukak, Nunavachak, Togiak, Hagemeister, Pyrite Point and Cape Newenham, 5-20 May 1989.

| Sample Dates | Age | Sex (number) |        |         | Percent of Total | Weight   |     |                | Length    |     |                 |     |
|--------------|-----|--------------|--------|---------|------------------|----------|-----|----------------|-----------|-----|-----------------|-----|
|              |     | Male         | Female | Unknown |                  | Mean (g) | SD  | Number Weighed | Mean (mm) | SD  | Number Measured |     |
| 5 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 4            | 5      | 0       | 9                | 4.2      | 173 | 47.2           | 9         | 254 | 12.7            | 9   |
|              | 6   | 9            | 15     | 0       | 24               | 11.2     | 199 | 63.5           | 24        | 269 | 11.5            | 24  |
|              | 7   | 2            | 4      | 0       | 6                | 2.8      | 245 | 29.4           | 6         | 274 | 18.2            | 6   |
|              | 8   | 18           | 24     | 0       | 42               | 19.6     | 277 | 51.3           | 42        | 293 | 10.6            | 42  |
|              | 9   | 5            | 6      | 0       | 11               | 5.1      | 335 | 60.1           | 11        | 303 | 12.1            | 11  |
|              | 10  | 25           | 18     | 0       | 43               | 20.1     | 344 | 67.5           | 43        | 309 | 10.2            | 43  |
|              | 11  | 32           | 21     | 0       | 53               | 24.8     | 370 | 60.7           | 53        | 312 | 12.4            | 53  |
|              | 12  | 5            | 19     | 0       | 24               | 11.2     | 393 | 77.9           | 24        | 319 | 11.8            | 24  |
|              | 13  | 0            | 2      | 0       | 2                | 0.9      | 420 | 14.1           | 2         | 328 | 3.5             | 2   |
|              | 14  |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 100          | 114    | 0       | 214              | 100.0    | 317 | 90.4           | 214       | 300 | 21.4            | 214 |
| 7 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 0            | 2      | 0       | 2                | 1.2      | 203 | 33.2           | 2         | 247 | 2.1             | 2   |
|              | 6   | 6            | 8      | 0       | 14               | 8.4      | 259 | 32.3           | 14        | 259 | 11.1            | 14  |
|              | 7   | 1            | 1      | 0       | 2                | 1.2      | 339 | 91.2           | 2         | 275 | 13.4            | 2   |
|              | 8   | 11           | 15     | 0       | 26               | 15.7     | 371 | 47.3           | 26        | 285 | 9.8             | 26  |
|              | 9   | 3            | 7      | 0       | 10               | 6.0      | 426 | 46.4           | 10        | 295 | 12.1            | 10  |
|              | 10  | 11           | 22     | 0       | 33               | 19.9     | 418 | 57.5           | 33        | 299 | 8.6             | 33  |
|              | 11  | 20           | 27     | 0       | 47               | 28.3     | 441 | 63.0           | 46        | 302 | 12.0            | 47  |
|              | 12  | 11           | 12     | 0       | 23               | 13.9     | 462 | 65.0           | 23        | 306 | 11.2            | 23  |
|              | 13  | 3            | 3      | 0       | 6                | 3.6      | 467 | 78.5           | 6         | 313 | 8.3             | 6   |
|              | 14  | 0            | 3      | 0       | 3                | 1.8      | 497 | 68.0           | 3         | 311 | 6.7             | 3   |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 66           | 100    | 0       | 166              | 100.0    | 410 | 82.7           | 165       | 295 | 17.8            | 166 |
| 8 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 0            | 3      | 0       | 3                | 2.0      | 208 | 26.1           | 3         | 252 | 9.3             | 3   |
|              | 6   | 5            | 8      | 0       | 13               | 8.7      | 260 | 57.2           | 13        | 261 | 15.5            | 13  |
|              | 7   | 2            | 1      | 0       | 3                | 2.0      | 318 | 23.6           | 3         | 282 | 5.3             | 3   |
|              | 8   | 8            | 15     | 0       | 23               | 15.4     | 388 | 52.5           | 23        | 288 | 9.2             | 23  |
|              | 9   | 2            | 4      | 0       | 6                | 4.0      | 416 | 45.5           | 6         | 292 | 10.8            | 6   |
|              | 10  | 16           | 21     | 0       | 37               | 24.8     | 430 | 60.9           | 37        | 302 | 12.3            | 37  |
|              | 11  | 17           | 22     | 0       | 39               | 26.2     | 456 | 64.6           | 39        | 304 | 11.5            | 39  |
|              | 12  | 5            | 18     | 0       | 23               | 15.4     | 505 | 33.9           | 23        | 311 | 7.6             | 23  |
|              | 13  | 0            | 1      | 0       | 1                | 0.7      | 508 |                | 1         | 316 |                 | 1   |
|              | 14  | 1            | 0      | 0       | 1                | 0.7      | 524 |                | 1         | 325 |                 | 1   |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 56           | 93     | 0       | 149              | 100.0    | 421 | 89.7           | 149       | 297 | 18.6            | 149 |

-Continued-

Appendix A.15. (p. 2 of 3)

| Sample Dates | Age | Sex (number) |        |         | Percent of Total | Weight   |     |                | Length    |     |                 |     |
|--------------|-----|--------------|--------|---------|------------------|----------|-----|----------------|-----------|-----|-----------------|-----|
|              |     | Male         | Female | Unknown |                  | Mean (g) | SD  | Number Weighed | Mean (mm) | SD  | Number Measured |     |
| 9 May        | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 2            | 1      | 0       | 3                | 1.1      | 172 | 31.0           | 3         | 231 | 11.5            | 3   |
|              | 6   | 5            | 6      | 0       | 11               | 4.2      | 250 | 59.6           | 11        | 257 | 8.7             | 11  |
|              | 7   | 6            | 3      | 0       | 9                | 3.4      | 274 | 50.4           | 9         | 263 | 11.7            | 9   |
|              | 8   | 16           | 25     | 0       | 41               | 15.6     | 346 | 64.7           | 41        | 281 | 10.9            | 41  |
|              | 9   | 4            | 16     | 0       | 20               | 7.6      | 381 | 65.5           | 20        | 290 | 11.2            | 20  |
|              | 10  | 25           | 31     | 0       | 56               | 23.4     | 412 | 86.9           | 56        | 296 | 13.0            | 56  |
|              | 11  | 29           | 32     | 0       | 61               | 23.3     | 431 | 79.1           | 61        | 298 | 11.4            | 61  |
|              | 12  | 25           | 25     | 0       | 50               | 19.1     | 468 | 59.3           | 50        | 304 | 9.6             | 50  |
|              | 13  | 1            | 3      | 0       | 4                | 1.5      | 478 | 140.2          | 4         | 315 | 14.9            | 4   |
|              | 14  | 0            | 5      | 0       | 5                | 1.9      | 571 | 61.3           | 5         | 320 | 6.6             | 5   |
|              | 15  | 1            | 1      | 0       | 2                | 0.8      | 458 | 33.9           | 2         | 303 | 1.4             | 2   |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 114          | 148    | 0       | 262              | 100.0    | 405 | 97.6           | 262       | 292 | 18.1            | 262 |
| 10 May       | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 3            | 1      | 0       | 4                | 2.2      | 164 | 41.5           | 4         | 240 | 7.5             | 4   |
|              | 6   | 7            | 4      | 0       | 11               | 6.0      | 213 | 62.5           | 11        | 256 | 12.3            | 11  |
|              | 7   | 2            | 5      | 0       | 7                | 3.8      | 255 | 60.1           | 7         | 273 | 8.6             | 7   |
|              | 8   | 10           | 11     | 0       | 21               | 11.5     | 282 | 86.7           | 21        | 280 | 15.9            | 21  |
|              | 9   | 5            | 5      | 0       | 10               | 5.5      | 309 | 84.1           | 10        | 284 | 8.8             | 10  |
|              | 10  | 15           | 17     | 0       | 32               | 17.6     | 386 | 94.0           | 32        | 296 | 12.4            | 32  |
|              | 11  | 20           | 31     | 0       | 51               | 28.0     | 398 | 101.2          | 51        | 301 | 11.0            | 51  |
|              | 12  | 12           | 32     | 0       | 44               | 24.2     | 415 | 97.4           | 44        | 305 | 10.2            | 44  |
|              | 13  |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 14  |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 15  | 0            | 2      | 0       | 2                | 1.1      | 472 | 203.6          | 2         | 300 | 11.3            | 2   |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 74           | 108    | 0       | 182              | 100.0    | 361 | 114.9          | 182       | 293 | 19.4            | 182 |
| 11 May       | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|              | 5   | 0            | 2      | 0       | 2                | 0.7      | 200 | 33.9           | 2         | 242 | 12.0            | 2   |
|              | 6   | 1            | 8      | 0       | 9                | 3.3      | 275 | 47.3           | 9         | 262 | 8.7             | 9   |
|              | 7   | 5            | 6      | 0       | 11               | 4.1      | 295 | 63.4           | 11        | 268 | 16.0            | 11  |
|              | 8   | 14           | 20     | 0       | 34               | 12.6     | 348 | 41.7           | 34        | 282 | 10.2            | 34  |
|              | 9   | 6            | 11     | 0       | 17               | 6.3      | 415 | 54.8           | 17        | 292 | 10.6            | 17  |
|              | 10  | 29           | 37     | 0       | 66               | 24.5     | 413 | 63.3           | 66        | 296 | 11.3            | 66  |
|              | 11  | 37           | 36     | 0       | 73               | 27.1     | 451 | 55.2           | 73        | 304 | 8.9             | 73  |
|              | 12  | 20           | 32     | 0       | 52               | 19.3     | 466 | 53.2           | 52        | 309 | 9.9             | 52  |
|              | 13  | 0            | 2      | 0       | 2                | 0.7      | 538 | 17.0           | 2         | 324 | 2.8             | 2   |
|              | 14  | 3            | 0      | 0       | 3                | 1.1      | 442 | 8.7            | 3         | 304 | 2.5             | 3   |
|              | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16           |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total |     | 115          | 154    | 0       | 269              | 100.0    | 416 | 78.1           | 269       | 296 | 16.7            | 269 |

-Continued-

Appendix A.15. (p. 3 of 3)

| Sample Dates         | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |     |                   | Length       |     |                    |      |
|----------------------|-----|--------------|--------|---------|------------------------|-------------|-----|-------------------|--------------|-----|--------------------|------|
|                      |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD  | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |      |
| 20 May               | 3   |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 5   | 54           | 59     | 0       | 113                    | 37.8        | 163 | 22.8              | 113          | 238 | 6.8                | 113  |
|                      | 6   | 47           | 35     | 0       | 82                     | 27.4        | 212 | 40.2              | 82           | 255 | 10.6               | 82   |
|                      | 7   | 8            | 2      | 0       | 10                     | 3.3         | 255 | 53.8              | 10           | 268 | 14.2               | 10   |
|                      | 8   | 24           | 20     | 0       | 44                     | 14.7        | 317 | 47.8              | 44           | 279 | 10.7               | 44   |
|                      | 9   | 7            | 0      | 0       | 7                      | 2.3         | 352 | 99.5              | 7            | 288 | 8.6                | 7    |
|                      | 10  | 9            | 5      | 0       | 14                     | 4.7         | 384 | 59.2              | 14           | 293 | 11.7               | 14   |
|                      | 11  | 12           | 8      | 0       | 20                     | 6.7         | 406 | 52.3              | 20           | 302 | 8.3                | 20   |
|                      | 12  | 2            | 7      | 0       | 9                      | 3.0         | 447 | 46.1              | 9            | 307 | 5.1                | 9    |
|                      | 13  |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 14  |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 15  |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 16  |              |        |         |                        |             |     |                   |              |     |                    |      |
| Sample Total         |     | 163          | 136    | 0       | 299                    | 100.0       | 242 | 97.0              | 299          | 260 | 24.2               | 299  |
| 5-20 May             | 3   |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 4   |              |        |         |                        |             |     |                   |              |     |                    |      |
|                      | 5   | 63           | 73     | 0       | 136                    | 8.8         | 166 | 27.0              | 136          | 239 | 8.7                | 136  |
|                      | 6   | 80           | 84     | 0       | 164                    | 10.6        | 224 | 53.2              | 164          | 259 | 12.0               | 164  |
|                      | 7   | 26           | 22     | 0       | 48                     | 3.1         | 274 | 56.9              | 48           | 270 | 13.8               | 48   |
|                      | 8   | 101          | 130    | 0       | 231                    | 15.0        | 330 | 66.3              | 231          | 284 | 11.9               | 231  |
|                      | 9   | 32           | 49     | 0       | 81                     | 5.3         | 379 | 74.7              | 81           | 292 | 11.7               | 81   |
|                      | 10  | 130          | 151    | 0       | 281                    | 18.2        | 400 | 76.3              | 281          | 299 | 12.4               | 281  |
|                      | 11  | 167          | 177    | 0       | 344                    | 22.3        | 424 | 76.4              | 343          | 303 | 11.7               | 344  |
|                      | 12  | 80           | 145    | 0       | 225                    | 14.6        | 451 | 74.2              | 225          | 308 | 10.7               | 225  |
|                      | 13  | 4            | 11     | 0       | 15                     | 1.0         | 476 | 86.9              | 15           | 317 | 10.2               | 15   |
|                      | 14  | 4            | 8      | 0       | 12                     | 0.8         | 516 | 72.0              | 12           | 315 | 9.0                | 12   |
|                      | 15  | 1            | 3      | 0       | 4                      | 0.3         | 465 | 119.5             | 4            | 302 | 6.8                | 4    |
|                      | 16  |              |        |         |                        |             |     |                   |              |     |                    |      |
| All Samples Combined |     | 688          | 853    | 0       | 1541                   | 100.0       | 360 | 114.7             | 1540         | 288 | 24.4               | 1541 |
| Sex Composition      |     | 44.6         | 55.4   |         |                        |             |     |                   |              |     |                    |      |
| Unaged               |     | 88           | 119    | 0       | 207                    | 13.4        | 373 | 118.7             | 207          | 291 | 24.1               | 207  |
| Sex Composition      |     | 42.5         | 57.5   |         |                        |             |     |                   |              |     |                    |      |

Appendix A.16. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet Kulukak Section, 1-23 May 1989.

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 1 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 11  | 1            | 0      | 0       | 1     | 100.0            | 362      |      | 1              | 280       |      | 1               |
|              | 12  |              |        |         |       |                  |          |      |                |           |      |                 |
| 13           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 14           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 15           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 1            | 0      | 0       | 1     | 100.0            | 362      |      | 1              | 280       |      | 1               |
| 3 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   | 0            | 1      | 0       | 1     | 11.1             | 274      |      | 1              | 265       |      | 1               |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 1            | 1      | 0       | 2     | 22.2             | 358      | 19.8 | 2              | 286       | 6.4  | 2               |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  | 0            | 1      | 0       | 1     | 11.1             | 480      |      | 1              | 305       |      | 1               |
|              | 11  | 1            | 2      | 0       | 3     | 33.3             | 469      | 63.4 | 3              | 305       | 9.9  | 3               |
|              | 12  | 0            | 1      | 0       | 1     | 11.1             | 478      |      | 1              | 310       |      | 1               |
| 13           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 14           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 15           | 0   | 1            | 0      | 1       | 11.1  | 554              |          | 1    | 324            |           | 1    |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 2            | 7      | 0       | 9     | 100.0            | 434      | 92.1 | 9              | 299       | 18.2 | 9               |
| 4 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 1            | 0      | 0       | 1     | 33.3             | 326      |      | 1              | 293       |      | 1               |
|              | 9   | 1            | 0      | 0       | 1     | 33.3             | 406      |      | 1              | 312       |      | 1               |
|              | 10  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 11  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 12  | 1            | 0      | 0       | 1     | 33.3             | 404      |      | 1              | 311       |      | 1               |
| 13           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 14           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 15           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 3            | 0      | 0       | 3     | 100.0            | 379      | 45.6 | 3              | 305       | 10.7 | 3               |

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Appendix A.16. (p. 2 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |      |                   | Length       |      |                    |
|--------------|-----|--------------|--------|---------|-------|------------------------|-------------|------|-------------------|--------------|------|--------------------|
|              |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD   | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
| 5 May        | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 5   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 6   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 7   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 8   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 9   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 10  |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 11  | 3            | 1      | 0       | 4     | 80.0                   | 409         | 38.6 | 4                 | 309          | 13.8 | 4                  |
|              | 12  | 0            | 1      | 0       | 1     | 20.0                   | 448         |      | 1                 | 315          |      | 1                  |
|              | 13  |              |        |         |       |                        |             |      |                   |              |      |                    |
| 14           |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| 15           |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| 16           |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| Sample Total |     | 3            | 2      | 0       | 5     | 100.0                  | 416         | 37.8 | 5                 | 310          | 12.3 | 5                  |
| 6 May        | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 5   | 0            | 1      | 0       | 1     | 2.5                    | 174         |      | 1                 | 241          |      | 1                  |
|              | 6   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 7   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 8   | 3            | 4      | 0       | 7     | 17.5                   | 367         | 66.3 | 7                 | 288          | 9.6  | 7                  |
|              | 9   | 2            | 0      | 0       | 2     | 5.0                    | 398         | 36.8 | 2                 | 298          | 4.2  | 2                  |
|              | 10  | 7            | 3      | 0       | 10    | 25.0                   | 397         | 64.7 | 10                | 293          | 9.5  | 10                 |
|              | 11  | 3            | 8      | 0       | 11    | 27.5                   | 427         | 39.2 | 11                | 301          | 10.7 | 11                 |
|              | 12  | 1            | 5      | 0       | 6     | 15.0                   | 460         | 50.7 | 6                 | 310          | 7.7  | 6                  |
|              | 13  | 0            | 1      | 0       | 1     | 2.5                    | 546         |      | 1                 | 326          |      | 1                  |
| 14           |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| 15           | 1   | 1            | 0      | 2       | 5.0   | 481                    | 89.1        | 2    | 327               | 9.2          | 2    |                    |
| 16           |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| Sample Total |     | 17           | 23     | 0       | 40    | 100.0                  | 412         | 74.9 | 40                | 298          | 16.5 | 40                 |
| 7 May        | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 5   | 2            | 0      | 0       | 2     | 2.9                    | 200         | 14.1 | 2                 | 248          | 12.0 | 2                  |
|              | 6   | 0            | 1      | 0       | 1     | 1.5                    | 222         |      | 1                 | 248          |      | 1                  |
|              | 7   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 8   | 8            | 7      | 0       | 15    | 22.1                   | 357         | 38.5 | 15                | 289          | 8.4  | 15                 |
|              | 9   | 4            | 3      | 0       | 7     | 10.3                   | 401         | 39.7 | 7                 | 297          | 5.3  | 7                  |
|              | 10  | 8            | 3      | 0       | 11    | 16.2                   | 410         | 36.1 | 11                | 302          | 6.6  | 11                 |
|              | 11  | 12           | 5      | 0       | 17    | 25.0                   | 426         | 35.7 | 17                | 304          | 8.9  | 17                 |
|              | 12  | 9            | 3      | 0       | 12    | 17.6                   | 461         | 53.9 | 12                | 310          | 10.5 | 12                 |
|              | 13  |              |        |         |       |                        |             |      |                   |              |      |                    |
| 14           | 2   | 0            | 0      | 2       | 2.9   | 454                    | 22.6        | 2    | 311               | 5.7          | 2    |                    |
| 15           | 1   | 0            | 0      | 1       | 1.5   | 552                    |             | 1    | 328               |              | 1    |                    |
| 16           |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| Sample Total |     | 46           | 22     | 0       | 68    | 100.0                  | 405         | 69.2 | 68                | 299          | 15.8 | 68                 |

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Appendix A.16. (p. 3 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 8 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 2            | 1      | 0       | 3     | 25.0             | 367      | 59.0 | 3              | 288       | 9.1  | 3               |
|              | 9   | 1            | 0      | 0       | 1     | 8.3              | 398      |      | 1              | 304       |      | 1               |
|              | 10  | 2            | 1      | 0       | 3     | 25.0             | 469      | 31.4 | 3              | 301       | 5.7  | 3               |
|              | 11  | 1            | 2      | 0       | 3     | 25.0             | 447      | 31.3 | 3              | 302       | 9.2  | 3               |
|              | 12  | 1            | 1      | 0       | 2     | 16.7             | 442      | 31.1 | 2              | 309       | 9.9  | 2               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 7            | 5      | 0       | 12    | 100.0            | 428      | 52.5 | 12             | 300       | 10.0 | 12              |
| 9 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 4            | 0      | 0       | 4     | 3.6              | 191      | 34.0 | 4              | 241       | 9.7  | 4               |
|              | 6   | 4            | 4      | 0       | 8     | 7.2              | 252      | 23.9 | 8              | 259       | 6.8  | 8               |
|              | 7   | 1            | 0      | 0       | 1     | 0.9              | 292      |      | 1              | 260       |      | 1               |
|              | 8   | 14           | 13     | 0       | 27    | 24.3             | 339      | 53.2 | 27             | 282       | 11.7 | 27              |
|              | 9   | 9            | 1      | 0       | 10    | 9.0              | 356      | 24.1 | 10             | 289       | 8.2  | 10              |
|              | 10  | 7            | 11     | 0       | 18    | 16.2             | 394      | 43.7 | 18             | 297       | 12.4 | 18              |
|              | 11  | 16           | 13     | 1       | 30    | 27.0             | 422      | 47.0 | 30             | 301       | 7.9  | 30              |
|              | 12  | 6            | 4      | 0       | 10    | 9.0              | 416      | 46.0 | 10             | 307       | 11.0 | 10              |
|              | 13  | 2            | 0      | 0       | 2     | 1.8              | 360      | 96.2 | 2              | 303       | 3.5  | 2               |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           | 0   | 1            | 0      | 1       | 0.9   | 464              |          | 1    | 325            |           | 1    |                 |
| Sample Total |     | 63           | 47     | 1       | 111   | 100.0            | 368      | 74.3 | 111            | 290       | 18.9 | 111             |
| 10 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 5            | 1      | 0       | 6     | 6.7              | 195      | 28.8 | 6              | 242       | 12.2 | 6               |
|              | 6   | 4            | 9      | 0       | 13    | 14.6             | 263      | 38.1 | 13             | 263       | 8.8  | 13              |
|              | 7   | 2            | 0      | 0       | 2     | 2.2              | 340      | 31.1 | 2              | 275       | 2.1  | 2               |
|              | 8   | 10           | 8      | 0       | 18    | 20.2             | 336      | 38.1 | 18             | 277       | 8.8  | 18              |
|              | 9   | 4            | 1      | 0       | 5     | 5.6              | 351      | 31.0 | 5              | 286       | 8.2  | 5               |
|              | 10  | 10           | 4      | 0       | 14    | 15.7             | 407      | 28.8 | 14             | 296       | 6.4  | 14              |
|              | 11  | 13           | 10     | 0       | 23    | 25.8             | 424      | 43.3 | 23             | 300       | 6.8  | 23              |
|              | 12  | 5            | 3      | 0       | 8     | 9.0              | 438      | 41.8 | 8              | 299       | 6.7  | 8               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 53           | 36     | 0       | 89    | 100.0            | 360      | 81.5 | 89             | 284       | 19.2 | 89              |

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Appendix A.16. (p.4 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 11 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 5            | 0      | 0       | 5     | 4.1              | 159      | 19.6 | 5              | 235       | 3.9  | 5               |
|              | 6   | 2            | 6      | 0       | 8     | 6.6              | 214      | 34.7 | 8              | 257       | 10.8 | 8               |
|              | 7   | 0            | 2      | 0       | 2     | 1.6              | 317      | 38.2 | 2              | 288       | 0.0  | 2               |
|              | 8   | 14           | 16     | 0       | 30    | 24.6             | 318      | 39.6 | 30             | 283       | 9.3  | 30              |
|              | 9   | 5            | 2      | 0       | 7     | 5.7              | 339      | 46.8 | 7              | 290       | 10.6 | 7               |
|              | 10  | 13           | 10     | 0       | 23    | 18.9             | 362      | 49.8 | 23             | 296       | 10.4 | 23              |
|              | 11  | 22           | 13     | 0       | 35    | 28.7             | 380      | 54.0 | 35             | 300       | 10.1 | 35              |
|              | 12  | 7            | 4      | 1       | 12    | 9.8              | 390      | 58.0 | 12             | 301       | 8.8  | 12              |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 68           | 53     | 1       | 122   | 100.0            | 339      | 74.0 | 122            | 289       | 18.5 | 122             |
| 12 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 2            | 0      | 0       | 2     | 1.7              | 192      | 33.9 | 2              | 245       | 17.7 | 2               |
|              | 6   | 9            | 4      | 0       | 13    | 10.9             | 210      | 39.7 | 13             | 254       | 11.1 | 13              |
|              | 7   | 5            | 0      | 0       | 5     | 4.2              | 238      | 13.4 | 5              | 263       | 7.5  | 5               |
|              | 8   | 17           | 5      | 0       | 22    | 18.5             | 319      | 50.0 | 22             | 280       | 9.7  | 22              |
|              | 9   | 6            | 2      | 0       | 8     | 6.7              | 333      | 28.5 | 8              | 286       | 7.0  | 8               |
|              | 10  | 16           | 7      | 0       | 23    | 19.3             | 363      | 59.6 | 23             | 292       | 12.5 | 23              |
|              | 11  | 13           | 18     | 0       | 31    | 26.1             | 392      | 73.3 | 31             | 297       | 10.6 | 31              |
|              | 12  | 10           | 4      | 0       | 14    | 11.8             | 394      | 37.8 | 14             | 300       | 9.0  | 14              |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  | 0            | 1      | 0       | 1     | 0.8              | 394      |      | 1              | 309       |      | 1               |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 78           | 41     | 0       | 119   | 100.0            | 339      | 82.5 | 119            | 286       | 18.4 | 119             |
| 13 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 1            | 1      | 0       | 2     | 2.0              | 180      | 5.7  | 2              | 237       | 1.4  | 2               |
|              | 6   | 13           | 5      | 0       | 18    | 17.8             | 238      | 39.0 | 18             | 258       | 10.8 | 18              |
|              | 7   | 1            | 0      | 0       | 1     | 1.0              | 398      |      | 1              | 280       |      | 1               |
|              | 8   | 12           | 7      | 0       | 19    | 18.8             | 318      | 54.9 | 19             | 282       | 9.1  | 19              |
|              | 9   | 3            | 2      | 0       | 5     | 5.0              | 389      | 68.2 | 5              | 293       | 13.2 | 5               |
|              | 10  | 6            | 7      | 0       | 13    | 12.9             | 388      | 55.1 | 13             | 295       | 9.4  | 13              |
|              | 11  | 11           | 13     | 1       | 25    | 24.8             | 410      | 64.6 | 25             | 300       | 10.3 | 25              |
|              | 12  | 5            | 9      | 0       | 14    | 13.9             | 418      | 71.4 | 14             | 302       | 12.3 | 14              |
|              | 13  | 1            | 0      | 0       | 1     | 1.0              | 426      |      | 1              | 306       |      | 1               |
|              | 14  | 1            | 0      | 0       | 1     | 1.0              | 374      |      | 1              | 302       |      | 1               |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           | 0   | 2            | 0      | 2       | 2.0   | 441              | 32.5     | 2    | 309            | 0.7       | 2    |                 |
| Sample Total |     | 54           | 46     | 1       | 101   | 100.0            | 355      | 90.1 | 101            | 287       | 19.8 | 101             |

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Appendix A.16. (p. 5 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 14 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 4            | 3      | 0       | 7     | 6.1              | 171      | 29.8 | 7              | 229       | 18.7 | 7               |
|              | 6   | 14           | 5      | 0       | 19    | 16.7             | 225      | 35.2 | 19             | 254       | 9.2  | 19              |
|              | 7   | 3            | 6      | 0       | 9     | 7.9              | 295      | 48.0 | 9              | 272       | 10.9 | 9               |
|              | 8   | 9            | 8      | 0       | 17    | 14.9             | 318      | 42.0 | 17             | 282       | 4.7  | 17              |
|              | 9   | 4            | 2      | 0       | 6     | 5.3              | 348      | 66.1 | 6              | 291       | 14.5 | 6               |
|              | 10  | 15           | 6      | 1       | 22    | 19.3             | 390      | 46.6 | 22             | 295       | 7.8  | 22              |
|              | 11  | 16           | 7      | 0       | 23    | 20.2             | 394      | 48.3 | 23             | 300       | 9.4  | 23              |
|              | 12  | 3            | 7      | 0       | 10    | 8.8              | 448      | 80.6 | 10             | 310       | 12.7 | 10              |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           | 1   | 0            | 0      | 1       | 0.9   | 404              |          | 1    | 301            |           | 1    |                 |
| Sample Total |     | 69           | 44     | 1       | 114   | 100.0            | 335      | 92.6 | 114            | 282       | 24.1 | 114             |
| 16 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 5            | 3      | 0       | 8     | 9.0              | 177      | 26.6 | 8              | 238       | 7.8  | 8               |
|              | 6   | 16           | 5      | 0       | 21    | 23.6             | 235      | 27.8 | 21             | 258       | 8.6  | 21              |
|              | 7   | 3            | 3      | 1       | 7     | 7.9              | 285      | 30.9 | 7              | 273       | 11.6 | 7               |
|              | 8   | 11           | 8      | 0       | 19    | 21.3             | 322      | 37.8 | 19             | 283       | 7.9  | 19              |
|              | 9   | 2            | 2      | 0       | 4     | 4.5              | 335      | 50.2 | 4              | 285       | 6.5  | 4               |
|              | 10  | 2            | 6      | 0       | 8     | 9.0              | 363      | 44.3 | 8              | 295       | 9.2  | 8               |
|              | 11  | 10           | 6      | 0       | 16    | 18.0             | 378      | 39.1 | 16             | 298       | 9.2  | 16              |
|              | 12  | 2            | 4      | 0       | 6     | 6.7              | 436      | 46.4 | 6              | 306       | 10.7 | 6               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 51           | 37     | 1       | 89    | 100.0            | 308      | 80.2 | 89             | 277       | 21.9 | 89              |
| 17 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 1            | 0      | 0       | 1     | 9.1              | 186      |      | 1              | 238       |      | 1               |
|              | 6   | 3            | 1      | 0       | 4     | 36.4             | 213      | 21.2 | 4              | 252       | 9.6  | 4               |
|              | 7   | 2            | 1      | 0       | 3     | 27.3             | 280      | 27.1 | 3              | 268       | 9.5  | 3               |
|              | 8   | 1            | 0      | 0       | 1     | 9.1              | 326      |      | 1              | 248       |      | 1               |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  | 1            | 0      | 0       | 1     | 9.1              | 336      |      | 1              | 286       |      | 1               |
|              | 11  | 1            | 0      | 0       | 1     | 9.1              | 364      |      | 1              | 287       |      | 1               |
|              | 12  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 9            | 2      | 0       | 11    | 100.0            | 264      | 62.7 | 11             | 261       | 17.1 | 11              |

