

# **Strait of Georgia Juvenile Herring Survey, September 2011 and 2012**

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## **Canadian Manuscript Report of Fisheries and Aquatic Sciences 3016**



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STRAIT OF GEORGIA JUVENILE HERRING SURVEY,  
SEPTEMBER 2011 AND 2012

by

M. Thompson, C. Fort, and J. Schweigert

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## ABSTRACT

Thompson, M., Fort, C., and Schweigert, J. 2013. Strait of Georgia juvenile herring survey, September 2011 and 2012. *Can. Manuscr. Rep. Fish. Aquat. Sci.* 3016: vi + 63 p.

Fall juvenile herring surveys of the Strait of Georgia took place in 2011 and 2012. All forty-eight stations were sampled throughout the Strait of Georgia following the ten core transects that have been sampled since 1990. The survey area extends from Trincomali Channel in the south to Smelt Bay in the north. Both surveys were run through the month of September. Plankton tows were performed to determine food organism abundance in the study area. CTD casts were made *only* during the 2011 survey to determine temperature and salinity.

## RESUME

Thompson, M., Fort, C., and Schweigert, J. 2013. Strait of Georgia juvenile herring survey, September 2011 and 2012. *Rapp. manus. can. sci. halieut. aquat.* 3016: vi + 63 p.

Des enquêtes automnales sur le hareng juvénile dans le détroit de Georgie ont eu lieu en 2011 et 2012. Les quarante-huit stations ont fait l'objet d'un échantillonnage dans l'ensemble du détroit de Georgie après l'échantillonnage de 10 transects principaux depuis 1990. La zone d'enquête s'étend du chenal Trincomali au sud jusqu'à Smelt Bay au nord. Les deux enquêtes ont eu lieu tout au long du mois de septembre. On a effectué des traits de plancton pour évaluer l'abondance des organismes alimentaires dans la zone à l'étude. On a procédé à des profils CTP *uniquement* au cours de l'enquête de 2011 pour déterminer la température et la salinité.

## INTRODUCTION

Pacific herring (*Clupea pallasii*) are an important commercial and a vital forage species for many marine mammals, birds and other fish in British Columbia's coastal waters. Herring spawn principally on marine vegetation in the subtidal and upper intertidal zone between February and June, with peak spawning between March and April (Humphreys and Hourston 1978). Larvae hatch in two to three weeks, and disperse with surface currents, metamorphosing into juvenile or young-of-the-year herring at a length of ~25mm (Hourston and Haegele 1980). Herring are considered juveniles or immature until they are about three years of age and have joined the sexually mature spawning population (Hay and McCarter 1999). During daylight hours, juvenile herring congregate in schools, occasionally forming mixed aggregates with other pelagic species, close to shore near the bottom (Haegele 1997). At dusk, these fish migrate into surface waters to feed on plankton. During this time they are vulnerable to purse seine gear.

Purse seine surveys to determine the distribution and abundance of juvenile herring in the Strait of Georgia have been conducted annually since 1990, except for 1995 (Figure 1). The main objective of the survey was to estimate the density and relative abundance of the juvenile herring population as a potential indicator of recruitment before they have joined the spawning stock (Schweigert et. al. 2009). In addition to recruitment prediction, the surveys have contributed to a better understanding of the distribution, abundance, and ecological role of herring in the Strait of Georgia.

## METHODS

The annual survey of juvenile herring in the Strait of Georgia (Figure 2) followed the ten core sampling transects (1 – 6, 8 – 11); which are made up of 48 sampling stations and have been sampled consistently since 1990 (except 1995). These ten core transects have been used in juvenile herring recruitment prediction (Hay et. al. 2003). Originally, the sampling sites were chosen based on known historical herring spawning sites, and represent both nearshore and open water habitats (Haegele et. al. 2005). In 2011, sampling was conducted from September 11<sup>th</sup> to 30<sup>th</sup> (Table 1). In 2012, sampling was conducted from September 11<sup>th</sup> to 26<sup>th</sup> (Table 2). All forty-eight core stations were sampled in both years.

### **Fish Sampling**

The 12 m, aluminum-hulled Fisheries Research Vessel *Walker Rock* was used for all fishing events. A 183 m long and 27 m deep purse seine net of knotless web, resulting in an area fished of ~2665 m<sup>2</sup>, was used for all fishing events. The body of the net had 46 m of 22.2 mm mesh at the tow end followed by 91 m of 19.0 mm mesh, and the bunt end was 46 m of 9.5 mm mesh. The net fished to a depth of 10 m, and was able to retain fish greater than 20 mm in length. All sets were made after dusk when herring are feeding

near the surface. All sets were made “blind” at the pre-determined sampling stations. Five sets were completed per night, depending on location, and length of travel between transects and the marine weather forecast. For most sets, it was possible to land the entire catch for biological sampling. On occasion, it was not practical to land a large set in its entirety, so sub-sampling was necessary. When sub-sampling was required, a 40 kg tote was filled with randomly selected fish and retained for biological sampling. Several dipnet samples were taken from various parts of the net (catch) to make up the random sub-sample. The remainder of the set was released over the corkline, its size estimated as the number of totes released. The number of herring caught in each set was determined by dividing the total catch weight by the mean weight of sub-sampled herring. The number of other species caught was determined in the same manner (Tables 3 and 4). All fish retained for sampling were bagged and preserved in a 3.7 % seawater formalin solution, with the exception of large predator species (e.g. adult salmon and flatfish). These fish were individually measured in the field. All retained fish were later sampled in the laboratory at the Pacific Biological Station. From each set, 100 or more herring and all other fish species caught were identified, weighed and measured. If the set contained less than 100 herring, then all herring were weighed and measured. Consistent with standard practices, herring were measured to standard length, salmon to fork length and groundfish to total length; all to the nearest millimeter. All other fish species were measured to standard length.

### **Plankton Sampling**

Twenty stepped oblique plankton tows were performed during both surveys (Figures 3 and 4). The tows always were completed after dusk and immediately before the fishing events. A nearshore and offshore tow location was sampled for all transects. Dual 19 cm diameter bongo nets with 350 µm mesh were used for sampling, resulting in ‘left’ and ‘right’ bongo plankton samples (only left samples were processed). The bongos were lowered to 20 m (10 m in shallow areas) and raised by an electric winch at a rate of 1 m every 15 sec (or 1 m every 30 sec for shallow areas). A General Oceanics® 2030R model flowmeter was attached to the left bongo to determine the volume of seawater filtered. Volume filtered was calculated using the following equation (McCarter and Hay 2002):

$$V = (A \cdot F \cdot K) / 999,999$$

where:

**V** = volume of water filtered through the plankton net (m<sup>3</sup>)

**A** = area of net opening (0.02835 m<sup>2</sup>)

**F** = number of revolutions recorded by the flow meter (m)

**K** = standard speed rotor constant for 7cm rotor (26,873)

Upon retrieval, the bongo nets were washed with a high pressure deck hose, and the samples preserved in 3.7 % seawater formalin.

In the laboratory, a volumetric splitter was used to reduce the sample size to a point where organisms could be conveniently counted and identified in a counting tray using a stereo microscope under 30X magnification. Sample splitting continued until a target size of roughly 300 organisms was reached (Thompson et al. 2003).

When possible, plankters were identified to the lowest taxonomic level. Copepods were identified to species. Densities for all plankters were determined and expressed as plankters/ m<sup>3</sup>.

### **CTD Sampling**

In 2011, to characterize oceanographic conditions in the surveyed area, a total of 20 CTD (conductivity – temperature – density) casts were made using a Seabird SBE 19*plus* (Figure 3). A CTD cast was performed at each plankton tow location following the nearshore/offshore sampling location protocol. The CTD unit was lowered over the side of the vessel, at a rate of 1m/sec, to within two meters of the bottom. Data was downloaded to a laptop computer for further processing at the conclusion of the survey.

## **RESULTS**

### **Herring 2011**

Forty-eight stations were sampled from transects 1 – 6, 8 – 11. A total of 2724 herring were weighed and measured resulting in a length frequency distribution that was distinctly unimodal for age-0+ herring (Figure 4). Three length designations for the juvenile herring age-classes were produced:

- 0+ = herring less than or equal to 97 mm standard length
- 1+ = herring between 98 mm and 147 mm standard length
- 2+ and older = herring greater than or equal to 148 mm standard length

Age-0+ herring occurred in 89.6 % of the stations (Table 5). Forty-three of the forty-eight stations contained age-0+ herring. The mean length and weight for age-0+ herring was 78 mm and 6.60 g respectively. A total of 18749 age-0+ were caught for a total weight of 109.5 kg (Table 6).

Age-1+ herring occurred in 54.2 % of the stations (Table 5). Twenty-six of the forty-eight stations sampled contained age-1+ herring. The mean length and weight for age-1+ herring was 125 mm and 27.20 g, respectively. A total of 690 age-1+ herring were caught for a total weight of 21.0 kg (Table 6).

Age-2+ herring occurred in 25.0 % of the stations (Table 5). Twelve of the forty-eight stations sampled contained age-2+ herring. The mean length and weight for age-2+ herring was 160 mm and 57.42 g, respectively. A total of 532 age-2+ herring were caught for a total weight of 30.7 kg (Table 6).

Length frequency histograms by transect location for all sampled herring are shown in Figure 6. Only Yellow Point (transect 2) and Trincomali Channel (transect 6) were dominated by an age-0+ age-class. The majority of transects had a mixture of all three age classes. As seen in previous surveys, Trincomali Channel (Transect 6) and Yellow Point (Transect 2) produced age-0+ herring smaller than the survey average. This is more than likely due to the variation in spawning times of herring above and below Dodds Narrows. A length-weight relationship for all sampled herring from the survey showed a positive correlation coefficient ( $r^2$ ) of 0.9867 (Figure 7).

## **Herring 2012**

Forty-eight stations were sampled from transects 1 – 6, 8 – 11. A total of 4560 herring were weighed and measured resulting in a length frequency distribution that was distinctly unimodal for age-0+ herring (Figure 5). Three length designations for the juvenile herring age-classes were produced:

- 0+ = herring less than or equal to 109 mm standard length
- 1+ = herring between 110 mm and 153 mm standard length
- 2+ and older = herring greater than or equal to 154 mm standard length

Age-0+ herring occurred in 95.8 % of the stations (Table 5). Forty-six of the forty-eight stations contained age-0+ herring. The mean length and weight for age-0+ herring was 82 mm and 7.66 g respectively. A total of 122907 age-0+ herring were caught for a total weight of 971.39 kg (Table 7). This is the third largest catch total of age-0+ herring since the start of the survey in 1990.

Age-1+ herring occurred in 45.8 % of the stations (Table 5). Twenty-two of the forty-eight stations sampled contained age-1+ herring. The mean length and weight for age-1+ herring was 131 mm and 32.46 g, respectively. A total of 6445 age-1+ herring were caught for a total weight of 247.57 kg (Table 7).

Age-2+ herring occurred in 14.6 % of the stations (Table 5). Seven of the forty-eight stations sampled contained age-2+ herring. The mean length and weight for age-2+ herring was 162 mm and 57.23 g, respectively. A total of 168 age-2+ herring were caught for a total weight of 9.72 kg (Table 7).

Length frequency histograms by transect location for all sampled herring are shown in Figure 7. Most transects were dominated by a single age-0+ age-class except Clarke Rock (transect 1) and Atrevida Reef (transect 9) which included a mixture of all three herring age-classes. As seen in previous surveys, Trincomali Channel (transect 6) and Yellow Point (transect 2) produced age-0+ herring smaller than the survey average. This is more than likely due to the variation in spawning times of herring above and below Dodds Narrows. A length-weight relationship for all sampled herring from the survey showed a positive correlation coefficient ( $r^2$ ) of 0.9761 (Figure 8).

## **Plankton 2011**

There were 24 categories of organisms identified in 20 plankton samples (Tables 8 and 9). An average of 12.854 m<sup>3</sup> of water was filtered per plankton tow. Calanoid copepod *Paracalanus parvus* was the only category to occur in all samples. Calanoid copepod *Paracalanus parvus*, ctenophores and medusae (*Aequorea victoria*) occurred in >95% of the samples. More than 60% of all plankton biomass captured were calanoid copepods *Paracalanus parvus* and *Metridia pacifica*, cyclopoid copepod *Corycaeus anglicus*, and ctenophores.

## **Plankton 2012**

There were 25 categories of organisms identified in 20 plankton samples (Tables 11 and 12). An average of 8.792 m<sup>3</sup> of water was filtered per plankton tow. Calanoid copepod *Paracalanus parvus* and larvaceans (*Oikopleura sp.* and *Fritillaria sp.*) were the only category to occur in all samples. Larvaceans (*Oikopleura sp.* and *Fritillaria sp.*), calanoid copepod *Paracalanus parvus*, cyclopoid copepod *Corycaeus anglicus*, ctenophores and siphonophores occurred in >95% of the samples. More than 75% of all plankton biomass captured were larvaceans (*Oikopleura sp.* and *Fritillaria sp.*), calanoid copepod *Paracalanus parvus* and barnacle larvae.

## **CTD**

Two CTD casts were performed at each transect at a nearshore and offshore sampling location for a total of 20 casts. The CTD casts provided depth (m), temperature (°C) and salinity (S/m) (Figure 7). Unfortunately, data was lost due to a logging error for Bowser (transect 3), Henry Bay (transect 4), Smelt Bay (transect 8) and Atrevida Reef (transect 9).

## **CONCLUSION**

### **2011**

Forty-eight stations were sampled resulting in 22 different fish species recorded from purse seine sets. A total of 2724 herring were measured and weighed creating a unimodal histogram clearly representing age-0+ juvenile herring. Twenty plankton tows were performed resulting in calanoid copepod *Paracalanus parvus* being the predominant organisms in numbers and biomass.

### **2012**

Forty-eight stations were sampled resulting in 22 different fish species recorded from purse seine sets. A total of 4560 herring were measured and weighed creating a unimodal histogram clearly representing age-0+ juvenile herring. Twenty plankton tows were performed resulting in larvaceans (*Oikopleura sp.* and *Fritillaria sp.*) and calanoid copepod *Paracalanus parvus* being the predominant organisms in numbers and biomass.

## ACKNOWLEDGMENTS

Both the 2011 and 2012 Strait of Georgia juvenile herring survey was funded by the Department of Fisheries and Oceans. This survey could not have been possible without the hard work and good cheer of skipper Doug Henderson. Plankton samples were processed by Zotec services.

## REFERENCES

- Haegele, C.W. 1997. The occurrence, abundance and food of juvenile herring and salmon in the Strait of Georgia, British Columbia in 1990 to 1994. Can. Manusc. Rep. Fish. Aquat. Sci. 2390: 124 p.
- Haegele, C.W., Hay, D.E., Schweigert, J.F., Armstrong, R.W., Hrabok, C., Thompson, M., and Daniel, K. 2005. Juvenile herring surveys in Johnstone Strait and Georgia Straits – 1996 to 2003. Can. Data Rep. Fish. Aquat. Sci. 1171:xi + 243 p.
- Hay, D.E., and McCarter, P.B. 1999. Age of sexual maturation and recruitment in Pacific herring. Can. Sci. Advis. Sec. Res. Doc. 99/175: 42 p.
- Hay, D.E., Schweigert, J.F., Thompson, M., Haegele, C.W., and Midgley, P. 2003. Analyses of juvenile surveys for recruitment prediction in the Strait of Georgia. Can. Sci. Advis. Sec. Res. Doc. 2003/107: 28 p.
- Hourston, A.S., and Haegele, C.W. 1980. Herring on Canada's Pacific coast. Can. Spec. Publ. Fish. Aquat. Sci. 48: 23 p.
- Humphreys, R.D., and Hourston, A.S. 1978. British Columbia herring spawn deposition survey manual. Fish. Mar. Serv. Misc. Spec. Publ. 38: 40 p.
- McCarter, P.B., and Hay, D.E. 2002. Eulachon embryonic egg and larval outdrift sampling manual for ocean and river surveys. Can. Tech. Rep. Fish. Aquat. Sci. 2451: 33 p.
- Schweigert, J.F. Hay, D.E., Therriault, T.W., Thompson, M., and Haegele, C.W. 2009. Recruitment forecasting using indices of young-of-the-year (age-0<sup>+</sup>) Pacific herring (*Clupea pallasii*) abundance in the Strait of Georgia, British Columbia, Canada. ICES Journal of Marine Science. 66:1681-1687.
- Thompson, M., Hrabok, C., Hay, D.E., Schweigert, J., Haegele, C., and Armstrong, B. 2003. Juvenile herring surveys: methods and data base. Can. Manusc. Rep. Fish. Aquat. Sci. 2651: 31 p.

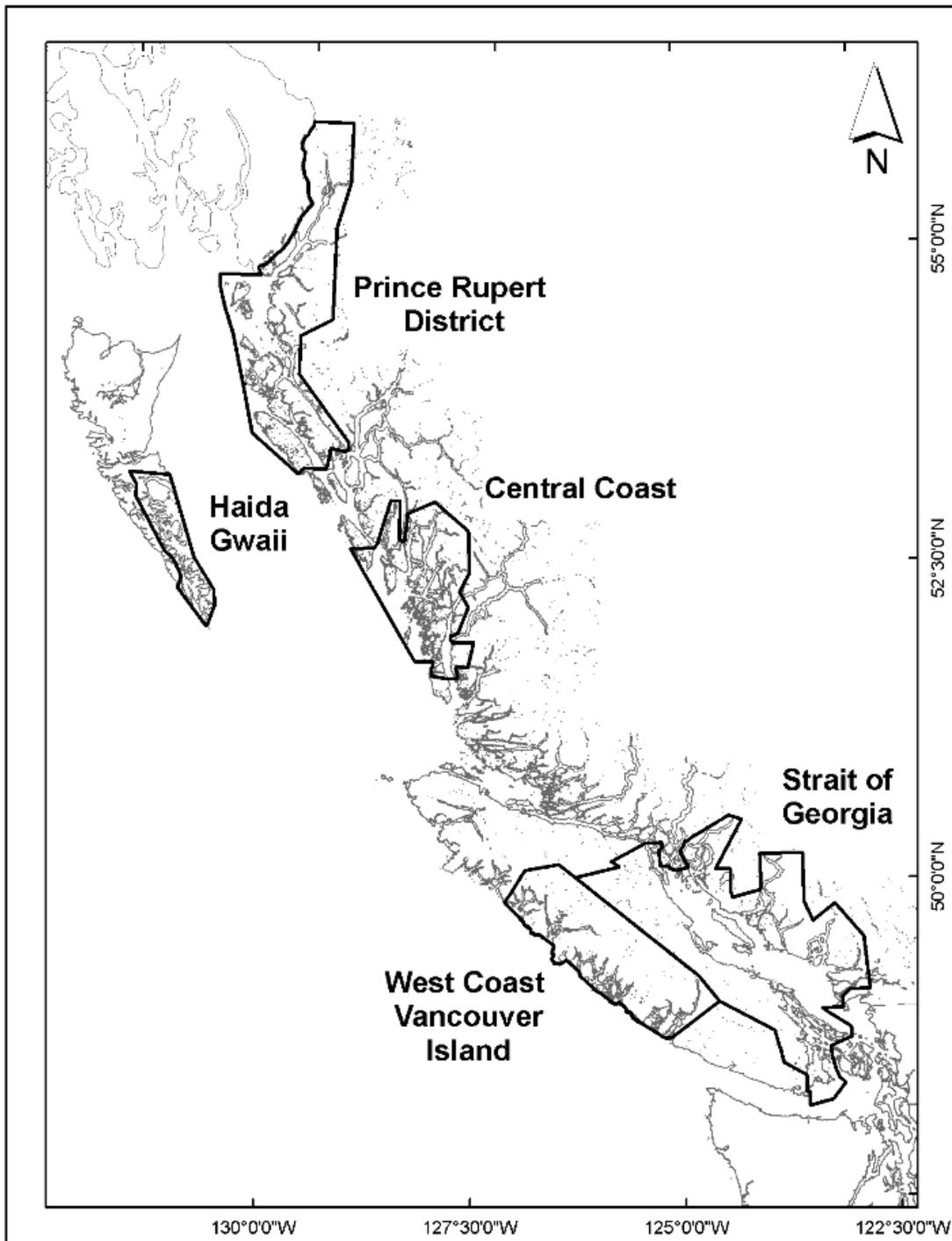


Figure 1. The five major British Columbia herring stock assessment areas.