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Appendix A.16. (p. 6 of 8)

| Sample Dates | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |     |                   | Length       |     |                    |     |
|--------------|-----|--------------|--------|---------|------------------------|-------------|-----|-------------------|--------------|-----|--------------------|-----|
|              |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD  | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |     |
| 18 May       | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 5   | 24           | 19     | 0       | 43                     | 36.1        | 164 | 18.5              | 43           | 235 | 7.5                | 43  |
|              | 6   | 22           | 15     | 0       | 37                     | 31.1        | 212 | 29.2              | 37           | 252 | 10.5               | 37  |
|              | 7   | 3            | 1      | 0       | 4                      | 3.4         | 252 | 36.3              | 4            | 263 | 9.4                | 4   |
|              | 8   | 6            | 10     | 0       | 16                     | 13.4        | 320 | 54.4              | 16           | 277 | 12.1               | 16  |
|              | 9   | 1            | 1      | 0       | 2                      | 1.7         | 342 | 25.5              | 2            | 281 | 4.9                | 2   |
|              | 10  | 2            | 1      | 0       | 3                      | 2.5         | 377 | 42.2              | 3            | 292 | 10.4               | 3   |
|              | 11  | 6            | 3      | 0       | 9                      | 7.6         | 413 | 61.9              | 9            | 296 | 12.6               | 9   |
|              | 12  | 3            | 2      | 0       | 5                      | 4.2         | 408 | 86.3              | 5            | 301 | 5.7                | 5   |
|              | 13  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 14  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16           |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total |     | 67           | 52     | 0       | 119                    | 100.0       | 240 | 93.3              | 119          | 257 | 23.8               | 119 |
| 19 May       | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 5   | 8            | 10     | 0       | 18                     | 15.7        | 180 | 27.4              | 18           | 241 | 8.4                | 18  |
|              | 6   | 18           | 14     | 0       | 32                     | 29.6        | 223 | 40.8              | 32           | 255 | 9.7                | 32  |
|              | 7   | 1            | 1      | 0       | 2                      | 1.9         | 229 | 43.8              | 2            | 265 | 2.8                | 2   |
|              | 8   | 11           | 10     | 0       | 21                     | 19.4        | 313 | 42.0              | 21           | 276 | 9.0                | 21  |
|              | 9   | 4            | 0      | 0       | 4                      | 3.7         | 323 | 67.0              | 4            | 293 | 4.7                | 4   |
|              | 10  | 8            | 4      | 0       | 12                     | 11.1        | 392 | 35.1              | 12           | 296 | 4.5                | 12  |
|              | 11  | 9            | 6      | 0       | 15                     | 13.9        | 392 | 53.5              | 15           | 299 | 9.5                | 15  |
|              | 12  | 4            | 0      | 0       | 4                      | 3.7         | 343 | 76.1              | 4            | 294 | 9.6                | 4   |
|              | 13  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 14  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16           |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total |     | 63           | 45     | 0       | 108                    | 100.0       | 284 | 89.7              | 108          | 270 | 22.8               | 108 |
| 20 May       | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 5   | 6            | 5      | 0       | 11                     | 15.5        | 164 | 23.7              | 11           | 234 | 7.4                | 11  |
|              | 6   | 11           | 9      | 0       | 20                     | 28.2        | 201 | 27.8              | 20           | 254 | 9.3                | 20  |
|              | 7   | 2            | 1      | 0       | 3                      | 4.2         | 299 | 66.2              | 3            | 279 | 14.7               | 3   |
|              | 8   | 7            | 3      | 0       | 10                     | 14.1        | 283 | 39.0              | 10           | 276 | 9.0                | 10  |
|              | 9   | 3            | 2      | 0       | 5                      | 7.0         | 340 | 64.7              | 5            | 285 | 5.7                | 5   |
|              | 10  | 5            | 2      | 0       | 7                      | 9.9         | 317 | 48.2              | 7            | 292 | 12.1               | 7   |
|              | 11  | 5            | 6      | 0       | 11                     | 15.5        | 384 | 47.6              | 11           | 307 | 12.1               | 11  |
|              | 12  | 1            | 0      | 1       | 2                      | 2.8         | 346 | 33.9              | 2            | 304 | 10.6               | 2   |
|              | 13  | 0            | 2      | 0       | 2                      | 2.8         | 482 | 82.0              | 2            | 316 | 6.4                | 2   |
|              | 14  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16           |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total |     | 40           | 30     | 1       | 71                     | 100.0       | 273 | 93.4              | 71           | 272 | 27.0               | 71  |

-Continued-

Appendix A.16. (p. 7 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |       |                   | Length       |      |                    |
|--------------|-----|--------------|--------|---------|-------|------------------------|-------------|-------|-------------------|--------------|------|--------------------|
|              |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD    | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
|              |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| 21 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 9            | 14     | 0       | 23    | 20.7                   | 180         | 50.9  | 23                | 241          | 12.8 | 23                 |
|              | 6   | 16           | 11     | 0       | 27    | 24.3                   | 206         | 38.7  | 27                | 253          | 12.2 | 27                 |
|              | 7   | 1            | 1      | 0       | 2     | 1.8                    | 243         | 7.1   | 2                 | 269          | 6.4  | 2                  |
|              | 8   | 8            | 11     | 0       | 19    | 17.1                   | 307         | 48.2  | 19                | 280          | 10.3 | 19                 |
|              | 9   | 2            | 4      | 0       | 6     | 5.4                    | 340         | 54.6  | 6                 | 290          | 8.2  | 6                  |
|              | 10  | 6            | 3      | 0       | 9     | 8.1                    | 361         | 42.3  | 9                 | 291          | 11.1 | 9                  |
|              | 11  | 9            | 6      | 0       | 15    | 13.5                   | 387         | 48.4  | 15                | 297          | 9.0  | 15                 |
|              | 12  | 5            | 5      | 0       | 10    | 9.0                    | 408         | 58.7  | 10                | 302          | 7.9  | 10                 |
|              | 13  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
| 16           |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 56           | 55     | 0       | 111   | 100.0                  | 281         | 97.2  | 111               | 271          | 25.2 | 111                |
| 22 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 14           | 15     | 0       | 29    | 26.1                   | 191         | 59.4  | 29                | 238          | 10.3 | 29                 |
|              | 6   | 21           | 13     | 0       | 34    | 30.6                   | 231         | 47.2  | 34                | 254          | 13.5 | 34                 |
|              | 7   | 2            | 3      | 0       | 5     | 4.5                    | 249         | 36.5  | 5                 | 262          | 9.8  | 5                  |
|              | 8   | 6            | 1      | 0       | 7     | 6.3                    | 343         | 54.5  | 7                 | 285          | 11.8 | 7                  |
|              | 9   | 2            | 2      | 0       | 4     | 3.6                    | 311         | 9.2   | 4                 | 280          | 7.2  | 4                  |
|              | 10  | 6            | 3      | 0       | 9     | 8.1                    | 344         | 73.2  | 9                 | 289          | 16.3 | 9                  |
|              | 11  | 8            | 4      | 0       | 12    | 10.8                   | 421         | 51.8  | 12                | 306          | 7.7  | 12                 |
|              | 12  | 3            | 7      | 0       | 10    | 9.0                    | 450         | 51.1  | 10                | 314          | 6.5  | 10                 |
|              | 13  | 0            | 1      | 0       | 1     | 0.9                    | 286         |       | 1                 | 274          |      | 1                  |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
| 16           |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 62           | 49     | 0       | 111   | 100.0                  | 281         | 104.7 | 111               | 267          | 28.8 | 111                |
| 23 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   | 1            | 0      | 0       | 1     | 1.7                    | 108         |       | 1                 | 224          |      | 1                  |
|              | 5   | 6            | 9      | 0       | 15    | 25.4                   | 156         | 19.9  | 15                | 237          | 7.3  | 15                 |
|              | 6   | 12           | 8      | 0       | 20    | 33.9                   | 198         | 26.8  | 20                | 252          | 9.6  | 20                 |
|              | 7   | 1            | 0      | 0       | 1     | 1.7                    | 264         |       | 1                 | 277          |      | 1                  |
|              | 8   | 2            | 3      | 0       | 5     | 8.5                    | 304         | 54.1  | 5                 | 281          | 9.4  | 5                  |
|              | 9   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 10  | 4            | 1      | 0       | 5     | 8.5                    | 282         | 75.0  | 5                 | 281          | 23.9 | 5                  |
|              | 11  | 4            | 4      | 0       | 8     | 13.6                   | 378         | 60.6  | 8                 | 304          | 11.2 | 8                  |
|              | 12  | 1            | 0      | 3       | 4     | 6.8                    | 319         | 28.8  | 4                 | 298          | 10.6 | 4                  |
|              | 13  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
| 16           |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 31           | 25     | 3       | 59    | 100.0                  | 236         | 87.7  | 59                | 263          | 26.8 | 59                 |

-Continued-

Appendix A.16. (p. 8 of 8)

| Sample Dates         | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |       |                   | Length       |      |                    |
|----------------------|-----|--------------|--------|---------|-------|------------------------|-------------|-------|-------------------|--------------|------|--------------------|
|                      |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD    | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
|                      | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|                      | 4   | 1            | 0      | 0       | 1     | 0.1                    | 108         |       | 1                 | 224          |      | 1                  |
|                      | 5   | 96           | 81     | 0       | 177   | 12.0                   | 175         | 37.1  | 177               | 238          | 9.9  | 177                |
|                      | 6   | 165          | 111    | 0       | 276   | 18.7                   | 221         | 38.8  | 276               | 255          | 10.7 | 276                |
|                      | 7   | 27           | 19     | 1       | 47    | 3.2                    | 277         | 46.9  | 47                | 270          | 10.9 | 47                 |
|                      | 8   | 143          | 116    | 0       | 259   | 17.6                   | 324         | 48.3  | 259               | 281          | 10.1 | 259                |
| 1-23 May             | 9   | 53           | 24     | 0       | 77    | 5.2                    | 352         | 49.1  | 77                | 290          | 9.6  | 77                 |
|                      | 10  | 118          | 73     | 1       | 192   | 13.0                   | 378         | 56.4  | 192               | 295          | 10.9 | 192                |
|                      | 11  | 164          | 127    | 2       | 293   | 19.9                   | 403         | 55.1  | 293               | 300          | 9.9  | 293                |
|                      | 12  | 67           | 60     | 5       | 132   | 9.0                    | 419         | 63.5  | 132               | 305          | 10.4 | 132                |
|                      | 13  | 3            | 4      | 0       | 7     | 0.5                    | 420         | 103.9 | 7                 | 306          | 16.7 | 7                  |
|                      | 14  | 3            | 0      | 0       | 3     | 0.2                    | 427         | 48.9  | 3                 | 308          | 6.6  | 3                  |
|                      | 15  | 2            | 3      | 0       | 5     | 0.3                    | 492         | 79.4  | 5                 | 323          | 9.1  | 5                  |
|                      | 16  | 1            | 3      | 0       | 4     | 0.3                    | 438         | 31.1  | 4                 | 311          | 10.1 | 4                  |
| All Samples Combined |     | 843          | 621    | 9       | 1473  | 100.0                  | 319         | 99.3  | 1473              | 279          | 25.0 | 1473               |
| Sex Composition      |     | 57.6         | 42.4   |         |       |                        |             |       |                   |              |      |                    |
| Unaged               |     | 130          | 96     | 0       | 226   | 15.3                   | 308         | 98.4  | 226               | 277          | 24.6 | 226                |
| Sex Composition      |     | 57.5         | 42.5   |         |       |                        |             |       |                   |              |      |                    |

Appendix A.17. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet Nunavachak Section, 4-19 May 1989.

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 4 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 11  | 0            | 1      | 0       | 1     | 100.0            | 355      |      | 1              | 310       |      | 1               |
|              | 12  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
| 14           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 15           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 0            | 1      | 0       | 1     | 100.0            | 355      |      | 1              | 310       |      | 1               |
| 9 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   | 1            | 1      | 0       | 2     | 1.6              | 324      | 28.3 | 2              | 273       | 9.9  | 2               |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 6            | 10     | 0       | 16    | 12.7             | 385      | 50.6 | 16             | 288       | 11.2 | 16              |
|              | 9   | 1            | 6      | 0       | 7     | 5.6              | 411      | 53.6 | 7              | 297       | 9.6  | 7               |
|              | 10  | 12           | 8      | 0       | 20    | 15.9             | 425      | 44.0 | 20             | 297       | 9.0  | 20              |
|              | 11  | 22           | 32     | 0       | 54    | 42.9             | 448      | 42.7 | 54             | 301       | 9.4  | 54              |
|              | 12  | 14           | 11     | 0       | 25    | 19.8             | 464      | 40.5 | 25             | 306       | 7.9  | 25              |
|              | 13  | 1            | 1      | 0       | 2     | 1.6              | 518      | 88.4 | 2              | 311       | 2.1  | 2               |
| 14           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 15           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 57           | 69     | 0       | 126   | 100.0            | 436      | 53.0 | 126            | 299       | 11.2 | 126             |
| 11 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 5            | 6      | 0       | 11    | 5.8              | 196      | 44.3 | 11             | 241       | 16.0 | 11              |
|              | 6   | 11           | 11     | 0       | 22    | 11.6             | 259      | 35.9 | 22             | 261       | 10.5 | 22              |
|              | 7   | 8            | 1      | 0       | 9     | 4.8              | 302      | 55.0 | 9              | 277       | 16.5 | 9               |
|              | 8   | 30           | 16     | 0       | 46    | 24.3             | 331      | 40.4 | 46             | 287       | 10.8 | 46              |
|              | 9   | 6            | 8      | 0       | 14    | 7.4              | 368      | 47.7 | 14             | 294       | 11.1 | 14              |
|              | 10  | 17           | 8      | 0       | 25    | 13.2             | 391      | 46.5 | 25             | 301       | 10.7 | 25              |
|              | 11  | 28           | 9      | 0       | 37    | 19.6             | 401      | 52.0 | 37             | 303       | 12.7 | 37              |
|              | 12  | 13           | 9      | 0       | 22    | 11.6             | 423      | 53.1 | 22             | 307       | 8.5  | 22              |
|              | 13  | 2            | 1      | 0       | 3     | 1.6              | 355      | 57.0 | 3              | 315       | 12.3 | 3               |
| 14           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 15           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 120          | 69     | 0       | 189   | 100.0            | 349      | 77.5 | 189            | 289       | 21.7 | 189             |

-Continued-

Appendix A.17. (p. 2 of 3)

| Sample Dates | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |     |                   | Length       |     |                    |     |
|--------------|-----|--------------|--------|---------|------------------------|-------------|-----|-------------------|--------------|-----|--------------------|-----|
|              |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD  | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |     |
| 12 May       | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 5   | 2            | 2      | 0       | 4                      | 2.4         | 217 | 16.8              | 4            | 252 | 3.7                | 4   |
|              | 6   | 10           | 6      | 0       | 16                     | 9.5         | 256 | 38.4              | 16           | 261 | 9.5                | 16  |
|              | 7   | 2            | 2      | 0       | 4                      | 2.4         | 288 | 28.1              | 4            | 275 | 5.3                | 4   |
|              | 8   | 17           | 12     | 0       | 29                     | 17.3        | 328 | 47.4              | 29           | 282 | 10.8               | 29  |
|              | 9   | 7            | 9      | 0       | 16                     | 9.5         | 387 | 43.9              | 16           | 293 | 9.4                | 16  |
|              | 10  | 23           | 20     | 0       | 43                     | 25.6        | 403 | 52.2              | 43           | 302 | 9.9                | 43  |
|              | 11  | 21           | 11     | 0       | 32                     | 19.0        | 420 | 42.2              | 32           | 306 | 10.1               | 32  |
|              | 12  | 11           | 6      | 0       | 17                     | 10.1        | 452 | 67.1              | 17           | 308 | 18.8               | 17  |
|              | 13  | 1            | 2      | 0       | 3                      | 1.8         | 455 | 76.2              | 3            | 320 | 12.1               | 3   |
|              | 14  | 1            | 0      | 0       | 1                      | 0.6         | 400 |                   | 1            | 310 |                    | 1   |
|              | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16           |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total |     | 98           | 70     | 0       | 168                    | 100.0       | 371 | 84.9              | 168          | 294 | 19.7               | 168 |
| 14 May       | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 5   | 4            | 1      | 0       | 5                      | 12.2        | 194 | 29.7              | 5            | 239 | 7.0                | 5   |
|              | 6   | 2            | 8      | 0       | 10                     | 24.4        | 245 | 38.6              | 10           | 260 | 11.6               | 10  |
|              | 7   | 1            | 0      | 0       | 1                      | 2.4         | 272 |                   | 1            | 275 |                    | 1   |
|              | 8   | 4            | 2      | 0       | 6                      | 14.6        | 346 | 36.7              | 6            | 285 | 8.7                | 6   |
|              | 9   | 1            | 0      | 0       | 1                      | 2.4         | 255 |                   | 1            | 274 |                    | 1   |
|              | 10  | 2            | 1      | 0       | 3                      | 7.3         | 422 | 57.0              | 3            | 302 | 5.9                | 3   |
|              | 11  | 7            | 0      | 0       | 7                      | 17.1        | 436 | 36.4              | 7            | 306 | 11.6               | 7   |
|              | 12  | 3            | 3      | 0       | 6                      | 14.6        | 415 | 46.0              | 6            | 314 | 5.6                | 6   |
|              | 13  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 14  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 15  | 0            | 1      | 0       | 1                      | 2.4         | 492 |                   | 1            | 319 |                    | 1   |
| 16           |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total |     | 25           | 16     | 0       | 41                     | 100.0       | 328 | 104.8             | 41           | 284 | 28.0               | 41  |
| 19 May       | 3   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 4   |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 5   | 16           | 20     | 0       | 36                     | 20.8        | 186 | 35.4              | 36           | 240 | 9.5                | 36  |
|              | 6   | 25           | 15     | 0       | 40                     | 23.1        | 215 | 22.5              | 40           | 255 | 8.3                | 40  |
|              | 7   | 3            | 3      | 0       | 6                      | 3.5         | 254 | 8.5               | 6            | 267 | 5.1                | 6   |
|              | 8   | 27           | 12     | 0       | 39                     | 22.5        | 322 | 54.8              | 39           | 282 | 10.8               | 39  |
|              | 9   | 5            | 3      | 0       | 8                      | 4.6         | 367 | 50.2              | 8            | 296 | 7.2                | 8   |
|              | 10  | 7            | 8      | 0       | 15                     | 8.7         | 365 | 51.4              | 15           | 295 | 11.5               | 15  |
|              | 11  | 16           | 7      | 0       | 23                     | 13.3        | 375 | 57.4              | 23           | 300 | 10.4               | 23  |
|              | 12  | 2            | 3      | 0       | 5                      | 2.9         | 462 | 34.5              | 5            | 308 | 4.3                | 5   |
|              | 13  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 14  |              |        |         |                        |             |     |                   |              |     |                    |     |
|              | 15  |              |        |         |                        |             |     |                   |              |     |                    |     |
| 16           |     |              |        |         |                        |             |     |                   |              |     |                    |     |
| Sample Total |     | 102          | 71     | 0       | 173                    | 100.0       | 282 | 91.5              | 173          | 272 | 25.0               | 173 |

-Continued-

Appendix A.17. (p. 3 of 3)

| Sample Dates         | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |      |                   | Length       |      |                    |
|----------------------|-----|--------------|--------|---------|-------|------------------------|-------------|------|-------------------|--------------|------|--------------------|
|                      |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD   | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
| 4-19 May             | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|                      | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|                      | 5   | 27           | 29     | 0       | 56    | 8.0                    | 191         | 36.2 | 56                | 241          | 10.8 | 56                 |
|                      | 6   | 49           | 41     | 0       | 90    | 12.9                   | 239         | 38.8 | 90                | 259          | 9.9  | 90                 |
|                      | 7   | 14           | 6      | 0       | 20    | 2.9                    | 283         | 43.1 | 20                | 274          | 12.1 | 20                 |
|                      | 8   | 84           | 52     | 0       | 136   | 19.5                   | 335         | 50.5 | 136               | 284          | 10.9 | 136                |
|                      | 9   | 20           | 26     | 0       | 46    | 6.6                    | 378         | 51.6 | 46                | 294          | 9.9  | 46                 |
|                      | 10  | 61           | 45     | 0       | 106   | 15.2                   | 400         | 51.7 | 106               | 300          | 10.2 | 106                |
|                      | 11  | 94           | 60     | 0       | 154   | 22.1                   | 419         | 53.4 | 154               | 303          | 10.7 | 154                |
|                      | 12  | 43           | 32     | 0       | 75    | 10.7                   | 445         | 53.7 | 75                | 308          | 11.1 | 75                 |
|                      | 13  | 4            | 4      | 0       | 8     | 1.1                    | 433         | 92.5 | 8                 | 316          | 10.0 | 8                  |
|                      | 14  | 1            | 0      | 0       | 1     | 0.1                    | 400         |      | 1                 | 310          |      | 1                  |
|                      | 15  | 0            | 1      | 0       | 1     | 0.1                    | 492         |      | 1                 | 319          |      | 1                  |
| 16                   |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| All Samples Combined |     | 402          | 296    | 0       | 698   | 100.0                  | 352         | 95.7 | 698               | 288          | 23.2 | 698                |
| Sex Composition      |     | 57.6         | 42.4   |         |       |                        |             |      |                   |              |      |                    |
| Unaged               |     | 57           | 50     | 0       | 107   | 15.3                   | 358         | 87.0 | 107               | 291          | 22.4 | 107                |
| Sex Composition      |     | 53.3         | 46.7   |         |       |                        |             |      |                   |              |      |                    |

Appendix A.18. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet Togiak Section, 19 May 1989.

| Sample Dates    | Age | Sex (number) |        |         | Percent of Total | Weight   |     |                | Length    |     |                 |     |
|-----------------|-----|--------------|--------|---------|------------------|----------|-----|----------------|-----------|-----|-----------------|-----|
|                 |     | Male         | Female | Unknown |                  | Mean (g) | SD  | Number Weighed | Mean (mm) | SD  | Number Measured |     |
| 19 May          | 3   |              |        |         |                  |          |     |                |           |     |                 |     |
|                 | 4   |              |        |         |                  |          |     |                |           |     |                 |     |
|                 | 5   | 5            | 3      | 0       | 8                | 6.4      | 196 | 16.1           | 8         | 240 | 9.3             | 8   |
|                 | 6   | 18           | 11     | 0       | 29               | 23.2     | 245 | 38.4           | 29        | 254 | 10.1            | 29  |
|                 | 7   | 2            | 2      | 0       | 4                | 3.2      | 277 | 53.8           | 4         | 266 | 9.4             | 4   |
|                 | 8   | 15           | 15     | 0       | 30               | 24.0     | 346 | 39.5           | 30        | 282 | 7.7             | 30  |
|                 | 9   | 0            | 3      | 0       | 3                | 2.4      | 340 | 21.0           | 3         | 286 | 9.0             | 3   |
|                 | 10  | 9            | 5      | 0       | 14               | 11.2     | 404 | 43.8           | 14        | 299 | 8.3             | 14  |
|                 | 11  | 18           | 10     | 0       | 28               | 22.4     | 412 | 47.6           | 28        | 300 | 11.4            | 28  |
|                 | 12  | 4            | 3      | 0       | 7                | 5.6      | 403 | 40.6           | 7         | 306 | 4.6             | 7   |
|                 | 13  |              |        |         |                  |          |     |                |           |     |                 |     |
|                 | 14  | 1            | 1      | 0       | 2                | 1.6      | 475 | 65.8           | 2         | 318 | 11.3            | 2   |
|                 | 15  |              |        |         |                  |          |     |                |           |     |                 |     |
| 16              |     |              |        |         |                  |          |     |                |           |     |                 |     |
| Sample Total    |     | 72           | 53     | 0       | 125              | 100.0    | 337 | 85.6           | 125       | 280 | 23.1            | 125 |
| Sex Composition |     | 57.6         | 42.4   |         |                  |          |     |                |           |     |                 |     |
| Unaged          |     | 9            | 9      | 0       | 18               | 14.4     | 297 | 103.4          | 18        | 269 | 26.9            | 18  |
| Sex Composition |     | 50.0         | 50.0   |         |                  |          |     |                |           |     |                 |     |

Appendix A.19. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet Hagemeister Section, 17-23 May 1989.

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
|              |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 17 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 0            | 1      | 0       | 1     | 3.1              | 172      |      | 1              | 222       |      | 1               |
|              | 6   | 3            | 3      | 0       | 6     | 18.8             | 233      | 30.6 | 6              | 244       | 11.0 | 6               |
|              | 7   | 1            | 1      | 0       | 2     | 6.3              | 332      | 31.1 | 2              | 276       | 9.9  | 2               |
|              | 8   | 1            | 5      | 0       | 6     | 18.8             | 347      | 60.7 | 6              | 280       | 15.5 | 6               |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  | 4            | 2      | 0       | 6     | 18.8             | 412      | 43.6 | 6              | 297       | 8.8  | 6               |
|              | 11  | 1            | 6      | 0       | 7     | 21.9             | 439      | 51.5 | 7              | 299       | 11.2 | 7               |
|              | 12  | 3            | 1      | 0       | 4     | 12.5             | 422      | 56.6 | 4              | 302       | 5.5  | 4               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 13           | 19     | 0       | 32    | 100.0            | 361      | 93.1 | 32             | 281       | 25.6 | 32              |
| 18 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 2            | 4      | 0       | 6     | 4.9              | 185      | 24.9 | 6              | 237       | 6.8  | 6               |
|              | 6   | 14           | 6      | 0       | 20    | 16.4             | 231      | 34.9 | 20             | 253       | 12.1 | 20              |
|              | 7   | 1            | 1      | 0       | 2     | 1.6              | 289      | 32.5 | 2              | 274       | 9.9  | 2               |
|              | 8   | 18           | 9      | 0       | 27    | 22.1             | 293      | 38.0 | 27             | 274       | 10.8 | 27              |
|              | 9   | 6            | 2      | 0       | 8     | 6.6              | 340      | 56.7 | 8              | 285       | 7.9  | 8               |
|              | 10  | 12           | 9      | 0       | 21    | 17.2             | 413      | 36.6 | 21             | 294       | 9.4  | 21              |
|              | 11  | 16           | 10     | 0       | 26    | 21.3             | 416      | 49.1 | 26             | 301       | 9.2  | 26              |
|              | 12  | 8            | 3      | 0       | 11    | 9.0              | 443      | 79.8 | 11             | 310       | 9.1  | 11              |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  | 0            | 1      | 0       | 1     | 0.8              | 577      |      | 1              | 325       |      | 1               |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 77           | 45     | 0       | 122   | 100.0            | 343      | 95.9 | 122            | 282       | 23.1 | 122             |
| 19 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 13           | 5      | 0       | 18    | 14.4             | 175      | 26.3 | 18             | 240       | 6.6  | 18              |
|              | 6   | 20           | 5      | 0       | 25    | 20.0             | 226      | 35.1 | 25             | 253       | 10.5 | 25              |
|              | 7   | 2            | 1      | 0       | 3     | 2.4              | 214      | 12.2 | 3              | 256       | 7.8  | 3               |
|              | 8   | 14           | 3      | 0       | 17    | 13.6             | 304      | 51.8 | 17             | 274       | 11.8 | 17              |
|              | 9   | 6            | 6      | 0       | 12    | 9.6              | 356      | 51.6 | 12             | 288       | 12.0 | 12              |
|              | 10  | 16           | 8      | 0       | 24    | 19.2             | 407      | 48.1 | 24             | 295       | 12.0 | 24              |
|              | 11  | 16           | 2      | 0       | 18    | 14.4             | 366      | 58.2 | 18             | 295       | 10.9 | 18              |
|              | 12  | 6            | 1      | 0       | 7     | 5.6              | 392      | 27.8 | 7              | 302       | 9.7  | 7               |
|              | 13  | 1            | 0      | 0       | 1     | 0.8              | 454      |      | 1              | 313       |      | 1               |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 94           | 31     | 0       | 125   | 100.0            | 307      | 95.8 | 125            | 275       | 24.3 | 125             |

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Appendix A.19. (p. 2 of 2)

| Sample Dates         | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       |                | Length    |      |                 |
|----------------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|                      |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
| 21 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 5   | 4            | 7      | 0       | 11    | 8.8              | 181      | 24.1  | 11             | 236       | 12.1 | 11              |
|                      | 6   | 6            | 12     | 0       | 18    | 14.4             | 231      | 39.8  | 18             | 254       | 10.1 | 18              |
|                      | 7   | 9            | 3      | 0       | 12    | 9.6              | 280      | 40.3  | 12             | 270       | 12.0 | 12              |
|                      | 8   | 18           | 7      | 0       | 25    | 20.0             | 341      | 38.1  | 25             | 282       | 9.0  | 25              |
|                      | 9   | 5            | 3      | 0       | 8     | 6.4              | 385      | 26.1  | 8              | 292       | 4.2  | 8               |
|                      | 10  | 12           | 7      | 0       | 19    | 15.2             | 393      | 59.6  | 19             | 296       | 11.2 | 19              |
|                      | 11  | 14           | 6      | 0       | 20    | 16.0             | 401      | 47.6  | 20             | 296       | 9.3  | 20              |
|                      | 12  | 7            | 3      | 0       | 10    | 8.0              | 426      | 27.4  | 10             | 306       | 7.1  | 10              |
|                      | 13  | 0            | 1      | 0       | 1     | 0.8              | 498      |       | 1              | 317       |      | 1               |
|                      | 14  | 1            | 0      | 0       | 1     | 0.8              | 484      |       | 1              | 322       |      | 1               |
|                      | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 76           | 49     | 0       | 125   | 100.0            | 335      | 89.9  | 125            | 280       | 23.2 | 125             |
| 23 May               | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 5   | 0            | 1      | 0       | 1     | 3.7              | 138      |       | 1              | 218       |      | 1               |
|                      | 6   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 7   | 2            | 1      | 0       | 3     | 11.1             | 299      | 37.6  | 3              | 268       | 13.2 | 3               |
|                      | 8   | 3            | 4      | 0       | 7     | 25.9             | 341      | 38.0  | 7              | 261       | 7.9  | 7               |
|                      | 9   | 2            | 0      | 0       | 2     | 7.4              | 347      | 52.3  | 2              | 294       | 12.7 | 2               |
|                      | 10  | 3            | 2      | 0       | 5     | 18.5             | 437      | 19.6  | 5              | 299       | 10.0 | 5               |
|                      | 11  | 4            | 1      | 0       | 5     | 18.5             | 397      | 103.7 | 5              | 306       | 10.0 | 5               |
|                      | 12  | 1            | 1      | 0       | 2     | 7.4              | 429      | 35.4  | 2              | 301       | 1.4  | 2               |
|                      | 13  | 1            | 0      | 0       | 1     | 3.7              | 408      |       | 1              | 301       |      | 1               |
|                      | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 15  | 1            | 0      | 0       | 1     | 3.7              | 454      |       | 1              | 307       |      | 1               |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total         |     | 17           | 10     | 0       | 27    | 100.0            | 371      | 82.6  | 27             | 289       | 21.0 | 27              |
| 17-23 May            | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|                      | 5   | 19           | 18     | 0       | 37    | 8.6              | 177      | 25.2  | 37             | 237       | 9.5  | 37              |
|                      | 6   | 43           | 26     | 0       | 69    | 16.0             | 229      | 35.4  | 69             | 252       | 11.0 | 69              |
|                      | 7   | 15           | 7      | 0       | 22    | 5.1              | 279      | 45.1  | 22             | 269       | 11.8 | 22              |
|                      | 8   | 54           | 28     | 0       | 82    | 19.0             | 318      | 47.8  | 82             | 277       | 11.1 | 82              |
|                      | 9   | 19           | 11     | 0       | 30    | 7.0              | 359      | 48.4  | 30             | 289       | 9.4  | 30              |
|                      | 10  | 47           | 28     | 0       | 75    | 17.4             | 407      | 47.1  | 75             | 295       | 10.6 | 75              |
|                      | 11  | 51           | 25     | 0       | 76    | 17.6             | 401      | 58.6  | 76             | 298       | 10.2 | 76              |
|                      | 12  | 25           | 9      | 0       | 34    | 7.9              | 424      | 54.3  | 34             | 306       | 8.5  | 34              |
|                      | 13  | 2            | 1      | 0       | 3     | 0.7              | 453      | 45.0  | 3              | 310       | 8.3  | 3               |
|                      | 14  | 1            | 0      | 0       | 1     | 0.2              | 484      |       | 1              | 322       |      | 1               |
|                      | 15  | 1            | 1      | 0       | 2     | 0.5              | 516      | 87.0  | 2              | 316       | 12.7 | 2               |
|                      | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| All Samples Combined |     | 277          | 154    | 0       | 431   | 100.0            | 333      | 94.7  | 431            | 280       | 23.8 | 431             |
| Sex Composition      |     | 64.3         | 35.7   |         |       |                  |          |       |                |           |      |                 |
| Unaged               |     | 26           | 19     | 0       | 45    | 10.4             | 330      | 90.9  | 45             | 279       | 23.2 | 45              |
| Sex Composition      |     | 57.8         | 42.2   |         |       |                  |          |       |                |           |      |                 |

**Appendix A.20. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet Kulukak, Nunavachak and Hagermeister sections combined, 1-23 May 1989.**

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
| 1 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 11  | 1            | 0      | 0       | 1     | 100.0            | 362      |      | 1              | 280       |      | 1               |
|              | 12  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 1            | 0      | 0       | 1     | 100.0            | 362      |      | 1              | 280       |      | 1               |
| 3 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   | 0            | 1      | 0       | 1     | 11.1             | 274      |      | 1              | 265       |      | 1               |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 1            | 1      | 0       | 2     | 22.2             | 358      | 19.8 | 2              | 286       | 6.4  | 2               |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  | 0            | 1      | 0       | 1     | 11.1             | 480      |      | 1              | 305       |      | 1               |
|              | 11  | 1            | 2      | 0       | 3     | 33.3             | 469      | 63.4 | 3              | 305       | 9.9  | 3               |
|              | 12  | 0            | 1      | 0       | 1     | 11.1             | 478      |      | 1              | 310       |      | 1               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  | 0            | 1      | 0       | 1     | 11.1             | 554      |      | 1              | 324       |      | 1               |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 2            | 7      | 0       | 9     | 100.0            | 434      | 92.1 | 9              | 299       | 18.2 | 9               |
| 4 May        | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 8   | 1            | 0      | 0       | 1     | 25.0             | 326      |      | 1              | 293       |      | 1               |
|              | 9   | 1            | 0      | 0       | 1     | 25.0             | 406      |      | 1              | 312       |      | 1               |
|              | 10  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 11  | 0            | 1      | 0       | 1     | 25.0             | 355      |      | 1              | 310       |      | 1               |
|              | 12  | 1            | 0      | 0       | 1     | 25.0             | 404      |      | 1              | 311       |      | 1               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 3            | 1      | 0       | 4     | 100.0            | 373      | 39.1 | 4              | 307       | 9.0  | 4               |

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Appendix A.20. (p. 2 of 8)

| Sample Dates | Age | Sex (number) |        |         | Percent<br>of<br>Total | Weight      |      |                   | Length       |     |                    |    |
|--------------|-----|--------------|--------|---------|------------------------|-------------|------|-------------------|--------------|-----|--------------------|----|
|              |     | Male         | Female | Unknown |                        | Mean<br>(g) | SD   | Number<br>Weighed | Mean<br>(mm) | SD  | Number<br>Measured |    |
| 5 May        | 3   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 4   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 5   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 6   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 7   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 8   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 9   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 10  |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 11  | 3            | 1      | 0       | 4                      | 80.0        | 409  | 38.6              | 4            | 309 | 13.8               | 4  |
|              | 12  | 0            | 1      | 0       | 1                      | 20.0        | 448  |                   | 1            | 315 |                    | 1  |
|              | 13  |              |        |         |                        |             |      |                   |              |     |                    |    |
| 14           |     |              |        |         |                        |             |      |                   |              |     |                    |    |
| 15           |     |              |        |         |                        |             |      |                   |              |     |                    |    |
| 16           |     |              |        |         |                        |             |      |                   |              |     |                    |    |
| Sample Total |     | 3            | 2      | 0       | 5                      | 100.0       | 416  | 37.8              | 5            | 310 | 12.3               | 5  |
| 6 May        | 3   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 4   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 5   | 0            | 1      | 0       | 1                      | 2.5         | 174  |                   | 1            | 241 |                    | 1  |
|              | 6   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 7   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 8   | 3            | 4      | 0       | 7                      | 17.5        | 367  | 66.3              | 7            | 288 | 9.6                | 7  |
|              | 9   | 2            | 0      | 0       | 2                      | 5.0         | 398  | 36.8              | 2            | 298 | 4.2                | 2  |
|              | 10  | 7            | 3      | 0       | 10                     | 25.0        | 397  | 64.7              | 10           | 293 | 9.5                | 10 |
|              | 11  | 3            | 8      | 0       | 11                     | 27.5        | 427  | 39.2              | 11           | 301 | 10.7               | 11 |
|              | 12  | 1            | 5      | 0       | 6                      | 15.0        | 460  | 50.7              | 6            | 310 | 7.7                | 6  |
|              | 13  | 0            | 1      | 0       | 1                      | 2.5         | 546  |                   | 1            | 326 |                    | 1  |
| 14           |     |              |        |         |                        |             |      |                   |              |     |                    |    |
| 15           | 1   | 1            | 0      | 2       | 5.0                    | 481         | 89.1 | 2                 | 327          | 9.2 | 2                  |    |
| 16           |     |              |        |         |                        |             |      |                   |              |     |                    |    |
| Sample Total |     | 17           | 23     | 0       | 40                     | 100.0       | 412  | 74.9              | 40           | 298 | 16.5               | 40 |
| 7 May        | 3   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 4   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 5   | 2            | 0      | 0       | 2                      | 2.9         | 200  | 14.1              | 2            | 248 | 12.0               | 2  |
|              | 6   | 0            | 1      | 0       | 1                      | 1.5         | 222  |                   | 1            | 248 |                    | 1  |
|              | 7   |              |        |         |                        |             |      |                   |              |     |                    |    |
|              | 8   | 8            | 7      | 0       | 15                     | 22.1        | 357  | 38.5              | 15           | 289 | 8.4                | 15 |
|              | 9   | 4            | 3      | 0       | 7                      | 10.3        | 401  | 39.7              | 7            | 297 | 5.3                | 7  |
|              | 10  | 8            | 3      | 0       | 11                     | 16.2        | 410  | 36.1              | 11           | 302 | 6.6                | 11 |
|              | 11  | 12           | 5      | 0       | 17                     | 25.0        | 426  | 35.7              | 17           | 304 | 8.9                | 17 |
|              | 12  | 9            | 3      | 0       | 12                     | 17.6        | 461  | 53.9              | 12           | 310 | 10.5               | 12 |
|              | 13  |              |        |         |                        |             |      |                   |              |     |                    |    |
| 14           | 2   | 0            | 0      | 2       | 2.9                    | 454         | 22.6 | 2                 | 311          | 5.7 | 2                  |    |
| 15           | 1   | 0            | 0      | 1       | 1.5                    | 552         |      | 1                 | 328          |     | 1                  |    |
| 16           |     |              |        |         |                        |             |      |                   |              |     |                    |    |
| Sample Total |     | 46           | 22     | 0       | 68                     | 100.0       | 405  | 69.2              | 68           | 299 | 15.8               | 68 |

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Appendix A.20. (p. 3 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
| 8 May        | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 5   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 6   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 7   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 8   | 2            | 1      | 0       | 3     | 25.0             | 367      | 59.0  | 3              | 288       | 9.1  | 3               |
|              | 9   | 1            | 0      | 0       | 1     | 8.3              | 398      |       | 1              | 304       |      | 1               |
|              | 10  | 2            | 1      | 0       | 3     | 25.0             | 469      | 31.4  | 3              | 301       | 5.7  | 3               |
|              | 11  | 1            | 2      | 0       | 3     | 25.0             | 447      | 31.3  | 3              | 302       | 9.2  | 3               |
|              | 12  | 1            | 1      | 0       | 2     | 16.7             | 442      | 31.1  | 2              | 309       | 9.9  | 2               |
|              | 13  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total |     | 7            | 5      | 0       | 12    | 100.0            | 428      | 52.5  | 12             | 300       | 10.0 | 12              |
| 9 May        | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 5   | 4            | 0      | 0       | 4     | 1.7              | 191      | 34.0  | 4              | 241       | 9.7  | 4               |
|              | 6   | 5            | 5      | 0       | 10    | 4.2              | 266      | 38.2  | 10             | 262       | 9.0  | 10              |
|              | 7   | 1            | 0      | 0       | 1     | 0.4              | 292      |       | 1              | 260       |      | 1               |
|              | 8   | 20           | 23     | 0       | 43    | 18.1             | 356      | 56.3  | 43             | 284       | 11.7 | 43              |
|              | 9   | 10           | 7      | 0       | 17    | 7.2              | 379      | 46.7  | 17             | 292       | 9.5  | 17              |
|              | 10  | 19           | 19     | 0       | 38    | 16.0             | 410      | 46.0  | 38             | 297       | 10.6 | 38              |
|              | 11  | 38           | 45     | 1       | 84    | 35.4             | 439      | 45.7  | 84             | 301       | 8.9  | 84              |
|              | 12  | 20           | 15     | 0       | 35    | 14.8             | 450      | 46.9  | 35             | 307       | 8.7  | 35              |
|              | 13  | 3            | 1      | 0       | 4     | 1.7              | 439      | 118.1 | 4              | 307       | 5.2  | 4               |
|              | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
| 16           | 0   | 1            | 0      | 1       | 0.4   | 464              |          | 1     | 325            |           | 1    |                 |
| Sample Total |     | 120          | 116    | 1       | 237   | 100.0            | 405      | 72.3  | 237            | 295       | 16.0 | 237             |
| 10 May       | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 5   | 5            | 1      | 0       | 6     | 6.7              | 195      | 28.8  | 6              | 242       | 12.2 | 6               |
|              | 6   | 4            | 9      | 0       | 13    | 14.6             | 263      | 38.1  | 13             | 263       | 8.8  | 13              |
|              | 7   | 2            | 0      | 0       | 2     | 2.2              | 340      | 31.1  | 2              | 275       | 2.1  | 2               |
|              | 8   | 10           | 8      | 0       | 18    | 20.2             | 336      | 38.1  | 18             | 277       | 8.8  | 18              |
|              | 9   | 4            | 1      | 0       | 5     | 5.6              | 351      | 31.0  | 5              | 286       | 8.2  | 5               |
|              | 10  | 10           | 4      | 0       | 14    | 15.7             | 407      | 28.8  | 14             | 296       | 6.4  | 14              |
|              | 11  | 13           | 10     | 0       | 23    | 25.8             | 424      | 43.3  | 23             | 300       | 6.8  | 23              |
|              | 12  | 5            | 3      | 0       | 8     | 9.0              | 438      | 41.8  | 8              | 299       | 6.7  | 8               |
|              | 13  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
| 16           |     |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total |     | 53           | 36     | 0       | 89    | 100.0            | 360      | 81.5  | 89             | 284       | 19.2 | 89              |

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Appendix A.20. (p. 4 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |      |                   | Length       |      |                    |
|--------------|-----|--------------|--------|---------|-------|------------------------|-------------|------|-------------------|--------------|------|--------------------|
|              |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD   | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
|              |     |              |        |         |       |                        |             |      |                   |              |      |                    |
| 11 May       | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 5   | 10           | 6      | 0       | 16    | 5.1                    | 185         | 41.6 | 16                | 239          | 13.5 | 16                 |
|              | 6   | 13           | 17     | 0       | 30    | 9.6                    | 247         | 40.4 | 30                | 260          | 10.6 | 30                 |
|              | 7   | 8            | 3      | 0       | 11    | 3.5                    | 305         | 51.0 | 11                | 279          | 15.4 | 11                 |
|              | 8   | 44           | 32     | 0       | 76    | 24.4                   | 326         | 40.4 | 76                | 286          | 10.3 | 76                 |
|              | 9   | 11           | 10     | 0       | 21    | 6.8                    | 358         | 48.2 | 21                | 293          | 10.9 | 21                 |
|              | 10  | 30           | 18     | 0       | 48    | 15.4                   | 378         | 49.8 | 48                | 299          | 10.7 | 48                 |
|              | 11  | 50           | 22     | 0       | 72    | 23.2                   | 391         | 53.7 | 72                | 301          | 11.5 | 72                 |
|              | 12  | 20           | 13     | 1       | 34    | 10.9                   | 411         | 56.4 | 34                | 305          | 9.0  | 34                 |
|              | 13  | 2            | 1      | 0       | 3     | 1.0                    | 355         | 57.0 | 3                 | 315          | 12.3 | 3                  |
|              | 14  |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 15  |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 16  |              |        |         |       |                        |             |      |                   |              |      |                    |
| Sample Total |     | 188          | 122    | 1       | 311   | 100.0                  | 345         | 76.2 | 311               | 289          | 20.5 | 311                |
| 12 May       | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 5   | 2            | 0      | 0       | 2     | 1.0                    | 192         | 33.9 | 2                 | 245          | 17.7 | 2                  |
|              | 6   | 12           | 4      | 0       | 16    | 7.9                    | 220         | 43.3 | 16                | 256          | 11.1 | 16                 |
|              | 7   | 7            | 0      | 0       | 7     | 3.4                    | 249         | 29.1 | 7                 | 267          | 10.1 | 7                  |
|              | 8   | 23           | 13     | 0       | 36    | 17.7                   | 324         | 45.5 | 36                | 282          | 9.5  | 36                 |
|              | 9   | 12           | 5      | 0       | 17    | 8.4                    | 353         | 37.9 | 17                | 289          | 8.3  | 17                 |
|              | 10  | 26           | 18     | 0       | 44    | 21.7                   | 381         | 61.7 | 44                | 297          | 13.1 | 44                 |
|              | 11  | 25           | 24     | 0       | 49    | 24.1                   | 399         | 62.6 | 49                | 300          | 11.2 | 49                 |
|              | 12  | 19           | 9      | 0       | 28    | 13.8                   | 424         | 64.6 | 28                | 304          | 16.2 | 28                 |
|              | 13  | 1            | 1      | 0       | 2     | 1.0                    | 414         | 36.8 | 2                 | 314          | 9.9  | 2                  |
|              | 14  | 1            | 0      | 0       | 1     | 0.5                    | 400         |      | 1                 | 310          |      | 1                  |
|              | 15  | 0            | 1      | 0       | 1     | 0.5                    | 394         |      | 1                 | 309          |      | 1                  |
|              | 16  |              |        |         |       |                        |             |      |                   |              |      |                    |
| Sample Total |     | 128          | 75     | 0       | 203   | 100.0                  | 360         | 80.8 | 203               | 291          | 18.7 | 203                |
| 13 May       | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 5   | 1            | 1      | 0       | 2     | 2.0                    | 180         | 5.7  | 2                 | 237          | 1.4  | 2                  |
|              | 6   | 13           | 5      | 0       | 18    | 17.8                   | 238         | 39.0 | 18                | 258          | 10.8 | 18                 |
|              | 7   | 1            | 0      | 0       | 1     | 1.0                    | 398         |      | 1                 | 280          |      | 1                  |
|              | 8   | 12           | 7      | 0       | 19    | 18.8                   | 318         | 54.9 | 19                | 282          | 9.1  | 19                 |
|              | 9   | 3            | 2      | 0       | 5     | 5.0                    | 389         | 68.2 | 5                 | 293          | 13.2 | 5                  |
|              | 10  | 6            | 7      | 0       | 13    | 12.9                   | 388         | 55.1 | 13                | 295          | 9.4  | 13                 |
|              | 11  | 11           | 13     | 1       | 25    | 24.8                   | 410         | 64.6 | 25                | 300          | 10.3 | 25                 |
|              | 12  | 5            | 9      | 0       | 14    | 13.9                   | 418         | 71.4 | 14                | 302          | 12.3 | 14                 |
|              | 13  | 1            | 0      | 0       | 1     | 1.0                    | 426         |      | 1                 | 306          |      | 1                  |
|              | 14  | 1            | 0      | 0       | 1     | 1.0                    | 374         |      | 1                 | 302          |      | 1                  |
|              | 15  |              |        |         |       |                        |             |      |                   |              |      |                    |
|              | 16  | 0            | 2      | 0       | 2     | 2.0                    | 441         | 32.5 | 2                 | 309          | 0.7  | 2                  |
| Sample Total |     | 54           | 46     | 1       | 101   | 100.0                  | 355         | 90.1 | 101               | 287          | 19.8 | 101                |

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Appendix A.20. (p. 5 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |      |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD   | Number Weighed | Mean (mm) | SD   | Number Measured |
|              |     |              |        |         |       |                  |          |      |                |           |      |                 |
| 14 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 9            | 5      | 0       | 14    | 6.4              | 188      | 33.6 | 14             | 238       | 16.6 | 14              |
|              | 6   | 23           | 16     | 0       | 39    | 17.9             | 239      | 40.3 | 39             | 258       | 10.4 | 39              |
|              | 7   | 3            | 8      | 0       | 11    | 5.0              | 296      | 43.1 | 11             | 271       | 9.8  | 11              |
|              | 8   | 23           | 12     | 0       | 35    | 16.1             | 325      | 48.7 | 35             | 281       | 9.0  | 35              |
|              | 9   | 5            | 8      | 0       | 13    | 6.0              | 380      | 61.7 | 13             | 293       | 12.3 | 13              |
|              | 10  | 30           | 15     | 1       | 46    | 21.1             | 398      | 45.5 | 46             | 298       | 8.0  | 46              |
|              | 11  | 28           | 12     | 0       | 40    | 18.3             | 410      | 50.2 | 40             | 303       | 9.7  | 40              |
|              | 12  | 5            | 9      | 0       | 14    | 6.4              | 449      | 69.8 | 14             | 310       | 10.7 | 14              |
|              | 13  | 0            | 1      | 0       | 1     | 0.5              | 538      |      | 1              | 331       |      | 1               |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  | 0            | 1      | 0       | 1     | 0.5              | 492      |      | 1              | 319       |      | 1               |
|              | 16  | 1            | 0      | 0       | 1     | 0.5              | 404      |      | 1              | 301       |      | 1               |
| Sample Total |     | 130          | 87     | 1       | 218   | 100.0            | 341      | 95.4 | 218            | 285       | 23.8 | 218             |
| 16 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 5            | 3      | 0       | 8     | 9.0              | 177      | 26.6 | 8              | 238       | 7.8  | 8               |
|              | 6   | 16           | 5      | 0       | 21    | 23.6             | 235      | 27.8 | 21             | 258       | 8.6  | 21              |
|              | 7   | 3            | 3      | 1       | 7     | 7.9              | 285      | 30.9 | 7              | 273       | 11.6 | 7               |
|              | 8   | 11           | 8      | 0       | 19    | 21.3             | 322      | 37.8 | 19             | 283       | 7.9  | 19              |
|              | 9   | 2            | 2      | 0       | 4     | 4.5              | 335      | 50.2 | 4              | 285       | 6.5  | 4               |
|              | 10  | 2            | 6      | 0       | 8     | 9.0              | 363      | 44.3 | 8              | 295       | 9.2  | 8               |
|              | 11  | 10           | 6      | 0       | 16    | 18.0             | 378      | 39.1 | 16             | 298       | 9.2  | 16              |
|              | 12  | 2            | 4      | 0       | 6     | 6.7              | 436      | 46.4 | 6              | 306       | 10.7 | 6               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 51           | 37     | 1       | 89    | 100.0            | 308      | 80.2 | 89             | 277       | 21.9 | 89              |
| 17 May       | 3   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 5   | 1            | 1      | 0       | 2     | 4.7              | 179      | 9.9  | 2              | 230       | 11.3 | 2               |
|              | 6   | 6            | 4      | 0       | 10    | 23.3             | 225      | 28.0 | 10             | 247       | 10.8 | 10              |
|              | 7   | 3            | 2      | 0       | 5     | 11.6             | 301      | 37.7 | 5              | 271       | 9.4  | 5               |
|              | 8   | 2            | 5      | 0       | 7     | 16.3             | 344      | 56.0 | 7              | 276       | 18.6 | 7               |
|              | 9   |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 10  | 5            | 2      | 0       | 7     | 16.3             | 401      | 49.2 | 7              | 295       | 8.9  | 7               |
|              | 11  | 2            | 6      | 0       | 8     | 18.6             | 430      | 54.5 | 8              | 297       | 11.1 | 8               |
|              | 12  | 3            | 1      | 0       | 4     | 9.3              | 422      | 56.6 | 4              | 302       | 5.5  | 4               |
|              | 13  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 14  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |      |                |           |      |                 |
|              | 16  |              |        |         |       |                  |          |      |                |           |      |                 |
| Sample Total |     | 22           | 21     | 0       | 43    | 100.0            | 336      | 95.8 | 43             | 276       | 25.1 | 43              |

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Appendix A.20. (p. 6 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |       |                   | Length       |      |                    |
|--------------|-----|--------------|--------|---------|-------|------------------------|-------------|-------|-------------------|--------------|------|--------------------|
|              |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD    | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
|              |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| 18 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 26           | 23     | 0       | 49    | 20.3                   | 166         | 20.3  | 49                | 236          | 7.4  | 49                 |
|              | 6   | 36           | 21     | 0       | 57    | 23.7                   | 219         | 32.4  | 57                | 252          | 11.0 | 57                 |
|              | 7   | 4            | 2      | 0       | 6     | 2.5                    | 264         | 37.0  | 6                 | 267          | 10.3 | 6                  |
|              | 8   | 24           | 19     | 0       | 43    | 17.8                   | 303         | 46.1  | 43                | 275          | 11.3 | 43                 |
|              | 9   | 7            | 3      | 0       | 10    | 4.1                    | 340         | 50.7  | 10                | 284          | 7.4  | 10                 |
|              | 10  | 14           | 10     | 0       | 24    | 10.0                   | 408         | 38.2  | 24                | 294          | 9.3  | 24                 |
|              | 11  | 22           | 13     | 0       | 35    | 14.5                   | 415         | 51.7  | 35                | 299          | 10.2 | 35                 |
|              | 12  | 11           | 5      | 0       | 16    | 6.6                    | 432         | 80.7  | 16                | 307          | 9.1  | 16                 |
|              | 13  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  | 0            | 1      | 0       | 1     | 0.4                    | 577         |       | 1                 | 325          |      | 1                  |
| 16           |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 144          | 97     | 0       | 241   | 100.0                  | 292         | 107.6 | 241               | 270          | 26.7 | 241                |
| 19 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 43           | 39     | 0       | 82    | 14.9                   | 183         | 30.3  | 82                | 240          | 8.4  | 82                 |
|              | 6   | 81           | 48     | 0       | 129   | 23.4                   | 226         | 35.3  | 129               | 255          | 9.4  | 129                |
|              | 7   | 9            | 7      | 0       | 16    | 2.9                    | 250         | 36.1  | 16                | 265          | 7.7  | 16                 |
|              | 8   | 68           | 42     | 0       | 110   | 19.9                   | 324         | 49.2  | 110               | 280          | 10.2 | 110                |
|              | 9   | 16           | 12     | 0       | 28    | 5.1                    | 349         | 53.1  | 28                | 290          | 10.3 | 28                 |
|              | 10  | 40           | 26     | 0       | 66    | 12.0                   | 395         | 48.6  | 66                | 296          | 10.0 | 66                 |
|              | 11  | 63           | 25     | 0       | 88    | 15.9                   | 391         | 56.0  | 88                | 299          | 11.1 | 88                 |
|              | 12  | 19           | 9      | 0       | 28    | 5.1                    | 402         | 52.4  | 28                | 305          | 9.0  | 28                 |
|              | 13  | 1            | 0      | 0       | 1     | 0.2                    | 454         |       | 1                 | 313          |      | 1                  |
|              | 14  | 1            | 1      | 0       | 2     | 0.4                    | 475         | 65.8  | 2                 | 318          | 11.3 | 2                  |
|              | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
| 16           |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 343          | 209    | 0       | 552   | 100.0                  | 303         | 93.7  | 552               | 275          | 24.5 | 552                |
| 20 May       | 3   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 4   |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 5   | 6            | 5      | 0       | 11    | 15.5                   | 164         | 23.7  | 11                | 234          | 7.4  | 11                 |
|              | 6   | 11           | 9      | 0       | 20    | 28.2                   | 201         | 27.8  | 20                | 254          | 9.3  | 20                 |
|              | 7   | 2            | 1      | 0       | 3     | 4.2                    | 299         | 66.2  | 3                 | 279          | 14.7 | 3                  |
|              | 8   | 7            | 3      | 0       | 10    | 14.1                   | 283         | 39.0  | 10                | 276          | 9.0  | 10                 |
|              | 9   | 3            | 2      | 0       | 5     | 7.0                    | 340         | 64.7  | 5                 | 285          | 5.7  | 5                  |
|              | 10  | 5            | 2      | 0       | 7     | 9.9                    | 317         | 48.2  | 7                 | 292          | 12.1 | 7                  |
|              | 11  | 5            | 6      | 0       | 11    | 15.5                   | 384         | 47.6  | 11                | 307          | 12.1 | 11                 |
|              | 12  | 1            | 0      | 1       | 2     | 2.8                    | 346         | 33.9  | 2                 | 304          | 10.6 | 2                  |
|              | 13  | 0            | 2      | 0       | 2     | 2.8                    | 482         | 82.0  | 2                 | 316          | 6.4  | 2                  |
|              | 14  |              |        |         |       |                        |             |       |                   |              |      |                    |
|              | 15  |              |        |         |       |                        |             |       |                   |              |      |                    |
| 16           |     |              |        |         |       |                        |             |       |                   |              |      |                    |
| Sample Total |     | 40           | 30     | 1       | 71    | 100.0                  | 273         | 93.4  | 71                | 272          | 27.0 | 71                 |