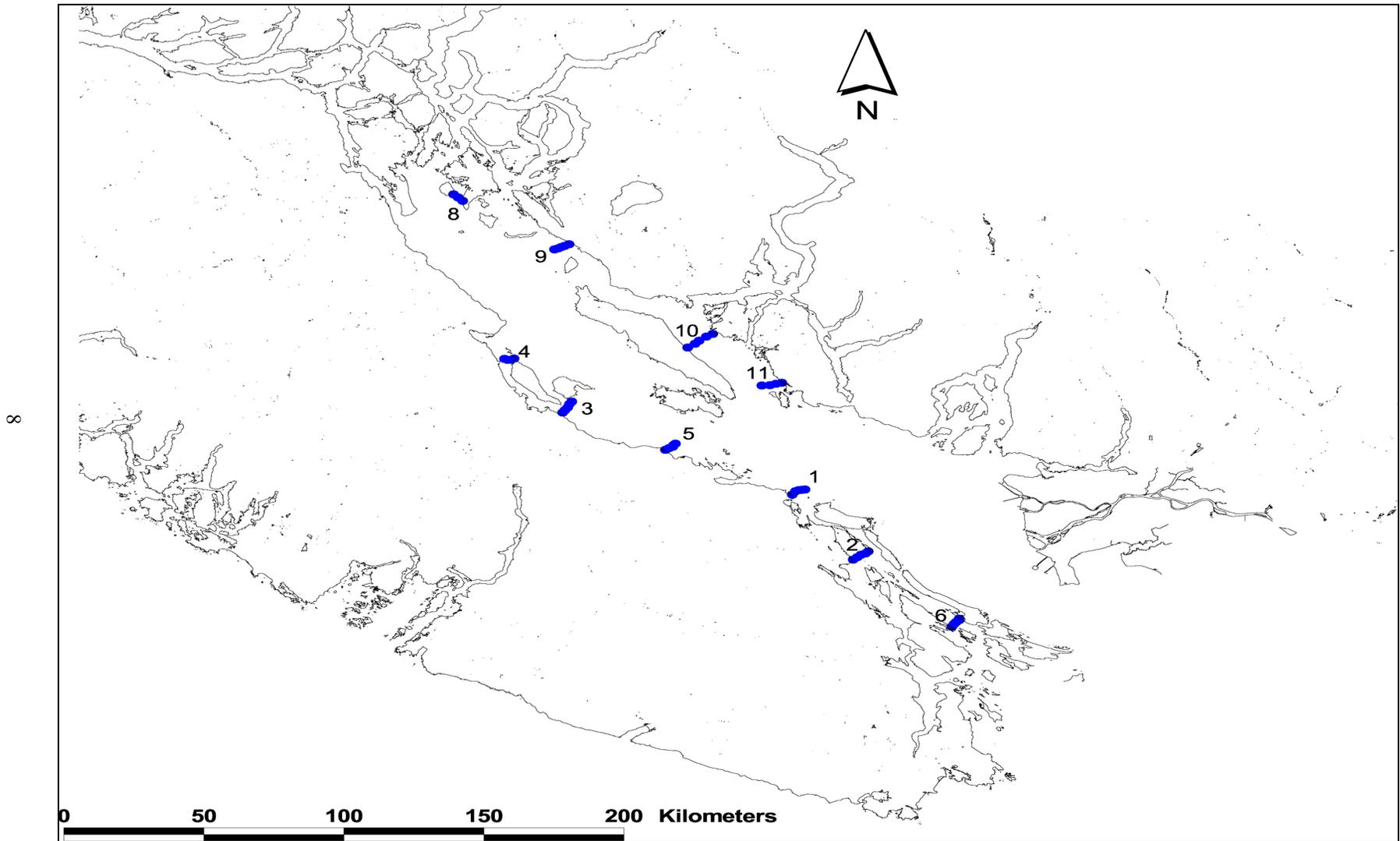


Figure 2. Purse seine set locations for the 2011 and 2012 Strait of Georgia juvenile herring survey.

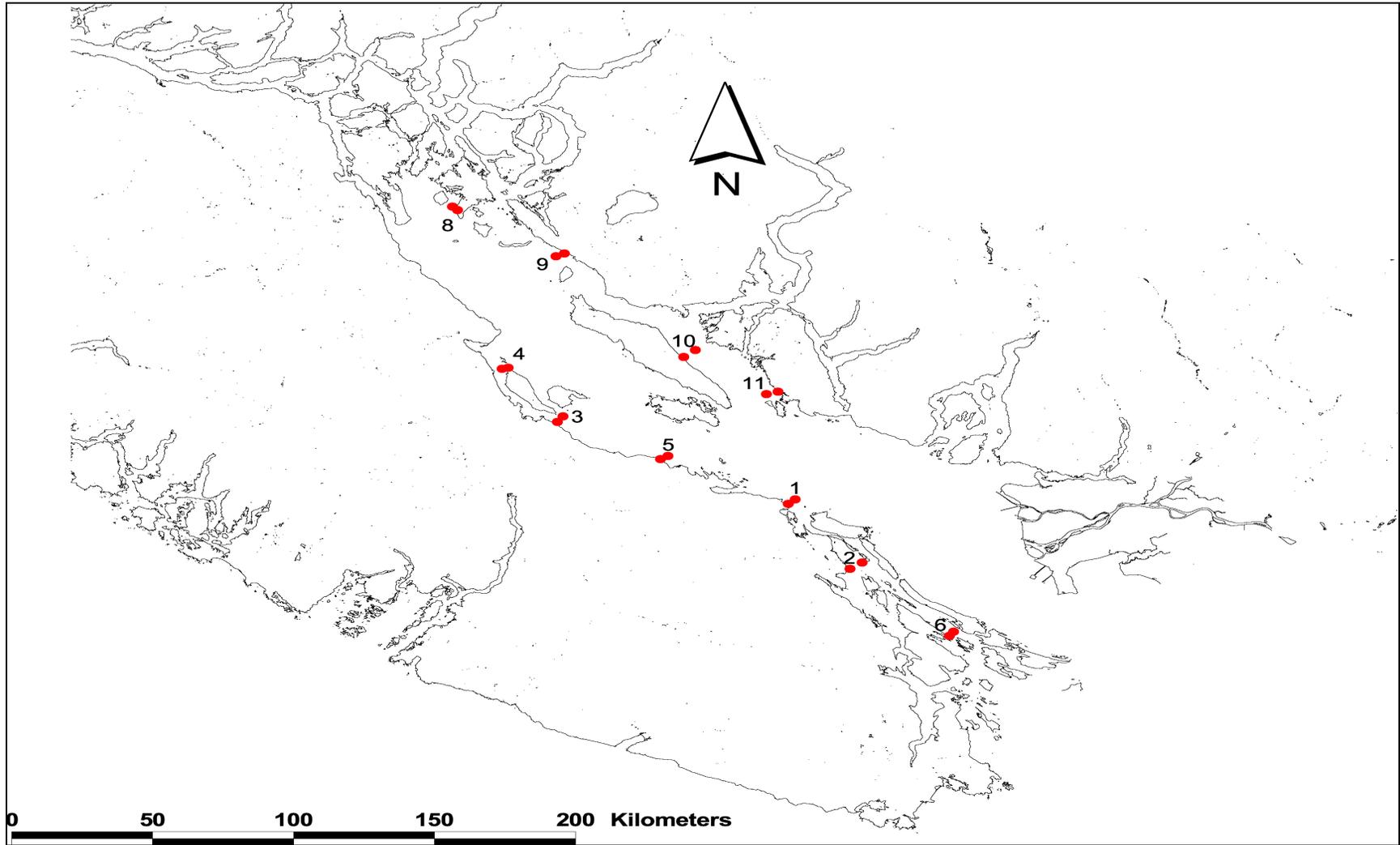


Figure 3. Plankton and CTD stations for 2011 and plankton stations for the 2012 Strait of Georgia juvenile herring survey.

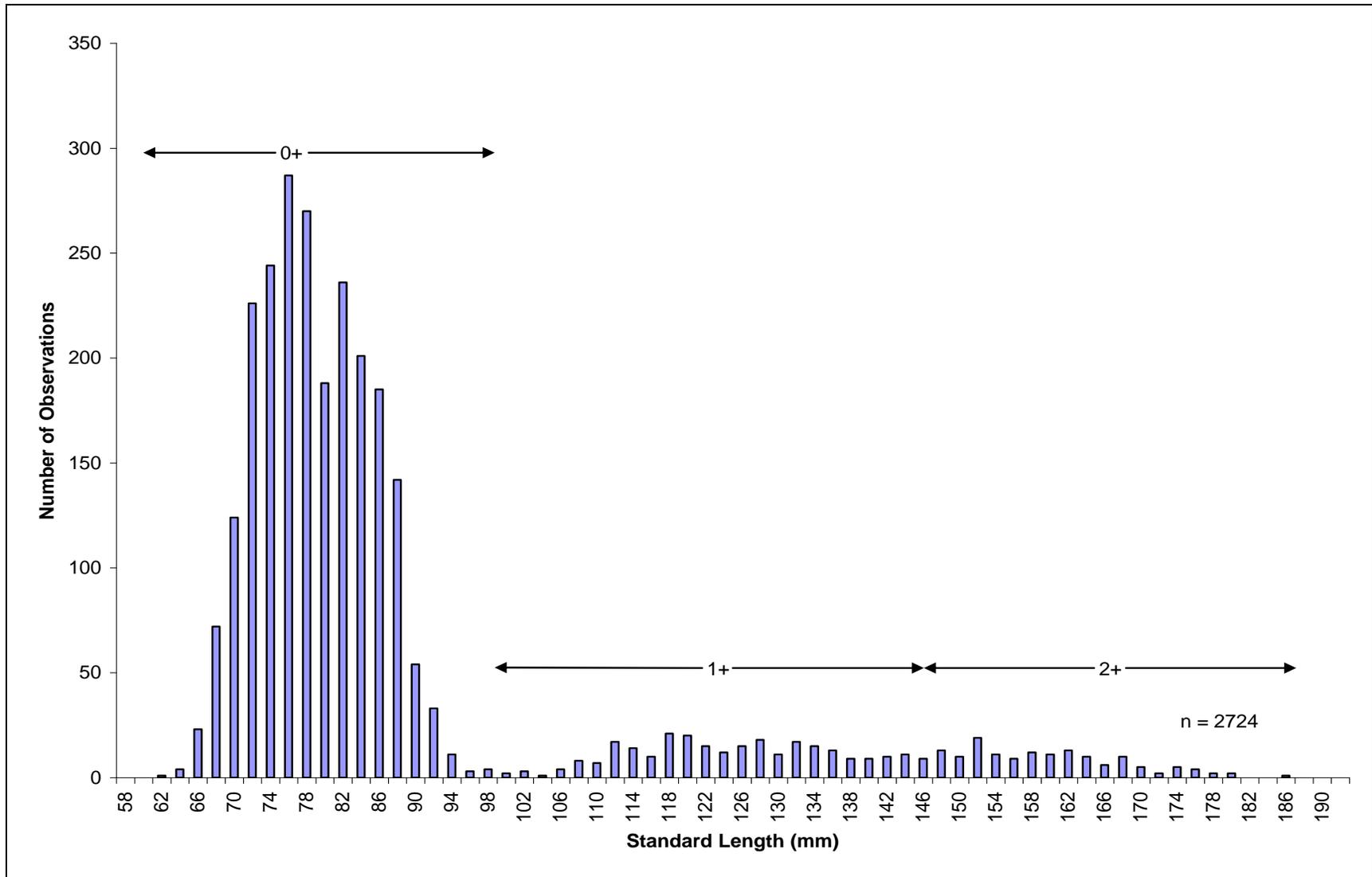


Figure 4. Length-frequency distribution for all herring sampled during the 2011 Strait of Georgia juvenile herring survey.

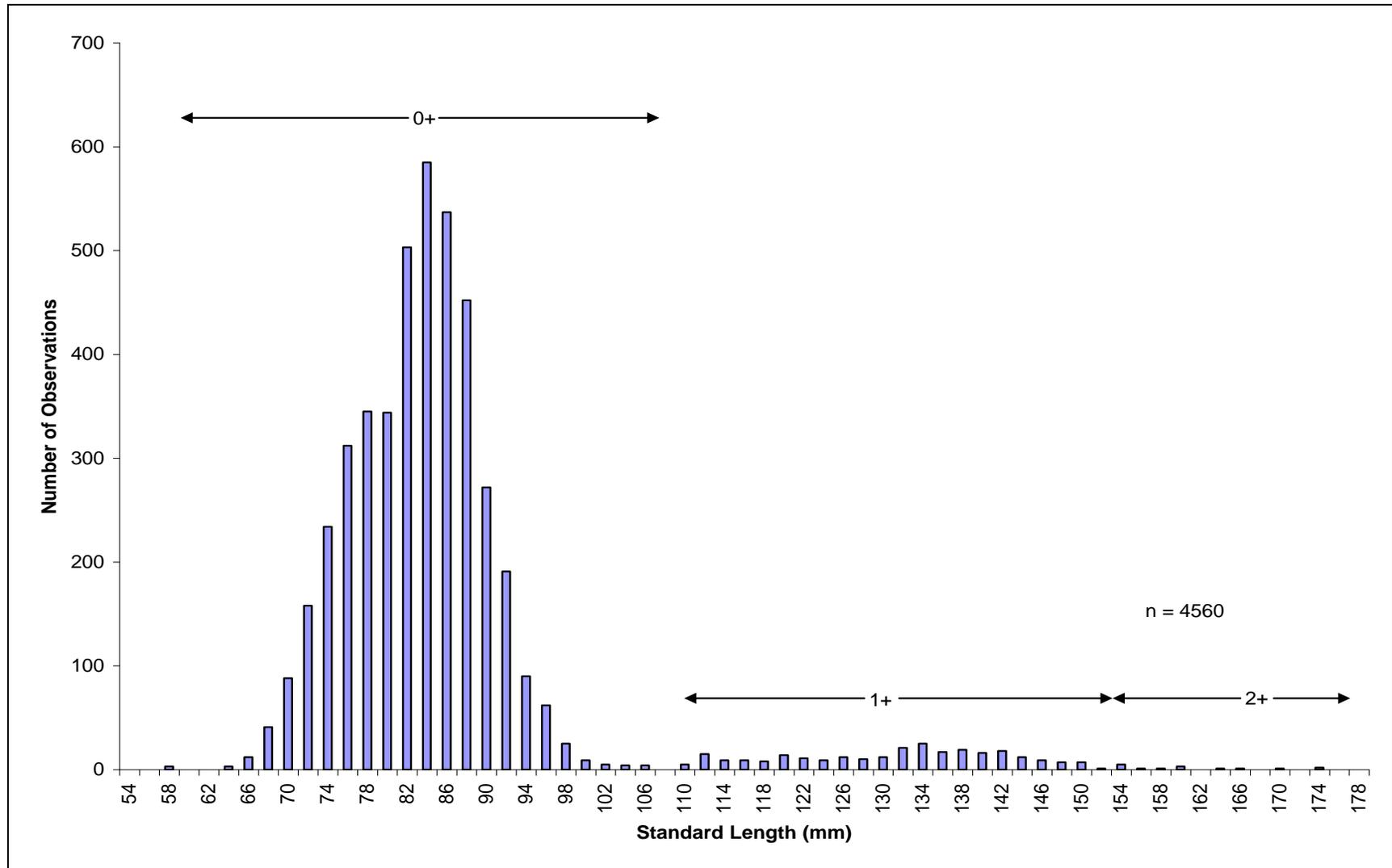
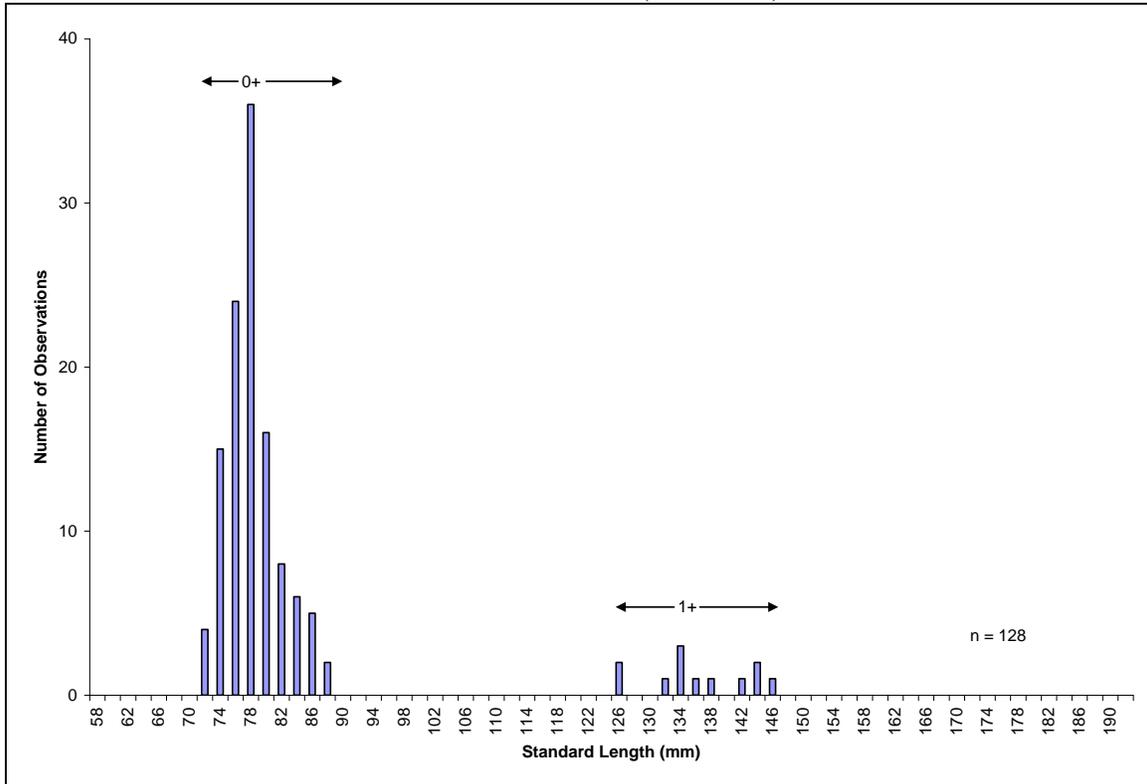


Figure 5. Length-frequency distribution for all herring sampled during the 2012 Strait of Georgia juvenile herring survey.