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Appendix A.20. (p. 7 of 8)

| Sample Dates | Age | Sex (number) |        |         |       | Percent of Total | Weight   |       |                | Length    |      |                 |
|--------------|-----|--------------|--------|---------|-------|------------------|----------|-------|----------------|-----------|------|-----------------|
|              |     | Male         | Female | Unknown | Total |                  | Mean (g) | SD    | Number Weighed | Mean (mm) | SD   | Number Measured |
|              |     |              |        |         |       |                  |          |       |                |           |      |                 |
| 21 May       | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 5   | 13           | 21     | 0       | 34    | 14.4             | 180      | 43.6  | 34             | 239       | 12.7 | 34              |
|              | 6   | 22           | 23     | 0       | 45    | 19.1             | 216      | 40.6  | 45             | 253       | 11.3 | 45              |
|              | 7   | 10           | 4      | 0       | 14    | 5.9              | 275      | 39.5  | 14             | 270       | 11.2 | 14              |
|              | 8   | 26           | 18     | 0       | 44    | 18.6             | 326      | 45.6  | 44             | 281       | 9.5  | 44              |
|              | 9   | 7            | 7      | 0       | 14    | 5.9              | 366      | 45.2  | 14             | 291       | 6.0  | 14              |
|              | 10  | 18           | 10     | 0       | 28    | 11.9             | 383      | 55.9  | 28             | 294       | 11.2 | 28              |
|              | 11  | 23           | 12     | 0       | 35    | 14.8             | 395      | 47.8  | 35             | 297       | 9.0  | 35              |
|              | 12  | 12           | 8      | 0       | 20    | 8.5              | 417      | 45.5  | 20             | 304       | 7.5  | 20              |
|              | 13  | 0            | 1      | 0       | 1     | 0.4              | 498      |       | 1              | 317       |      | 1               |
|              | 14  | 1            | 0      | 0       | 1     | 0.4              | 484      |       | 1              | 322       |      | 1               |
|              | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total |     | 132          | 104    | 0       | 236   | 100.0            | 309      | 97.0  | 236            | 276       | 24.5 | 236             |
| 22 May       | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 4   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 5   | 14           | 15     | 0       | 29    | 26.1             | 191      | 59.4  | 29             | 238       | 10.3 | 29              |
|              | 6   | 21           | 13     | 0       | 34    | 30.6             | 231      | 47.2  | 34             | 254       | 13.5 | 34              |
|              | 7   | 2            | 3      | 0       | 5     | 4.5              | 249      | 36.5  | 5              | 262       | 9.8  | 5               |
|              | 8   | 6            | 1      | 0       | 7     | 6.3              | 343      | 54.5  | 7              | 285       | 11.8 | 7               |
|              | 9   | 2            | 2      | 0       | 4     | 3.6              | 311      | 9.2   | 4              | 280       | 7.2  | 4               |
|              | 10  | 6            | 3      | 0       | 9     | 8.1              | 344      | 73.2  | 9              | 289       | 16.3 | 9               |
|              | 11  | 8            | 4      | 0       | 12    | 10.8             | 421      | 51.8  | 12             | 306       | 7.7  | 12              |
|              | 12  | 3            | 7      | 0       | 10    | 9.0              | 450      | 51.1  | 10             | 314       | 6.5  | 10              |
|              | 13  | 0            | 1      | 0       | 1     | 0.9              | 286      |       | 1              | 274       |      | 1               |
|              | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 15  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total |     | 62           | 49     | 0       | 111   | 100.0            | 281      | 104.7 | 111            | 267       | 28.8 | 111             |
| 23 May       | 3   |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 4   | 1            | 0      | 0       | 1     | 1.2              | 108      |       | 1              | 224       |      | 1               |
|              | 5   | 6            | 10     | 0       | 16    | 18.6             | 155      | 19.7  | 16             | 236       | 8.5  | 16              |
|              | 6   | 12           | 8      | 0       | 20    | 23.3             | 198      | 26.8  | 20             | 252       | 9.6  | 20              |
|              | 7   | 3            | 1      | 0       | 4     | 4.7              | 290      | 35.3  | 4              | 270       | 11.7 | 4               |
|              | 8   | 5            | 7      | 0       | 12    | 14.0             | 326      | 47.1  | 12             | 281       | 8.2  | 12              |
|              | 9   | 2            | 0      | 0       | 2     | 2.3              | 347      | 52.3  | 2              | 294       | 12.7 | 2               |
|              | 10  | 7            | 3      | 0       | 10    | 11.6             | 359      | 96.8  | 10             | 290       | 19.8 | 10              |
|              | 11  | 8            | 5      | 0       | 13    | 15.1             | 385      | 76.3  | 13             | 305       | 10.4 | 13              |
|              | 12  | 2            | 1      | 3       | 6     | 7.0              | 356      | 63.0  | 6              | 299       | 8.5  | 6               |
|              | 13  | 1            | 0      | 0       | 1     | 1.2              | 408      |       | 1              | 301       |      | 1               |
|              | 14  |              |        |         |       |                  |          |       |                |           |      |                 |
|              | 15  | 1            | 0      | 0       | 1     | 1.2              | 454      |       | 1              | 307       |      | 1               |
|              | 16  |              |        |         |       |                  |          |       |                |           |      |                 |
| Sample Total |     | 48           | 35     | 3       | 86    | 100.0            | 278      | 106.3 | 86             | 271       | 27.8 | 86              |

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Appendix A.20. (p. 8 of 8)

| Sample Dates         | Age | Sex (number) |        |         |       | Percent<br>of<br>Total | Weight      |      |                   | Length       |      |                    |
|----------------------|-----|--------------|--------|---------|-------|------------------------|-------------|------|-------------------|--------------|------|--------------------|
|                      |     | Male         | Female | Unknown | Total |                        | Mean<br>(g) | SD   | Number<br>Weighed | Mean<br>(mm) | SD   | Number<br>Measured |
|                      | 3   |              |        |         |       |                        |             |      |                   |              |      |                    |
|                      | 4   | 1            | 0      | 0       | 1     | 0.0                    | 108         |      | 1                 | 224          |      | 1                  |
|                      | 5   | 147          | 131    | 0       | 278   | 10.2                   | 179         | 35.6 | 278               | 238          | 10.1 | 278                |
|                      | 6   | 275          | 189    | 0       | 464   | 17.0                   | 227         | 39.0 | 464               | 255          | 10.7 | 464                |
|                      | 7   | 58           | 34     | 1       | 93    | 3.4                    | 279         | 45.2 | 93                | 270          | 11.3 | 93                 |
|                      | 8   | 296          | 211    | 0       | 507   | 18.6                   | 327         | 48.8 | 507               | 281          | 10.6 | 507                |
| 1-23 May             | 9   | 92           | 64     | 0       | 156   | 5.7                    | 361         | 50.4 | 156               | 291          | 9.8  | 156                |
|                      | 10  | 235          | 151    | 1       | 387   | 14.2                   | 390         | 54.4 | 387               | 296          | 10.8 | 387                |
|                      | 11  | 327          | 222    | 2       | 551   | 20.2                   | 407         | 55.1 | 551               | 301          | 10.3 | 551                |
|                      | 12  | 139          | 104    | 5       | 248   | 9.1                    | 427         | 59.9 | 248               | 306          | 10.3 | 248                |
|                      | 13  | 9            | 9      | 0       | 18    | 0.7                    | 432         | 87.8 | 18                | 311          | 13.0 | 18                 |
|                      | 14  | 6            | 1      | 0       | 7     | 0.3                    | 445         | 50.5 | 7                 | 313          | 8.5  | 7                  |
|                      | 15  | 3            | 5      | 0       | 8     | 0.3                    | 498         | 69.3 | 8                 | 321          | 9.0  | 8                  |
|                      | 16  | 1            | 3      | 0       | 4     | 0.1                    | 438         | 31.1 | 4                 | 311          | 10.1 | 4                  |
| All Samples Combined |     | 1594         | 1124   | 9       | 2727  | 100.0                  | 331         | 98.0 | 2727              | 281          | 24.6 | 2727               |
| Sex Composition      |     | 58.6         | 41.4   |         |       |                        |             |      |                   |              |      |                    |
| Unaged               |     | 222          | 174    | 0       | 396   | 14.5                   | 323         | 97.1 | 396               | 281          | 24.7 | 396                |
| Sex Composition      |     | 56.1         | 43.9   |         |       |                        |             |      |                   |              |      |                    |

## **Appendix B**

Appendix B.1. Age, sex, and size composition of Pacific herring caught by commercial purse seine  
Togiak Section, 12-13 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |       |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|-------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |       |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawnout | Unknown | Green | Ripe | Spawnout |       |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   | 0           | 1             | 0              | 1            |                    |      |          | .0      | .0    | .0   | 100.0    |       |
|              | 5   | 25          | 25            | 0              | 50           | .0                 | 4.0  | 76.0     | 20.0    | .0    | 32.0 | 48.0     | 20.0  |
|              | 6   | 21          | 31            | 0              | 52           | .0                 | 9.5  | 57.1     | 33.3    | .0    | 45.2 | 29.0     | 25.8  |
|              | 7   | 6           | 11            | 0              | 17           | .0                 | .0   | 66.7     | 33.3    | .0    | 36.4 | 54.5     | 9.1   |
| 12 May       | 8   | 24          | 22            | 0              | 46           | .0                 | .0   | 79.2     | 20.8    | .0    | 31.8 | 50.0     | 18.2  |
|              | 9   | 14          | 13            | 0              | 27           | .0                 | 7.1  | 50.0     | 42.9    | .0    | 23.1 | 61.5     | 15.4  |
|              | 10  | 30          | 23            | 0              | 53           | .0                 | 3.3  | 60.0     | 36.7    | .0    | 8.7  | 60.9     | 30.4  |
|              | 11  | 33          | 42            | 0              | 75           | .0                 | .0   | 78.8     | 21.2    | .0    | 19.0 | 52.4     | 28.6  |
|              | 12  | 10          | 16            | 0              | 26           | .0                 | 10.0 | 60.0     | 30.0    | .0    | 6.3  | 81.3     | 12.5  |
|              | 13  | 0           | 2             | 0              | 2            | .0                 |      |          |         | .0    | .0   | 50.0     | 50.0  |
|              | 14  | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 166         | 188           | 0              | 354          | .0                 | 3.6  | 68.7     | 27.7    | .0    | 25.0 | 52.1     | 22.9  |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 5   | 34          | 30            | 0              | 64           | .0                 | .0   | 97.1     | 2.9     | .0    | 13.3 | 83.3     | 3.3   |
|              | 6   | 24          | 39            | 0              | 63           | .0                 | .0   | 87.5     | 12.5    | .0    | 15.4 | 82.1     | 2.6   |
|              | 7   | 8           | 11            | 0              | 19           | .0                 | .0   | 75.0     | 25.0    | .0    | 18.2 | 63.6     | 18.2  |
| 13 May       | 8   | 20          | 35            | 0              | 55           | .0                 | .0   | 90.0     | 10.0    | .0    | 11.4 | 74.3     | 14.3  |
|              | 9   | 5           | 9             | 0              | 14           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 88.9     | 11.1  |
|              | 10  | 17          | 18            | 0              | 35           | .0                 | .0   | 88.2     | 11.8    | .0    | 11.1 | 66.7     | 22.2  |
|              | 11  | 31          | 33            | 0              | 64           | .0                 | .0   | 90.3     | 9.7     | .0    | 12.1 | 69.7     | 18.2  |
|              | 12  | 12          | 13            | 0              | 25           | .0                 | .0   | 83.3     | 16.7    | .0    | .0   | 76.9     | 23.1  |
|              | 13  | 0           | 3             | 0              | 3            | .0                 |      |          |         | .0    | .0   | 66.7     | 33.3  |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 153         | 191           | 0              | 344          | .0                 | .0   | 90.2     | 9.8     | .0    | 11.5 | 75.9     | 12.6  |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | .0       | 100.0 |
|              | 5   | 59          | 55            | 0              | 114          | .0                 | 1.7  | 88.1     | 10.2    | .0    | 21.8 | 67.3     | 10.9  |
|              | 6   | 45          | 70            | 0              | 115          | .0                 | 4.4  | 73.3     | 22.2    | .0    | 28.6 | 58.6     | 12.9  |
|              | 7   | 14          | 22            | 0              | 36           | .0                 | .0   | 71.4     | 28.6    | .0    | 27.3 | 59.1     | 13.6  |
| 12-13 May    | 8   | 44          | 57            | 0              | 101          | .0                 | .0   | 84.1     | 15.9    | .0    | 19.3 | 64.9     | 15.8  |
|              | 9   | 19          | 22            | 0              | 41           | .0                 | 5.3  | 63.2     | 31.6    | .0    | 13.6 | 72.7     | 13.6  |
|              | 10  | 47          | 41            | 0              | 88           | .0                 | 2.1  | 70.2     | 27.7    | .0    | 9.8  | 63.4     | 26.8  |
|              | 11  | 64          | 75            | 0              | 139          | .0                 | .0   | 84.4     | 15.6    | .0    | 16.0 | 60.0     | 24.0  |
|              | 12  | 22          | 29            | 0              | 51           | .0                 | 4.5  | 72.7     | 22.7    | .0    | 3.4  | 79.3     | 17.2  |
|              | 13  | 0           | 5             | 0              | 5            | .0                 |      |          |         | .0    | .0   | 60.0     | 40.0  |
|              | 14  | 3           | 2             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| All Samples  |     | 319         | 379           | 0              | 698          | .0                 | 1.9  | 79.0     | 19.1    | .0    | 18.2 | 64.1     | 17.7  |

**Appendix B.2. Age, sex, and size composition of Pacific herring caught by commercial purse seine Hagemeister Section, 12-13 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |       |          |  |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|----------|---------|-------|-------|----------|--|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |       |       | Female   |         |       |       |          |  |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawncut | Unknown | Green | Ripe  | Spawncut |  |
|              | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 4           | 8             | 0              | 12           | .0                 | 50.0  | 50.0  | .0       | .0      | 37.5  | 37.5  | 25.0     |  |
|              | 6   | 9           | 8             | 0              | 17           | .0                 | 33.3  | 44.4  | 22.2     | .0      | 37.5  | 50.0  | 12.5     |  |
|              | 7   | 3           | 6             | 0              | 9            | .0                 | .0    | 33.3  | 66.7     | .0      | 16.7  | 66.7  | 16.7     |  |
| 12 May       | 8   | 36          | 24            | 0              | 60           | 2.8                | 25.0  | 50.0  | 22.2     | .0      | 20.8  | 62.5  | 16.7     |  |
|              | 9   | 13          | 4             | 0              | 17           | .0                 | 38.5  | 38.5  | 23.1     | .0      | 25.0  | 75.0  | .0       |  |
|              | 10  | 22          | 25            | 0              | 47           | .0                 | 45.5  | 50.0  | 4.5      | .0      | 20.0  | 64.0  | 16.0     |  |
|              | 11  | 38          | 38            | 0              | 76           | .0                 | 23.7  | 65.8  | 10.5     | .0      | 2.6   | 94.7  | 2.6      |  |
|              | 12  | 41          | 45            | 0              | 86           | .0                 | 34.1  | 58.5  | 7.3      | .0      | 13.3  | 77.8  | 8.9      |  |
|              | 13  | 0           | 3             | 0              | 3            |                    |       |       |          | .0      | .0    | 100.0 | .0       |  |
|              | 14  | 3           | 2             | 0              | 5            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
| Sample Total |     | 169         | 163           | 0              | 332          | .6                 | 30.8  | 55.0  | 13.6     | .0      | 15.3  | 74.2  | 10.4     |  |
|              | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 7           | 2             | 0              | 9            | .0                 | 28.6  | 14.3  | 57.1     | .0      | .0    | 100.0 | .0       |  |
|              | 6   | 12          | 13            | 0              | 25           | .0                 | 16.7  | 50.0  | 33.3     | .0      | 38.5  | 61.5  | .0       |  |
|              | 7   | 6           | 3             | 0              | 9            | .0                 | .0    | 66.7  | 33.3     | .0      | 33.3  | 66.7  | .0       |  |
| 13 May       | 8   | 29          | 27            | 0              | 56           | .0                 | 3.4   | 58.6  | 37.9     | .0      | 18.5  | 59.3  | 22.2     |  |
|              | 9   | 7           | 8             | 0              | 15           | .0                 | 14.3  | 57.1  | 28.6     | .0      | .0    | 75.0  | 25.0     |  |
|              | 10  | 30          | 27            | 0              | 57           | .0                 | .0    | 93.3  | 6.7      | .0      | 14.8  | 85.2  | .0       |  |
|              | 11  | 46          | 41            | 0              | 87           | .0                 | 4.3   | 67.4  | 28.3     | .0      | 7.3   | 82.9  | 9.8      |  |
|              | 12  | 32          | 38            | 0              | 70           | .0                 | 3.1   | 68.8  | 28.1     | .0      | 2.6   | 92.1  | 5.3      |  |
|              | 13  | 2           | 3             | 0              | 5            | .0                 | .0    | 50.0  | 50.0     | .0      | .0    | 100.0 | .0       |  |
|              | 14  | 2           | 3             | 0              | 5            | .0                 | .0    | 100.0 | .0       | .0      | 33.3  | 66.7  | .0       |  |
|              | 15  | 1           | 2             | 0              | 3            | .0                 | .0    | .0    | 100.0    | .0      | .0    | 100.0 | .0       |  |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
| Sample Total |     | 174         | 167           | 0              | 341          | .0                 | 5.2   | 66.7  | 28.2     | .0      | 12.0  | 79.6  | 8.4      |  |
|              | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 11          | 10            | 0              | 21           | .0                 | 36.4  | 27.3  | 36.4     | .0      | 30.0  | 50.0  | 20.0     |  |
|              | 6   | 21          | 21            | 0              | 42           | .0                 | 23.8  | 47.6  | 28.6     | .0      | 38.1  | 57.1  | 4.8      |  |
|              | 7   | 9           | 9             | 0              | 18           | .0                 | .0    | 55.6  | 44.4     | .0      | 22.2  | 66.7  | 11.1     |  |
| 12-13 May    | 8   | 65          | 51            | 0              | 116          | 1.5                | 15.4  | 53.8  | 29.2     | .0      | 19.6  | 60.8  | 19.6     |  |
|              | 9   | 20          | 12            | 0              | 32           | .0                 | 30.0  | 45.0  | 25.0     | .0      | 8.3   | 75.0  | 16.7     |  |
|              | 10  | 52          | 52            | 0              | 104          | .0                 | 19.2  | 75.0  | 5.8      | .0      | 17.3  | 75.0  | 7.7      |  |
|              | 11  | 84          | 79            | 0              | 163          | .0                 | 13.1  | 66.7  | 20.2     | .0      | 5.1   | 88.6  | 6.3      |  |
|              | 12  | 73          | 83            | 0              | 156          | .0                 | 20.5  | 63.0  | 16.4     | .0      | 8.4   | 84.3  | 7.2      |  |
|              | 13  | 2           | 6             | 0              | 8            | .0                 | .0    | 50.0  | 50.0     | .0      | .0    | 100.0 | .0       |  |
|              | 14  | 5           | 5             | 0              | 10           | .0                 | .0    | 100.0 | .0       | .0      | 20.0  | 80.0  | .0       |  |
|              | 15  | 1           | 2             | 0              | 3            | .0                 | .0    | .0    | 100.0    | .0      | .0    | 100.0 | .0       |  |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
| All Samples  |     | 343         | 330           | 0              | 673          | .3                 | 17.8  | 60.9  | 21.0     | .0      | 13.6  | 77.0  | 9.4      |  |

Appendix B.3. Age, sex, and size composition of Pacific herring caught by commercial purse seine  
Pyrite Point Section, 12-13 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |       |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|-------|----------|------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |       |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawnout | Unknown | Green | Ripe  | Spawnout |      |
| 12 May       | 3   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 5   | 3           | 1             | 0              | 4            | .0                 | 33.3 | 66.7     | .0      | .0    | 100.0 | .0       | .0   |
|              | 6   | 2           | 2             | 0              | 4            | .0                 | .0   | .0       | 100.0   | .0    | 50.0  | 50.0     | .0   |
|              | 7   | 2           | 5             | 0              | 7            | .0                 | .0   | 50.0     | 50.0    | .0    | .0    | 100.0    | .0   |
|              | 8   | 21          | 21            | 0              | 42           | .0                 | .0   | 95.2     | 4.8     | .0    | 23.8  | 71.4     | 4.8  |
|              | 9   | 9           | 14            | 0              | 23           | .0                 | .0   | 77.8     | 22.2    | .0    | .0    | 92.9     | 7.1  |
|              | 10  | 41          | 17            | 0              | 58           | .0                 | 4.9  | 90.2     | 4.9     | .0    | .0    | 94.1     | 5.9  |
|              | 11  | 37          | 29            | 0              | 66           | .0                 | 2.7  | 89.2     | 8.1     | .0    | 13.8  | 75.9     | 10.3 |
|              | 12  | 27          | 27            | 0              | 54           | .0                 | 3.7  | 92.6     | 3.7     | .0    | 11.1  | 85.2     | 3.7  |
|              | 13  | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 14  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0    | 100.0    | .0   |
|              | 15  |             |               |                |              |                    |      |          |         |       |       |          |      |
| 16           |     |             |               |                |              |                    |      |          |         |       |       |          |      |
| Sample Total |     | 144         | 119           | 0              | 263          | .0                 | 3.5  | 88.2     | 8.3     | .0    | 11.8  | 82.4     | 5.9  |
| 13 May       | 3   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 5   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 6   | 3           | 1             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 7   | 1           | 2             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 8   | 4           | 8             | 0              | 12           | .0                 | .0   | 100.0    | .0      | .0    | 12.5  | 87.5     | .0   |
|              | 9   | 3           | 1             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 10  | 23          | 12            | 0              | 35           | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 11  | 15          | 13            | 0              | 28           | .0                 | .0   | 100.0    | .0      | .0    | 15.4  | 84.6     | .0   |
|              | 12  | 13          | 7             | 0              | 20           | .0                 | .0   | 92.3     | 7.7     | .0    | 14.3  | 85.7     | .0   |
|              | 13  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0    | 100.0    | .0   |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |       |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |       |          |      |
| 16           |     |             |               |                |              |                    |      |          |         |       |       |          |      |
| Sample Total |     | 63          | 45            | 0              | 108          | .0                 | .0   | 98.4     | 1.6     | .0    | 8.9   | 91.1     | .0   |
| 12-13 May    | 3   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |       |          |      |
|              | 5   | 3           | 1             | 0              | 4            | .0                 | 33.3 | 66.7     | .0      | .0    | 100.0 | .0       | .0   |
|              | 6   | 5           | 3             | 0              | 8            | .0                 | .0   | 60.0     | 40.0    | .0    | 33.3  | 66.7     | .0   |
|              | 7   | 3           | 7             | 0              | 10           | .0                 | .0   | 66.7     | 33.3    | .0    | .0    | 100.0    | .0   |
|              | 8   | 25          | 29            | 0              | 54           | .0                 | .0   | 96.0     | 4.0     | .0    | 20.7  | 75.9     | 3.4  |
|              | 9   | 12          | 15            | 0              | 27           | .0                 | .0   | 83.3     | 16.7    | .0    | .0    | 93.3     | 6.7  |
|              | 10  | 64          | 29            | 0              | 93           | .0                 | 3.1  | 93.8     | 3.1     | .0    | .0    | 96.6     | 3.4  |
|              | 11  | 52          | 42            | 0              | 94           | .0                 | 1.9  | 92.3     | 5.8     | .0    | 14.3  | 78.6     | 7.1  |
|              | 12  | 40          | 34            | 0              | 74           | .0                 | 2.5  | 92.5     | 5.0     | .0    | 11.8  | 85.3     | 2.9  |
|              | 13  | 2           | 3             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 14  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0    | 100.0    | .0   |
|              | 15  |             |               |                |              |                    |      |          |         |       |       |          |      |
| 16           |     |             |               |                |              |                    |      |          |         |       |       |          |      |
| All Samples  |     | 207         | 164           | 0              | 371          | .0                 | 2.4  | 91.3     | 6.3     | .0    | 11.0  | 84.8     | 4.3  |

**Appendix B.4. Age, sex, and size composition of Pacific herring caught by commercial purse seine  
Cape Newenham Section, 13 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |       |          |  |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|----------|---------|-------|-------|----------|--|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |       |       |          | Female  |       |       |          |  |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawnout | Unknown | Green | Ripe  | Spawnout |  |
|              | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0       |         |       |       |          |  |
|              | 6   | 2           | 0             | 0              | 2            | .0                 | .0    | 100.0 | .0       |         |       |       |          |  |
|              | 7   | 1           | 3             | 0              | 4            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 33.3  | 66.7     |  |
| 13 May       | 8   | 8           | 9             | 0              | 17           | .0                 | .0    | 75.0  | 25.0     | .0      | .0    | 100.0 | .0       |  |
|              | 9   | 3           | 3             | 0              | 6            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 10  | 11          | 6             | 0              | 17           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 11  | 19          | 17            | 0              | 36           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 12  | 17          | 14            | 0              | 31           | .0                 | .0    | 100.0 | .0       | .0      | 7.1   | 92.9  | .0       |  |
|              | 13  | 3           | 0             | 0              | 3            | .0                 | .0    | 100.0 | .0       |         |       |       |          |  |
|              | 14  | 0           | 1             | 0              | 1            |                    |       |       |          | .0      | .0    | 100.0 | .0       |  |
|              | 15  | 0           | 2             | 0              | 2            |                    |       |       |          | .0      | .0    | 100.0 | .0       |  |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
| Sample Total |     | 65          | 55            | 0              | 120          | .0                 | .0    | 96.9  | 3.1      | .0      | 1.8   | 94.5  | 3.6      |  |

**Appendix B.5. Age, sex, and size composition of Pacific herring caught by commercial purse seine  
Togiak, Hagemester, Pyrite Point and Cape Newenham sections, 12-13 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |         |         |       |       |         |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|---------|---------|-------|-------|---------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Unknown            | Male  |       |         | Female  |       |       |         |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawout | Unknown | Green | Ripe  | Spawout |
|              | 3   |             |               |                |              |                    |       |       |         |         |       |       |         |
|              | 4   | 0           | 1             | 0              | 1            |                    |       |       |         | .0      | .0    | .0    | 100.0   |
|              | 5   | 32          | 34            | 0              | 66           | .0                 | 12.5  | 71.9  | 15.6    | .0      | 35.3  | 44.1  | 20.6    |
|              | 6   | 32          | 41            | 0              | 73           | .0                 | 15.6  | 50.0  | 34.4    | .0      | 43.9  | 34.1  | 22.0    |
|              | 7   | 11          | 22            | 0              | 33           | .0                 | .0    | 54.5  | 45.5    | .0      | 22.7  | 68.2  | 9.1     |
|              | 8   | 81          | 67            | 0              | 148          | 1.2                | 11.1  | 70.4  | 17.3    | .0      | 25.4  | 61.2  | 13.4    |
| 12 May       | 9   | 36          | 31            | 0              | 67           | .0                 | 16.7  | 52.8  | 30.6    | .0      | 12.9  | 77.4  | 9.7     |
|              | 10  | 93          | 65            | 0              | 158          | .0                 | 14.0  | 71.0  | 15.1    | .0      | 10.8  | 70.8  | 18.5    |
|              | 11  | 108         | 109           | 0              | 217          | .0                 | 9.3   | 77.8  | 13.0    | .0      | 11.9  | 73.4  | 14.7    |
|              | 12  | 78          | 88            | 0              | 166          | .0                 | 20.5  | 70.5  | 9.0     | .0      | 11.4  | 80.7  | 8.0     |
|              | 13  | 2           | 7             | 0              | 9            | .0                 | .0    | 100.0 | .0      | .0      | .0    | 85.7  | 14.3    |
|              | 14  | 5           | 5             | 0              | 10           | .0                 | .0    | 100.0 | .0      | .0      | .0    | 100.0 | .0      |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0      |         |       |       |         |
|              | 16  |             |               |                |              |                    |       |       |         |         |       |       |         |
| Sample Total |     | 479         | 470           | 0              | 949          | .2                 | 13.2  | 69.7  | 16.9    | .0      | 18.3  | 67.4  | 14.3    |
|              | 3   |             |               |                |              |                    |       |       |         |         |       |       |         |
|              | 4   | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0      |         |       |       |         |
|              | 5   | 42          | 32            | 0              | 74           | .0                 | 4.8   | 83.3  | 11.9    | .0      | 12.5  | 84.4  | 3.1     |
|              | 6   | 41          | 53            | 0              | 94           | .0                 | 4.9   | 78.0  | 17.1    | .0      | 20.8  | 77.4  | 1.9     |
|              | 7   | 16          | 19            | 0              | 35           | .0                 | .0    | 75.0  | 25.0    | .0      | 15.8  | 63.2  | 21.1    |
|              | 8   | 61          | 79            | 0              | 140          | .0                 | 1.6   | 73.8  | 24.6    | .0      | 12.7  | 73.4  | 13.9    |
| 13 May       | 9   | 18          | 21            | 0              | 39           | .0                 | 5.6   | 83.3  | 11.1    | .0      | .0    | 85.7  | 14.3    |
|              | 10  | 81          | 63            | 0              | 144          | .0                 | .0    | 95.1  | 4.9     | .0      | 9.5   | 84.1  | 6.3     |
|              | 11  | 111         | 104           | 0              | 215          | .0                 | 1.8   | 83.8  | 14.4    | .0      | 8.7   | 81.7  | 9.6     |
|              | 12  | 74          | 72            | 0              | 146          | .0                 | 1.4   | 82.4  | 16.2    | .0      | 4.2   | 88.9  | 6.9     |
|              | 13  | 5           | 7             | 0              | 12           | .0                 | .0    | 80.0  | 20.0    | .0      | .0    | 85.7  | 14.3    |
|              | 14  | 4           | 4             | 0              | 8            | .0                 | .0    | 100.0 | .0      | .0      | 25.0  | 75.0  | .0      |
|              | 15  | 1           | 4             | 0              | 5            | .0                 | .0    | .0    | 100.0   | .0      | .0    | 100.0 | .0      |
|              | 16  |             |               |                |              |                    |       |       |         |         |       |       |         |
| Sample Total |     | 455         | 458           | 0              | 913          | .0                 | 2.0   | 83.3  | 14.7    | .0      | 10.3  | 81.0  | 8.7     |
|              | 3   |             |               |                |              |                    |       |       |         |         |       |       |         |
|              | 4   | 1           | 1             | 0              | 2            | .0                 | .0    | 100.0 | .0      | .0      | .0    | .0    | 100.0   |
|              | 5   | 74          | 66            | 0              | 140          | .0                 | 8.1   | 78.4  | 13.5    | .0      | 24.2  | 63.6  | 12.1    |
|              | 6   | 73          | 94            | 0              | 167          | .0                 | 9.6   | 65.8  | 24.7    | .0      | 30.9  | 58.5  | 10.6    |
|              | 7   | 27          | 41            | 0              | 68           | .0                 | .0    | 66.7  | 33.3    | .0      | 19.5  | 65.9  | 14.6    |
|              | 8   | 142         | 146           | 0              | 288          | .7                 | 7.0   | 71.8  | 20.4    | .0      | 18.5  | 67.8  | 13.7    |
| 12-13 May    | 9   | 54          | 52            | 0              | 106          | .0                 | 13.0  | 63.0  | 24.1    | .0      | 7.7   | 80.8  | 11.5    |
|              | 10  | 174         | 128           | 0              | 302          | .0                 | 7.5   | 82.2  | 10.3    | .0      | 10.2  | 77.3  | 12.5    |
|              | 11  | 219         | 213           | 0              | 432          | .0                 | 5.5   | 80.8  | 13.7    | .0      | 10.3  | 77.5  | 12.2    |
|              | 12  | 152         | 160           | 0              | 312          | .0                 | 11.2  | 76.3  | 12.5    | .0      | 8.1   | 84.4  | 7.5     |
|              | 13  | 7           | 14            | 0              | 21           | .0                 | .0    | 85.7  | 14.3    | .0      | .0    | 85.7  | 14.3    |
|              | 14  | 9           | 9             | 0              | 18           | .0                 | .0    | 100.0 | .0      | .0      | 11.1  | 88.9  | .0      |
|              | 15  | 2           | 4             | 0              | 6            | .0                 | .0    | 50.0  | 50.0    | .0      | .0    | 100.0 | .0      |
|              | 16  |             |               |                |              |                    |       |       |         |         |       |       |         |
| All Samples  |     | 934         | 928           | 0              | 1862         | .1                 | 7.7   | 76.3  | 15.8    | .0      | 14.3  | 74.1  | 11.5    |

**Appendix B.6. Age, sex, and size composition of Pacific herring caught by commercial gillnet  
Kulukak Section, 9-14 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |         |         |        |      |         |  |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|---------|---------|--------|------|---------|--|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |      |         |         | Female |      |         |  |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawout | Unknown | Green  | Ripe | Spawout |  |
|              | 3   |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 4   |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 5   | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 6   | 19          | 17            | 0              | 36           | .0                 | 57.9 | 42.1    | .0      | .0     | 29.4 | 70.6    |  |
|              | 7   | 12          | 8             | 0              | 20           | .0                 | 25.0 | 66.7    | 8.3     | .0     | 12.5 | 87.5    |  |
|              | 8   | 43          | 35            | 0              | 78           | .0                 | 44.2 | 55.8    | .0      | .0     | 5.7  | 94.3    |  |
| 9 May        | 9   | 12          | 19            | 0              | 31           | .0                 | 33.3 | 66.7    | .0      | .0     | 26.3 | 73.7    |  |
|              | 10  | 21          | 22            | 0              | 43           | .0                 | 38.1 | 61.9    | .0      | .0     | 18.2 | 77.3    |  |
|              | 11  | 40          | 29            | 1              | 70           | .0                 | 15.0 | 82.5    | 2.5     | .0     | 13.8 | 86.2    |  |
|              | 12  | 25          | 26            | 0              | 51           | .0                 | 40.0 | 60.0    | .0      | .0     | 15.4 | 80.8    |  |
|              | 13  | 3           | 1             | 0              | 4            | .0                 | 33.3 | 66.7    | .0      | .0     | .0   | 100.0   |  |
|              | 14  | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0   | .0      | .0     | 50.0 | 50.0    |  |
|              | 15  |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 16  |             |               |                |              |                    |      |         |         |        |      |         |  |
| Sample Total |     | 178         | 160           | 1              | 339          | .0                 | 34.8 | 64.0    | 1.1     | .0     | 16.3 | 82.5    |  |
|              | 3   |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 4   |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 5   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 6   | 17          | 9             | 0              | 26           | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 7   | 5           | 5             | 0              | 10           | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 8   | 48          | 15            | 0              | 63           | .0                 | .0   | 97.9    | 2.1     | .0     | .0   | 100.0   |  |
| 14 May       | 9   | 25          | 9             | 0              | 34           | .0                 | .0   | 100.0   | .0      | .0     | 12.5 | 87.5    |  |
|              | 10  | 33          | 22            | 0              | 55           | .0                 | .0   | 100.0   | .0      | .0     | .0   | 90.9    |  |
|              | 11  | 64          | 28            | 0              | 92           | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 12  | 23          | 14            | 0              | 37           | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 13  | 4           | 2             | 0              | 6            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 14  | 4           | 1             | 0              | 5            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 15  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 16  |             |               |                |              |                    |      |         |         |        |      |         |  |
| Sample Total |     | 225         | 106           | 0              | 331          | .0                 | .0   | 99.6    | .4      | .0     | 1.0  | 97.1    |  |
|              | 3   |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 4   |             |               |                |              |                    |      |         |         |        |      |         |  |
|              | 5   | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 6   | 36          | 26            | 0              | 62           | .0                 | 30.6 | 69.4    | .0      | .0     | 19.2 | 80.8    |  |
|              | 7   | 17          | 13            | 0              | 30           | .0                 | 17.6 | 76.5    | 5.9     | .0     | 7.7  | 92.3    |  |
|              | 8   | 91          | 50            | 0              | 141          | .0                 | 20.9 | 78.0    | 1.1     | .0     | 4.0  | 96.0    |  |
| 9-14 May     | 9   | 37          | 28            | 0              | 65           | .0                 | 10.8 | 89.2    | .0      | .0     | 22.2 | 77.8    |  |
|              | 10  | 54          | 44            | 0              | 98           | .0                 | 14.8 | 85.2    | .0      | .0     | 9.1  | 84.1    |  |
|              | 11  | 104         | 57            | 1              | 162          | .0                 | 5.8  | 93.3    | 1.0     | .0     | 7.0  | 93.0    |  |
|              | 12  | 48          | 40            | 0              | 88           | .0                 | 20.8 | 79.2    | .0      | .0     | 10.0 | 87.5    |  |
|              | 13  | 7           | 3             | 0              | 10           | .0                 | 14.3 | 85.7    | .0      | .0     | .0   | 100.0   |  |
|              | 14  | 6           | 3             | 0              | 9            | .0                 | .0   | 100.0   | .0      | .0     | 33.3 | 66.7    |  |
|              | 15  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0   | .0      | .0     | .0   | 100.0   |  |
|              | 16  |             |               |                |              |                    |      |         |         |        |      |         |  |
| All Samples  |     | 403         | 266           | 1              | 670          | .0                 | 15.4 | 83.9    | .7      | .0     | 10.2 | 88.3    |  |

Appendix B.7. Age, sex, and size composition of Pacific herring caught by commercial gillnet  
 Nunavachak Section, 9-14 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |      |  |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|------|--|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |      |  |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |      |  |
| 9 May        | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 5   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |  |
|              | 6   | 5           | 9             | 0              | 14           | .0                 | 20.0 | 80.0     | .0      | .0    | 44.4 | 55.6     | .0   |  |
|              | 7   | 6           | 4             | 0              | 10           | .0                 | 16.7 | 83.3     | .0      | .0    | 25.0 | 75.0     | .0   |  |
|              | 8   | 40          | 32            | 0              | 72           | .0                 | 17.5 | 80.0     | 2.5     | .0    | 18.8 | 78.1     | 3.1  |  |
|              | 9   | 15          | 6             | 0              | 21           | .0                 | 20.0 | 73.3     | 6.7     | .0    | 16.7 | 66.7     | 16.7 |  |
|              | 10  | 31          | 27            | 0              | 58           | .0                 | 12.9 | 83.9     | 3.2     | .0    | 11.1 | 88.9     | .0   |  |
|              | 11  | 41          | 28            | 0              | 69           | .0                 | 12.2 | 85.4     | 2.4     | .0    | 7.1  | 85.7     | 7.1  |  |
|              | 12  | 21          | 14            | 0              | 35           | .0                 | 23.8 | 66.7     | 9.5     | .0    | .0   | 92.9     | 7.1  |  |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 14  | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | 50.0 | .0       | 50.0 |  |
|              | 15  | 0           | 2             | 0              | 2            |                    |      |          |         | .0    | .0   | 100.0    | .0   |  |
|              | 16  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |  |
| Sample Total |     | 162         | 125           | 0              | 287          | .0                 | 16.0 | 80.2     | 3.7     | .0    | 14.4 | 80.8     | 4.8  |  |
| 14 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 5   | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |  |
|              | 6   | 11          | 18            | 0              | 29           | .0                 | .0   | 100.0    | .0      | .0    | 5.6  | 77.8     | 16.7 |  |
|              | 7   | 13          | 8             | 0              | 21           | .0                 | .0   | 92.3     | 7.7     | .0    | .0   | 100.0    | .0   |  |
|              | 8   | 41          | 24            | 0              | 65           | .0                 | .0   | 70.7     | 29.3    | .0    | .0   | 62.5     | 37.5 |  |
|              | 9   | 14          | 7             | 0              | 21           | .0                 | .0   | 71.4     | 28.6    | .0    | 14.3 | 71.4     | 14.3 |  |
|              | 10  | 32          | 23            | 0              | 55           | .0                 | .0   | 59.4     | 40.6    | .0    | .0   | 56.5     | 43.5 |  |
|              | 11  | 57          | 35            | 0              | 92           | .0                 | .0   | 64.9     | 35.1    | .0    | 11.4 | 42.9     | 45.7 |  |
|              | 12  | 25          | 24            | 0              | 49           | .0                 | .0   | 56.0     | 44.0    | .0    | 4.2  | 62.5     | 33.3 |  |
|              | 13  | 2           | 6             | 0              | 8            | .0                 | .0   | .0       | 100.0   | .0    | .0   | 50.0     | 50.0 |  |
|              | 14  | 5           | 0             | 0              | 5            | .0                 | .0   | 40.0     | 60.0    |       |      |          |      |  |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |  |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |  |
| Sample Total |     | 201         | 146           | 0              | 347          | .0                 | .0   | 67.2     | 32.8    | .0    | 4.8  | 61.0     | 34.2 |  |
| 9-14 May     | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |  |
|              | 5   | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |  |
|              | 6   | 16          | 27            | 0              | 43           | .0                 | 6.3  | 93.8     | .0      | .0    | 18.5 | 70.4     | 11.1 |  |
|              | 7   | 19          | 12            | 0              | 31           | .0                 | 5.3  | 89.5     | 5.3     | .0    | 8.3  | 91.7     | .0   |  |
|              | 8   | 81          | 56            | 0              | 137          | .0                 | 8.6  | 75.3     | 16.0    | .0    | 10.7 | 71.4     | 17.9 |  |
|              | 9   | 29          | 13            | 0              | 42           | .0                 | 10.3 | 72.4     | 17.2    | .0    | 15.4 | 69.2     | 15.4 |  |
|              | 10  | 63          | 50            | 0              | 113          | .0                 | 6.3  | 71.4     | 22.2    | .0    | 6.0  | 74.0     | 20.0 |  |
|              | 11  | 98          | 63            | 0              | 161          | .0                 | 5.1  | 73.5     | 21.4    | .0    | 9.5  | 61.9     | 28.6 |  |
|              | 12  | 46          | 38            | 0              | 84           | .0                 | 10.9 | 60.9     | 28.3    | .0    | 2.6  | 73.7     | 23.7 |  |
|              | 13  | 2           | 6             | 0              | 8            | .0                 | .0   | .0       | 100.0   | .0    | .0   | 50.0     | 50.0 |  |
|              | 14  | 7           | 2             | 0              | 9            | .0                 | .0   | 57.1     | 42.9    | .0    | 50.0 | .0       | 50.0 |  |
|              | 15  | 1           | 2             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |  |
|              | 16  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |  |
| All Samples  |     | 363         | 271           | 0              | 634          | .0                 | 7.2  | 73.0     | 19.8    | .0    | 9.2  | 70.1     | 20.7 |  |

Appendix B.8. Age, sex, and size composition of Pacific herring caught by commercial gillnet  
Kulukak and Nunavachak sections, 9-14 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |        |       |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|--------|-------|----------|------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          |         | Female |       |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green  | Ripe  | Spawncut |      |
| 9 May        | 3   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 5   | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0     | .0    | 100.0    | .0   |
|              | 6   | 24          | 26            | 0              | 50           | .0                 | 50.0 | 50.0     | .0      | .0     | 34.6  | 65.4     | .0   |
|              | 7   | 18          | 12            | 0              | 30           | .0                 | 22.2 | 72.2     | 5.6     | .0     | 16.7  | 83.3     | .0   |
|              | 8   | 83          | 67            | 0              | 150          | .0                 | 31.3 | 67.5     | 1.2     | .0     | 11.9  | 86.6     | 1.5  |
|              | 9   | 27          | 25            | 0              | 52           | .0                 | 25.9 | 70.4     | 3.7     | .0     | 24.0  | 72.0     | 4.0  |
|              | 10  | 52          | 49            | 0              | 101          | .0                 | 23.1 | 75.0     | 1.9     | .0     | 14.3  | 83.7     | 2.0  |
|              | 11  | 81          | 57            | 1              | 139          | .0                 | 13.6 | 84.0     | 2.5     | .0     | 10.5  | 86.0     | 3.5  |
|              | 12  | 46          | 40            | 0              | 86           | .0                 | 32.6 | 63.0     | 4.3     | .0     | 10.0  | 85.0     | 5.0  |
|              | 13  | 3           | 1             | 0              | 4            | .0                 | 33.3 | 66.7     | .0      | .0     | .0    | 100.0    | .0   |
|              | 14  | 4           | 4             | 0              | 8            | .0                 | .0   | 100.0    | .0      | .0     | 50.0  | 25.0     | 25.0 |
|              | 15  | 0           | 2             | 0              | 2            |                    |      |          |         | .0     | .0    | 100.0    | .0   |
| 16           | 0   | 1           | 0             | 1              |              |                    |      |          | .0      | .0     | 100.0 | .0       |      |
| Sample Total |     | 340         | 285           | 1              | 626          | .0                 | 25.9 | 71.8     | 2.4     | .0     | 15.4  | 81.8     | 2.8  |
| 14 May       | 3   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 5   | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0     | .0    | 100.0    | .0   |
|              | 6   | 28          | 27            | 0              | 55           | .0                 | .0   | 100.0    | .0      | .0     | 3.7   | 85.2     | 11.1 |
|              | 7   | 18          | 13            | 0              | 31           | .0                 | .0   | 94.4     | 5.6     | .0     | .0    | 100.0    | .0   |
|              | 8   | 89          | 39            | 0              | 128          | .0                 | .0   | 85.4     | 14.6    | .0     | .0    | 76.9     | 23.1 |
|              | 9   | 39          | 16            | 0              | 55           | .0                 | .0   | 89.7     | 10.3    | .0     | 13.3  | 80.0     | 6.7  |
|              | 10  | 65          | 45            | 0              | 110          | .0                 | .0   | 80.0     | 20.0    | .0     | .0    | 73.3     | 26.7 |
|              | 11  | 121         | 63            | 0              | 184          | .0                 | .0   | 83.5     | 16.5    | .0     | 6.3   | 68.3     | 25.4 |
|              | 12  | 48          | 38            | 0              | 86           | .0                 | .0   | 77.1     | 22.9    | .0     | 2.6   | 76.3     | 21.1 |
|              | 13  | 6           | 8             | 0              | 14           | .0                 | .0   | 66.7     | 33.3    | .0     | .0    | 62.5     | 37.5 |
|              | 14  | 9           | 1             | 0              | 10           | .0                 | .0   | 66.7     | 33.3    | .0     | .0    | 100.0    | .0   |
|              | 15  | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0     | .0    | 100.0    | .0   |
| 16           |     |             |               |                |              |                    |      |          |         |        |       |          |      |
| Sample Total |     | 426         | 252           | 0              | 678          | .0                 | .0   | 84.3     | 15.7    | .0     | 3.2   | 76.1     | 20.7 |
| 9-14 May     | 3   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 5   | 3           | 2             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0     | .0    | 100.0    | .0   |
|              | 6   | 52          | 53            | 0              | 105          | .0                 | 23.1 | 76.9     | .0      | .0     | 18.9  | 75.5     | 5.7  |
|              | 7   | 36          | 25            | 0              | 61           | .0                 | 11.1 | 83.3     | 5.6     | .0     | 8.0   | 92.0     | .0   |
|              | 8   | 172         | 106           | 0              | 278          | .0                 | 15.1 | 76.7     | 8.1     | .0     | 7.5   | 83.0     | 9.4  |
|              | 9   | 66          | 41            | 0              | 107          | .0                 | 10.6 | 81.8     | 7.6     | .0     | 20.0  | 75.0     | 5.0  |
|              | 10  | 117         | 94            | 0              | 211          | .0                 | 10.3 | 77.8     | 12.0    | .0     | 7.4   | 78.7     | 13.8 |
|              | 11  | 202         | 120           | 1              | 323          | .0                 | 5.4  | 83.7     | 10.9    | .0     | 8.3   | 76.7     | 15.0 |
|              | 12  | 94          | 78            | 0              | 172          | .0                 | 16.0 | 70.2     | 13.8    | .0     | 6.4   | 80.8     | 12.8 |
|              | 13  | 9           | 9             | 0              | 18           | .0                 | 11.1 | 66.7     | 22.2    | .0     | .0    | 66.7     | 33.3 |
|              | 14  | 13          | 5             | 0              | 18           | .0                 | .0   | 76.9     | 23.1    | .0     | 40.0  | 40.0     | 20.0 |
|              | 15  | 2           | 3             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0     | .0    | 100.0    | .0   |
| 16           | 0   | 1           | 0             | 1              |              |                    |      |          | .0      | .0     | 100.0 | .0       |      |
| All Samples  |     | 766         | 537           | 1              | 1304         | .0                 | 11.5 | 78.7     | 9.8     | .0     | 9.7   | 79.1     | 11.2 |

**Appendix B.9. Age, sex, and size composition of Pacific herring caught by test commercial purse seine  
Kulukak Section, 7 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |          |         |        |      |          |    |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|----------|---------|--------|------|----------|----|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |       |          |         | Female |      |          |    |
|              |     |             |               |                | Unknown      | Green              | Ripe  | Spawncut | Unknown | Green  | Ripe | Spawncut |    |
|              | 3   |             |               |                |              |                    |       |          |         |        |      |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |      |          |    |
|              | 5   | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | .0   | 100.0    | .0 |
|              | 6   | 4           | 1             | 0              | 5            | .0                 | 25.0  | 75.0     | .0      | .0     | .0   | 100.0    | .0 |
|              | 7   | 1           | 0             | 0              | 1            | .0                 | 100.0 | .0       | .0      |        |      |          |    |
|              | 8   | 3           | 3             | 0              | 6            | .0                 | 33.3  | 66.7     | .0      | .0     | .0   | 100.0    | .0 |
| 7 May        | 9   | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0    | .0      |        |      |          |    |
|              | 10  | 5           | 4             | 0              | 9            | .0                 | .0    | 100.0    | .0      | .0     | 25.0 | 75.0     | .0 |
|              | 11  | 6           | 14            | 0              | 20           | .0                 | .0    | 100.0    | .0      | .0     | 28.6 | 71.4     | .0 |
|              | 12  | 5           | 2             | 0              | 7            | .0                 | 20.0  | 80.0     | .0      | .0     | .0   | 100.0    | .0 |
|              | 13  | 2           | 1             | 0              | 3            | .0                 | .0    | 100.0    | .0      | .0     | .0   | 100.0    | .0 |
|              | 14  | 0           | 2             | 0              | 2            |                    |       |          |         | .0     | 50.0 | 50.0     | .0 |
|              | 15  |             |               |                |              |                    |       |          |         |        |      |          |    |
|              | 16  |             |               |                |              |                    |       |          |         |        |      |          |    |
| Sample Total |     | 27          | 28            | 0              | 55           | .0                 | 14.8  | 85.2     | .0      | .0     | 21.4 | 78.6     | .0 |

**Appendix B.10. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Nunavachak Section, 20 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |       |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|-------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |       |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |       |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 43          | 53            | 0              | 96           | .0                 | .0   | 2.3      | 97.7    | .0    | .0   | .0       | 100.0 |
|              | 6   | 30          | 23            | 0              | 53           | .0                 | .0   | .0       | 100.0   | .0    | .0   | .0       | 100.0 |
|              | 7   | 4           | 2             | 0              | 6            | .0                 | .0   | .0       | 100.0   | .0    | .0   | .0       | 100.0 |
| 20 May       | 8   | 4           | 5             | 0              | 9            | .0                 | .0   | .0       | 100.0   | .0    | .0   | .0       | 100.0 |
|              | 9   | 1           | 0             | 0              | 1            | .0                 | .0   | .0       | 100.0   |       |      |          |       |
|              | 10  | 1           | 1             | 0              | 2            | .0                 | .0   | .0       | 100.0   | .0    | .0   | .0       | 100.0 |
|              | 11  | 4           | 1             | 0              | 5            | .0                 | .0   | 25.0     | 75.0    | .0    | .0   | .0       | 100.0 |
|              | 12  | 1           | 1             | 0              | 2            | .0                 | .0   | .0       | 100.0   | .0    | .0   | .0       | 100.0 |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 88          | 86            | 0              | 174          | .0                 | .0   | 2.3      | 97.7    | .0    | .0   | .0       | 100.0 |

Appendix B.11. Age, sex, and size composition of Pacific herring caught by test commercial purse seine  
Togiak Section, 5-10 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |      |          |         |       |      |          |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|------|----------|---------|-------|------|----------|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |       |      |          | Female  |       |      |          |
|              |     | Male        | Female        | Unknown        |              | Unknown            | Green | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |
| 5 May        | 3   |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 4   |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 5   | 1           | 5             | 0              | 6            | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 6   | 6           | 13            | 0              | 19           | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 7   | 1           | 3             | 0              | 4            | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 8   | 13          | 21            | 0              | 34           | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 9   | 4           | 4             | 0              | 8            | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 10  | 19          | 14            | 0              | 33           | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 11  | 21          | 19            | 0              | 40           | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 12  | 3           | 14            | 0              | 17           | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 13  | 0           | 2             | 0              | 2            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 14  |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 15  |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 16  |             |               |                |              |                    |       |      |          |         |       |      |          |
| Sample Total |     | 68          | 95            | 0              | 163          | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0   | .0       |
| 7 May        | 3   |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 4   |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 5   | 0           | 1             | 0              | 1            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 6   | 2           | 4             | 0              | 6            | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 7   | 0           | 1             | 0              | 1            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 8   | 6           | 4             | 0              | 10           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 9   | 1           | 4             | 0              | 5            | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 10  | 3           | 10            | 0              | 13           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 11  | 8           | 9             | 0              | 17           | .0                 | 100.0 | .0   | .0       | .0      | 88.9  | 11.1 | .0       |
|              | 12  | 4           | 10            | 0              | 14           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 13  | 0           | 2             | 0              | 2            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 14  | 0           | 1             | 0              | 1            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 15  |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 16  |             |               |                |              |                    |       |      |          |         |       |      |          |
| Sample Total |     | 24          | 46            | 0              | 70           | .0                 | 100.0 | .0   | .0       | .0      | 97.8  | 2.2  | .0       |
| 8 May        | 3   |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 4   |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 5   | 0           | 3             | 0              | 3            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 6   | 5           | 7             | 0              | 12           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 7   | 2           | 1             | 0              | 3            | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 8   | 6           | 10            | 0              | 16           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 9   | 0           | 3             | 0              | 3            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 10  | 12          | 12            | 0              | 24           | 8.3                | 91.7  | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 11  | 15          | 17            | 0              | 32           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 12  | 1           | 13            | 0              | 14           | .0                 | 100.0 | .0   | .0       | .0      | 100.0 | .0   | .0       |
|              | 13  | 0           | 1             | 0              | 1            |                    |       |      |          | .0      | 100.0 | .0   | .0       |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | 100.0 | .0   | .0       |         |       |      |          |
|              | 15  |             |               |                |              |                    |       |      |          |         |       |      |          |
|              | 16  |             |               |                |              |                    |       |      |          |         |       |      |          |
| Sample Total |     | 42          | 67            | 0              | 109          | 2.4                | 97.6  | .0   | .0       | .0      | 100.0 | .0   | .0       |

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Appendix B.11. (p.2 of 2)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |      |          |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|----------|---------|-------|------|----------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |       |       |          | Female  |       |      |          |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawncut | Unknown | Green | Ripe | Spawncut |
| 9 May        | 3   |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 5   | 1           | 1             | 0              | 2            | .0                 | 100.0 | .0    | .0       | .0      | 100.0 | .0   | .0       |
|              | 6   | 2           | 4             | 0              | 6            | .0                 | 100.0 | .0    | .0       | .0      | 100.0 | .0   | .0       |
|              | 7   | 1           | 2             | 0              | 3            | .0                 | .0    | 100.0 | .0       | .0      | 100.0 | .0   | .0       |
|              | 8   | 6           | 15            | 0              | 21           | .0                 | 50.0  | 50.0  | .0       | .0      | 100.0 | .0   | .0       |
|              | 9   | 0           | 8             | 0              | 8            |                    |       |       |          | .0      | 75.0  | 12.5 | 12.5     |
|              | 10  | 7           | 11            | 0              | 18           | .0                 | 42.9  | 57.1  | .0       | .0      | 90.9  | 9.1  | .0       |
|              | 11  | 11          | 16            | 0              | 27           | .0                 | 54.5  | 45.5  | .0       | .0      | 93.8  | 6.3  | .0       |
|              | 12  | 19          | 16            | 0              | 35           | .0                 | 36.8  | 63.2  | .0       | .0      | 75.0  | 25.0 | .0       |
|              | 13  | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0       |         |       |      |          |
|              | 14  | 0           | 3             | 0              | 3            |                    |       |       |          | .0      | 66.7  | 33.3 | .0       |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0       |         |       |      |          |
| 16           |     |             |               |                |              |                    |       |       |          |         |       |      |          |
| Sample Total |     | 49          | 76            | 0              | 125          | .0                 | 44.9  | 55.1  | .0       | .0      | 88.2  | 10.5 | 1.3      |
| 10 May       | 3   |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 5   | 3           | 1             | 0              | 4            | .0                 | 33.3  | .0    | 66.7     | .0      | 100.0 | .0   | .0       |
|              | 6   | 5           | 3             | 0              | 8            | .0                 | .0    | .0    | 100.0    | .0      | .0    | 33.3 | 66.7     |
|              | 7   | 2           | 4             | 0              | 6            | .0                 | .0    | .0    | 100.0    | .0      | 25.0  | .0   | 75.0     |
|              | 8   | 4           | 6             | 0              | 10           | .0                 | .0    | .0    | 100.0    | .0      | .0    | 16.7 | 83.3     |
|              | 9   | 2           | 2             | 0              | 4            | .0                 | .0    | 50.0  | 50.0     | .0      | .0    | .0   | 100.0    |
|              | 10  | 3           | 5             | 0              | 8            | .0                 | .0    | .0    | 100.0    | .0      | .0    | .0   | 100.0    |
|              | 11  | 8           | 5             | 0              | 13           | .0                 | .0    | .0    | 100.0    | .0      | 20.0  | 20.0 | 60.0     |
|              | 12  | 4           | 4             | 0              | 8            | .0                 | .0    | .0    | 100.0    | .0      | .0    | 25.0 | 75.0     |
|              | 13  |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |      |          |
| 16           |     |             |               |                |              |                    |       |       |          |         |       |      |          |
| Sample Total |     | 31          | 30            | 0              | 61           | .0                 | 3.2   | 3.2   | 93.5     | .0      | 10.0  | 13.3 | 76.7     |
| 5-10 May     | 3   |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |      |          |
|              | 5   | 5           | 11            | 0              | 16           | 20.0               | 40.0  | .0    | 40.0     | .0      | 100.0 | .0   | .0       |
|              | 6   | 20          | 31            | 0              | 51           | 30.0               | 45.0  | .0    | 25.0     | .0      | 90.3  | 3.2  | 6.5      |
|              | 7   | 6           | 11            | 0              | 17           | 16.7               | 33.3  | 16.7  | 33.3     | .0      | 72.7  | .0   | 27.3     |
|              | 8   | 35          | 56            | 0              | 91           | 37.1               | 42.9  | 8.6   | 11.4     | .0      | 89.3  | 1.8  | 8.9      |
|              | 9   | 7           | 21            | 0              | 28           | 57.1               | 14.3  | 14.3  | 14.3     | .0      | 81.0  | 4.8  | 14.3     |
|              | 10  | 44          | 52            | 0              | 96           | 45.5               | 38.6  | 9.1   | 6.8      | .0      | 88.5  | 1.9  | 9.6      |
|              | 11  | 63          | 66            | 0              | 129          | 33.3               | 46.0  | 7.9   | 12.7     | .0      | 90.9  | 4.5  | 4.5      |
|              | 12  | 31          | 57            | 0              | 88           | 9.7                | 38.7  | 38.7  | 12.9     | .0      | 86.0  | 8.8  | 5.3      |
|              | 13  | 1           | 5             | 0              | 6            | .0                 | .0    | 100.0 | .0       | .0      | 100.0 | .0   | .0       |
|              | 14  | 1           | 4             | 0              | 5            | .0                 | 100.0 | .0    | .0       | .0      | 75.0  | 25.0 | .0       |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0       |         |       |      |          |
| 16           |     |             |               |                |              |                    |       |       |          |         |       |      |          |
| All Samples  |     | 214         | 314           | 0              | 528          | 32.2               | 41.1  | 13.1  | 13.6     | .0      | 88.2  | 4.1  | 7.6      |