2011 Clarke Rock (transect 1)



2012 Clarke Rock (transect 1)

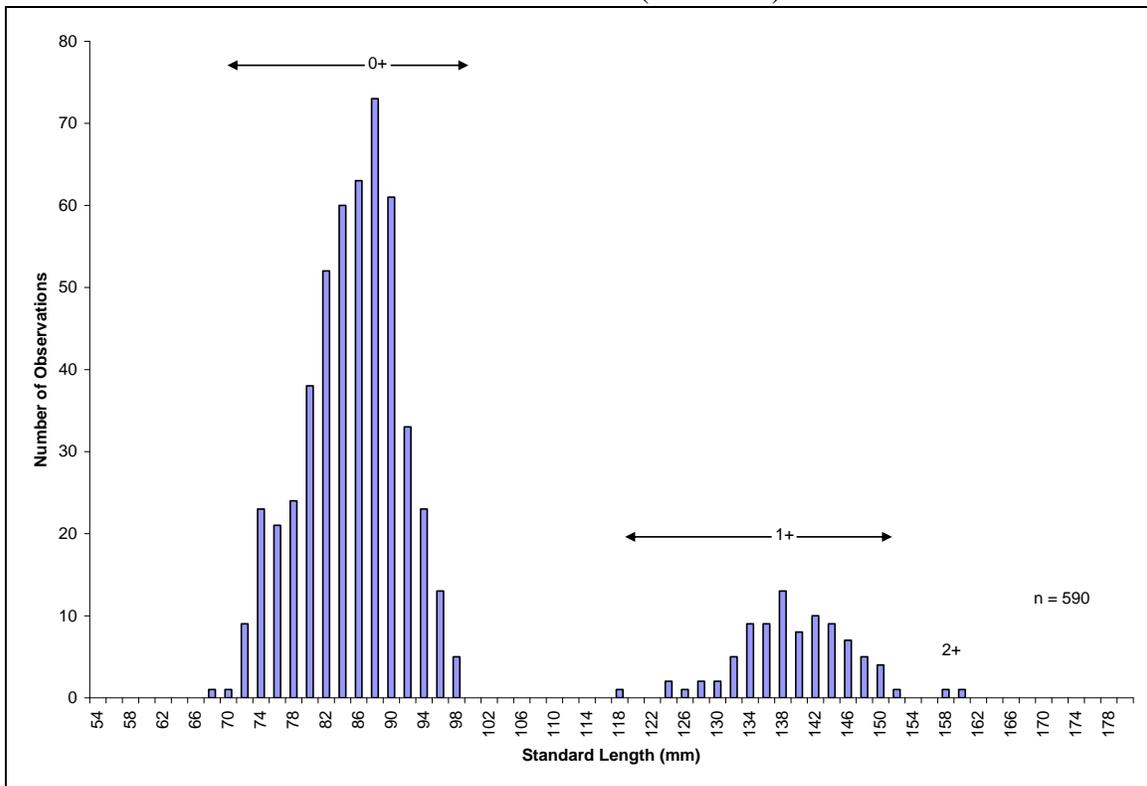
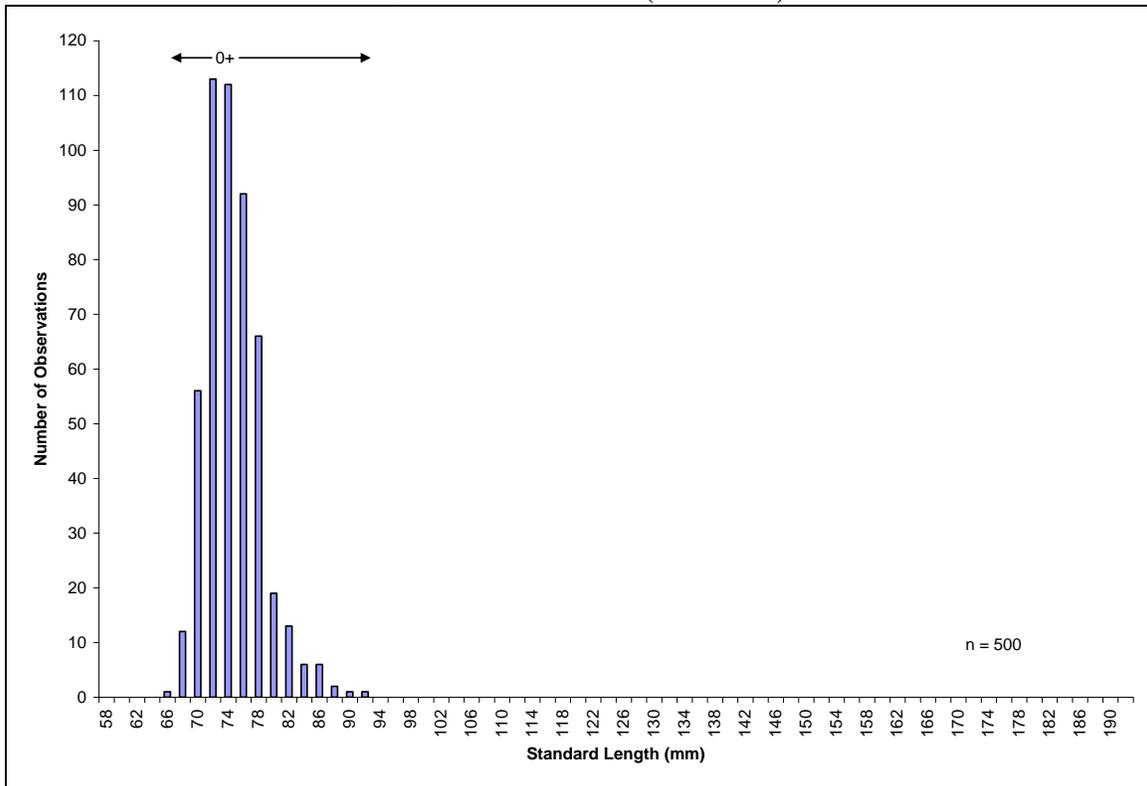


Figure 6. Length-frequency histograms of juvenile herring by transect location for the 2011 and 2012 Strait of Georgia juvenile herring survey.

2011 Yellow Point (transect 2)



2012 Yellow Point (transect 2)

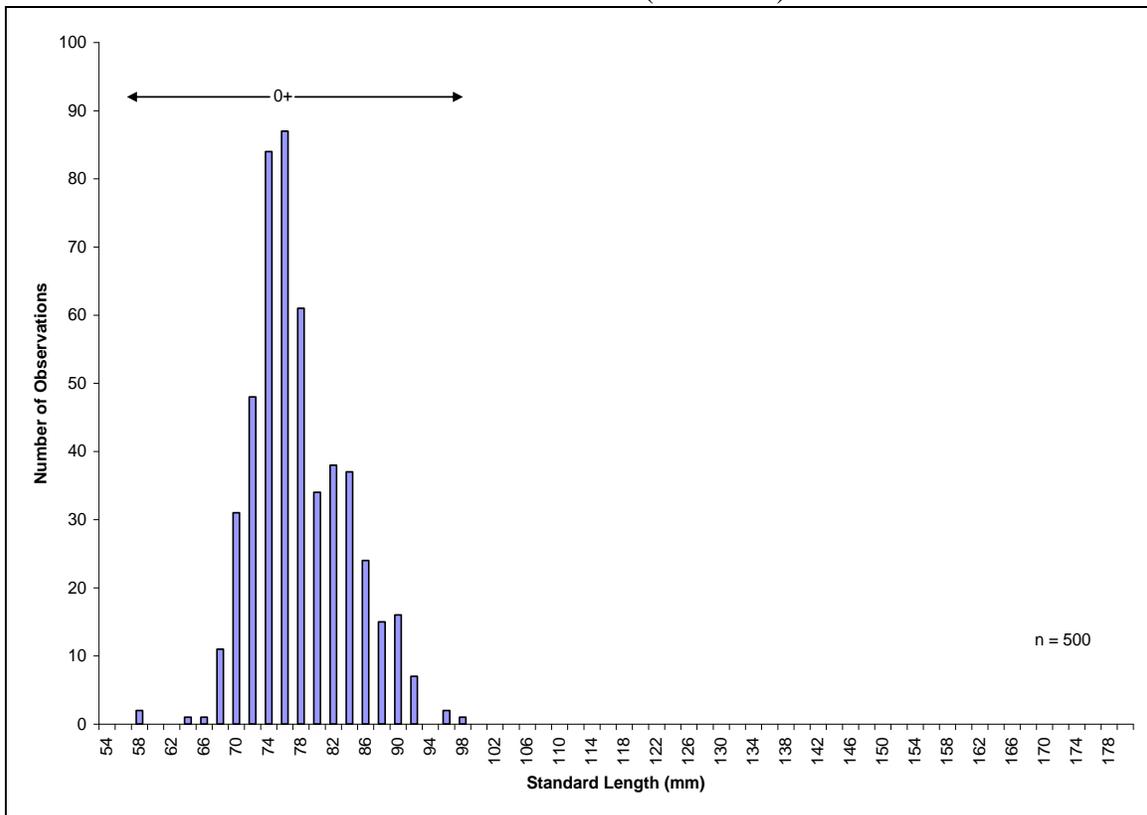
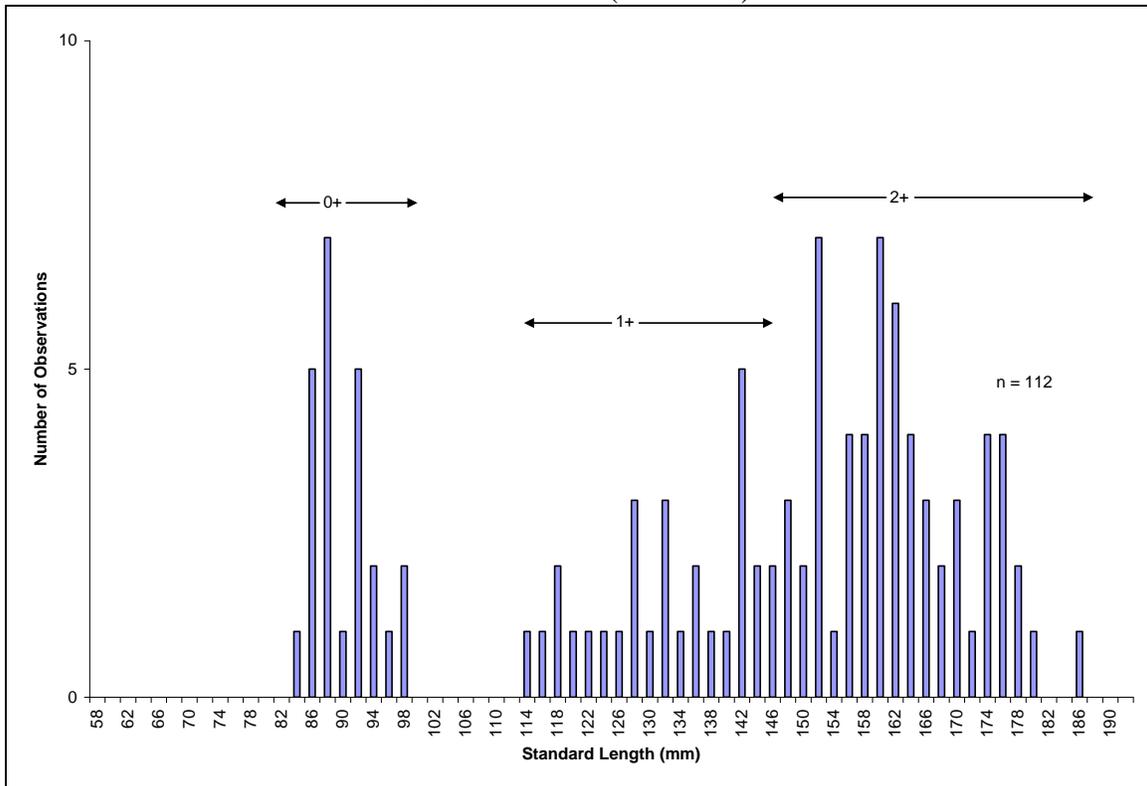


Figure 6 continued...

2011 Bowser (transect 3)



2012 Bowser (transect 3)

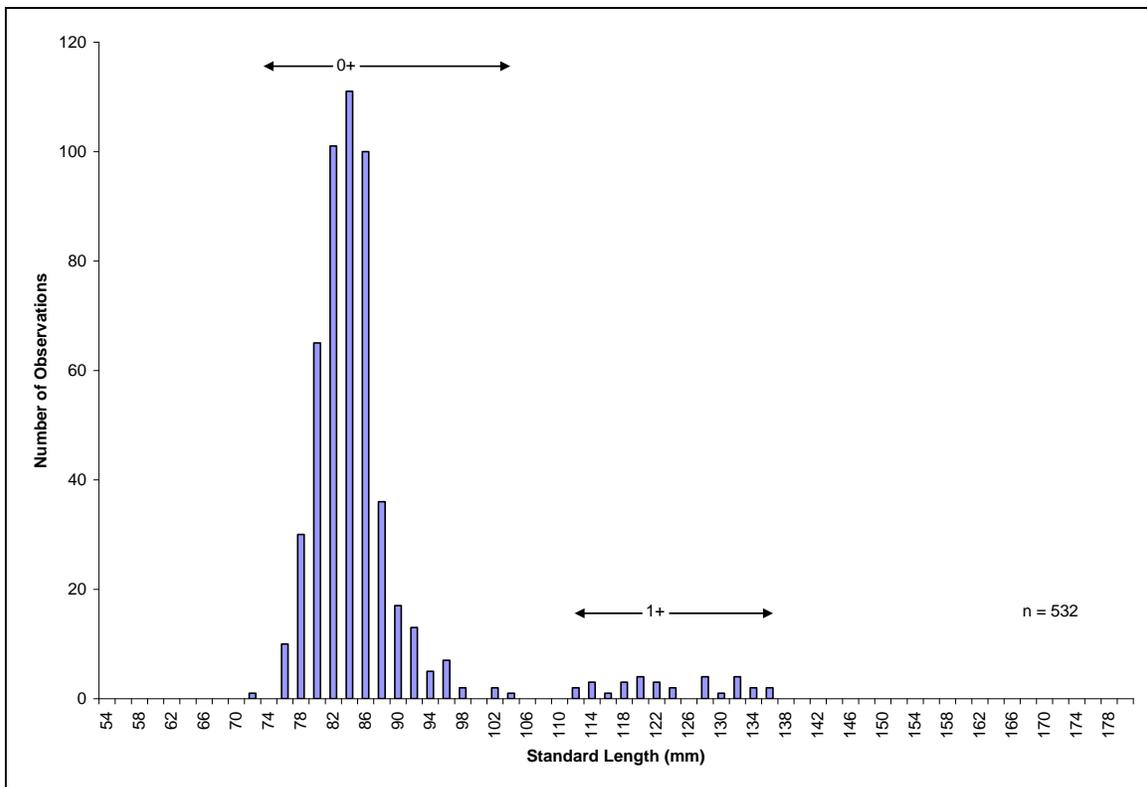
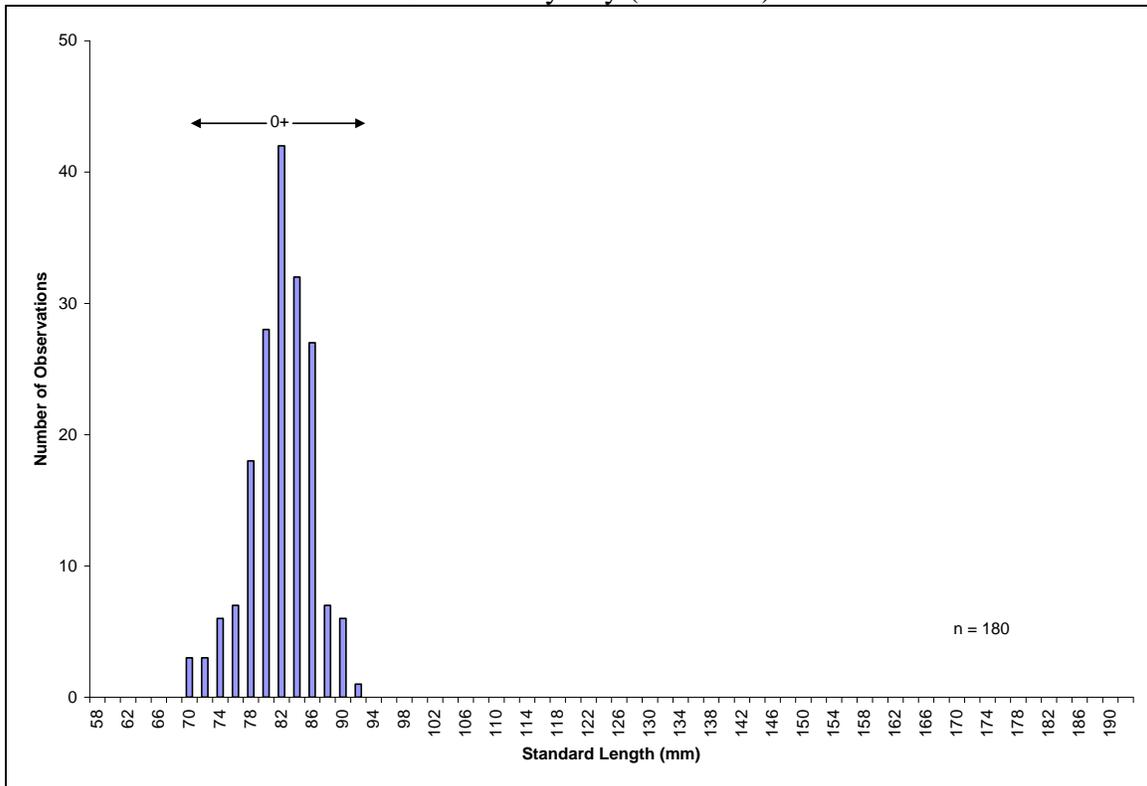


Figure 6 continued...

2011 Henry Bay (transect 4)



2012 Henry Bay (transect 4)

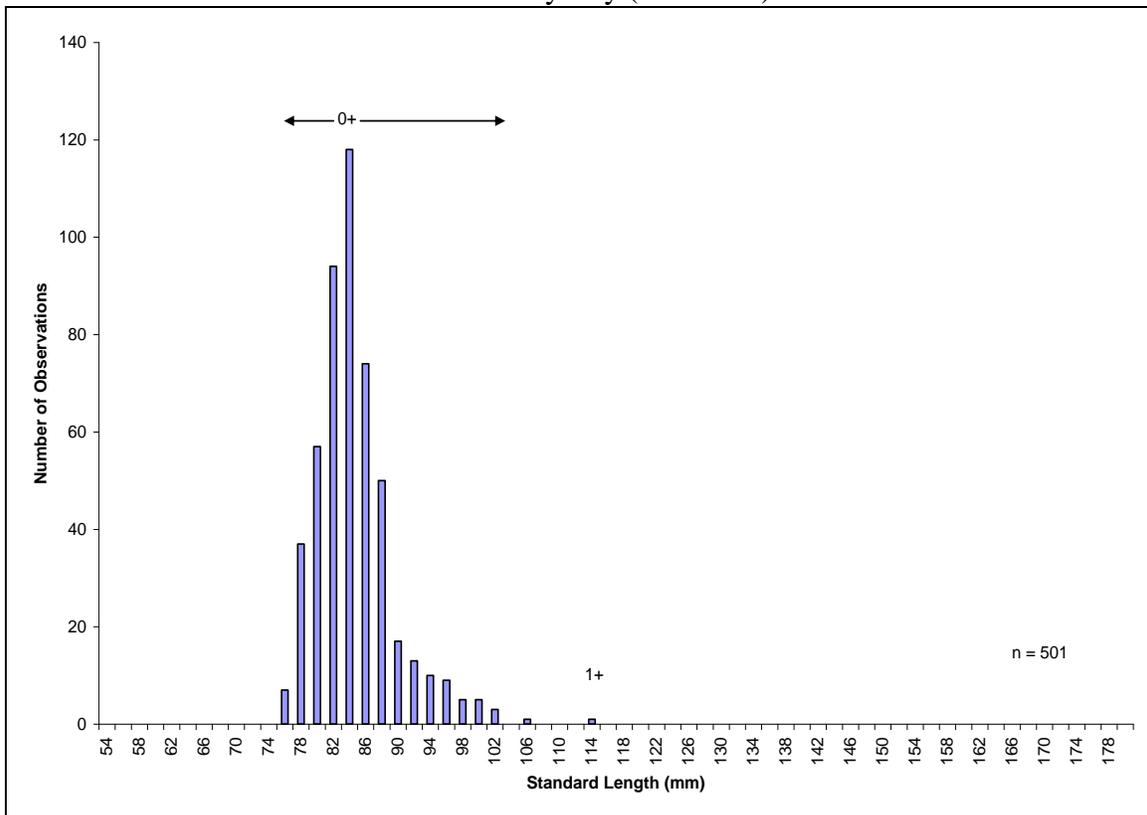
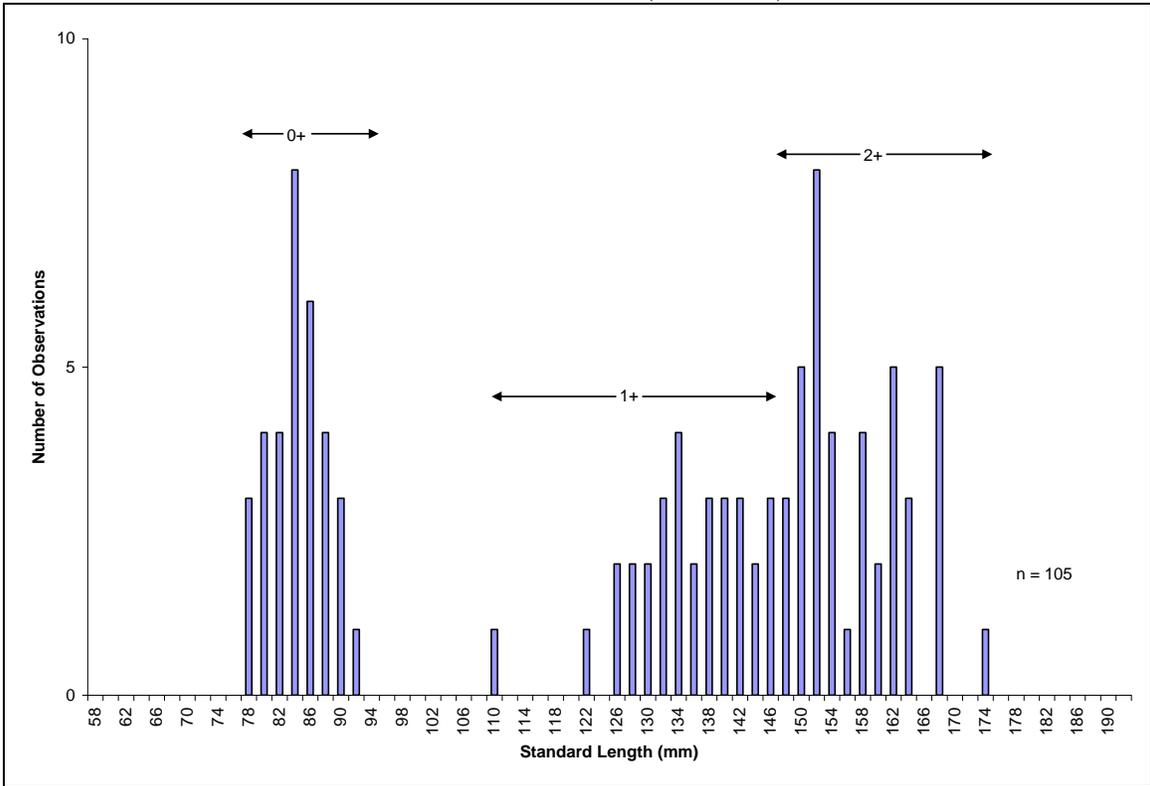


Figure 6 continued...