Appendix B.12. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Hagemeister Section, 5-20 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |          |         |       |       |          |    |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|----------|---------|-------|-------|----------|----|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |       |          | Female  |       |       |          |    |
|              |     |             |               |                | Unknown      | Green              | Ripe  | Spawncut | Unknown | Green | Ripe  | Spawncut |    |
| 5 May        | 3   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 5   | 3           | 0             | 0              | 3            | 100.0              | .0    | .0       | .0      |       |       |          |    |
|              | 6   | 3           | 2             | 0              | 5            | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 7   | 1           | 1             | 0              | 2            | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 8   | 5           | 3             | 0              | 8            | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 9   | 1           | 2             | 0              | 3            | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 10  | 6           | 4             | 0              | 10           | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 11  | 11          | 2             | 0              | 13           | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 12  | 2           | 5             | 0              | 7            | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |       |       |          |    |
| 16           |     |             |               |                |              |                    |       |          |         |       |       |          |    |
| Sample Total |     | 32          | 19            | 0              | 51           | 100.0              | .0    | .0       | .0      | .0    | .0    | 100.0    | .0 |
| 7 May        | 3   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 6   | 0           | 3             | 0              | 3            |                    |       |          |         | .0    | 100.0 | .0       | .0 |
|              | 7   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 8   | 2           | 8             | 0              | 10           | .0                 | 100.0 | .0       | .0      | .0    | 87.5  | 12.5     | .0 |
|              | 9   | 1           | 3             | 0              | 4            | .0                 | .0    | 100.0    | .0      | .0    | 66.7  | 33.3     | .0 |
|              | 10  | 3           | 8             | 0              | 11           | .0                 | 33.3  | 66.7     | .0      | .0    | 100.0 | .0       | .0 |
|              | 11  | 6           | 4             | 0              | 10           | .0                 | 16.7  | 83.3     | .0      | .0    | 100.0 | .0       | .0 |
|              | 12  | 2           | 0             | 0              | 2            | .0                 | .0    | 100.0    | .0      |       |       |          |    |
|              | 13  | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0    | .0      |       |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |       |       |          |    |
| 16           |     |             |               |                |              |                    |       |          |         |       |       |          |    |
| Sample Total |     | 15          | 26            | 0              | 41           | .0                 | 26.7  | 73.3     | .0      | .0    | 92.3  | 7.7      | .0 |
| 8 May        | 3   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 6   | 0           | 1             | 0              | 1            |                    |       |          |         | .0    | 100.0 | .0       | .0 |
|              | 7   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 8   | 2           | 5             | 0              | 7            | .0                 | .0    | 100.0    | .0      | .0    | 80.0  | 20.0     | .0 |
|              | 9   | 2           | 1             | 0              | 3            | .0                 | .0    | 100.0    | .0      | .0    | 100.0 | .0       | .0 |
|              | 10  | 4           | 9             | 0              | 13           | .0                 | .0    | 100.0    | .0      | .0    | 88.9  | 11.1     | .0 |
|              | 11  | 2           | 5             | 0              | 7            | .0                 | .0    | 100.0    | .0      | .0    | 100.0 | .0       | .0 |
|              | 12  | 4           | 5             | 0              | 9            | .0                 | .0    | 100.0    | .0      | .0    | 100.0 | .0       | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |       |       |          |    |
| 16           |     |             |               |                |              |                    |       |          |         |       |       |          |    |
| Sample Total |     | 14          | 26            | 0              | 40           | .0                 | .0    | 100.0    | .0      | .0    | 92.3  | 7.7      | .0 |

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Appendix B.12. (p.2 of 3)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |       |          |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|----------|---------|-------|-------|----------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Unknown            | Male  |       |          | Female  |       |       |          |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawncut | Unknown | Green | Ripe  | Spawncut |
| 9 May        | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 5   | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0 | .0       |         |       |       |          |
|              | 6   | 3           | 2             | 0              | 5            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 7   | 5           | 1             | 0              | 6            | .0                 | 80.0  | 20.0  | .0       | .0      | 100.0 | .0    | .0       |
|              | 8   | 10          | 10            | 0              | 20           | .0                 | 10.0  | 90.0  | .0       | .0      | 40.0  | 60.0  | .0       |
|              | 9   | 4           | 8             | 0              | 12           | .0                 | 100.0 | .0    | .0       | .0      | 75.0  | 25.0  | .0       |
|              | 10  | 18          | 20            | 0              | 38           | .0                 | 33.3  | 66.7  | .0       | .0      | 65.0  | 35.0  | .0       |
|              | 11  | 18          | 16            | 0              | 34           | .0                 | 16.7  | 83.3  | .0       | .0      | 81.3  | 18.8  | .0       |
|              | 12  | 6           | 9             | 0              | 15           | .0                 | 50.0  | 50.0  | .0       | .0      | 77.8  | 22.2  | .0       |
|              | 13  | 0           | 3             | 0              | 3            |                    |       |       |          | .0      | 66.7  | 33.3  | .0       |
|              | 14  | 0           | 2             | 0              | 2            |                    |       |       |          | .0      | .0    | 100.0 | .0       |
|              | 15  | 0           | 1             | 0              | 1            |                    |       |       |          | .0      | 100.0 | .0    | .0       |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |
| Sample Total |     | 65          | 72            | 0              | 137          | .0                 | 32.3  | 67.7  | .0       | .0      | 65.3  | 34.7  | .0       |
| 10 May       | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 5   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 6   | 2           | 1             | 0              | 3            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 7   | 0           | 1             | 0              | 1            |                    |       |       |          | .0      | .0    | 100.0 | .0       |
|              | 8   | 6           | 5             | 0              | 11           | .0                 | 66.7  | 33.3  | .0       | .0      | 40.0  | 60.0  | .0       |
|              | 9   | 3           | 3             | 0              | 6            | .0                 | .0    | 100.0 | .0       | .0      | 33.3  | 66.7  | .0       |
|              | 10  | 12          | 12            | 0              | 24           | .0                 | 33.3  | 66.7  | .0       | .0      | 25.0  | 75.0  | .0       |
|              | 11  | 12          | 26            | 0              | 38           | .0                 | 25.0  | 75.0  | .0       | .0      | 15.4  | 84.6  | .0       |
|              | 12  | 8           | 28            | 0              | 36           | .0                 | 12.5  | 87.5  | .0       | .0      | 39.3  | 60.7  | .0       |
|              | 13  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 15  | 0           | 2             | 0              | 2            |                    |       |       |          | .0      | .0    | 100.0 | .0       |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |
| Sample Total |     | 43          | 78            | 0              | 121          | .0                 | 27.9  | 72.1  | .0       | .0      | 26.9  | 73.1  | .0       |
| 11 May       | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 5   | 0           | 2             | 0              | 2            |                    |       |       |          | .0      | 50.0  | 50.0  | .0       |
|              | 6   | 1           | 7             | 0              | 8            | .0                 | .0    | 100.0 | .0       | .0      | 71.4  | 28.6  | .0       |
|              | 7   | 5           | 4             | 0              | 9            | .0                 | 20.0  | 80.0  | .0       | .0      | 50.0  | 50.0  | .0       |
|              | 8   | 1           | 12            | 0              | 13           | .0                 | .0    | 100.0 | .0       | .0      | 58.3  | 25.0  | 16.7     |
|              | 9   | 3           | 6             | 0              | 9            | .0                 | .0    | 100.0 | .0       | .0      | 50.0  | 50.0  | .0       |
|              | 10  | 8           | 14            | 0              | 22           | .0                 | 12.5  | 75.0  | 12.5     | .0      | 28.6  | 57.1  | 14.3     |
|              | 11  | 13          | 15            | 0              | 28           | .0                 | 30.8  | 61.5  | 7.7      | .0      | 40.0  | 40.0  | 20.0     |
|              | 12  | 8           | 11            | 0              | 19           | .0                 | .0    | 87.5  | 12.5     | .0      | 9.1   | 72.7  | 18.2     |
|              | 13  | 0           | 1             | 0              | 1            |                    |       |       |          | .0      | .0    | 100.0 | .0       |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |
| Sample Total |     | 39          | 72            | 0              | 111          | .0                 | 15.4  | 76.9  | 7.7      | .0      | 40.3  | 47.2  | 12.5     |

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Appendix B.12. (p. 3 of 3)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |       |          |  |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|----------|---------|-------|-------|----------|--|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |       |       | Female   |         |       |       |          |  |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawnout | Unknown | Green | Ripe  | Spawnout |  |
|              | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 11          | 6             | 0              | 17           | .0                 | 54.5  | 27.3  | 18.2     | .0      | 16.7  | 83.3  | .0       |  |
|              | 6   | 17          | 12            | 0              | 29           | .0                 | 47.1  | 41.2  | 11.8     | .0      | .0    | 100.0 | .0       |  |
|              | 7   | 4           | 0             | 0              | 4            | .0                 | 50.0  | 50.0  | .0       |         |       |       |          |  |
| 20 May       | 8   | 20          | 15            | 0              | 35           | .0                 | 50.0  | 40.0  | 10.0     | .0      | 6.7   | 93.3  | .0       |  |
|              | 9   | 6           | 0             | 0              | 6            | .0                 | 16.7  | 83.3  | .0       |         |       |       |          |  |
|              | 10  | 8           | 4             | 0              | 12           | .0                 | 37.5  | 62.5  | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 11  | 8           | 7             | 0              | 15           | .0                 | 37.5  | 62.5  | .0       | .0      | .0    | 85.7  | 14.3     |  |
|              | 12  | 1           | 6             | 0              | 7            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 83.3  | 16.7     |  |
|              | 13  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
| Sample Total |     | 75          | 50            | 0              | 125          | .0                 | 44.0  | 48.0  | 8.0      | .0      | 4.0   | 92.0  | 4.0      |  |
|              | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 15          | 8             | 0              | 23           | 20.0               | 40.0  | 26.7  | 13.3     | .0      | 25.0  | 75.0  | .0       |  |
|              | 6   | 26          | 28            | 0              | 54           | 11.5               | 30.8  | 50.0  | 7.7      | .0      | 32.1  | 67.9  | .0       |  |
|              | 7   | 15          | 7             | 0              | 22           | 6.7                | 46.7  | 46.7  | .0       | .0      | 42.9  | 57.1  | .0       |  |
| 5-20 May     | 8   | 46          | 58            | 0              | 104          | 10.9               | 37.0  | 47.8  | 4.3      | .0      | 43.1  | 53.4  | 3.4      |  |
|              | 9   | 20          | 23            | 0              | 43           | 5.0                | 25.0  | 70.0  | .0       | .0      | 56.5  | 43.5  | .0       |  |
|              | 10  | 59          | 71            | 0              | 130          | 10.2               | 25.4  | 62.7  | 1.7      | .0      | 50.7  | 46.5  | 2.8      |  |
|              | 11  | 70          | 75            | 0              | 145          | 15.7               | 20.0  | 62.9  | 1.4      | .0      | 42.7  | 52.0  | 5.3      |  |
|              | 12  | 31          | 64            | 0              | 95           | 6.5                | 12.9  | 77.4  | 3.2      | .0      | 37.5  | 57.8  | 4.7      |  |
|              | 13  | 1           | 4             | 0              | 5            | .0                 | .0    | 100.0 | .0       | .0      | 50.0  | 50.0  | .0       |  |
|              | 14  | 0           | 2             | 0              | 2            |                    |       |       |          | .0      | .0    | 100.0 | .0       |  |
|              | 15  | 0           | 3             | 0              | 3            |                    |       |       |          | .0      | 33.3  | 66.7  | .0       |  |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |  |
| All Samples  |     | 283         | 343           | 0              | 626          | 11.3               | 26.9  | 58.7  | 3.2      | .0      | 42.9  | 53.9  | 3.2      |  |

**Appendix B.13. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Pyrite Point Section, 11 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |        |       |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|--------|-------|----------|------|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |      |          |         | Female |       |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green  | Ripe  | Spawncut |      |
|              | 3   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 5   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 6   |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 7   | 0           | 1             | 0              | 1            |                    |      |          |         | .0     | .0    | 100.0    | .0   |
|              | 8   | 5           | 3             | 0              | 8            | .0                 | .0   | 80.0     | 20.0    | .0     | .0    | 66.7     | 33.3 |
| 11 May       | 9   | 2           | 0             | 0              | 2            | .0                 | .0   | 100.0    | .0      |        |       |          |      |
|              | 10  | 11          | 9             | 0              | 20           | .0                 | .0   | 100.0    | .0      | .0     | 55.6  | 44.4     | .0   |
|              | 11  | 11          | 13            | 0              | 24           | .0                 | 9.1  | 90.9     | .0      | .0     | 23.1  | 76.9     | .0   |
|              | 12  | 6           | 7             | 0              | 13           | .0                 | .0   | 100.0    | .0      | .0     | 42.9  | 57.1     | .0   |
|              | 13  | 0           | 1             | 0              | 1            |                    |      |          |         | .0     | 100.0 | .0       | .0   |
|              | 14  | 2           | 0             | 0              | 2            | .0                 | .0   | 100.0    | .0      |        |       |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |        |       |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |        |       |          |      |
| Sample Total |     | 37          | 34            | 0              | 71           | .0                 | 2.7  | 94.6     | 2.7     | .0     | 35.3  | 61.8     | 2.9  |

Appendix B.14. Age, sex, and size composition of Pacific herring caught by test commercial purse seine Kulukak, Nunavachak, Togiak, Hagermeister and Pyrite Point sections, 5-20 May 1989.

| Sample Dates | Age | Sex      |            |             | Total no. | Gonad Maturity (%) |       |          |         |        |       |          |    |
|--------------|-----|----------|------------|-------------|-----------|--------------------|-------|----------|---------|--------|-------|----------|----|
|              |     | Male no. | Female no. | Unknown no. |           | Male               |       |          |         | Female |       |          |    |
|              |     |          |            |             | Unknown   | Green              | Ripe  | Spawndut | Unknown | Green  | Ripe  | Spawndut |    |
| 5 May        | 3   |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 4   |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 5   | 4        | 5          | 0           | 9         | 100.0              | .0    | .0       | .0      | .0     | 100.0 | .0       | .0 |
|              | 6   | 9        | 15         | 0           | 24        | 100.0              | .0    | .0       | .0      | .0     | 86.7  | 13.3     | .0 |
|              | 7   | 2        | 4          | 0           | 6         | 100.0              | .0    | .0       | .0      | .0     | 75.0  | 25.0     | .0 |
|              | 8   | 18       | 24         | 0           | 42        | 100.0              | .0    | .0       | .0      | .0     | 87.5  | 12.5     | .0 |
|              | 9   | 5        | 6          | 0           | 11        | 100.0              | .0    | .0       | .0      | .0     | 66.7  | 33.3     | .0 |
|              | 10  | 25       | 18         | 0           | 43        | 100.0              | .0    | .0       | .0      | .0     | 77.8  | 22.2     | .0 |
|              | 11  | 32       | 21         | 0           | 53        | 100.0              | .0    | .0       | .0      | .0     | 90.5  | 9.5      | .0 |
|              | 12  | 5        | 19         | 0           | 24        | 100.0              | .0    | .0       | .0      | .0     | 73.7  | 26.3     | .0 |
|              | 13  | 0        | 2          | 0           | 2         |                    |       |          |         | .0     | 100.0 | .0       | .0 |
|              | 14  |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 15  |          |            |             |           |                    |       |          |         |        |       |          |    |
| 16           |     |          |            |             |           |                    |       |          |         |        |       |          |    |
| Sample Total |     | 100      | 114        | 0           | 214       | 100.0              | .0    | .0       | .0      | .0     | 83.3  | 16.7     | .0 |
| 7 May        | 3   |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 4   |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 5   | 0        | 2          | 0           | 2         |                    |       |          |         | .0     | 50.0  | 50.0     | .0 |
|              | 6   | 6        | 8          | 0           | 14        | .0                 | 50.0  | 50.0     | .0      | .0     | 87.5  | 12.5     | .0 |
|              | 7   | 1        | 1          | 0           | 2         | .0                 | 100.0 | .0       | .0      | .0     | 100.0 | .0       | .0 |
|              | 8   | 11       | 15         | 0           | 26        | .0                 | 81.8  | 18.2     | .0      | .0     | 73.3  | 26.7     | .0 |
|              | 9   | 3        | 7          | 0           | 10        | .0                 | 33.3  | 66.7     | .0      | .0     | 85.7  | 14.3     | .0 |
|              | 10  | 11       | 22         | 0           | 33        | .0                 | 35.4  | 63.6     | .0      | .0     | 86.4  | 13.6     | .0 |
|              | 11  | 20       | 27         | 0           | 47        | .0                 | 45.0  | 55.0     | .0      | .0     | 59.3  | 40.7     | .0 |
|              | 12  | 11       | 12         | 0           | 23        | .0                 | 45.5  | 54.5     | .0      | .0     | 83.3  | 16.7     | .0 |
|              | 13  | 3        | 3          | 0           | 6         | .0                 | .0    | 100.0    | .0      | .0     | 66.7  | 33.3     | .0 |
|              | 14  | 0        | 3          | 0           | 3         |                    |       |          |         | .0     | 66.7  | 33.3     | .0 |
|              | 15  |          |            |             |           |                    |       |          |         |        |       |          |    |
| 16           |     |          |            |             |           |                    |       |          |         |        |       |          |    |
| Sample Total |     | 66       | 100        | 0           | 166       | .0                 | 48.5  | 51.5     | .0      | .0     | 75.0  | 25.0     | .0 |
| 8 May        | 3   |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 4   |          |            |             |           |                    |       |          |         |        |       |          |    |
|              | 5   | 0        | 3          | 0           | 3         |                    |       |          |         | .0     | 100.0 | .0       | .0 |
|              | 6   | 5        | 8          | 0           | 13        | .0                 | 100.0 | .0       | .0      | .0     | 100.0 | .0       | .0 |
|              | 7   | 2        | 1          | 0           | 3         | .0                 | 100.0 | .0       | .0      | .0     | 100.0 | .0       | .0 |
|              | 8   | 8        | 15         | 0           | 23        | .0                 | 75.0  | 25.0     | .0      | .0     | 93.3  | 6.7      | .0 |
|              | 9   | 2        | 4          | 0           | 6         | .0                 | .0    | 100.0    | .0      | .0     | 100.0 | .0       | .0 |
|              | 10  | 16       | 21         | 0           | 37        | 6.3                | 68.8  | 25.0     | .0      | .0     | 95.2  | 4.8      | .0 |
|              | 11  | 17       | 22         | 0           | 39        | .0                 | 88.2  | 11.8     | .0      | .0     | 100.0 | .0       | .0 |
|              | 12  | 5        | 18         | 0           | 23        | .0                 | 20.0  | 80.0     | .0      | .0     | 100.0 | .0       | .0 |
|              | 13  | 0        | 1          | 0           | 1         |                    |       |          |         | .0     | 100.0 | .0       | .0 |
|              | 14  | 1        | 0          | 0           | 1         | .0                 | 100.0 | .0       | .0      |        |       |          |    |
|              | 15  |          |            |             |           |                    |       |          |         |        |       |          |    |
| 16           |     |          |            |             |           |                    |       |          |         |        |       |          |    |
| Sample Total |     | 56       | 93         | 0           | 149       | 1.8                | 73.2  | 25.0     | .0      | .0     | 97.8  | 2.2      | .0 |

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Appendix B.14. (p.2 of 3)

| Sample Dates | Age | Sex      |            |             | Total<br>no. | Gonad Maturity (%) |       |          |         |       |       |          |      |
|--------------|-----|----------|------------|-------------|--------------|--------------------|-------|----------|---------|-------|-------|----------|------|
|              |     | no. Male | no. Female | no. Unknown |              | Male               |       |          | Female  |       |       |          |      |
|              |     |          |            |             | Unknown      | Green              | Ripe  | Spawncut | Unknown | Green | Ripe  | Spawncut |      |
| 9 May        | 3   |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 4   |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 5   | 2        | 1          | 0           | 3            | .0                 | 50.0  | 50.0     | .0      | .0    | 100.0 | .0       | .0   |
|              | 6   | 5        | 6          | 0           | 11           | .0                 | 40.0  | 60.0     | .0      | .0    | 66.7  | 33.3     | .0   |
|              | 7   | 6        | 3          | 0           | 9            | .0                 | 66.7  | 33.3     | .0      | .0    | 100.0 | .0       | .0   |
|              | 8   | 16       | 25         | 0           | 41           | .0                 | 25.0  | 75.0     | .0      | .0    | 76.0  | 24.0     | .0   |
|              | 9   | 4        | 16         | 0           | 20           | .0                 | 100.0 | .0       | .0      | .0    | 75.0  | 18.8     | 6.3  |
|              | 10  | 25       | 31         | 0           | 56           | .0                 | 36.0  | 64.0     | .0      | .0    | 74.2  | 25.8     | .0   |
|              | 11  | 29       | 32         | 0           | 61           | .0                 | 31.0  | 69.0     | .0      | .0    | 87.5  | 12.5     | .0   |
|              | 12  | 25       | 25         | 0           | 50           | .0                 | 40.0  | 60.0     | .0      | .0    | 76.0  | 24.0     | .0   |
|              | 13  | 1        | 3          | 0           | 4            | .0                 | .0    | 100.0    | .0      | .0    | 66.7  | 33.3     | .0   |
|              | 14  | 0        | 5          | 0           | 5            | .0                 |       |          |         | .0    | 40.0  | 60.0     | .0   |
|              | 15  | 1        | 1          | 0           | 2            | .0                 | .0    | 100.0    | .0      | .0    | 100.0 | .0       | .0   |
|              | 16  |          |            |             |              |                    |       |          |         |       |       |          |      |
| Sample Total |     | 114      | 148        | 0           | 262          | .0                 | 37.7  | 62.3     | .0      | .0    | 77.0  | 22.3     | .7   |
| 10 May       | 3   |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 4   |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 5   | 3        | 1          | 0           | 4            | .0                 | 33.3  | .0       | 66.7    | .0    | 100.0 | .0       | .0   |
|              | 6   | 7        | 4          | 0           | 11           | .0                 | .0    | 28.6     | 71.4    | .0    | .0    | 50.0     | 50.0 |
|              | 7   | 2        | 5          | 0           | 7            | .0                 | .0    | .0       | 100.0   | .0    | 20.0  | 20.0     | 60.0 |
|              | 8   | 10       | 11         | 0           | 21           | .0                 | 40.0  | 20.0     | 40.0    | .0    | 18.2  | 36.4     | 45.5 |
|              | 9   | 5        | 5          | 0           | 10           | .0                 | .0    | 80.0     | 20.0    | .0    | 20.0  | 40.0     | 40.0 |
|              | 10  | 15       | 17         | 0           | 32           | .0                 | 26.7  | 53.3     | 20.0    | .0    | 17.6  | 52.9     | 29.4 |
|              | 11  | 20       | 31         | 0           | 51           | .0                 | 15.0  | 45.0     | 40.0    | .0    | 16.1  | 74.2     | 9.7  |
|              | 12  | 12       | 32         | 0           | 44           | .0                 | 8.3   | 58.3     | 33.3    | .0    | 34.4  | 56.3     | 9.4  |
|              | 13  |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 14  |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 15  | 0        | 2          | 0           | 2            |                    |       |          |         | .0    | .0    | 100.0    | .0   |
|              | 16  |          |            |             |              |                    |       |          |         |       |       |          |      |
| Sample Total |     | 74       | 108        | 0           | 182          | .0                 | 17.6  | 43.2     | 39.2    | .0    | 22.2  | 56.5     | 21.3 |
| 11 May       | 3   |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 4   |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 5   | 0        | 2          | 0           | 2            |                    |       |          |         | .0    | 50.0  | 50.0     | .0   |
|              | 6   | 1        | 8          | 0           | 9            | .0                 | .0    | 100.0    | .0      | .0    | 75.0  | 25.0     | .0   |
|              | 7   | 5        | 6          | 0           | 11           | .0                 | 20.0  | 80.0     | .0      | .0    | 33.3  | 66.7     | .0   |
|              | 8   | 14       | 20         | 0           | 34           | .0                 | .0    | 71.4     | 28.6    | .0    | 40.0  | 45.0     | 15.0 |
|              | 9   | 6        | 11         | 0           | 17           | .0                 | .0    | 100.0    | .0      | .0    | 63.6  | 36.4     | .0   |
|              | 10  | 29       | 37         | 0           | 66           | .0                 | 3.4   | 93.1     | 3.4     | .0    | 37.8  | 54.1     | 8.1  |
|              | 11  | 37       | 36         | 0           | 73           | .0                 | 13.5  | 83.8     | 2.7     | .0    | 25.0  | 66.7     | 8.3  |
|              | 12  | 20       | 32         | 0           | 52           | .0                 | .0    | 90.0     | 10.0    | .0    | 21.9  | 71.9     | 6.3  |
|              | 13  | 0        | 2          | 0           | 2            |                    |       |          |         | .0    | 50.0  | 50.0     | .0   |
|              | 14  | 3        | 0          | 0           | 3            | .0                 | .0    | 100.0    | .0      |       |       |          |      |
|              | 15  |          |            |             |              |                    |       |          |         |       |       |          |      |
|              | 16  |          |            |             |              |                    |       |          |         |       |       |          |      |
| Sample Total |     | 115      | 154        | 0           | 269          | .0                 | 6.1   | 87.0     | 7.0     | .0    | 35.7  | 57.1     | 7.1  |

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Appendix B.14. (p.3 of 3)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |       |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|-------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |       |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |       |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 54          | 59            | 0              | 113          | .0                 | 11.1 | 7.4      | 81.5    | .0    | 1.7  | 8.5      | 89.8  |
|              | 6   | 47          | 35            | 0              | 82           | .0                 | 17.0 | 14.9     | 68.1    | .0    | .0   | 34.3     | 65.7  |
|              | 7   | 8           | 2             | 0              | 10           | .0                 | 25.0 | 25.0     | 50.0    | .0    | .0   | .0       | 100.0 |
| 20 May       | 8   | 24          | 20            | 0              | 44           | .0                 | 41.7 | 33.3     | 25.0    | .0    | 5.0  | 70.0     | 25.0  |
|              | 9   | 7           | 0             | 0              | 7            | .0                 | 14.3 | 71.4     | 14.3    |       |      |          |       |
|              | 10  | 9           | 5             | 0              | 14           | .0                 | 33.3 | 55.6     | 11.1    | .0    | .0   | 80.0     | 20.0  |
|              | 11  | 12          | 8             | 0              | 20           | .0                 | 25.0 | 50.0     | 25.0    | .0    | .0   | 75.0     | 25.0  |
|              | 12  | 2           | 7             | 0              | 9            | .0                 | .0   | 50.0     | 50.0    | .0    | .0   | 71.4     | 28.6  |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 163         | 136           | 0              | 299          | .0                 | 20.2 | 23.3     | 56.4    | .0    | 1.5  | 33.8     | 64.7  |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 63          | 73            | 0              | 136          | 6.3                | 12.7 | 7.9      | 73.0    | .0    | 17.8 | 9.6      | 72.6  |
|              | 6   | 80          | 84            | 0              | 164          | 11.3               | 22.5 | 20.0     | 46.3    | .0    | 45.2 | 25.0     | 29.8  |
|              | 7   | 26          | 22            | 0              | 48           | 7.7                | 38.5 | 30.8     | 23.1    | .0    | 50.0 | 27.3     | 22.7  |
| 5-20 May     | 8   | 101         | 130           | 0              | 231          | 17.8               | 32.7 | 35.6     | 13.9    | .0    | 58.5 | 31.5     | 10.0  |
|              | 9   | 32          | 49            | 0              | 81           | 15.6               | 18.8 | 59.4     | 6.3     | .0    | 69.4 | 24.5     | 6.1   |
|              | 10  | 130         | 151           | 0              | 281          | 20.0               | 24.6 | 51.5     | 3.8     | .0    | 61.6 | 32.5     | 6.0   |
|              | 11  | 167         | 177           | 0              | 344          | 19.2               | 26.3 | 47.3     | 7.2     | .0    | 55.9 | 39.5     | 4.5   |
|              | 12  | 80          | 145           | 0              | 225          | 6.3                | 21.3 | 63.8     | 8.8     | .0    | 54.5 | 40.7     | 4.8   |
|              | 13  | 4           | 11            | 0              | 15           | .0                 | .0   | 100.0    | .0      | .0    | 72.7 | 27.3     | .0    |
|              | 14  | 4           | 8             | 0              | 12           | .0                 | 25.0 | 75.0     | .0      | .0    | 50.0 | 50.0     | .0    |
|              | 15  | 1           | 3             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | 33.3 | 66.7     | .0    |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| All Samples  |     | 688         | 853           | 0              | 1541         | 14.7               | 24.6 | 42.0     | 18.8    | .0    | 53.5 | 32.1     | 14.4  |