2011 French Creek (transect 5)



2012 French Creek (transect 5)

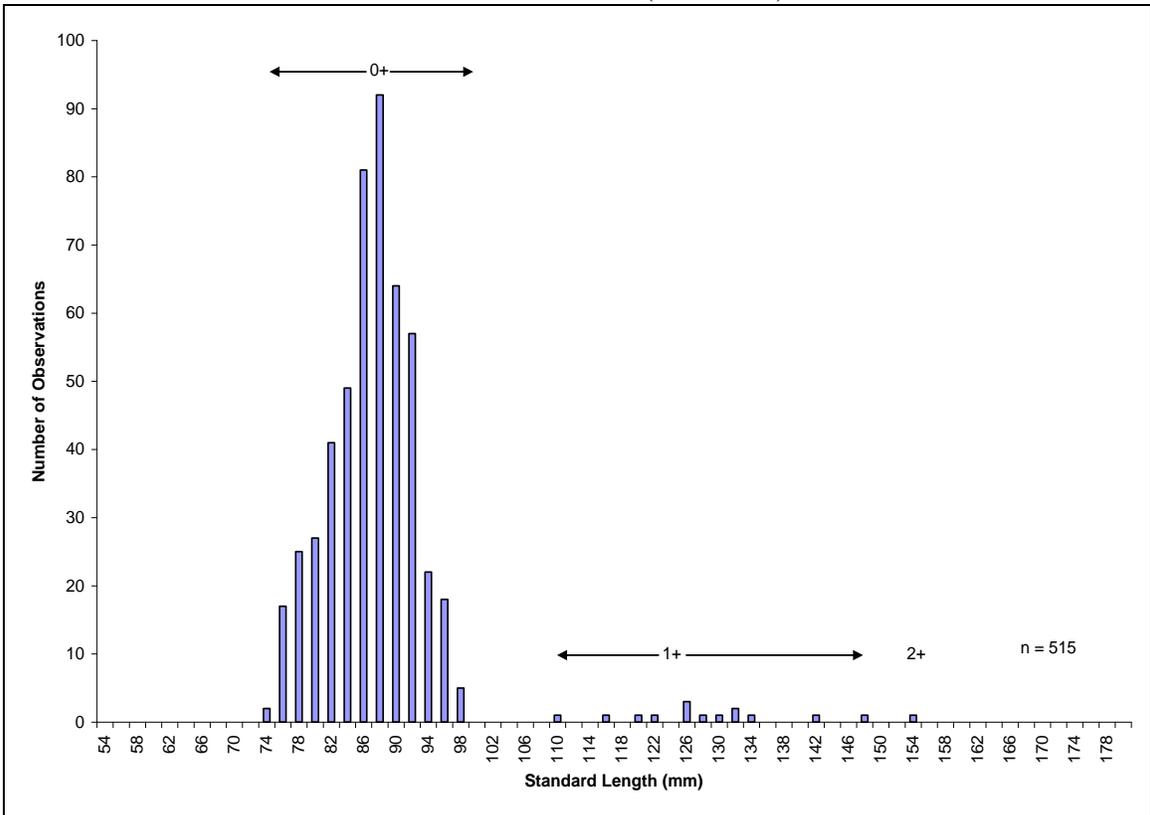
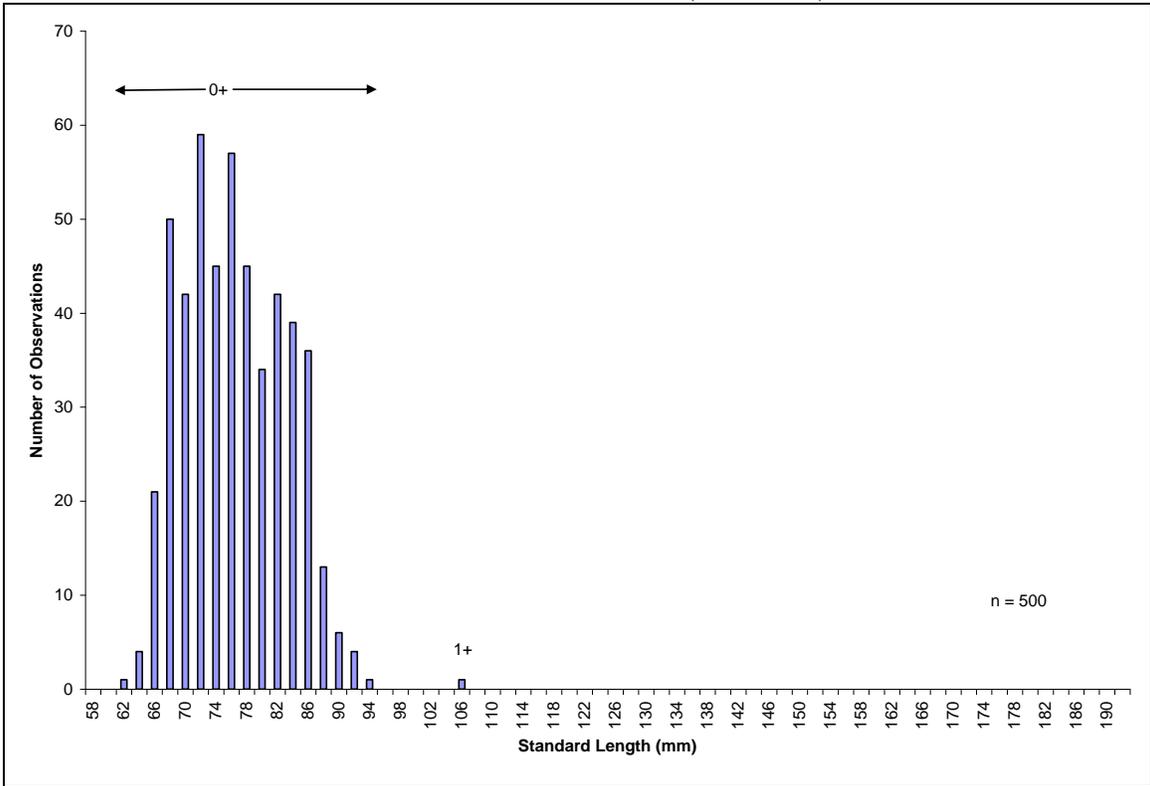


Figure 6 continued...

2011 Trincomali Channel (transect 6)



2012 Trincomali Channel (transect 6)

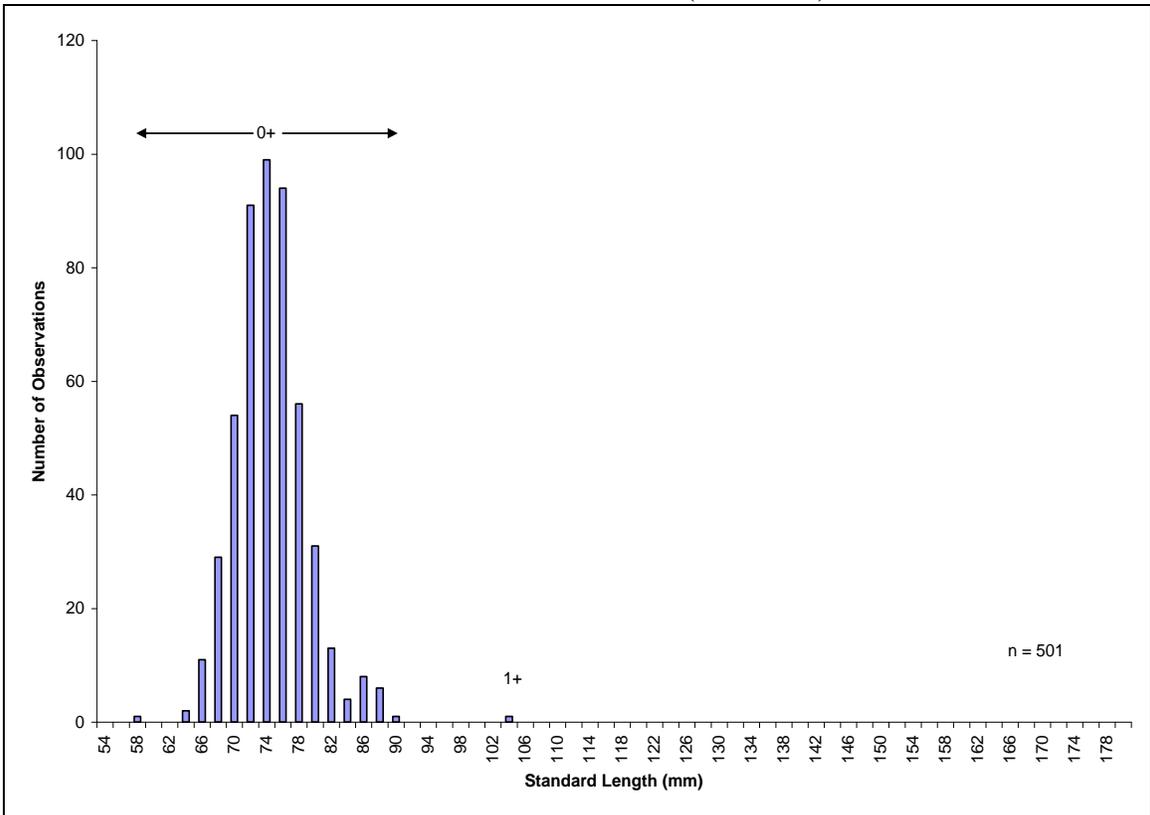
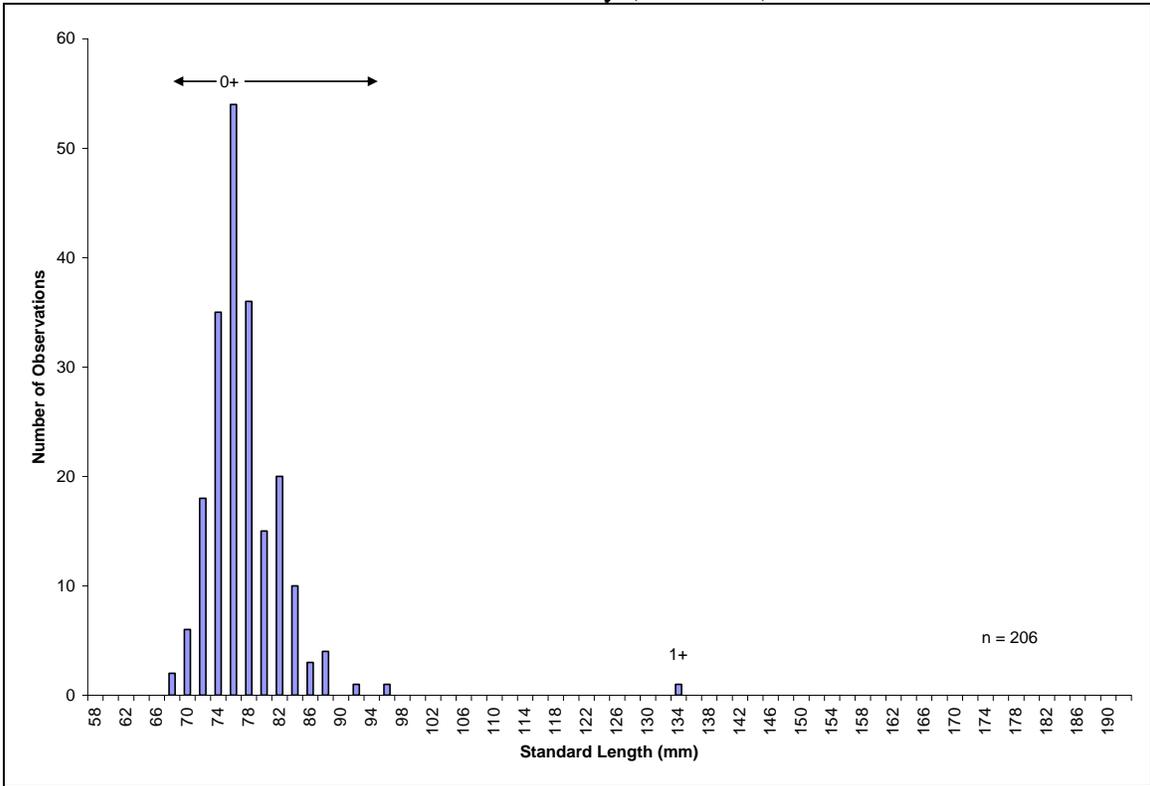


Figure 6 continued...

2011 Smelt Bay (transect 8)



2012 Smelt Bay (transect 8)

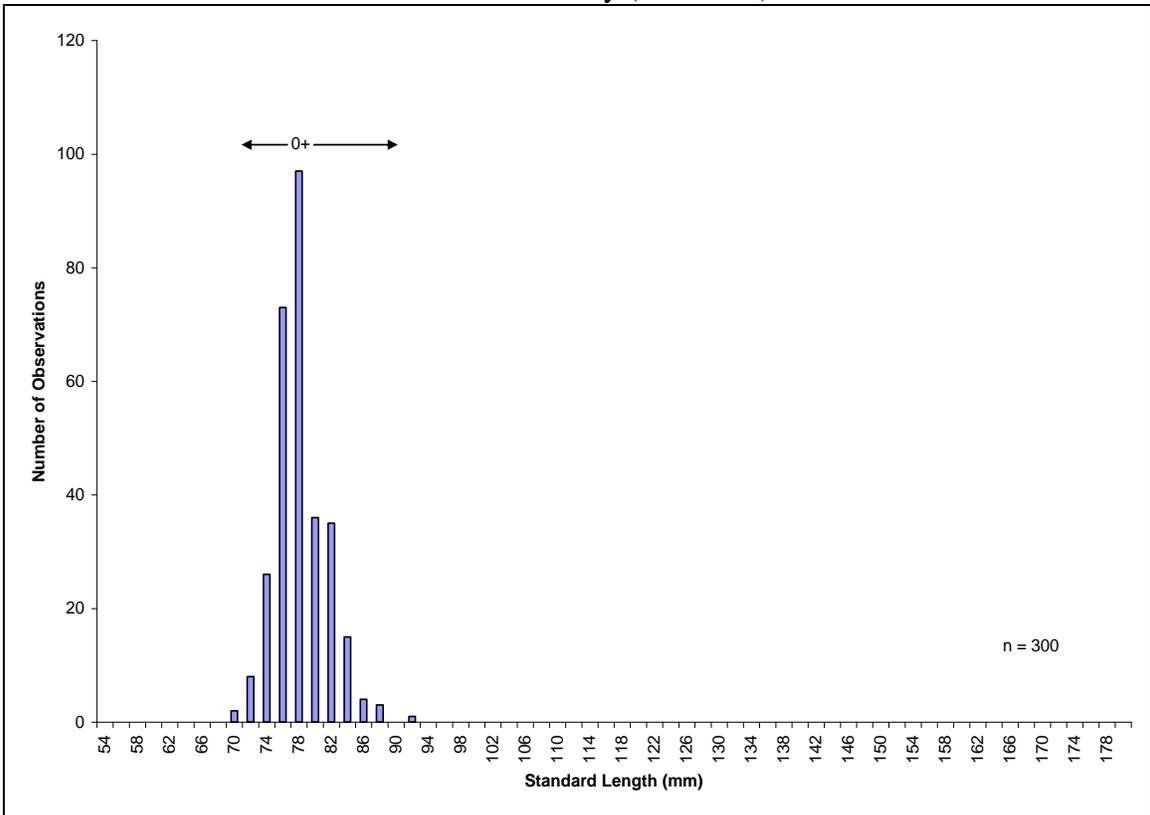
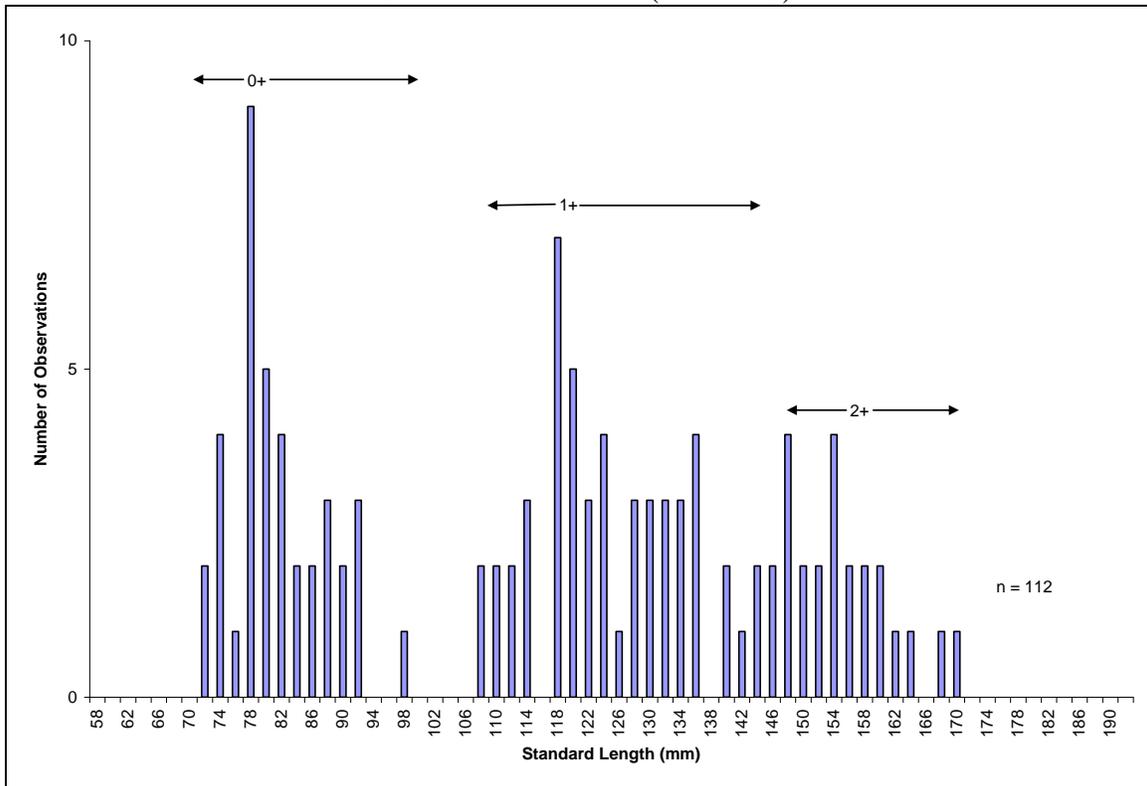


Figure 6 continued...