Appendix B.15. Age, sex, and size composition of Pacific herring caught by test variable mesh gill net  
Kulukak Section, 1-23 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |          |         |       |       |          |    |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|----------|---------|-------|-------|----------|----|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |       |          | Female  |       |       |          |    |
|              |     |             |               |                | Unknown      | Green              | Ripe  | Spawnout | Unknown | Green | Ripe  | Spawnout |    |
| 1 May        | 3   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 6   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 7   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 8   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 9   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 10  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 11  |             | 1             | 0              | 0            | 1                  | 100.0 | .0       | .0      | .0    |       |          |    |
|              | 12  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 13  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 16  |             |               |                |              |                    |       |          |         |       |       |          |    |
| Sample Total |     | 1           | 0             | 0              | 1            | 100.0              | .0    | .0       | .0      |       |       |          |    |
| 3 May        | 3   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 6   |             | 0             | 1              | 0            | 1                  |       |          |         | .0    | 100.0 | .0       | .0 |
|              | 7   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 8   |             | 1             | 1              | 0            | 2                  | 100.0 | .0       | .0      | .0    | .0    | 100.0    | .0 |
|              | 9   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 10  |             | 0             | 1              | 0            | 1                  |       |          |         | .0    | .0    | 100.0    | .0 |
|              | 11  |             | 1             | 2              | 0            | 3                  | 100.0 | .0       | .0      | .0    | 100.0 | .0       | .0 |
|              | 12  |             | 0             | 1              | 0            | 1                  |       |          |         | .0    | 100.0 | .0       | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 15  |             | 0             | 1              | 0            | 1                  |       |          |         | .0    | 100.0 | .0       | .0 |
|              | 16  |             |               |                |              |                    |       |          |         |       |       |          |    |
| Sample Total |     | 2           | 7             | 0              | 9            | 100.0              | .0    | .0       | .0      | .0    | 85.7  | 14.3     | .0 |
| 4 May        | 3   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 6   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 7   |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 8   |             | 1             | 0              | 0            | 1                  | 100.0 | .0       | .0      | .0    |       |          |    |
|              | 9   |             | 1             | 0              | 0            | 1                  | 100.0 | .0       | .0      | .0    |       |          |    |
|              | 10  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 11  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 12  |             | 1             | 0              | 0            | 1                  | 100.0 | .0       | .0      | .0    |       |          |    |
|              | 13  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |       |       |          |    |
|              | 16  |             |               |                |              |                    |       |          |         |       |       |          |    |
| Sample Total |     | 3           | 0             | 0              | 3            | 100.0              | .0    | .0       | .0      |       |       |          |    |

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Appendix B.15. (p.2 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |          |         |        |       |          |    |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|----------|---------|--------|-------|----------|----|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |       |          |         | Female |       |          |    |
|              |     |             |               |                | Unknown      | Green              | Ripe  | Spawncut | Unknown | Green  | Ripe  | Spawncut |    |
| 5 May        | 3   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 6   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 7   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 8   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 9   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 10  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 11  | 3           | 1             | 0              | 4            | 100.0              | .0    | .0       | .0      | .0     | 100.0 | .0       | .0 |
|              | 12  | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | 100.0 | .0       | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |    |
| 16           |     |             |               |                |              |                    |       |          |         |        |       |          |    |
| Sample Total |     | 3           | 2             | 0              | 5            | 100.0              | .0    | .0       | .0      | .0     | 100.0 | .0       | .0 |
| 6 May        | 3   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 5   | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | 100.0 | .0       | .0 |
|              | 6   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 7   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 8   | 3           | 4             | 0              | 7            | .0                 | .0    | 100.0    | .0      | .0     | 25.0  | 75.0     | .0 |
|              | 9   | 2           | 0             | 0              | 2            | .0                 | .0    | 100.0    | .0      |        |       |          |    |
|              | 10  | 7           | 3             | 0              | 10           | .0                 | 14.3  | 85.7     | .0      | .0     | 33.3  | 66.7     | .0 |
|              | 11  | 3           | 8             | 0              | 11           | .0                 | .0    | 100.0    | .0      | .0     | 37.5  | 62.5     | .0 |
|              | 12  | 1           | 5             | 0              | 6            | .0                 | 100.0 | .0       | .0      | .0     | 20.0  | 80.0     | .0 |
|              | 13  | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | 100.0 | .0       | .0 |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 15  | 1           | 1             | 0              | 2            | .0                 | 100.0 | .0       | .0      | .0     | .0    | 100.0    | .0 |
| 16           |     |             |               |                |              |                    |       |          |         |        |       |          |    |
| Sample Total |     | 17          | 23            | 0              | 40           | .0                 | 17.6  | 82.4     | .0      | .0     | 34.8  | 65.2     | .0 |
| 7 May        | 3   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 5   | 2           | 0             | 0              | 2            | .0                 | .0    | 100.0    | .0      |        |       |          |    |
|              | 6   | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | .0    | 100.0    | .0 |
|              | 7   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 8   | 8           | 7             | 0              | 15           | .0                 | .0    | 100.0    | .0      | .0     | .0    | 100.0    | .0 |
|              | 9   | 4           | 3             | 0              | 7            | .0                 | .0    | 100.0    | .0      | .0     | .0    | 100.0    | .0 |
|              | 10  | 8           | 3             | 0              | 11           | .0                 | .0    | 100.0    | .0      | .0     | .0    | 100.0    | .0 |
|              | 11  | 12          | 5             | 0              | 17           | .0                 | 8.3   | 91.7     | .0      | .0     | .0    | 100.0    | .0 |
|              | 12  | 9           | 3             | 0              | 12           | .0                 | 11.1  | 88.9     | .0      | .0     | .0    | 100.0    | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 14  | 2           | 0             | 0              | 2            | .0                 | .0    | 100.0    | .0      |        |       |          |    |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0    | .0      |        |       |          |    |
| 16           |     |             |               |                |              |                    |       |          |         |        |       |          |    |
| Sample Total |     | 46          | 22            | 0              | 68           | .0                 | 4.3   | 95.7     | .0      | .0     | .0    | 100.0    | .0 |

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Appendix B.15. (p. 3 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |          |         |        |       |          |    |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|----------|---------|--------|-------|----------|----|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |       |          |         | Female |       |          |    |
|              |     |             |               |                | Unknown      | Green              | Ripe  | Spawncut | Unknown | Green  | Ripe  | Spawncut |    |
|              | 3   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 5   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 6   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 7   |             |               |                |              |                    |       |          |         |        |       |          |    |
| 8 May        | 8   | 2           | 1             | 0              | 3            | .0                 | 50.0  | 50.0     | .0      | .0     | .0    | 100.0    | .0 |
|              | 9   | 1           | 0             | 0              | 1            | .0                 | 100.0 | .0       | .0      |        |       |          |    |
|              | 10  | 2           | 1             | 0              | 3            | .0                 | .0    | 100.0    | .0      | .0     | 100.0 | .0       | .0 |
|              | 11  | 1           | 2             | 0              | 3            | .0                 | .0    | 100.0    | .0      | .0     | .0    | 100.0    | .0 |
|              | 12  | 1           | 1             | 0              | 2            | .0                 | 100.0 | .0       | .0      | .0     | .0    | 100.0    | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 16  |             |               |                |              |                    |       |          |         |        |       |          |    |
| Sample Total |     | 7           | 5             | 0              | 12           | .0                 | 42.9  | 57.1     | .0      | .0     | 20.0  | 80.0     | .0 |
|              | 3   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 5   | 4           | 0             | 0              | 4            | .0                 | 50.0  | 50.0     | .0      |        |       |          |    |
|              | 6   | 4           | 4             | 0              | 8            | .0                 | .0    | 100.0    | .0      | .0     | 100.0 | .0       | .0 |
|              | 7   | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0    | .0      |        |       |          |    |
| 9 May        | 8   | 14          | 13            | 0              | 27           | .0                 | 35.7  | 57.1     | 7.1     | .0     | 15.4  | 84.6     | .0 |
|              | 9   | 9           | 1             | 0              | 10           | .0                 | 11.1  | 88.9     | .0      | .0     | .0    | 100.0    | .0 |
|              | 10  | 7           | 11            | 0              | 18           | .0                 | .0    | 100.0    | .0      | .0     | 18.2  | 81.8     | .0 |
|              | 11  | 16          | 13            | 1              | 30           | .0                 | .0    | 93.8     | 6.3     | .0     | 15.4  | 84.6     | .0 |
|              | 12  | 6           | 4             | 0              | 10           | .0                 | 16.7  | 83.3     | .0      | .0     | .0    | 100.0    | .0 |
|              | 13  | 2           | 0             | 0              | 2            | .0                 | .0    | 100.0    | .0      |        |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 16  | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | .0    | 100.0    | .0 |
| Sample Total |     | 63          | 47            | 1              | 111          | .0                 | 14.3  | 82.5     | 3.2     | .0     | 21.3  | 78.7     | .0 |
|              | 3   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 5   | 5           | 1             | 0              | 6            | .0                 | 40.0  | 60.0     | .0      | .0     | .0    | 100.0    | .0 |
|              | 6   | 4           | 9             | 0              | 13           | .0                 | 25.0  | 75.0     | .0      | .0     | .0    | 100.0    | .0 |
|              | 7   | 2           | 0             | 0              | 2            | .0                 | 50.0  | 50.0     | .0      |        |       |          |    |
| 10 May       | 8   | 10          | 8             | 0              | 18           | .0                 | 30.0  | 70.0     | .0      | .0     | 25.0  | 75.0     | .0 |
|              | 9   | 4           | 1             | 0              | 5            | .0                 | 25.0  | 75.0     | .0      | .0     | .0    | 100.0    | .0 |
|              | 10  | 10          | 4             | 0              | 14           | .0                 | 30.0  | 70.0     | .0      | .0     | 25.0  | 75.0     | .0 |
|              | 11  | 13          | 10            | 0              | 23           | .0                 | 30.8  | 69.2     | .0      | .0     | 20.0  | 80.0     | .0 |
|              | 12  | 5           | 3             | 0              | 8            | .0                 | 60.0  | 40.0     | .0      | .0     | 33.3  | 66.7     | .0 |
|              | 13  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |    |
|              | 16  |             |               |                |              |                    |       |          |         |        |       |          |    |
| Sample Total |     | 53          | 36            | 0              | 89           | .0                 | 34.0  | 66.0     | .0      | .0     | 16.7  | 83.3     | .0 |

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Appendix B.15. (p. 4 of 8)

| Sample Dates | Age          | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |        |      |          |      |    |
|--------------|--------------|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|--------|------|----------|------|----|
|              |              | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          |         | Female |      |          |      |    |
|              |              |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green  | Ripe | Spawncut |      |    |
| 11 May       | 3            |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 4            |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 5            | 5           | 0             | 0              | 5            | .0                 | .0   | 100.0    | .0      |        |      |          |      |    |
|              | 6            | 2           | 6             | 0              | 8            | .0                 | 50.0 | 50.0     | .0      | .0     | 16.7 | 83.3     | .0   |    |
|              | 7            | 0           | 2             | 0              | 2            |                    |      |          |         | .0     | .0   | 100.0    | .0   |    |
|              | 8            | 14          | 16            | 0              | 30           | .0                 | 21.4 | 71.4     | 7.1     | .0     | 6.3  | 93.8     | .0   |    |
|              | 9            | 5           | 2             | 0              | 7            | .0                 | 20.0 | 80.0     | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 10           | 13          | 10            | 0              | 23           | .0                 | 23.1 | 76.9     | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 11           | 22          | 13            | 0              | 35           | .0                 | 36.4 | 63.6     | .0      | .0     | 7.7  | 92.3     | .0   |    |
|              | 12           | 7           | 4             | 1              | 12           | .0                 | 14.3 | 71.4     | 14.3    | .0     | .0   | 100.0    | .0   |    |
|              | 13           |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 14           |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 15           |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 16           |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | Sample Total |             | 68            | 53             | 1            | 122                | .0   | 25.0     | 72.1    | 2.9    | .0   | 5.7      | 94.3 | .0 |
|              | 12 May       | 3           |               |                |              |                    |      |          |         |        |      |          |      |    |
| 4            |              |             |               |                |              |                    |      |          |         |        |      |          |      |    |
| 5            |              | 2           | 0             | 0              | 2            | .0                 | .0   | 100.0    | .0      |        |      |          |      |    |
| 6            |              | 9           | 4             | 0              | 13           | .0                 | 44.4 | 44.4     | 11.1    | .0     | .0   | 75.0     | 25.0 |    |
| 7            |              | 5           | 0             | 0              | 5            | .0                 | 20.0 | 80.0     | .0      |        |      |          |      |    |
| 8            |              | 17          | 5             | 0              | 22           | .0                 | 17.6 | 76.5     | 5.9     | .0     | .0   | 100.0    | .0   |    |
| 9            |              | 6           | 2             | 0              | 8            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
| 10           |              | 16          | 7             | 0              | 23           | .0                 | 31.3 | 68.8     | .0      | .0     | .0   | 100.0    | .0   |    |
| 11           |              | 13          | 18            | 0              | 31           | .0                 | 30.8 | 61.5     | 7.7     | .0     | .0   | 100.0    | .0   |    |
| 12           |              | 10          | 4             | 0              | 14           | .0                 | 30.0 | 70.0     | .0      | .0     | .0   | 100.0    | .0   |    |
| 13           |              |             |               |                |              |                    |      |          |         |        |      |          |      |    |
| 14           |              |             |               |                |              |                    |      |          |         |        |      |          |      |    |
| 15           |              | 0           | 1             | 0              | 1            |                    |      |          |         | .0     | .0   | 100.0    | .0   |    |
| 16           |              |             |               |                |              |                    |      |          |         |        |      |          |      |    |
| Sample Total |              | 78          | 41            | 0              | 119          | .0                 | 25.6 | 70.5     | 3.8     | .0     | .0   | 97.6     | 2.4  |    |
| 13 May       |              | 3           |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 4            |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 5            | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 6            | 13          | 5             | 0              | 18           | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 7            | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |        |      |          |      |    |
|              | 8            | 12          | 7             | 0              | 19           | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 9            | 3           | 2             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 10           | 6           | 7             | 0              | 13           | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 11           | 11          | 13            | 1              | 25           | .0                 | .0   | 100.0    | .0      | .0     | 7.7  | 92.3     | .0   |    |
|              | 12           | 5           | 9             | 0              | 14           | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |    |
|              | 13           | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |        |      |          |      |    |
|              | 14           | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |        |      |          |      |    |
|              | 15           |             |               |                |              |                    |      |          |         |        |      |          |      |    |
|              | 16           | 0           | 2             | 0              | 2            |                    |      |          |         | .0     | .0   | 100.0    | .0   |    |
|              | Sample Total |             | 54            | 46             | 1            | 101                | .0   | .0       | 100.0   | .0     | .0   | 2.2      | 97.8 | .0 |

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Appendix B.15. (p. 5 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |      |
| 14 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 5           | 6             | 0              | 11           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 6   | 20          | 6             | 0              | 26           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 7   | 3           | 6             | 0              | 9            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 14          | 8             | 0              | 22           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 9   | 4           | 2             | 0              | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 50.0     | 50.0 |
|              | 10  | 15          | 6             | 1              | 22           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 16          | 7             | 0              | 23           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 12  | 3           | 7             | 0              | 10           | .0                 | .0   | 66.7     | 33.3    | .0    | .0   | 100.0    | .0   |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
| Sample Total |     | 81          | 48            | 1              | 130          | .0                 | .0   | 98.8     | 1.2     | .0    | .0   | 97.9     | 2.1  |
| 16 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 4           | 0             | 0              | 4            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 6   | 11          | 4             | 0              | 15           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 66.7     | 33.3 |
|              | 7   | 3           | 3             | 1              | 7            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 66.7     | 33.3 |
|              | 8   | 7           | 8             | 0              | 15           | .0                 | .0   | 85.7     | 14.3    | .0    | 12.5 | 87.5     | .0   |
|              | 9   | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 2           | 6             | 0              | 8            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 66.7     | 33.3 |
|              | 11  | 10          | 6             | 0              | 16           | .0                 | .0   | 90.0     | 10.0    | .0    | .0   | 83.3     | 16.7 |
|              | 12  | 2           | 4             | 0              | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 41          | 33            | 1              | 75           | .0                 | .0   | 95.1     | 4.9     | .0    | 3.0  | 84.8     | 12.1 |
| 17 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 6   | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 7   | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 9   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 10  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 11  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 12  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 7           | 2             | 0              | 9            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |

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Appendix B.15. (p. 6 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |       |          |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|-------|----------|---------|-------|-------|----------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Unknown            | Male  |       |          | Female  |       |       |          |
|              |     |             |               |                |              | Unknown            | Green | Ripe  | Spawncut | Unknown | Green | Ripe  | Spawncut |
| 18 May       | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 5   | 24          | 19            | 0              | 43           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 6   | 22          | 17            | 0              | 39           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 7   | 3           | 1             | 0              | 4            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 8   | 7           | 11            | 0              | 18           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 9   | 1           | 1             | 0              | 2            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 10  | 2           | 1             | 0              | 3            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 11  | 6           | 3             | 0              | 9            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 12  | 3           | 2             | 0              | 5            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 13  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |
| Sample Total |     | 68          | 55            | 0              | 123          | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
| 19 May       | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 5   | 9           | 10            | 0              | 19           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 6   | 19          | 12            | 0              | 31           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 7   | 3           | 2             | 0              | 5            | .0                 | .0    | 66.7  | 33.3     | .0      | .0    | 100.0 | .0       |
|              | 8   | 10          | 9             | 0              | 19           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 9   | 6           | 0             | 0              | 6            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 10  | 8           | 4             | 0              | 12           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 11  | 9           | 6             | 0              | 15           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 12  | 4           | 0             | 0              | 4            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 13  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |
| Sample Total |     | 68          | 43            | 0              | 111          | .0                 | .0    | 98.5  | 1.5      | .0      | .0    | 100.0 | .0       |
| 20 May       | 3   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 4   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 5   | 5           | 5             | 0              | 10           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 6   | 10          | 9             | 0              | 19           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 88.9  | 11.1     |
|              | 7   |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 8   | 7           | 3             | 0              | 10           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 9   | 1           | 2             | 0              | 3            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 10  | 5           | 2             | 0              | 7            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 11  | 5           | 6             | 0              | 11           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 12  | 1           | 0             | 1              | 2            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |
|              | 13  | 0           | 2             | 0              | 2            |                    |       |       |          | .0      | .0    | 100.0 | .0       |
|              | 14  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 15  |             |               |                |              |                    |       |       |          |         |       |       |          |
|              | 16  |             |               |                |              |                    |       |       |          |         |       |       |          |
| Sample Total |     | 34          | 29            | 1              | 64           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 96.6  | 3.4      |

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Appendix B.15. (p. 7 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |       |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|-------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |       |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawnout | Unknown | Green | Ripe | Spawnout |       |
| 21 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 9           | 14            | 0              | 23           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 6   | 16          | 11            | 0              | 27           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 7   | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 8   | 8           | 11            | 0              | 19           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 9   | 2           | 4             | 0              | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 10  | 6           | 3             | 0              | 9            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 11  | 9           | 6             | 0              | 15           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 12  | 5           | 5             | 0              | 10           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 56          | 55            | 0              | 111          | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
| 22 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 14          | 15            | 0              | 29           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 6   | 21          | 13            | 0              | 34           | .0                 | .0   | 90.5     | 9.5     | .0    | .0   | 92.3     | 7.7   |
|              | 7   | 2           | 3             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 8   | 6           | 1             | 0              | 7            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 9   | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 10  | 6           | 3             | 0              | 9            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 66.7     | 33.3  |
|              | 11  | 8           | 4             | 0              | 12           | .0                 | .0   | 87.5     | 12.5    | .0    | .0   | 75.0     | 25.0  |
|              | 12  | 3           | 7             | 0              | 10           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 71.4     | 28.6  |
|              | 13  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0    |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 62          | 49            | 0              | 111          | .0                 | .0   | 95.2     | 4.8     | .0    | .0   | 89.8     | 10.2  |
| 23 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 5   | 6           | 9             | 0              | 15           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 6   | 12          | 8             | 0              | 20           | .0                 | .0   | 91.7     | 8.3     | .0    | .0   | 100.0    | .0    |
|              | 7   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 8   | 2           | 3             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 9   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 10  | 4           | 1             | 0              | 5            | .0                 | .0   | 75.0     | 25.0    | .0    | .0   | .0       | 100.0 |
|              | 11  | 4           | 4             | 0              | 8            | .0                 | .0   | 75.0     | 25.0    | .0    | .0   | 75.0     | 25.0  |
|              | 12  | 1           | 0             | 3              | 4            | .0                 | .0   | .0       | 100.0   |       |      |          |       |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 31          | 25            | 3              | 59           | .0                 | .0   | 87.1     | 12.9    | .0    | .0   | 92.0     | 8.0   |

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Appendix B.15. (p. 8 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |        |      |          |     |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|--------|------|----------|-----|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          |         | Female |      |          |     |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawnout | Unknown | Green  | Ripe | Spawnout |     |
|              | 3   |             |               |                |              |                    |      |          |         |        |      |          |     |
|              | 4   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |        |      |          |     |
|              | 5   | 96          | 81            | 0              | 177          | .0                 | 4.2  | 95.8     | .0      | .0     | 1.2  | 98.8     | .0  |
|              | 6   | 165         | 111           | 0              | 276          | .0                 | 3.6  | 93.9     | 2.4     | .0     | 5.4  | 91.9     | 2.7 |
|              | 7   | 27          | 19            | 1              | 47           | .0                 | 7.4  | 88.9     | 3.7     | .0     | .0   | 94.7     | 5.3 |
|              | 8   | 143         | 116           | 0              | 259          | 1.4                | 10.5 | 85.3     | 2.8     | .0     | 6.9  | 93.1     | .0  |
| 1-23 May     | 9   | 53          | 24            | 0              | 77           | 1.9                | 7.5  | 90.6     | .0      | .0     | .0   | 95.8     | 4.2 |
|              | 10  | 118         | 73            | 1              | 192          | .0                 | 10.2 | 89.0     | .8      | .0     | 6.8  | 87.7     | 5.5 |
|              | 11  | 164         | 127           | 2              | 293          | 3.0                | 10.4 | 83.5     | 3.0     | .0     | 9.4  | 88.2     | 2.4 |
|              | 12  | 67          | 60            | 5              | 132          | 1.5                | 16.4 | 77.6     | 4.5     | .0     | 6.7  | 90.0     | 3.3 |
|              | 13  | 3           | 4             | 0              | 7            | .0                 | .0   | 100.0    | .0      | .0     | 25.0 | 75.0     | .0  |
|              | 14  | 3           | 0             | 0              | 3            | .0                 | .0   | 100.0    | .0      |        |      |          |     |
|              | 15  | 2           | 3             | 0              | 5            | .0                 | 50.0 | 50.0     | .0      | .0     | 33.3 | 66.7     | .0  |
|              | 16  | 1           | 3             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0  |
| All Samples  |     | 843         | 621           | 9              | 1473         | 1.1                | 8.5  | 88.3     | 2.1     | .0     | 6.1  | 91.6     | 2.3 |

Appendix B.16. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet  
Togiak Section, 19 May 1989.

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |        |      |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|--------|------|----------|------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          |         | Female |      |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green  | Ripe | Spawncut |      |
|              | 3   |             |               |                |              |                    |      |          |         |        |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |        |      |          |      |
|              | 5   | 5           | 3             | 0              | 8            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |
|              | 6   | 18          | 11            | 0              | 29           | .0                 | .0   | 94.4     | 5.6     | .0     | .0   | 100.0    | .0   |
|              | 7   | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |
|              | 8   | 15          | 15            | 0              | 30           | .0                 | .0   | 93.3     | 6.7     | .0     | .0   | 100.0    | .0   |
| 19 May       | 9   | 0           | 3             | 0              | 3            |                    |      |          |         | .0     | .0   | 100.0    | .0   |
|              | 10  | 9           | 5             | 0              | 14           | .0                 | .0   | 100.0    | .0      | .0     | .0   | 80.0     | 20.0 |
|              | 11  | 18          | 10            | 0              | 28           | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |
|              | 12  | 4           | 3             | 0              | 7            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |
|              | 13  |             |               |                |              |                    |      |          |         |        |      |          |      |
|              | 14  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |
|              | 15  |             |               |                |              |                    |      |          |         |        |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |        |      |          |      |
| Sample Total |     | 72          | 53            | 0              | 125          | .0                 | .0   | 97.2     | 2.8     | .0     | .0   | 98.1     | 1.9  |

Appendix B.17. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet  
Hagemeister Section, 17-23 May 1989.

| Sample Dates | Age | Sex  |        |         | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |      |
|--------------|-----|------|--------|---------|--------------|--------------------|------|----------|---------|-------|------|----------|------|
|              |     | Male | Female | Unknown |              | Male               |      |          | Female  |       |      |          |      |
|              |     |      |        |         | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |      |
| 17 May       | 3   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 4   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 5   | 0    | 1      | 0       | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |
|              | 6   | 3    | 3      | 0       | 6            | .0                 | .0   | 66.7     | 33.3    | .0    | .0   | 100.0    | .0   |
|              | 7   | 1    | 1      | 0       | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 1    | 5      | 0       | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 9   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 10  | 4    | 2      | 0       | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 1    | 6      | 0       | 7            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 12  | 3    | 1      | 0       | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 13  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 14  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 15  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 16  |      |        |         |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 13   | 19     | 0       | 32           | .0                 | .0   | 92.3     | 7.7     | .0    | .0   | 100.0    | .0   |
| 18 May       | 3   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 4   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 5   | 2    | 4      | 0       | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 6   | 14   | 6      | 0       | 20           | .0                 | 14.3 | 85.7     | .0      | .0    | .0   | 83.3     | 16.7 |
|              | 7   | 1    | 1      | 0       | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 18   | 9      | 0       | 27           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 88.9     | 11.1 |
|              | 9   | 6    | 2      | 0       | 8            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 12   | 9      | 0       | 21           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 16   | 10     | 0       | 26           | .0                 | .0   | 100.0    | .0      | .0    | 10.0 | 80.0     | 10.0 |
|              | 12  | 8    | 3      | 0       | 11           | .0                 | 25.0 | 75.0     | .0      | .0    | .0   | 66.7     | 33.3 |
|              | 13  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 14  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 15  | 0    | 1      | 0       | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |
|              | 16  |      |        |         |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 77   | 45     | 0       | 122          | .0                 | 5.2  | 94.8     | .0      | .0    | 2.2  | 88.9     | 8.9  |
| 19 May       | 3   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 4   |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 5   | 13   | 5      | 0       | 18           | .0                 | .0   | 92.3     | 7.7     | .0    | .0   | 100.0    | .0   |
|              | 6   | 20   | 5      | 0       | 25           | .0                 | 5.0  | 90.0     | 5.0     | .0    | .0   | 80.0     | 20.0 |
|              | 7   | 2    | 1      | 0       | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 14   | 3      | 0       | 17           | .0                 | 7.1  | 92.9     | .0      | .0    | .0   | 100.0    | .0   |
|              | 9   | 6    | 6      | 0       | 12           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 16   | 8      | 0       | 24           | .0                 | 18.8 | 81.3     | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 16   | 2      | 0       | 18           | .0                 | 6.3  | 87.5     | 6.3     | .0    | .0   | 100.0    | .0   |
|              | 12  | 6    | 1      | 0       | 7            | .0                 | .0   | 83.3     | 16.7    | .0    | .0   | 100.0    | .0   |
|              | 13  | 1    | 0      | 0       | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 14  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 15  |      |        |         |              |                    |      |          |         |       |      |          |      |
|              | 16  |      |        |         |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 94   | 31     | 0       | 125          | .0                 | 6.4  | 89.4     | 4.3     | .0    | .0   | 96.8     | 3.2  |

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Appendix B.17. (p. 2 of 2)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |       |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|-------|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |      |          | Female  |       |      |          |       |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |       |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 4           | 7             | 0              | 11           | .0                 | .0   | 75.0     | 25.0    | .0    | .0   | 100.0    | .0    |
|              | 6   | 6           | 12            | 0              | 18           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 7   | 9           | 3             | 0              | 12           | .0                 | .0   | 88.9     | 11.1    | .0    | .0   | 66.7     | 33.3  |
| 21 May       | 8   | 18          | 7             | 0              | 25           | .0                 | .0   | 88.9     | 11.1    | .0    | .0   | 100.0    | .0    |
|              | 9   | 5           | 3             | 0              | 8            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 10  | 12          | 7             | 0              | 19           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 11  | 14          | 6             | 0              | 20           | .0                 | .0   | 92.9     | 7.1     | .0    | .0   | 100.0    | .0    |
|              | 12  | 7           | 3             | 0              | 10           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 13  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0    |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 76          | 49            | 0              | 125          | .0                 | .0   | 93.4     | 6.6     | .0    | .0   | 98.0     | 2.0   |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | .0       | 100.0 |
|              | 6   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 7   | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
| 23 May       | 8   | 3           | 4             | 0              | 7            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 9   | 2           | 0             | 0              | 2            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 10  | 3           | 2             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 11  | 4           | 1             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 12  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 13  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 17          | 10            | 0              | 27           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 90.0     | 10.0  |
|              | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 19          | 18            | 0              | 37           | .0                 | .0   | 89.5     | 10.5    | .0    | .0   | 94.4     | 5.6   |
|              | 6   | 43          | 26            | 0              | 69           | .0                 | 7.0  | 88.4     | 4.7     | .0    | .0   | 92.3     | 7.7   |
|              | 7   | 15          | 7             | 0              | 22           | .0                 | .0   | 93.3     | 6.7     | .0    | .0   | 85.7     | 14.3  |
|              | 8   | 54          | 28            | 0              | 82           | .0                 | 1.9  | 94.4     | 3.7     | .0    | .0   | 96.4     | 3.6   |
| 17-23 May    | 9   | 19          | 11            | 0              | 30           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 10  | 47          | 28            | 0              | 75           | .0                 | 6.4  | 93.6     | .0      | .0    | .0   | 100.0    | .0    |
|              | 11  | 51          | 25            | 0              | 76           | .0                 | 2.0  | 94.1     | 3.9     | .0    | 4.0  | 92.0     | 4.0   |
|              | 12  | 25          | 9             | 0              | 34           | .0                 | 8.0  | 88.0     | 4.0     | .0    | .0   | 88.9     | 11.1  |
|              | 13  | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 15  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| All Samples  |     | 277         | 154           | 0              | 431          | .0                 | 3.6  | 92.8     | 3.6     | .0    | .6   | 94.8     | 4.5   |