2011 Atrevida Reef (transect 9)



2012 Atrevida Reef (transect 9)

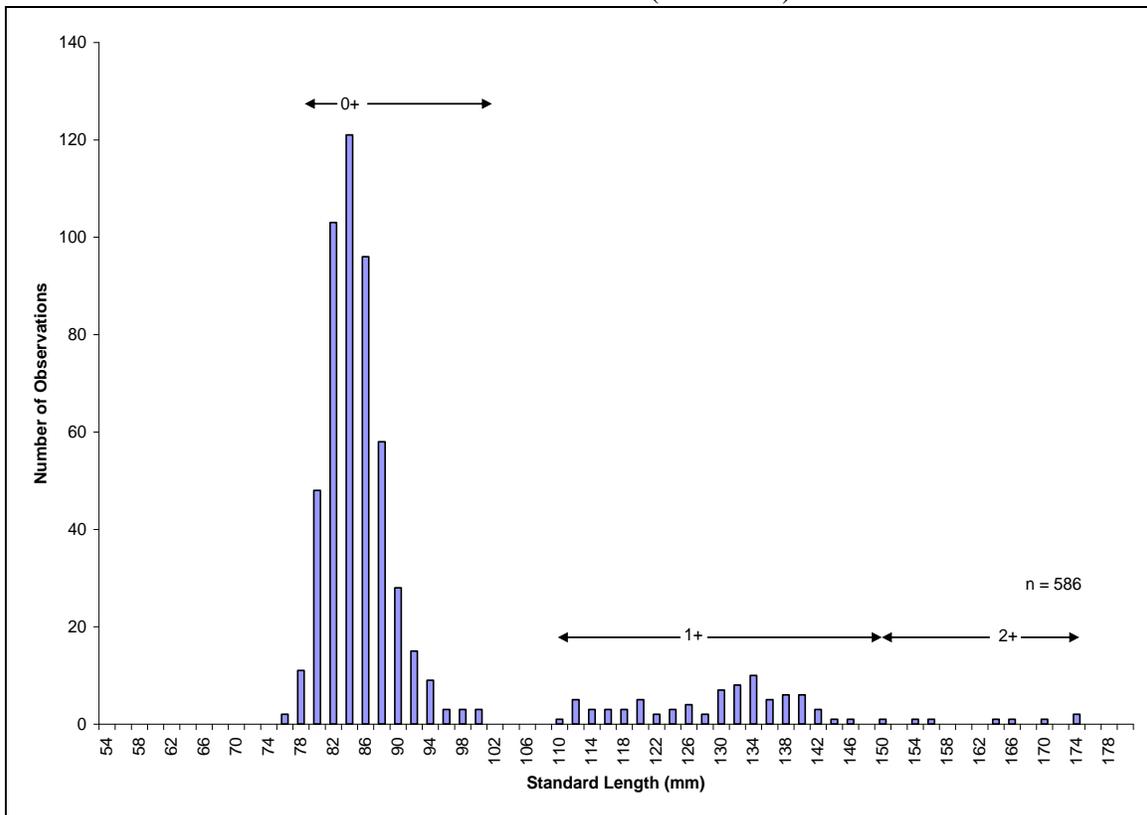
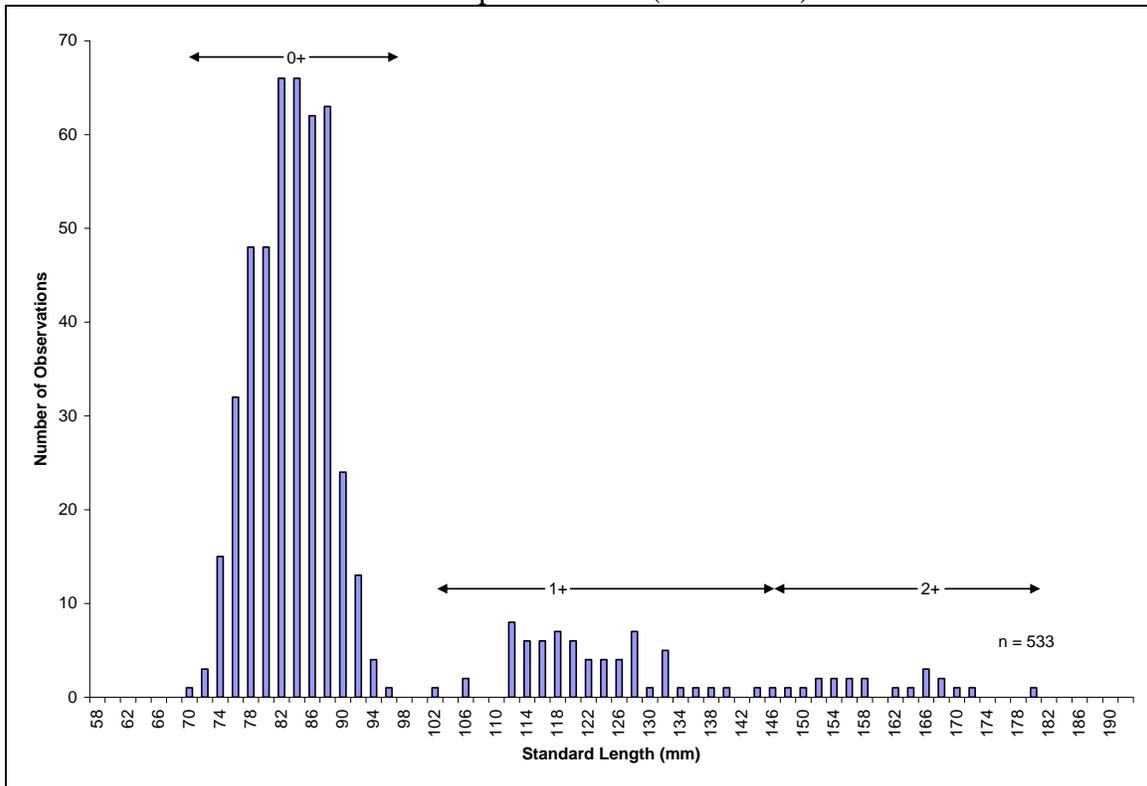


Figure 6 continued...

2011 Cape Cockburn (transect 10)



2012 Cape Cockburn (transect 10)

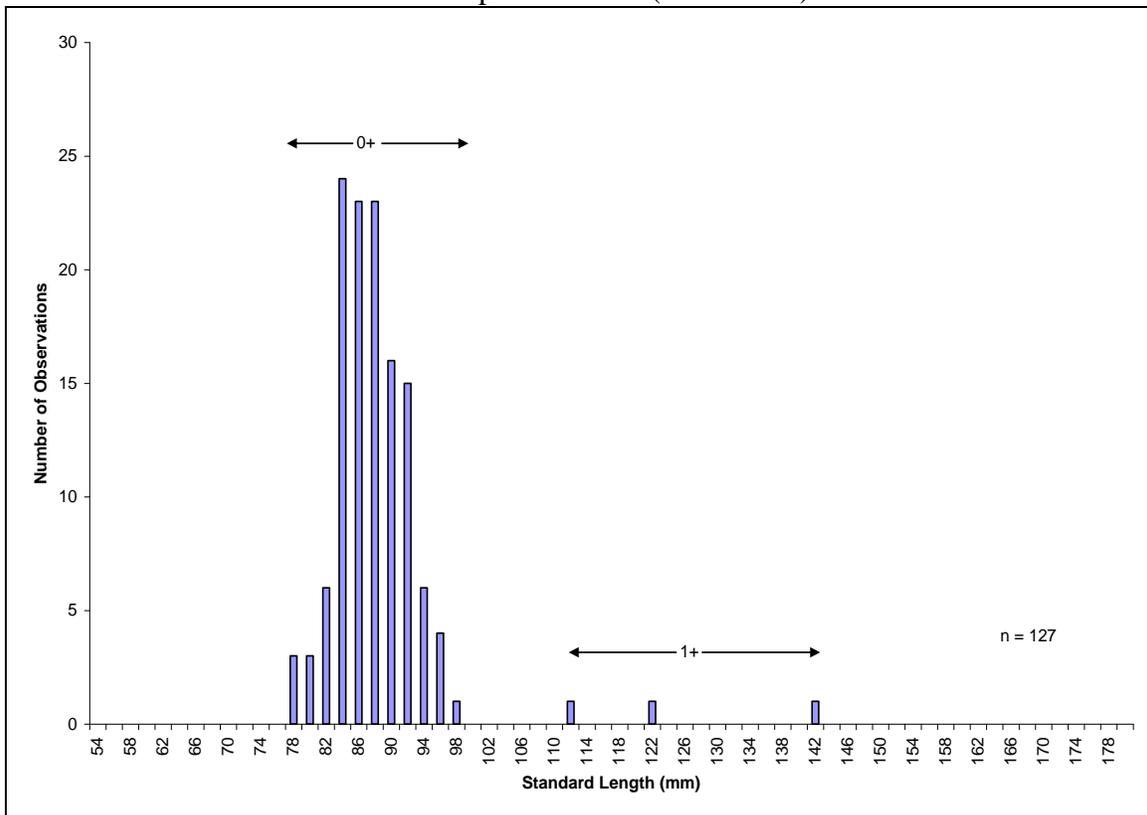
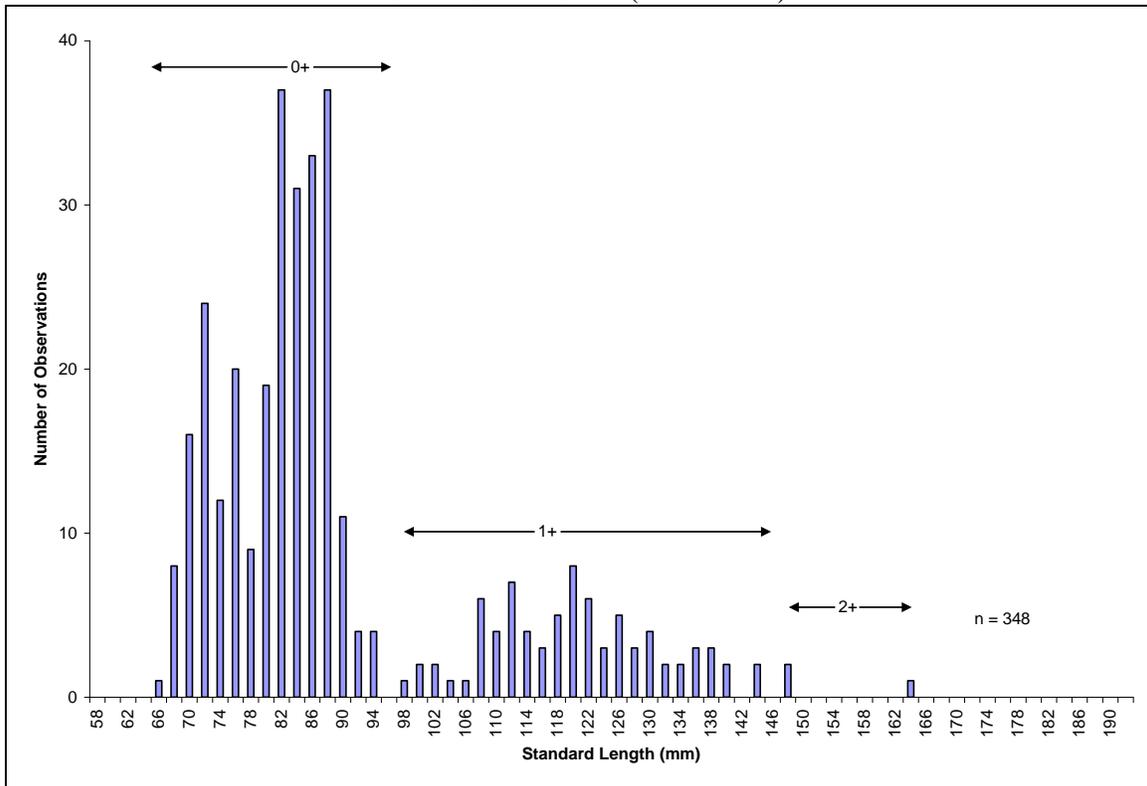


Figure 6 continued...

2011 Secret Cove (transect 11)



2012 Secret Cove (transect 11)

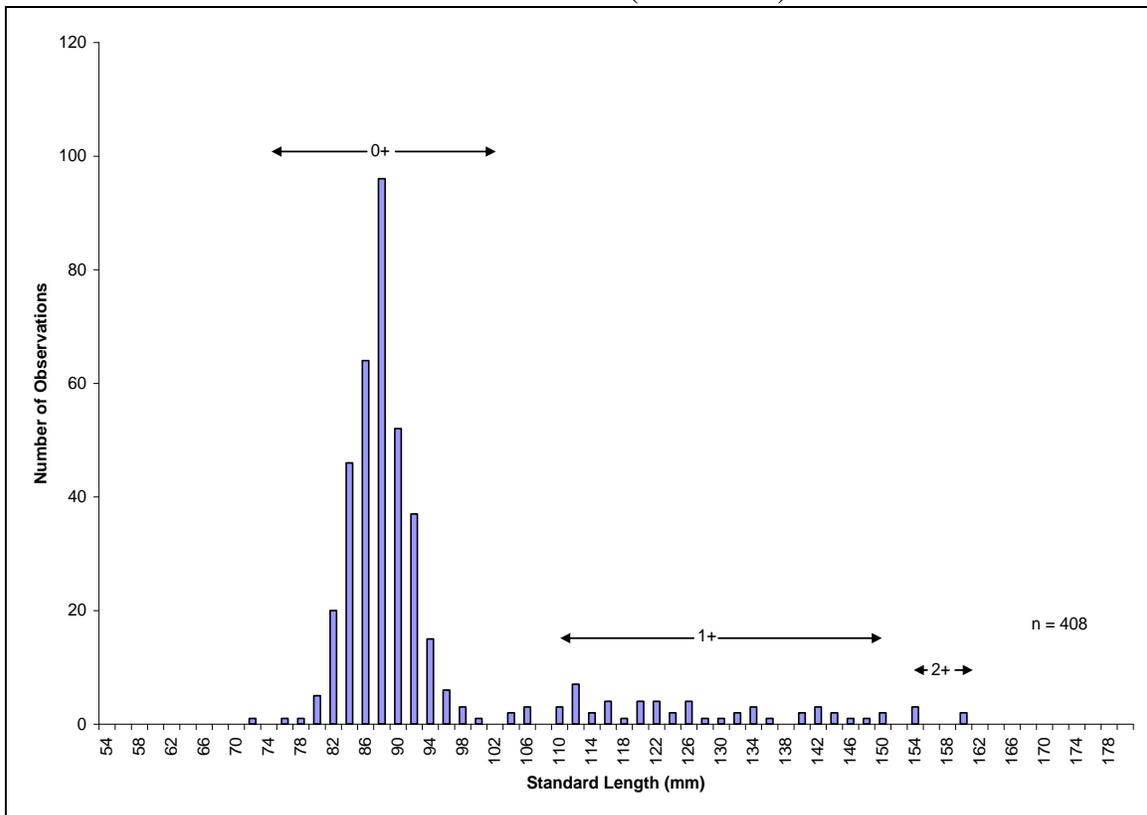


Figure 6 continued...

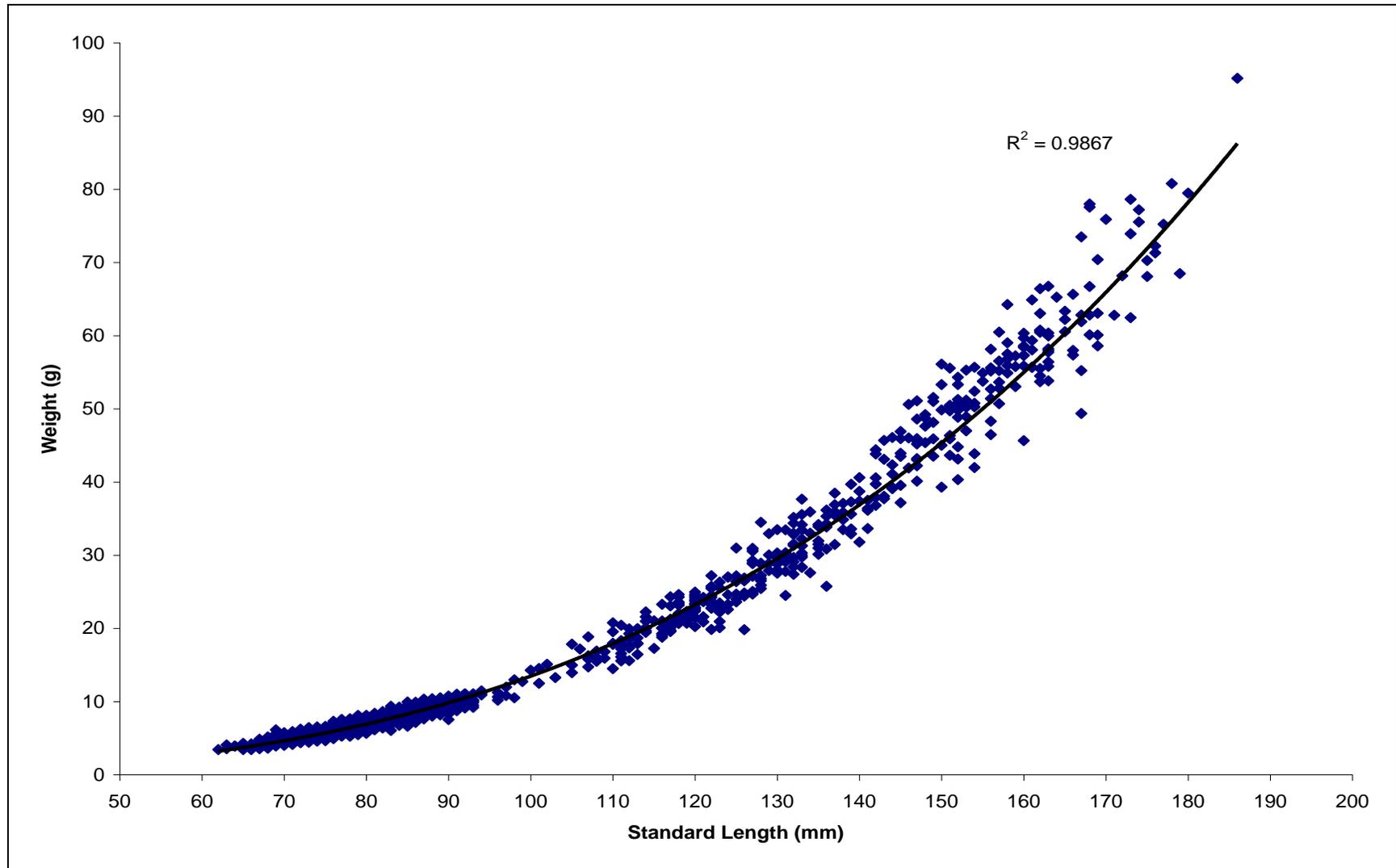


Figure 7. Length-weight relationship for all herring sampled during the 2011 Strait of Georgia juvenile herring survey.

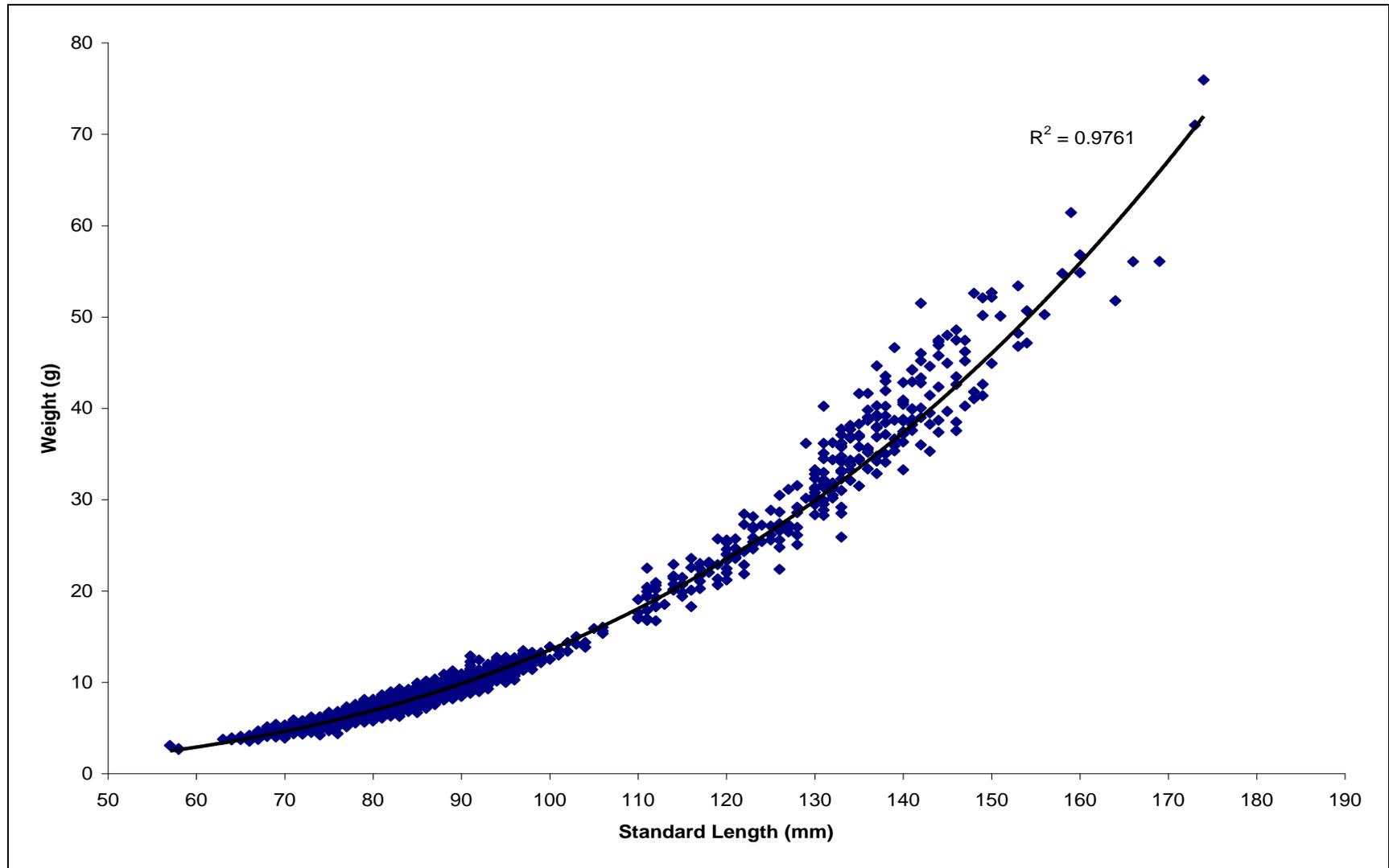


Figure 8. Length-weight relationship for all herring sampled during the 2012 Strait of Georgia juvenile herring survey.

### Clarke Rock (Transect 1)

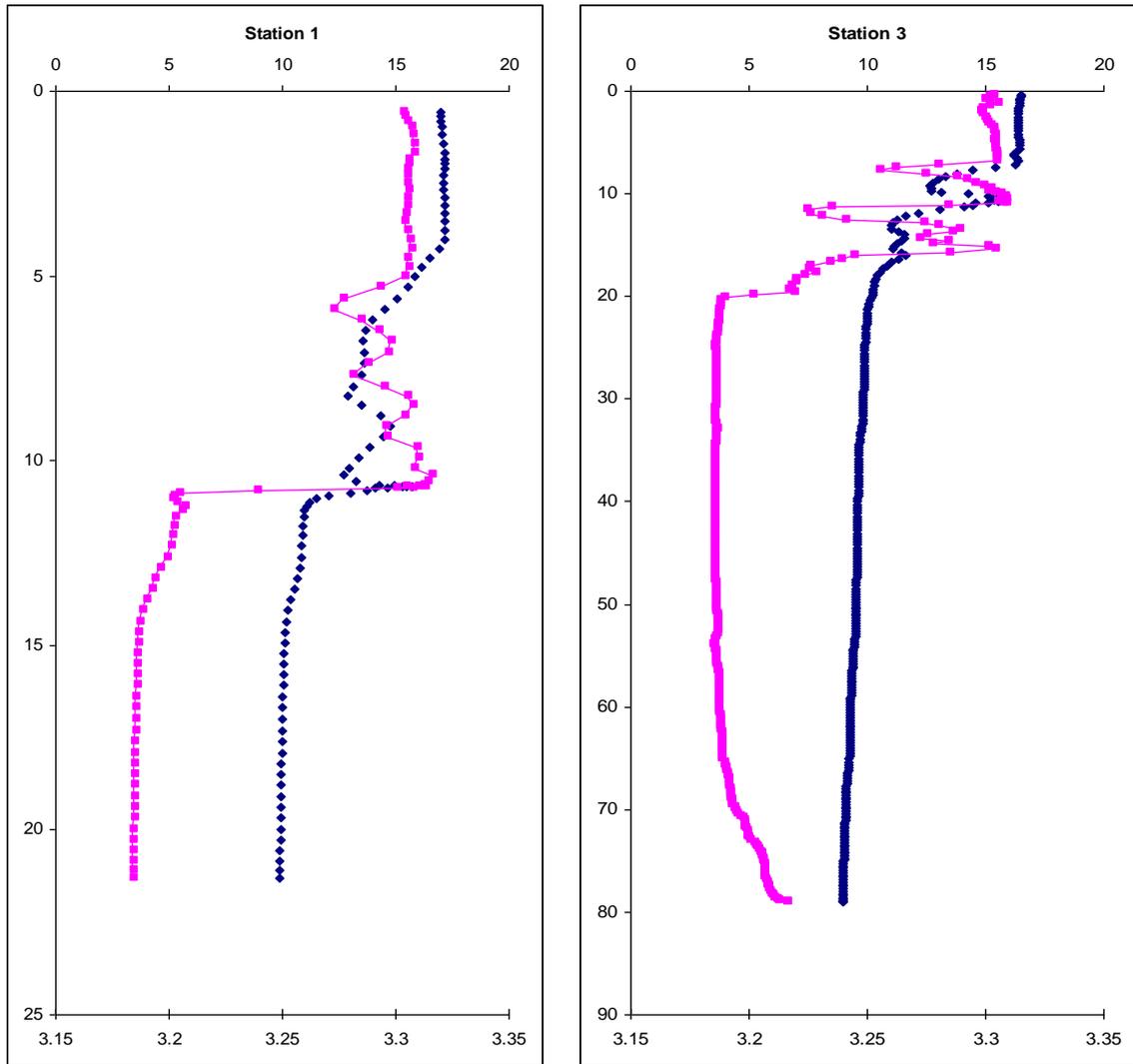


Figure 9. Temperature (squares) and salinity (diamonds) profiles from CTD casts during the 2011 Strait of Georgia juvenile herring survey.