**Appendix B.18. Age, sex, and size composition of Pacific herring caught by test variable mesh gillnet  
Kulukak, Togiak, Kulukak sections, 1-23 May 1989.**

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |      |          |         |       |       |          |  |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|------|----------|---------|-------|-------|----------|--|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Unknown            | Male  |      |          | Female  |       |       |          |  |
|              |     |             |               |                |              | Unknown            | Green | Ripe | Spawnout | Unknown | Green | Ripe  | Spawnout |  |
| 1 May        | 3   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 5   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 6   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 7   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 8   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 9   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 10  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 11  |             | 1             | 0              | 0            | 1                  | 100.0 | .0   | .0       | .0      |       |       |          |  |
|              | 12  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 13  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 14  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 15  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
| 16           |     |             |               |                |              |                    |       |      |          |         |       |       |          |  |
| Sample Total |     | 1           | 0             | 0              | 1            | 100.0              | .0    | .0   | .0       |         |       |       |          |  |
| 3 May        | 3   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 5   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 6   |             | 0             | 1              | 0            | 1                  |       |      |          | .0      | 100.0 | .0    | .0       |  |
|              | 7   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 8   |             | 1             | 1              | 0            | 2                  | 100.0 | .0   | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 9   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 10  |             | 0             | 1              | 0            | 1                  |       |      |          |         | .0    | .0    | 100.0    |  |
|              | 11  |             | 1             | 2              | 0            | 3                  | 100.0 | .0   | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 12  |             | 0             | 1              | 0            | 1                  |       |      |          |         | .0    | 100.0 | .0       |  |
|              | 13  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 14  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 15  |             | 0             | 1              | 0            | 1                  |       |      |          |         | .0    | 100.0 | .0       |  |
| 16           |     |             |               |                |              |                    |       |      |          |         |       |       |          |  |
| Sample Total |     | 2           | 7             | 0              | 9            | 100.0              | .0    | .0   | .0       | .0      | 85.7  | 14.3  | .0       |  |
| 4 May        | 3   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 4   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 5   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 6   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 7   |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 8   |             | 1             | 0              | 0            | 1                  | 100.0 | .0   | .0       | .0      |       |       |          |  |
|              | 9   |             | 1             | 0              | 0            | 1                  | 100.0 | .0   | .0       | .0      |       |       |          |  |
|              | 10  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 11  |             | 0             | 1              | 0            | 1                  |       |      |          |         | .0    | 100.0 | .0       |  |
|              | 12  |             | 1             | 0              | 0            | 1                  | 100.0 | .0   | .0       | .0      |       |       |          |  |
|              | 13  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 14  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
|              | 15  |             |               |                |              |                    |       |      |          |         |       |       |          |  |
| 16           |     |             |               |                |              |                    |       |      |          |         |       |       |          |  |
| Sample Total |     | 3           | 1             | 0              | 4            | 100.0              | .0    | .0   | .0       | .0      | 100.0 | .0    | .0       |  |

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Appendix B.18. (p.2 of 8)

| Sample Dates | Age | Sex      |            |             | Total<br>no. | Gonad Maturity (%) |       |          |         |       |       |          |       |    |
|--------------|-----|----------|------------|-------------|--------------|--------------------|-------|----------|---------|-------|-------|----------|-------|----|
|              |     | no. Male | no. Female | no. Unknown |              | Male               |       |          | Female  |       |       |          |       |    |
|              |     |          |            |             | Unknown      | Green              | Ripe  | Spawnout | Unknown | Green | Ripe  | Spawnout |       |    |
| 5 May        | 3   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 4   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 5   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 6   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 7   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 8   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 9   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 10  |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 11  |          | 3          | 1           | 0            | 4                  | 100.0 | .0       | .0      | .0    | .0    | 100.0    | .0    | .0 |
|              | 12  |          | 0          | 1           | 0            | 1                  |       |          |         | .0    | 100.0 | .0       | .0    |    |
|              | 13  |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 14  |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 15  |          |            |             |              |                    |       |          |         |       |       |          |       |    |
| 16           |     |          |            |             |              |                    |       |          |         |       |       |          |       |    |
| Sample Total |     | 3        | 2          | 0           | 5            | 100.0              | .0    | .0       | .0      | .0    | 100.0 | .0       | .0    |    |
| 6 May        | 3   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 4   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 5   |          | 0          | 1           | 0            | 1                  |       |          |         | .0    | 100.0 | .0       | .0    |    |
|              | 6   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 7   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 8   |          | 3          | 4           | 0            | 7                  | .0    | .0       | 100.0   | .0    | .0    | 25.0     | 75.0  | .0 |
|              | 9   |          | 2          | 0           | 0            | 2                  | .0    | .0       | 100.0   | .0    |       |          |       |    |
|              | 10  |          | 7          | 3           | 0            | 10                 | .0    | 14.3     | 85.7    | .0    | .0    | 33.3     | 66.7  | .0 |
|              | 11  |          | 3          | 8           | 0            | 11                 | .0    | .0       | 100.0   | .0    | .0    | 37.5     | 62.5  | .0 |
|              | 12  |          | 1          | 5           | 0            | 6                  | .0    | 100.0    | .0      | .0    | .0    | 20.0     | 80.0  | .0 |
|              | 13  |          | 0          | 1           | 0            | 1                  |       |          |         | .0    | 100.0 | .0       | .0    |    |
|              | 14  |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 15  |          | 1          | 1           | 0            | 2                  | .0    | 100.0    | .0      | .0    | .0    | 100.0    | .0    |    |
| 16           |     |          |            |             |              |                    |       |          |         |       |       |          |       |    |
| Sample Total |     | 17       | 23         | 0           | 40           | .0                 | 17.6  | 82.4     | .0      | .0    | 34.8  | 65.2     | .0    |    |
| 7 May        | 3   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 4   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 5   |          | 2          | 0           | 0            | 2                  | .0    | .0       | 100.0   | .0    |       |          |       |    |
|              | 6   |          | 0          | 1           | 0            | 1                  |       |          |         | .0    | .0    | 100.0    | .0    |    |
|              | 7   |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 8   |          | 8          | 7           | 0            | 15                 | .0    | .0       | 100.0   | .0    | .0    | .0       | 100.0 | .0 |
|              | 9   |          | 4          | 3           | 0            | 7                  | .0    | .0       | 100.0   | .0    | .0    | .0       | 100.0 | .0 |
|              | 10  |          | 8          | 3           | 0            | 11                 | .0    | .0       | 100.0   | .0    | .0    | .0       | 100.0 | .0 |
|              | 11  |          | 12         | 5           | 0            | 17                 | .0    | 8.3      | 91.7    | .0    | .0    | .0       | 100.0 | .0 |
|              | 12  |          | 9          | 3           | 0            | 12                 | .0    | 11.1     | 88.9    | .0    | .0    | .0       | 100.0 | .0 |
|              | 13  |          |            |             |              |                    |       |          |         |       |       |          |       |    |
|              | 14  |          | 2          | 0           | 0            | 2                  | .0    | .0       | 100.0   | .0    |       |          |       |    |
|              | 15  |          | 1          | 0           | 0            | 1                  | .0    | .0       | 100.0   | .0    |       |          |       |    |
| 16           |     |          |            |             |              |                    |       |          |         |       |       |          |       |    |
| Sample Total |     | 46       | 22         | 0           | 68           | .0                 | 4.3   | 95.7     | .0      | .0    | .0    | 100.0    | .0    |    |

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Appendix B.18. (p.3 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |       |          |         |        |       |          |     |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|-------|----------|---------|--------|-------|----------|-----|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |       |          |         | Female |       |          |     |
|              |     |             |               |                | Unknown      | Green              | Ripe  | Spawncut | Unknown | Green  | Ripe  | Spawncut |     |
|              | 3   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 5   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 6   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 7   |             |               |                |              |                    |       |          |         |        |       |          |     |
| 8 May        | 8   | 2           | 1             | 0              | 3            | .0                 | 50.0  | 50.0     | .0      | .0     | .0    | 100.0    | .0  |
|              | 9   | 1           | 0             | 0              | 1            | .0                 | 100.0 | .0       | .0      |        |       |          |     |
|              | 10  | 2           | 1             | 0              | 3            | .0                 | .0    | 100.0    | .0      | .0     | 100.0 | .0       | .0  |
|              | 11  | 1           | 2             | 0              | 3            | .0                 | .0    | 100.0    | .0      | .0     | .0    | 100.0    | .0  |
|              | 12  | 1           | 1             | 0              | 2            | .0                 | 100.0 | .0       | .0      | .0     | .0    | 100.0    | .0  |
|              | 13  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 16  |             |               |                |              |                    |       |          |         |        |       |          |     |
| Sample Total |     | 7           | 5             | 0              | 12           | .0                 | 42.9  | 57.1     | .0      | .0     | 20.0  | 80.0     | .0  |
|              | 3   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 5   | 4           | 0             | 0              | 4            | .0                 | 50.0  | 50.0     | .0      |        |       |          |     |
|              | 6   | 5           | 5             | 0              | 10           | .0                 | .0    | 100.0    | .0      | .0     | 80.0  | 20.0     | .0  |
|              | 7   | 1           | 0             | 0              | 1            | .0                 | .0    | 100.0    | .0      |        |       |          |     |
| 9 May        | 8   | 20          | 23            | 0              | 43           | .0                 | 25.0  | 65.0     | 10.0    | .0     | 13.0  | 82.6     | 4.3 |
|              | 9   | 10          | 7             | 0              | 17           | .0                 | 10.0  | 80.0     | 10.0    | .0     | 14.3  | 85.7     | .0  |
|              | 10  | 19          | 19            | 0              | 38           | .0                 | 5.3   | 84.2     | 10.5    | .0     | 15.8  | 84.2     | .0  |
|              | 11  | 38          | 45            | 1              | 84           | .0                 | 2.6   | 92.1     | 5.3     | .0     | 13.3  | 77.8     | 8.9 |
|              | 12  | 20          | 15            | 0              | 35           | .0                 | 5.0   | 85.0     | 10.0    | .0     | .0    | 93.3     | 6.7 |
|              | 13  | 3           | 1             | 0              | 4            | .0                 | .0    | 100.0    | .0      | .0     | .0    | 100.0    | .0  |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 16  | 0           | 1             | 0              | 1            |                    |       |          |         | .0     | .0    | 100.0    | .0  |
| Sample Total |     | 120         | 116           | 1              | 237          | .0                 | 9.2   | 83.3     | 7.5     | .0     | 14.7  | 80.2     | 5.2 |
|              | 3   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 4   |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 5   | 5           | 1             | 0              | 6            | .0                 | 40.0  | 60.0     | .0      | .0     | .0    | 100.0    | .0  |
|              | 6   | 4           | 9             | 0              | 13           | .0                 | 25.0  | 75.0     | .0      | .0     | .0    | 100.0    | .0  |
|              | 7   | 2           | 0             | 0              | 2            | .0                 | 50.0  | 50.0     | .0      |        |       |          |     |
| 10 May       | 8   | 10          | 8             | 0              | 18           | .0                 | 30.0  | 70.0     | .0      | .0     | 25.0  | 75.0     | .0  |
|              | 9   | 4           | 1             | 0              | 5            | .0                 | 25.0  | 75.0     | .0      | .0     | .0    | 100.0    | .0  |
|              | 10  | 10          | 4             | 0              | 14           | .0                 | 30.0  | 70.0     | .0      | .0     | 25.0  | 75.0     | .0  |
|              | 11  | 13          | 10            | 0              | 23           | .0                 | 30.8  | 69.2     | .0      | .0     | 20.0  | 80.0     | .0  |
|              | 12  | 5           | 3             | 0              | 8            | .0                 | 60.0  | 40.0     | .0      | .0     | 33.3  | 66.7     | .0  |
|              | 13  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 14  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 15  |             |               |                |              |                    |       |          |         |        |       |          |     |
|              | 16  |             |               |                |              |                    |       |          |         |        |       |          |     |
| Sample Total |     | 53          | 36            | 0              | 89           | .0                 | 34.0  | 66.0     | .0      | .0     | 16.7  | 83.3     | .0  |

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Appendix B.18. (p. 4 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |       |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|-------|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |      |          | Female  |       |      |          |       |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |       |
| 11 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 10          | 6             | 0              | 16           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 6   | 13          | 17            | 0              | 30           | .0                 | 7.7  | 84.6     | 7.7     | .0    | 5.9  | 88.2     | 5.9   |
|              | 7   | 8           | 3             | 0              | 11           | .0                 | .0   | 75.0     | 25.0    | .0    | .0   | 100.0    | .0    |
|              | 8   | 44          | 32            | 0              | 76           | .0                 | 9.1  | 52.3     | 38.6    | .0    | 3.1  | 62.5     | 34.4  |
|              | 9   | 11          | 10            | 0              | 21           | .0                 | 9.1  | 54.5     | 36.4    | .0    | .0   | 80.0     | 20.0  |
|              | 10  | 30          | 18            | 0              | 48           | .0                 | 10.0 | 50.0     | 40.0    | .0    | 5.6  | 61.1     | 33.3  |
|              | 11  | 50          | 22            | 0              | 72           | .0                 | 16.0 | 66.0     | 18.0    | .0    | 4.5  | 72.7     | 22.7  |
|              | 12  | 20          | 13            | 1              | 34           | .0                 | 5.0  | 75.0     | 20.0    | .0    | .0   | 61.5     | 38.5  |
|              | 13  | 2           | 1             | 0              | 3            | .0                 | .0   | 50.0     | 50.0    | .0    | .0   | .0       | 100.0 |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 188         | 122           | 1              | 311          | .0                 | 9.6  | 63.8     | 26.6    | .0    | 3.3  | 71.3     | 25.4  |
| 12 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 2           | 0             | 0              | 2            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 6   | 12          | 4             | 0              | 16           | .0                 | 33.3 | 58.3     | 8.3     | .0    | .0   | 75.0     | 25.0  |
|              | 7   | 7           | 0             | 0              | 7            | .0                 | 14.3 | 71.4     | 14.3    |       |      |          |       |
|              | 8   | 23          | 13            | 0              | 36           | .0                 | 13.0 | 73.9     | 13.0    | .0    | .0   | 84.6     | 15.4  |
|              | 9   | 12          | 5             | 0              | 17           | .0                 | .0   | 83.3     | 16.7    | .0    | .0   | 100.0    | .0    |
|              | 10  | 26          | 18            | 0              | 44           | .0                 | 19.2 | 57.7     | 23.1    | .0    | .0   | 66.7     | 33.3  |
|              | 11  | 25          | 24            | 0              | 49           | .0                 | 16.0 | 68.0     | 16.0    | .0    | .0   | 83.3     | 16.7  |
|              | 12  | 19          | 9             | 0              | 28           | .0                 | 15.8 | 73.7     | 10.5    | .0    | .0   | 88.9     | 11.1  |
|              | 13  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | .0       | 100.0 |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | .0       | 100.0   |       |      |          |       |
|              | 15  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0    |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |       |
| Sample Total |     | 128         | 75            | 0              | 203          | .0                 | 15.6 | 68.8     | 15.6    | .0    | .0   | 80.0     | 20.0  |
| 13 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 5   | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 6   | 14          | 5             | 0              | 19           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 7   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 8   | 12          | 7             | 0              | 19           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 9   | 3           | 2             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 10  | 6           | 7             | 0              | 13           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 11  | 11          | 13            | 1              | 25           | .0                 | .0   | 100.0    | .0      | .0    | 7.7  | 92.3     | .0    |
|              | 12  | 5           | 9             | 0              | 14           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0    |
|              | 13  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |       |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |       |
|              | 16  | 0           | 2             | 0              | 2            |                    |      |          |         | .0    | .0   | 100.0    | .0    |
| Sample Total |     | 55          | 46            | 1              | 102          | .0                 | .0   | 100.0    | .0      | .0    | 2.2  | 97.8     | .0    |

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Appendix B.18. (p. 5 of 8)

| Sample Dates | Age | Sex  |        |         | Total<br>no. | Gonad Maturity (%) |       |       |          |         |       |       |          |  |
|--------------|-----|------|--------|---------|--------------|--------------------|-------|-------|----------|---------|-------|-------|----------|--|
|              |     | Male | Female | Unknown |              | Male               |       |       |          | Female  |       |       |          |  |
|              |     |      |        |         |              | Unknown            | Green | Ripe  | Spawncut | Unknown | Green | Ripe  | Spawncut |  |
| 14 May       | 3   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 9    | 5      | 0       | 14           | .0                 | 0     | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 6   | 22   | 16     | 0       | 38           | .0                 | .0    | 95.5  | 4.5      | .0      | 12.5  | 81.3  | 6.3      |  |
|              | 7   | 3    | 8      | 0       | 11           | .0                 | .0    | 100.0 | .0       | .0      | 12.5  | 87.5  | .0       |  |
|              | 8   | 23   | 12     | 0       | 35           | .0                 | .0    | 95.7  | 4.3      | .0      | .0    | 100.0 | .0       |  |
|              | 9   | 5    | 8      | 0       | 13           | .0                 | .0    | 100.0 | .0       | .0      | 12.5  | 75.0  | 12.5     |  |
|              | 10  | 30   | 15     | 1       | 46           | .0                 | .0    | 93.3  | 6.7      | .0      | 6.7   | 73.3  | 20.0     |  |
|              | 11  | 28   | 12     | 0       | 40           | .0                 | .0    | 96.4  | 3.6      | .0      | .0    | 91.7  | 8.3      |  |
|              | 12  | 5    | 9      | 0       | 14           | .0                 | .0    | 80.0  | 20.0     | .0      | .0    | 100.0 | .0       |  |
|              | 13  | 0    | 1      | 0       | 1            |                    |       |       |          | .0      | .0    | 100.0 | .0       |  |
|              | 14  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 15  | 0    | 1      | 0       | 1            |                    |       |       |          | .0      | .0    | 100.0 | .0       |  |
|              | 16  | 1    | 0      | 0       | 1            | .0                 | .0    | 100.0 | .0       |         |       |       |          |  |
| Sample Total |     | 126  | 87     | 1       | 214          | .0                 | .0    | 95.2  | 4.8      | .0      | 5.7   | 87.4  | 6.9      |  |
| 16 May       | 3   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 5    | 3      | 0       | 8            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 6   | 16   | 5      | 0       | 21           | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 7   | 3    | 3      | 1       | 7            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 66.7  | 33.3     |  |
|              | 8   | 11   | 8      | 0       | 19           | .0                 | .0    | 90.9  | 9.1      | .0      | 12.5  | 87.5  | .0       |  |
|              | 9   | 2    | 2      | 0       | 4            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 10  | 2    | 6      | 0       | 8            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 66.7  | 33.3     |  |
|              | 11  | 10   | 6      | 0       | 16           | .0                 | .0    | 90.0  | 10.0     | .0      | .0    | 83.3  | 16.7     |  |
|              | 12  | 2    | 4      | 0       | 6            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 13  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 14  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 15  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 16  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
| Sample Total |     | 51   | 37     | 1       | 89           | .0                 | .0    | 96.1  | 3.9      | .0      | 2.7   | 86.5  | 10.8     |  |
| 17 May       | 3   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 4   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 5   | 1    | 1      | 0       | 2            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 6   | 6    | 4      | 0       | 10           | .0                 | .0    | 83.3  | 16.7     | .0      | .0    | 100.0 | .0       |  |
|              | 7   | 3    | 2      | 0       | 5            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 8   | 2    | 5      | 0       | 7            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 9   |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 10  | 5    | 2      | 0       | 7            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 11  | 2    | 6      | 0       | 8            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 12  | 3    | 1      | 0       | 4            | .0                 | .0    | 100.0 | .0       | .0      | .0    | 100.0 | .0       |  |
|              | 13  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 14  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 15  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
|              | 16  |      |        |         |              |                    |       |       |          |         |       |       |          |  |
| Sample Total |     | 22   | 21     | 0       | 43           | .0                 | .0    | 95.5  | 4.5      | .0      | .0    | 100.0 | .0       |  |

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Appendix B.18. (p. 6 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|------|
|              |     | Male<br>no. | Female<br>no. | Unknown<br>no. |              | Male               |      |          | Female  |       |      |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green | Ripe | Spawncut |      |
| 18 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 26          | 23            | 0              | 49           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 6   | 36          | 21            | 0              | 57           | .0                 | 5.6  | 94.4     | .0      | .0    | .0   | 95.2     | 4.8  |
|              | 7   | 4           | 2             | 0              | 6            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 24          | 19            | 0              | 43           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 94.7     | 5.3  |
|              | 9   | 7           | 3             | 0              | 10           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 14          | 10            | 0              | 24           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 22          | 13            | 0              | 35           | .0                 | .0   | 100.0    | .0      | .0    | 7.7  | 84.6     | 7.7  |
|              | 12  | 11          | 5             | 0              | 16           | .0                 | 18.2 | 81.8     | .0      | .0    | .0   | 80.0     | 20.0 |
|              | 13  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 144         | 97            | 0              | 241          | .0                 | 2.8  | 97.2     | .0      | .0    | 1.0  | 94.8     | 4.1  |
| 19 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 43          | 39            | 0              | 82           | .0                 | .0   | 95.3     | 4.7     | .0    | .0   | 82.1     | 17.9 |
|              | 6   | 81          | 48            | 0              | 129          | .0                 | 1.2  | 87.7     | 11.1    | .0    | .0   | 91.7     | 8.3  |
|              | 7   | 9           | 7             | 0              | 16           | .0                 | .0   | 88.9     | 11.1    | .0    | .0   | 85.7     | 14.3 |
|              | 8   | 68          | 42            | 0              | 110          | .0                 | 1.5  | 94.1     | 4.4     | .0    | .0   | 95.2     | 4.8  |
|              | 9   | 16          | 12            | 0              | 28           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 40          | 26            | 0              | 66           | .0                 | 7.5  | 85.0     | 7.5     | .0    | .0   | 88.5     | 11.5 |
|              | 11  | 63          | 25            | 0              | 88           | .0                 | 1.6  | 95.2     | 3.2     | .0    | .0   | 88.0     | 12.0 |
|              | 12  | 19          | 9             | 0              | 28           | .0                 | .0   | 78.9     | 21.1    | .0    | .0   | 88.9     | 11.1 |
|              | 13  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 14  | 1           | 1             | 0              | 2            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 341         | 209           | 0              | 550          | .0                 | 1.8  | 91.2     | 7.0     | .0    | .0   | 90.0     | 10.0 |
| 20 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 6           | 5             | 0              | 11           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 6   | 11          | 9             | 0              | 20           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 88.9     | 11.1 |
|              | 7   | 2           | 1             | 0              | 3            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 7           | 3             | 0              | 10           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 9   | 3           | 2             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 5           | 2             | 0              | 7            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 5           | 6             | 0              | 11           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 12  | 1           | 0             | 1              | 2            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 13  | 0           | 2             | 0              | 2            |                    |      |          |         | .0    | .0   | 100.0    | .0   |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 40          | 30            | 1              | 71           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 96.7     | 3.3  |

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Appendix B.18. (p. 7 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |       |      |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|-------|------|----------|------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          | Female  |       |      |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawnout | Unknown | Green | Ripe | Spawnout |      |
| 21 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 13          | 21            | 0              | 34           | .0                 | .0   | 92.3     | 7.7     | .0    | .0   | 100.0    | .0   |
|              | 6   | 22          | 23            | 0              | 45           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 7   | 10          | 4             | 0              | 14           | .0                 | .0   | 90.0     | 10.0    | .0    | .0   | 75.0     | 25.0 |
|              | 8   | 26          | 18            | 0              | 44           | .0                 | .0   | 92.3     | 7.7     | .0    | .0   | 100.0    | .0   |
|              | 9   | 7           | 7             | 0              | 14           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 18          | 10            | 0              | 28           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 11  | 23          | 12            | 0              | 35           | .0                 | .0   | 95.7     | 4.3     | .0    | .0   | 100.0    | .0   |
|              | 12  | 12          | 8             | 0              | 20           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 13  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |
|              | 14  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 132         | 104           | 0              | 236          | .0                 | .0   | 96.2     | 3.8     | .0    | .0   | 99.0     | 1.0  |
| 22 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 5   | 14          | 15            | 0              | 29           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 6   | 21          | 13            | 0              | 34           | .0                 | .0   | 90.5     | 9.5     | .0    | .0   | 92.3     | 7.7  |
|              | 7   | 2           | 3             | 0              | 5            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 6           | 1             | 0              | 7            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 9   | 2           | 2             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 10  | 6           | 3             | 0              | 9            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 66.7     | 33.3 |
|              | 11  | 8           | 4             | 0              | 12           | .0                 | .0   | 87.5     | 12.5    | .0    | .0   | 75.0     | 25.0 |
|              | 12  | 3           | 7             | 0              | 10           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 71.4     | 28.6 |
|              | 13  | 0           | 1             | 0              | 1            |                    |      |          |         | .0    | .0   | 100.0    | .0   |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 62          | 49            | 0              | 111          | .0                 | .0   | 95.2     | 4.8     | .0    | .0   | 89.8     | 10.2 |
| 23 May       | 3   |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 4   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 5   | 5           | 10            | 0              | 15           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 90.0     | 10.0 |
|              | 6   | 12          | 8             | 0              | 20           | .0                 | .0   | 91.7     | 8.3     | .0    | .0   | 100.0    | .0   |
|              | 7   | 3           | 1             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 8   | 5           | 7             | 0              | 12           | .0                 | .0   | 100.0    | .0      | .0    | .0   | 100.0    | .0   |
|              | 9   | 2           | 0             | 0              | 2            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 10  | 7           | 3             | 0              | 10           | .0                 | .0   | 85.7     | 14.3    | .0    | .0   | 66.7     | 33.3 |
|              | 11  | 8           | 5             | 0              | 13           | .0                 | .0   | 87.5     | 12.5    | .0    | .0   | 80.0     | 20.0 |
|              | 12  | 2           | 1             | 3              | 6            | .0                 | .0   | 50.0     | 50.0    | .0    | .0   | 100.0    | .0   |
|              | 13  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 14  |             |               |                |              |                    |      |          |         |       |      |          |      |
|              | 15  | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |       |      |          |      |
|              | 16  |             |               |                |              |                    |      |          |         |       |      |          |      |
| Sample Total |     | 47          | 35            | 3              | 85           | .0                 | .0   | 91.5     | 8.5     | .0    | .0   | 91.4     | 8.6  |

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Appendix B.18. (p. 8 of 8)

| Sample Dates | Age | Sex         |               |                | Total<br>no. | Gonad Maturity (%) |      |          |         |        |      |          |      |
|--------------|-----|-------------|---------------|----------------|--------------|--------------------|------|----------|---------|--------|------|----------|------|
|              |     | no.<br>Male | no.<br>Female | no.<br>Unknown |              | Male               |      |          |         | Female |      |          |      |
|              |     |             |               |                | Unknown      | Green              | Ripe | Spawncut | Unknown | Green  | Ripe | Spawncut |      |
|              | 3   |             |               |                |              |                    |      |          |         |        |      |          |      |
|              | 4   | 1           | 0             | 0              | 1            | .0                 | .0   | 100.0    | .0      |        |      |          |      |
|              | 5   | 146         | 131           | 0              | 277          | .0                 | 2.7  | 95.2     | 2.1     | .0     | .8   | 93.1     | 6.1  |
|              | 6   | 275         | 189           | 0              | 464          | .0                 | 3.3  | 90.9     | 5.8     | .0     | 4.2  | 90.5     | 5.3  |
|              | 7   | 58          | 34            | 1              | 93           | .0                 | 3.4  | 87.9     | 8.6     | .0     | 2.9  | 88.2     | 8.8  |
|              | 8   | 296         | 211           | 0              | 507          | .7                 | 5.7  | 83.8     | 9.8     | .0     | 4.3  | 87.7     | 8.1  |
| 1-23 May     | 9   | 92          | 64            | 0              | 156          | 1.1                | 4.3  | 87.0     | 7.6     | .0     | 3.1  | 92.2     | 4.7  |
|              | 10  | 235         | 151           | 1              | 387          | .0                 | 6.8  | 82.1     | 11.1    | .0     | 5.3  | 80.1     | 14.6 |
|              | 11  | 327         | 222           | 2              | 551          | 1.5                | 5.8  | 85.9     | 6.7     | .0     | 8.1  | 82.4     | 9.5  |
|              | 12  | 139         | 104           | 5              | 248          | .7                 | 9.4  | 79.9     | 10.1    | .0     | 3.8  | 85.6     | 10.6 |
|              | 13  | 9           | 9             | 0              | 18           | .0                 | .0   | 88.9     | 11.1    | .0     | 11.1 | 66.7     | 22.2 |
|              | 14  | 6           | 1             | 0              | 7            | .0                 | .0   | 83.3     | 16.7    | .0     | .0   | 100.0    | .0   |
|              | 15  | 3           | 5             | 0              | 8            | .0                 | 33.3 | 66.7     | .0      | .0     | 20.0 | 80.0     | .0   |
|              | 16  | 1           | 3             | 0              | 4            | .0                 | .0   | 100.0    | .0      | .0     | .0   | 100.0    | .0   |
| All Samples  |     | 1588        | 1124          | 9              | 2721         | .6                 | 5.4  | 86.3     | 7.8     | .0     | 4.7  | 86.7     | 8.6  |