## Yellow Point (Transect 2)

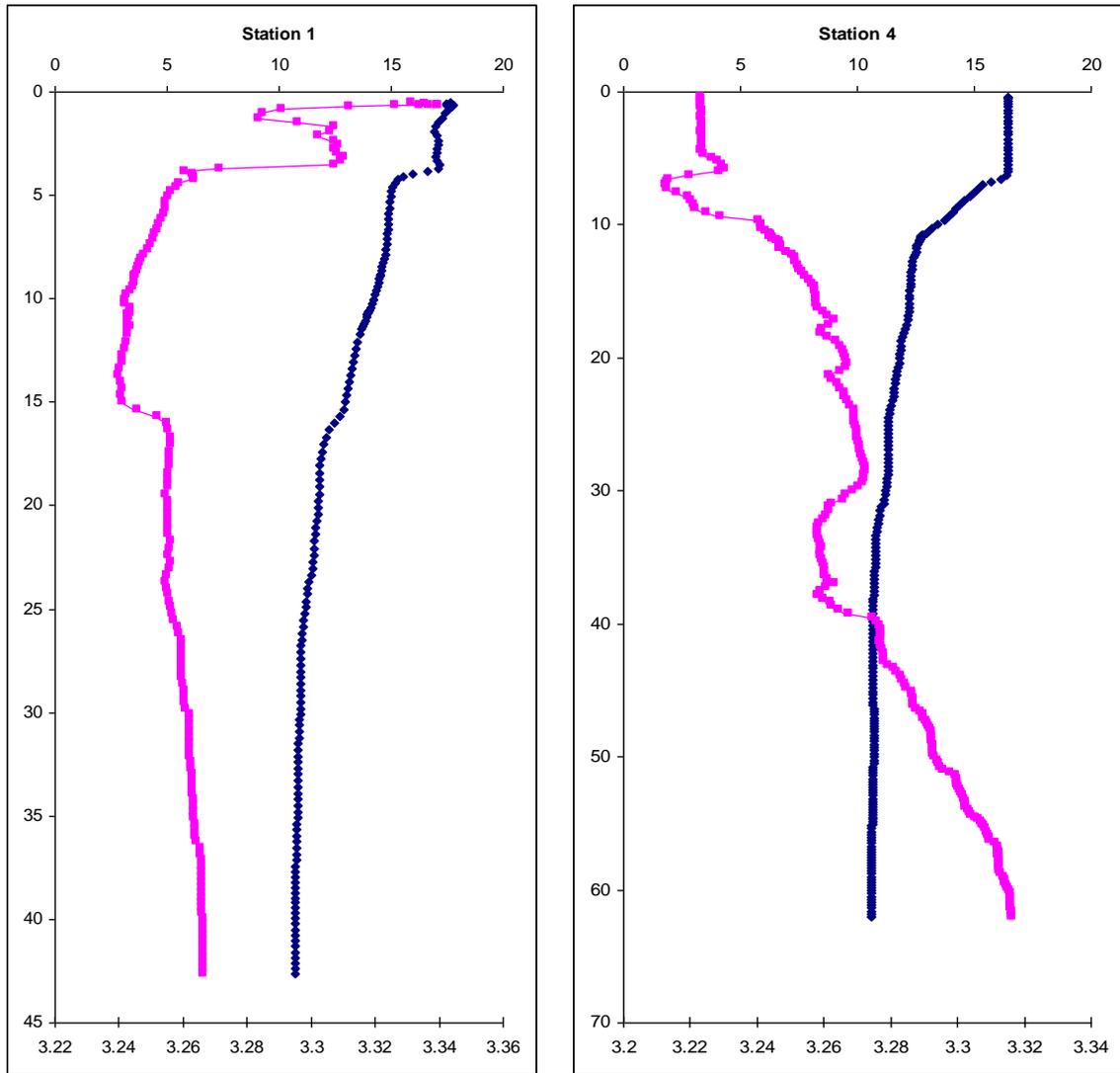


Figure 9...continued

# French Creek (Transect 5)

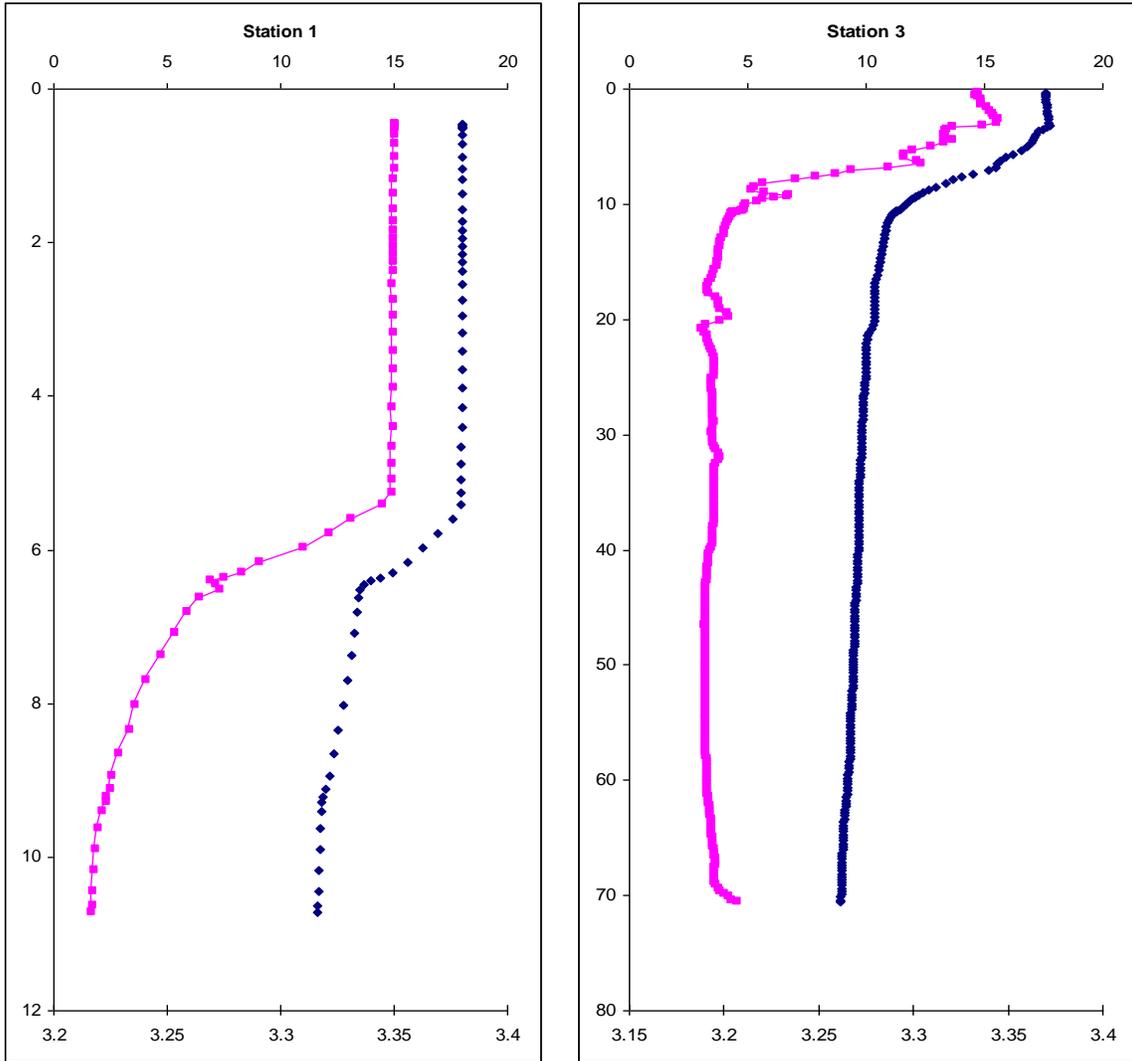


Figure 9...continued

### Trincomali Channel (Transect 6)

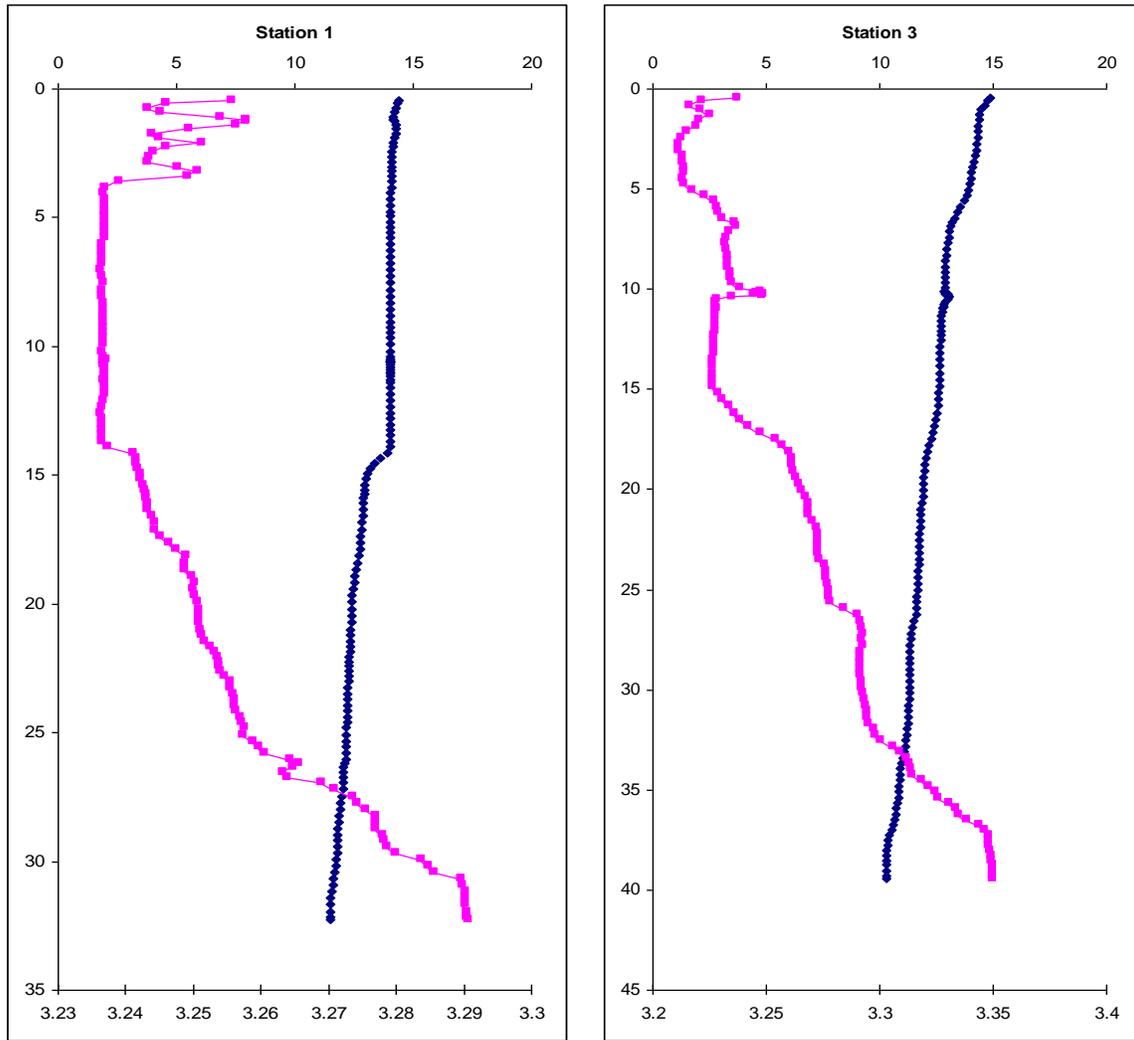


Figure 9...continued

### Cape Cockburn (Transect 10)

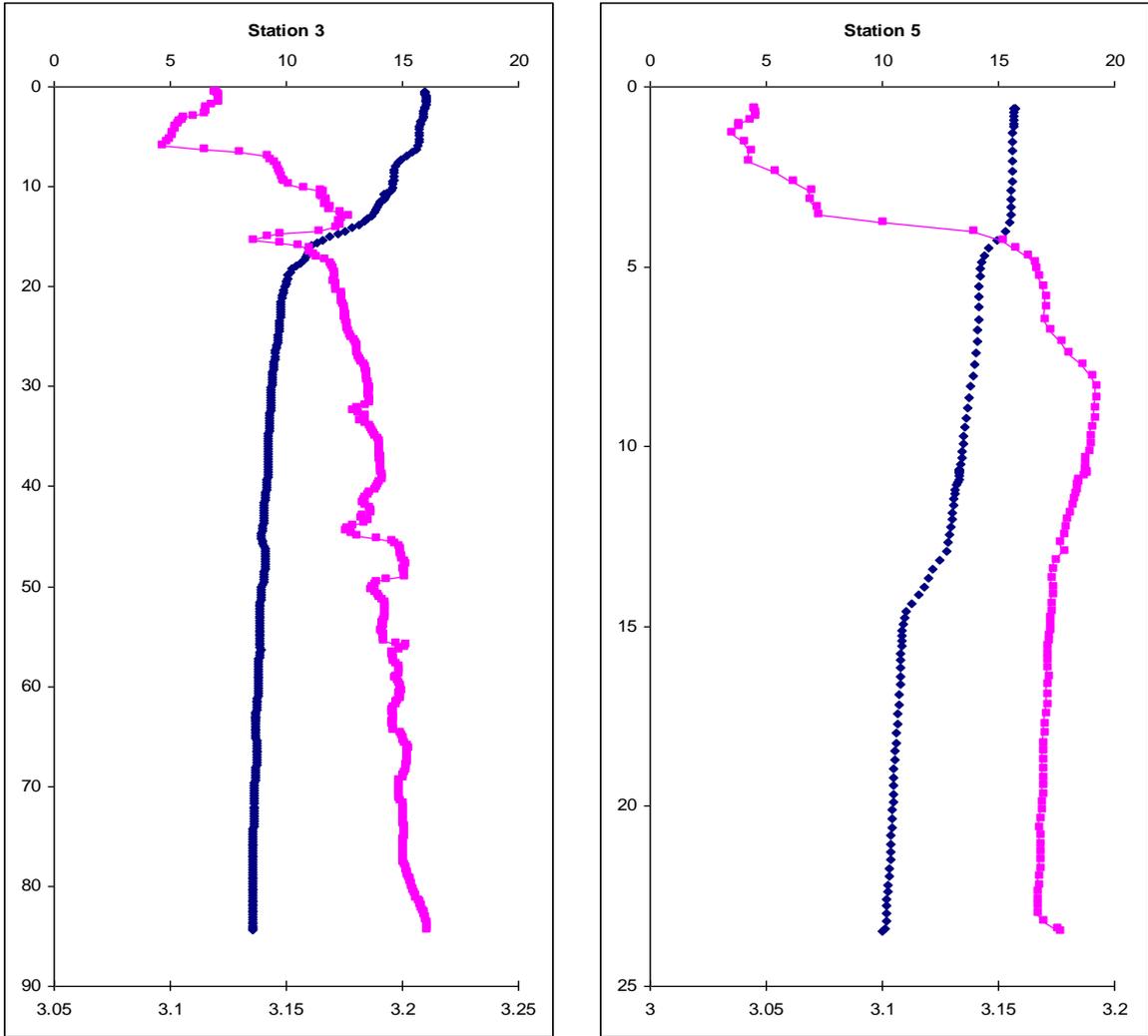


Figure 9...continued

# Secret Cove (Transect 11)

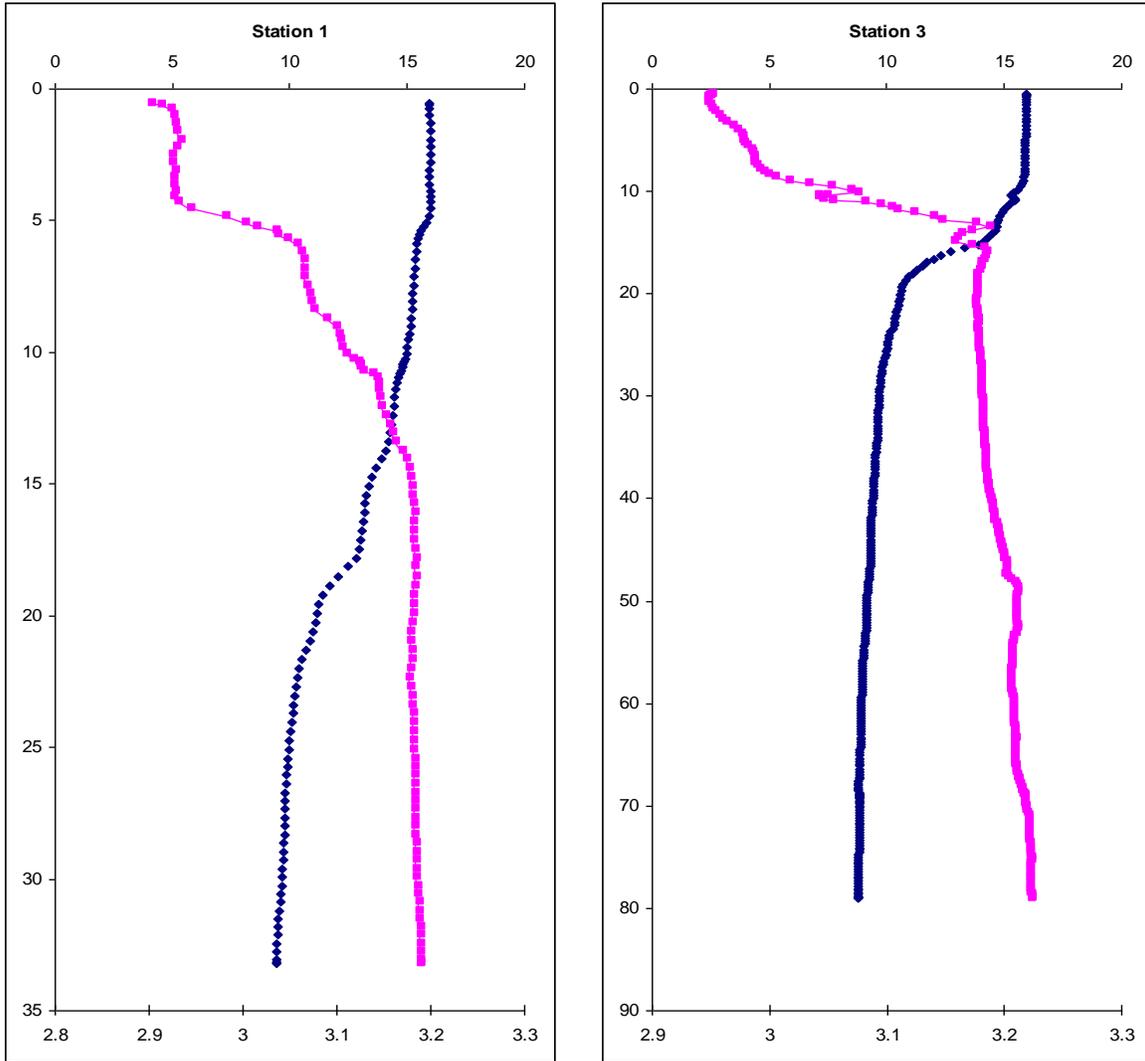


Figure 9...continued

Table 1. Summary of the purse seine set locations from the 2011 Strait of Georgia juvenile herring survey.

| Year | Month | Day | Transect | Station | Seine Set Time | Location Name      | DD Lat (N) | DD Long (W) |
|------|-------|-----|----------|---------|----------------|--------------------|------------|-------------|
| 2011 | 9     | 11  | 6        | 1       | 2100           | Trincomali Channel | 48.855     | 123.430     |
| 2011 | 9     | 11  | 6        | 2       | 2120           | Trincomali Channel | 48.862     | 123.423     |
| 2011 | 9     | 11  | 6        | 3       | 2140           | Trincomali Channel | 48.867     | 123.417     |
| 2011 | 9     | 11  | 6        | 4       | 2200           | Trincomali Channel | 48.873     | 123.407     |
| 2011 | 9     | 11  | 6        | 5       | 2220           | Trincomali Channel | 48.877     | 123.407     |
| 2011 | 9     | 12  | 2        | 5       | 2050           | Yellow Point       | 49.066     | 123.698     |
| 2011 | 9     | 12  | 2        | 4       | 2110           | Yellow Point       | 49.060     | 123.708     |
| 2011 | 9     | 12  | 2        | 3       | 2130           | Yellow Point       | 49.056     | 123.722     |
| 2011 | 9     | 12  | 2        | 2       | 2150           | Yellow Point       | 49.050     | 123.733     |
| 2011 | 9     | 12  | 2        | 1       | 2215           | Yellow Point       | 49.042     | 123.747     |
| 2011 | 9     | 13  | 1        | 1       | 2040           | Clarke Rock        | 49.224     | 123.943     |
| 2011 | 9     | 13  | 1        | 2       | 2100           | Clarke Rock        | 49.233     | 123.932     |
| 2011 | 9     | 13  | 1        | 3       | 2120           | Clarke Rock        | 49.237     | 123.922     |
| 2011 | 9     | 13  | 1        | 4       | 2140           | Clarke Rock        | 49.237     | 123.912     |
| 2011 | 9     | 13  | 1        | 5       | 2200           | Clarke Rock        | 49.238     | 123.902     |
| 2011 | 9     | 14  | 5        | 5       | 2030           | French Creek       | 49.366     | 124.317     |
| 2011 | 9     | 14  | 5        | 4       | 2045           | French Creek       | 49.362     | 124.323     |
| 2011 | 9     | 14  | 5        | 3       | 2110           | French Creek       | 49.358     | 124.327     |
| 2011 | 9     | 14  | 5        | 2       | 2130           | French Creek       | 49.353     | 124.338     |
| 2011 | 9     | 14  | 5        | 1       | 2155           | French Creek       | 49.348     | 124.350     |
| 2011 | 9     | 18  | 11       | 1       | 2105           | Secret Cove        | 49.535     | 123.977     |
| 2011 | 9     | 18  | 11       | 2       | 2125           | Secret Cove        | 49.532     | 123.995     |
| 2011 | 9     | 18  | 11       | 3       | 2145           | Secret Cove        | 49.528     | 124.014     |
| 2011 | 9     | 18  | 11       | 4       | 2210           | Secret Cove        | 49.527     | 124.040     |
| 2011 | 9     | 18  | 11       | 5       | 2230           | Secret Cove        | 49.523     | 124.060     |
| 2011 | 9     | 19  | 10       | 5       | 2045           | Cape Cockburn      | 49.632     | 124.278     |
| 2011 | 9     | 19  | 10       | 4       | 2110           | Cape Cockburn      | 49.642     | 124.255     |
| 2011 | 9     | 19  | 10       | 3       | 2130           | Cape Cockburn      | 49.651     | 124.242     |
| 2011 | 9     | 19  | 10       | 2       | 2150           | Cape Cockburn      | 49.662     | 124.218     |
| 2011 | 9     | 19  | 10       | 1       | 2215           | Cape Cockburn      | 49.670     | 124.198     |
| 2011 | 9     | 20  | 8        | 3       | 1955           | Smelt Bay          | 50.054     | 125.030     |
| 2011 | 9     | 20  | 8        | 2       | 2015           | Smelt Bay          | 50.046     | 125.016     |
| 2011 | 9     | 20  | 8        | 1       | 2045           | Smelt Bay          | 50.036     | 125.000     |
| 2011 | 9     | 28  | 9        | 1       | 2050           | Atrevida Reef      | 49.916     | 124.659     |
| 2011 | 9     | 28  | 9        | 2       | 2110           | Atrevida Reef      | 49.912     | 124.673     |
| 2011 | 9     | 28  | 9        | 3       | 2130           | Atrevida Reef      | 49.909     | 124.684     |
| 2011 | 9     | 28  | 9        | 4       | 2150           | Atrevida Reef      | 49.906     | 124.694     |
| 2011 | 9     | 28  | 9        | 5       | 2205           | Atrevida Reef      | 49.902     | 124.707     |
| 2011 | 9     | 29  | 4        | 1       | 2015           | Henry Bay          | 49.593     | 124.875     |
| 2011 | 9     | 29  | 4        | 2       | 2030           | Henry Bay          | 49.601     | 124.866     |
| 2011 | 9     | 29  | 4        | 3       | 2050           | Henry Bay          | 49.598     | 124.856     |
| 2011 | 9     | 29  | 4        | 4       | 2110           | Henry Bay          | 49.598     | 124.846     |
| 2011 | 9     | 29  | 4        | 5       | 2130           | Henry Bay          | 49.602     | 124.836     |

Table 1 continued...

| <b>Year</b> | <b>Month</b> | <b>Day</b> | <b>Transect</b> | <b>Station</b> | <b>Seine Set<br/>Time</b> | <b>Location Name</b> | <b>DD Lat<br/>(N)</b> | <b>DD Long<br/>(W)</b> |
|-------------|--------------|------------|-----------------|----------------|---------------------------|----------------------|-----------------------|------------------------|
| 2011        | 9            | 30         | 3               | 5              | 2010                      | Bowser               | 49.482                | 124.651                |
| 2011        | 9            | 30         | 3               | 4              | 2025                      | Bowser               | 49.476                | 124.657                |
| 2011        | 9            | 30         | 3               | 3              | 2045                      | Bowser               | 49.467                | 124.663                |
| 2011        | 9            | 30         | 3               | 2              | 2105                      | Bowser               | 49.459                | 124.672                |
| 2011        | 9            | 30         | 3               | 1              | 2120                      | Bowser               | 49.452                | 124.680                |

Table 2. Summary of the purse seine set locations from the 2012 Strait of Georgia juvenile herring survey.

| Year | Month | Day | Transect | Station | Seine Set Time | Location Name      | DD Lat (N) | DD Long (W) |
|------|-------|-----|----------|---------|----------------|--------------------|------------|-------------|
| 2012 | 9     | 11  | 6        | 1       | 2055           | Trincomali Channel | 48.855     | 123.430     |
| 2012 | 9     | 11  | 6        | 2       | 2120           | Trincomali Channel | 48.862     | 123.423     |
| 2012 | 9     | 11  | 6        | 3       | 2140           | Trincomali Channel | 48.867     | 123.417     |
| 2012 | 9     | 11  | 6        | 4       | 2200           | Trincomali Channel | 48.873     | 123.407     |
| 2012 | 9     | 11  | 6        | 5       | 2240           | Trincomali Channel | 48.877     | 123.407     |
| 2012 | 9     | 12  | 2        | 5       | 2105           | Yellow Point       | 49.066     | 123.698     |
| 2012 | 9     | 12  | 2        | 4       | 2125           | Yellow Point       | 49.060     | 123.708     |
| 2012 | 9     | 12  | 2        | 3       | 2150           | Yellow Point       | 49.056     | 123.722     |
| 2012 | 9     | 12  | 2        | 2       | 2210           | Yellow Point       | 49.050     | 123.733     |
| 2012 | 9     | 12  | 2        | 1       | 2230           | Yellow Point       | 49.042     | 123.747     |
| 2012 | 9     | 13  | 1        | 1       | 2045           | Clarke Rock        | 49.224     | 123.943     |
| 2012 | 9     | 13  | 1        | 2       | 2110           | Clarke Rock        | 49.233     | 123.932     |
| 2012 | 9     | 13  | 1        | 3       | 2135           | Clarke Rock        | 49.237     | 123.922     |
| 2012 | 9     | 13  | 1        | 4       | 2155           | Clarke Rock        | 49.237     | 123.912     |
| 2012 | 9     | 13  | 1        | 5       | 2220           | Clarke Rock        | 49.238     | 123.902     |
| 2012 | 9     | 17  | 11       | 1       | 2045           | Secret Cove        | 49.535     | 123.977     |
| 2012 | 9     | 17  | 11       | 2       | 2105           | Secret Cove        | 49.532     | 123.995     |
| 2012 | 9     | 17  | 11       | 3       | 2130           | Secret Cove        | 49.528     | 124.014     |
| 2012 | 9     | 17  | 11       | 4       | 2155           | Secret Cove        | 49.527     | 124.040     |
| 2012 | 9     | 17  | 11       | 5       | 2220           | Secret Cove        | 49.523     | 124.060     |
| 2012 | 9     | 18  | 10       | 5       | 2045           | Cape Cockburn      | 49.632     | 124.278     |
| 2012 | 9     | 18  | 10       | 4       | 2110           | Cape Cockburn      | 49.642     | 124.255     |
| 2012 | 9     | 18  | 10       | 3       | 2140           | Cape Cockburn      | 49.651     | 124.242     |
| 2012 | 9     | 18  | 10       | 2       | 2210           | Cape Cockburn      | 49.662     | 124.218     |
| 2012 | 9     | 18  | 10       | 1       | 2240           | Cape Cockburn      | 49.670     | 124.198     |
| 2012 | 9     | 19  | 8        | 3       | 2015           | Smelt Bay          | 50.054     | 125.030     |
| 2012 | 9     | 19  | 8        | 2       | 2035           | Smelt Bay          | 50.046     | 125.016     |
| 2012 | 9     | 19  | 8        | 1       | 2100           | Smelt Bay          | 50.036     | 125.000     |
| 2012 | 9     | 19  | 9        | 1       | 0055           | Atrevida Reef      | 49.916     | 124.659     |
| 2012 | 9     | 19  | 9        | 2       | 0115           | Atrevida Reef      | 49.912     | 124.673     |
| 2012 | 9     | 19  | 9        | 3       | 0135           | Atrevida Reef      | 49.909     | 124.684     |
| 2012 | 9     | 19  | 9        | 4       | 0200           | Atrevida Reef      | 49.906     | 124.694     |
| 2012 | 9     | 19  | 9        | 5       | 0220           | Atrevida Reef      | 49.902     | 124.707     |
| 2012 | 9     | 20  | 4        | 1       | 2030           | Henry Bay          | 49.593     | 124.875     |
| 2012 | 9     | 20  | 4        | 2       | 2050           | Henry Bay          | 49.601     | 124.866     |
| 2012 | 9     | 20  | 4        | 3       | 2110           | Henry Bay          | 49.598     | 124.856     |
| 2012 | 9     | 20  | 4        | 4       | 2135           | Henry Bay          | 49.598     | 124.846     |
| 2012 | 9     | 20  | 4        | 5       | 2155           | Henry Bay          | 49.602     | 124.836     |
| 2012 | 9     | 21  | 3        | 1       | 2035           | Bowser             | 49.452     | 124.680     |
| 2012 | 9     | 21  | 3        | 2       | 2055           | Bowser             | 49.459     | 124.672     |
| 2012 | 9     | 21  | 3        | 3       | 2115           | Bowser             | 49.467     | 124.663     |
| 2012 | 9     | 21  | 3        | 4       | 2140           | Bowser             | 49.476     | 124.657     |
| 2012 | 9     | 21  | 3        | 5       | 2205           | Bowser             | 49.482     | 124.651     |

Table 2 continued...

| <b>Year</b> | <b>Month</b> | <b>Day</b> | <b>Transect</b> | <b>Station</b> | <b>Seine Set<br/>Time</b> | <b>Location Name</b> | <b>DD Lat<br/>(N)</b> | <b>DD Long<br/>(W)</b> |
|-------------|--------------|------------|-----------------|----------------|---------------------------|----------------------|-----------------------|------------------------|
| 2012        | 9            | 26         | 5               | 5              | 2030                      | French Creek         | 49.366                | 124.317                |
| 2012        | 9            | 26         | 5               | 4              | 2050                      | French Creek         | 49.362                | 124.323                |
| 2012        | 9            | 26         | 5               | 3              | 2110                      | French Creek         | 49.358                | 124.327                |
| 2012        | 9            | 26         | 5               | 2              | 2130                      | French Creek         | 49.353                | 124.338                |
| 2012        | 9            | 26         | 5               | 1              | 2150                      | French Creek         | 49.348                | 124.350                |

Table 3. Summary of the number and weight by species, transect, and station for 2011 Strait of Georgia juvenile herring survey.

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 1               | 1              | Clarke Rock          | <b>Pacific herring age-0+</b> | 12            | 0.07                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 1             | 0.03                |
|                 |                |                      | Squid                         | 54            | 0.60                |
|                 |                |                      | Chinook salmon                | 1             | 0.08                |
|                 |                |                      | Juvenile walleye pollock      | 1             | trace               |
| 1               | 2              | Clarke Rock          | <b>Pacific herring age-0+</b> | 47            | 0.27                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 1             | 0.03                |
|                 |                |                      | Squid                         | 32            | 0.63                |
|                 |                |                      | Chinook salmon                | 3             | 0.35                |
|                 |                |                      | Coho salmon                   | 1             | 0.04                |
|                 |                |                      | Bay pipefish                  | 1             | trace               |
| 1               | 3              | Clarke Rock          | <b>Pacific herring age-0+</b> | 18            | 0.11                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 4             | 0.14                |
|                 |                |                      | Chinook salmon                | 7             | 0.37                |
| 1               | 4              | Clarke Rock          | <b>Pacific herring age-0+</b> | 24            | 0.15                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 3             | 0.11                |
|                 |                |                      | Chinook salmon                | 6             | 0.36                |
|                 |                |                      | Squid                         | 2             | 0.01                |
|                 |                |                      | Pacific sand lance            | 1             | trace               |
| 1               | 5              | Clarke Rock          | <b>Pacific herring age-0+</b> | 15            | 0.10                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 3             | 0.13                |
|                 |                |                      | Chinook salmon                | 6             | 0.40                |
|                 |                |                      | Juvenile hake                 | 5             | 0.01                |
| 2               | 1              | Yellow Point         | <b>Pacific herring age-0+</b> | 518           | 2.83                |
|                 |                |                      | Chum salmon                   | 2             | 0.10                |
|                 |                |                      | Pink salmon                   | 2             | 0.06                |
|                 |                |                      | Squid                         | 2             | 0.05                |
| 2               | 2              | Yellow Point         | <b>Pacific herring age-0+</b> | 921           | 5.15                |
|                 |                |                      | Chum salmon                   | 6             | 0.33                |
|                 |                |                      | Pink salmon                   | 3             | 0.11                |
| 2               | 3              | Yellow Point         | <b>Pacific herring age-0+</b> | 1670          | 9.26                |
|                 |                |                      | Squid                         | 5             | 0.09                |
| 2               | 4              | Yellow Point         | <b>Pacific herring age-0+</b> | 2916          | 15.94               |

\* Weights  $\leq$  9g referred to as trace

Table 3 continued...

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 2               | 5              | Yellow Point         | <b>Pacific herring age-0+</b> | 3681          | 20.09               |
|                 |                |                      | Northern anchovy              | 27            | 0.35                |
|                 |                |                      | Pink salmon                   | 9             | 0.13                |
|                 |                |                      | Sculpin                       | 9             | 0.20                |
| 3               | 1              | Bowser               | <b>Pacific herring age-0+</b> | 42            | 0.36                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 46            | 1.55                |
|                 |                |                      | <b>Pacific herring age-2+</b> | 110           | 6.47                |
|                 |                |                      | Squid                         | 16            | 0.23                |
|                 |                |                      | Pacific sand lance            | 6             | 0.01                |
|                 |                |                      | Chinook salmon                | 4             | 0.24                |
|                 |                |                      | Juvenile walleye pollock      | 4             | 0.03                |
|                 |                |                      | Chum salmon                   | 2             | 0.21                |
|                 |                |                      | Shiner perch                  | 2             | 0.03                |
| 3               | 2              | Bowser               | <b>Pacific herring age-2+</b> | 1             | 0.10                |
|                 |                |                      | Plainfin midshipman           | 1             | 0.02                |
|                 |                |                      | Pink salmon                   | 1             | 0.10                |
| 3               | 3              | Bowser               | <i>NO CATCH</i>               |               |                     |
| 3               | 4              | Bowser               | <b>Pacific herring age-0+</b> | 2             | 0.02                |
|                 |                |                      | Chinook salmon                | 1             | 0.04                |
|                 |                |                      | Chum salmon                   | 1             | 0.10                |
|                 |                |                      | Gunnel                        | 1             | 0.01                |
|                 |                |                      | Three-spine stickleback       | 1             | trace               |
| 3               | 5              | Bowser               | <b>Pacific herring age-1+</b> | 10            | 0.24                |
|                 |                |                      | Chum salmon                   | 3             | 0.33                |
|                 |                |                      | Pink salmon                   | 1             | 0.06                |
|                 |                |                      | Adult walleye pollock         | 1             | 0.41                |
|                 |                |                      | Juvenile walleye pollock      | 1             | trace               |
| 4               | 1              | Henry Bay            | <b>Pacific herring age-0+</b> | 102           | 0.69                |
|                 |                |                      | Three-spine stickleback       | 134           | 0.10                |
|                 |                |                      | Juvenile walleye pollock      | 6             | 0.03                |
|                 |                |                      | Flatfish                      | 2             | 0.06                |
|                 |                |                      | Capelin                       | 2             | trace               |
|                 |                |                      | Snake prickleback             | 2             | trace               |

Table 3 continued...

| Transect | Station | Location Name | Species                       | Number | Weight (Kg)* |
|----------|---------|---------------|-------------------------------|--------|--------------|
| 4        | 2       | Henry Bay     | <b>Pacific herring age-0+</b> | 6      | 0.04         |
|          |         |               | Three-spine stickleback       | 5      | 0.01         |
|          |         |               | Plainfin midshipman           | 4      | trace        |
|          |         |               | Gunnel                        | 1      | trace        |
|          |         |               | Juvenile walleye pollock      | 1      | trace        |
| 4        | 3       | Henry Bay     | <b>Pacific herring age-0+</b> | 322    | 2.37         |
|          |         |               | Plainfin midshipman           | 14     | 0.01         |
|          |         |               | Three-spine stickleback       | 4      | 0.01         |
|          |         |               | Juvenile walleye pollock      | 2      | 0.01         |
|          |         |               | Bay pipefish                  | 2      | trace        |
| 4        | 4       | Henry Bay     | <b>Pacific herring age-0+</b> | 23     | 0.16         |
|          |         |               | Plainfin midshipman           | 5      | trace        |
|          |         |               | Three-spine stickleback       | 4      | 0.01         |
|          |         |               | Bay pipefish                  | 1      | trace        |
|          |         |               | Pacific sand lance            | 1      | trace        |
| 4        | 5       | Henry Bay     | Plainfin midshipman           | 20     | 0.04         |
|          |         |               | Pacific sand lance            | 14     | 0.03         |
|          |         |               | Gunnel                        | 6      | 0.03         |
|          |         |               | Sculpin                       | 2      | 0.04         |
|          |         |               | Three-spine stickleback       | 2      | trace        |
|          |         |               | Bay pipefish                  | 2      | trace        |
| 5        | 1       | French Creek  | <b>Pacific herring age-0+</b> | 126    | 1.00         |
|          |         |               | <b>Pacific herring age-1+</b> | 261    | 9.64         |
|          |         |               | <b>Pacific herring age-2+</b> | 351    | 20.33        |
|          |         |               | Northern anchovy              | 9      | 0.18         |
|          |         |               | Juvenile walleye pollock      | 9      | 0.03         |
|          |         |               |                               |        |              |
| 5        | 2       | French Creek  | <b>Pacific herring age-0+</b> | 11     | 0.08         |
|          |         |               | Plainfin midshipman           | 6      | 0.12         |
|          |         |               | Chinook salmon                | 3      | 0.20         |
|          |         |               | Pink salmon                   | 3      | 0.14         |
|          |         |               | Coho salmon                   | 1      | 0.21         |
|          |         |               | Sculpin                       | 1      | 0.03         |
| 5        | 3       | French Creek  | <b>Pacific herring age-0+</b> | 7      | 0.06         |
|          |         |               | <b>Pacific herring age-1+</b> | 1      | 0.03         |
|          |         |               | Coho salmon                   | 4      | 0.84         |
|          |         |               | Chinook salmon                | 1      | 0.02         |

Table 3 continued...

| Transect | Station | Location Name      | Species                       | Number | Weight (Kg)* |
|----------|---------|--------------------|-------------------------------|--------|--------------|
| 5        | 4       | French Creek       | <b>Pacific herring age-0+</b> | 1      | 0.01         |
|          |         |                    | <b>Pacific herring age-1+</b> | 3      | 0.09         |
|          |         |                    | Spiny dogfish                 | 50     | 7.00         |
|          |         |                    | Pink salmon                   | 3      | 0.12         |
|          |         |                    | Coho salmon                   | 2      | 0.47         |
|          |         |                    | Northern anchovy              | 1      | 0.02         |
| 5        | 5       | French Creek       | Spiny dogfish                 | 100    | 15.00        |
| 6        | 1       | Trincomali Channel | <b>Pacific herring age-0+</b> | 208    | 1.32         |
| 6        | 2       | Trincomali Channel | <b>Pacific herring age-0+</b> | 369    | 2.23         |
|          |         |                    | <b>Pacific herring age-1+</b> | 1      | 0.01         |
|          |         |                    | Juvenile walleye pollock      | 1      | 0.01         |
|          |         |                    | Northern anchovy              | 1      | trace        |
| 6        | 3       | Trincomali Channel | <b>Pacific herring age-0+</b> | 2175   | 11.74        |
|          |         |                    | Chinook salmon                | 5      | 0.13         |
|          |         |                    | Chum salmon                   | 5      | 0.21         |
| 6        | 4       | Trincomali Channel | <b>Pacific herring age-0+</b> | 1765   | 9.27         |
| 6        | 5       | Trincomali Channel | <b>Pacific herring age-0+</b> | 1410   | 9.15         |
|          |         |                    | Chinook salmon                | 5      | 0.12         |
| 8        | 1       | Smelt Bay          | <b>Pacific herring age-0+</b> | 97     | 0.63         |
|          |         |                    | <b>Pacific herring age-1+</b> | 1      | 0.03         |
|          |         |                    | Chum salmon                   | 10     | 0.63         |
|          |         |                    | Chinook salmon                | 2      | 0.22         |
|          |         |                    | Three-spine stickleback       | 2      | trace        |
|          |         |                    | Plainfin midshipman           | 1      | 0.04         |
|          |         |                    | Pink salmon                   | 1      | 0.02         |
| 8        | 2       | Smelt Bay          | <b>Pacific herring age-0+</b> | 408    | 2.56         |
|          |         |                    | Chinook salmon                | 6      | 0.37         |
|          |         |                    | Juvenile walleye pollock      | 4      | 0.02         |
|          |         |                    | Squid                         | 4      | 0.07         |
|          |         |                    | Chum salmon                   | 2      | 0.11         |
| 8        | 3       | Smelt Bay          | <b>Pacific herring age-0+</b> | 8      | 0.05         |
|          |         |                    | Chinook salmon                | 3      | 0.07         |
|          |         |                    | Three-spine stickleback       | 1      | trace        |

Table 3 continued...

| Transect                      | Station | Location Name | Species                       | Number | Weight (Kg)*  |
|-------------------------------|---------|---------------|-------------------------------|--------|---------------|
| 9                             | 1       | Atrevida Reef | <b>Pacific herring age-0+</b> | 17     | 0.14          |
|                               |         |               | Juvenile walleye pollock      | 4      | 0.02          |
|                               |         |               | Chum salmon                   | 2      | 0.15          |
|                               |         |               | Three-spine stickleback       | 2      | trace         |
|                               |         |               | Chinook salmon                | 1      | 0.02          |
|                               |         |               | Sculpin                       | 1      | 0.01          |
|                               |         |               | 9                             | 2      | Atrevida Reef |
| <b>Pacific herring age-1+</b> | 2       | 0.09          |                               |        |               |
| <b>Pacific herring age-2+</b> | 1       | 0.06          |                               |        |               |
| Juvenile walleye pollock      | 101     | 0.74          |                               |        |               |
| Chum salmon                   | 1       | 0.08          |                               |        |               |
| Coho salmon                   | 1       | 0.02          |                               |        |               |
| Pink salmon                   | 1       | 0.06          |                               |        |               |
| Juvenile hake                 | 1       | trace         |                               |        |               |
| 9                             | 3       | Atrevida Reef |                               |        |               |
|                               |         |               | <b>Pacific herring age-1+</b> | 120    | 3.38          |
|                               |         |               | <b>Pacific herring age-2+</b> | 32     | 1.74          |
|                               |         |               | Pink salmon                   | 76     | 5.57          |
|                               |         |               | Three-spine stickleback       | 20     | 0.01          |
|                               |         |               | Juvenile walleye pollock      | 16     | 0.08          |
|                               |         |               | Chum salmon                   | 4      | 0.24          |
|                               |         |               | Juvenile hake                 | 4      | 0.01          |
|                               |         |               | 9                             | 4      | Atrevida Reef |
| <b>Pacific herring age-1+</b> | 16      | 0.45          |                               |        |               |
| <b>Pacific herring age-2+</b> | 5       | 0.24          |                               |        |               |
| Chum salmon                   | 11      | 0.96          |                               |        |               |
| Chinook salmon                | 6       | 0.25          |                               |        |               |
| Three-spine stickleback       | 3       | trace         |                               |        |               |
| Juvenile hake                 | 2       | 0.01          |                               |        |               |
| Juvenile walleye pollock      | 1       | 0.01          |                               |        |               |
| 9                             | 5       | Atrevida Reef |                               |        |               |
|                               |         |               | <b>Pacific herring age-1+</b> | 7      | 0.19          |
|                               |         |               | <b>Pacific herring age-2+</b> | 5      | 0.25          |
|                               |         |               | Juvenile walleye pollock      | 17     | 0.11          |
|                               |         |               | Chum salmon                   | 3      | 0.21          |
|                               |         |               | Juvenile hake                 | 2      | 0.01          |
|                               |         |               | Three-spine stickleback       | 2      | trace         |
|                               |         |               | Chinook salmon                | 1      | 0.03          |
|                               |         |               | Plainfin midshipman           | 1      | 0.01          |
|                               |         |               | Adult walleye pollock         | 1      | 0.12          |

Table 3 continued...

| Transect | Station | Location Name | Species                       | Number | Weight (Kg)* |
|----------|---------|---------------|-------------------------------|--------|--------------|
| 10       | 1       | Cape Cockburn | <b>Pacific herring age-0+</b> | 61     | 0.44         |
|          |         |               | <b>Pacific herring age-1+</b> | 2      | 0.05         |
|          |         |               | Northern anchovy              | 7      | 0.03         |
|          |         |               | Juvenile walleye pollock      | 2      | 0.01         |
|          |         |               | Plainfin midshipman           | 1      | 0.07         |
|          |         |               | Bay pipefish                  | 1      | trace        |
|          |         |               |                               |        |              |
| 10       | 2       | Cape Cockburn | <b>Pacific herring age-0+</b> | 190    | 1.46         |
|          |         |               | <b>Pacific herring age-1+</b> | 100    | 2.21         |
|          |         |               | <b>Pacific herring age-2+</b> | 8      | 0.46         |
|          |         |               | Coho salmon                   | 14     | 0.21         |
|          |         |               | Chinook salmon                | 12     | 0.21         |
|          |         |               | Juvenile hake                 | 8      | 0.02         |
|          |         |               | Northern anchovy              | 2      | 0.01         |
|          |         |               | Juvenile walleye pollock      | 2      | 0.01         |
| 10       | 3       | Cape Cockburn | <b>Pacific herring age-0+</b> | 322    | 2.74         |
|          |         |               | <b>Pacific herring age-1+</b> | 20     | 0.55         |
|          |         |               | <b>Pacific herring age-2+</b> | 2      | 0.11         |
|          |         |               | Chinook salmon                | 16     | 0.33         |
|          |         |               | Chum salmon                   | 4      | 0.32         |
|          |         |               | Juvenile hake                 | 2      | 0.00         |
|          |         |               |                               |        |              |
| 10       | 4       | Cape Cockburn | <b>Pacific herring age-0+</b> | 382    | 3.16         |
|          |         |               | <b>Pacific herring age-1+</b> | 2      | 0.06         |
|          |         |               | Chum salmon                   | 8      | 0.74         |
|          |         |               | Chinook salmon                | 4      | 0.08         |
|          |         |               | Juvenile hake                 | 4      | 0.01         |
|          |         |               |                               |        |              |
| 10       | 5       | Cape Cockburn | <b>Pacific herring age-0+</b> | 90     | 0.70         |
|          |         |               | <b>Pacific herring age-1+</b> | 5      | 0.18         |
|          |         |               | <b>Pacific herring age-2+</b> | 14     | 0.79         |
|          |         |               | Chum salmon                   | 5      | 0.58         |
|          |         |               | Chinook salmon                | 2      | 0.09         |
|          |         |               | Flatfish                      | 1      | 0.02         |
| 11       | 1       | Secret Cove   | <b>Pacific herring age-0+</b> | 540    | 3.19         |
|          |         |               | <b>Pacific herring age-1+</b> | 3      | 0.05         |
|          |         |               | Three-spine stickleback       | 24     | 0.03         |
|          |         |               | Northern anchovy              | 12     | 0.01         |
|          |         |               | Coho salmon                   | 12     | 0.08         |
|          |         |               | Pacific sand lance            | 3      | 0.01         |
|          |         |               |                               |        |              |

Table 3 continued...

| Transect                      | Station | Location Name | Species                       | Number | Weight (Kg)* |                               |     |      |
|-------------------------------|---------|---------------|-------------------------------|--------|--------------|-------------------------------|-----|------|
| 11                            | 2       | Secret Cove   | <b>Pacific herring age-0+</b> | 14     | 0.11         |                               |     |      |
|                               |         |               | <b>Pacific herring age-1+</b> | 38     | 0.87         |                               |     |      |
|                               |         |               | Three-spine stickleback       | 29     | 0.03         |                               |     |      |
|                               |         |               | Juvenile hake                 | 14     | 0.04         |                               |     |      |
|                               |         |               | Chinook salmon                | 6      | 0.07         |                               |     |      |
|                               |         |               | Coho salmon                   | 3      | 0.03         |                               |     |      |
|                               |         |               | Juvenile walleye pollock      | 2      | 0.01         |                               |     |      |
|                               |         |               | Adult walleye pollock         | 1      | 0.10         |                               |     |      |
| 11                            | 3       | Secret Cove   | <b>Pacific herring age-0+</b> | 26     | 0.22         |                               |     |      |
|                               |         |               | <b>Pacific herring age-1+</b> | 14     | 0.32         |                               |     |      |
|                               |         |               | Juvenile walleye pollock      | 8      | 0.04         |                               |     |      |
|                               |         |               | Juvenile hake                 | 5      | 0.01         |                               |     |      |
|                               |         |               | Three-spine stickleback       | 4      | trace        |                               |     |      |
|                               |         |               | Chinook salmon                | 2      | 0.03         |                               |     |      |
|                               |         |               | Coho salmon                   | 2      | 0.02         |                               |     |      |
|                               |         |               | Northern anchovy              | 1      | 0.02         |                               |     |      |
|                               |         |               | Plainfin midshipman           | 1      | 0.01         |                               |     |      |
|                               |         |               | Adult walleye pollock         | 1      | 0.13         |                               |     |      |
|                               |         |               | 11                            | 4      | Secret Cove  | <b>Pacific herring age-0+</b> | 26  | 0.22 |
| <b>Pacific herring age-1+</b> | 18      | 0.38          |                               |        |              |                               |     |      |
| <b>Pacific herring age-2+</b> | 2       | 0.09          |                               |        |              |                               |     |      |
| Chum salmon                   | 5       | 0.33          |                               |        |              |                               |     |      |
| Coho salmon                   | 5       | 0.06          |                               |        |              |                               |     |      |
| Pink salmon                   | 2       | 0.11          |                               |        |              |                               |     |      |
| Juvenile walleye pollock      | 2       | 0.01          |                               |        |              |                               |     |      |
| Chinook salmon                | 1       | 0.12          |                               |        |              |                               |     |      |
| 11                            | 5       | Secret Cove   |                               |        |              | <b>Pacific herring age-0+</b> | 153 | 1.29 |
|                               |         |               |                               |        |              | <b>Pacific herring age-1+</b> | 8   | 0.19 |
|                               |         |               | <b>Pacific herring age-2+</b> | 1      | 0.06         |                               |     |      |
|                               |         |               | Juvenile hake                 | 7      | 0.03         |                               |     |      |
|                               |         |               | Chum salmon                   | 3      | 0.19         |                               |     |      |
|                               |         |               | Chinook salmon                | 1      | 0.02         |                               |     |      |
|                               |         |               | Coho salmon                   | 1      | 0.01         |                               |     |      |
|                               |         |               | Three-spine stickleback       | 1      | trace        |                               |     |      |

Table 4. Summary of the number and weight by species, transect, and station for 2012 Strait of Georgia juvenile herring survey.

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 1               | 1              | Clarke Rock          | <b>Pacific herring age-0+</b> | 20448         | 180.35              |
|                 |                |                      | <b>Pacific herring age-1+</b> | 5391          | 216.94              |
|                 |                |                      | <b>Pacific herring age-2+</b> | 124           | 7.20                |
|                 |                |                      | Flatfish                      | 62            | 1.87                |
|                 |                |                      | Juvenile walleye pollock      | 7             | 0.02                |
| 1               | 2              | Clarke Rock          | <b>Pacific herring age-0+</b> | 3887          | 32.22               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 13            | 0.52                |
|                 |                |                      | Chinook salmon                | 13            | 1.66                |
|                 |                |                      | Coho salmon                   | 13            | 0.66                |
|                 |                |                      | Bay pipefish                  | 13            | 0.01                |
| 1               | 3              | Clarke Rock          | <b>Pacific herring age-0+</b> | 3355          | 26.50               |
| 1               | 4              | Clarke Rock          | <b>Pacific herring age-0+</b> | 3146          | 26.69               |
|                 |                |                      | Chinook salmon                | 11            | 1.51                |
|                 |                |                      | Juvenile walleye pollock      | 11            | 0.02                |
| 1               | 5              | Clarke Rock          | <b>Pacific herring age-0+</b> | 662           | 5.74                |
|                 |                |                      | Juvenile walleye pollock      | 18            | 0.03                |
|                 |                |                      | Coho salmon                   | 8             | 0.56                |
| 2               | 1              | Yellow Point         | <b>Pacific herring age-0+</b> | 5239          | 33.15               |
|                 |                |                      | Chinook salmon                | 13            | 0.29                |
|                 |                |                      | Squid                         | 13            | 0.41                |
| 2               | 2              | Yellow Point         | <b>Pacific herring age-0+</b> | 3445          | 21.04               |
| 2               | 3              | Yellow Point         | <b>Pacific herring age-0+</b> | 7329          | 49.83               |
|                 |                |                      | Plainfin midshipman           | 21            | 2.99                |
| 2               | 4              | Yellow Point         | <b>Pacific herring age-0+</b> | 3384          | 22.88               |
|                 |                |                      | Northern anchovy              | 9             | 0.12                |
| 2               | 5              | Yellow Point         | <b>Pacific herring age-0+</b> | 432           | 2.91                |
|                 |                |                      | Pacific sand lance            | 10            | 0.02                |
|                 |                |                      | Northern anchovy              | 2             | 0.05                |
|                 |                |                      | Gunnel                        | 2             | 0.02                |
|                 |                |                      | Juvenile walleye pollock      | 2             | 0.01                |
|                 |                |                      | Shiner perch                  | 2             | 0.01                |

\* Weights  $\leq$  9g referred to as trace

Table 4 continued...

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 3               | 1              | Bowser               | <b>Pacific herring age-0+</b> | 281           | 2.26                |
|                 |                |                      | Plainfin midshipman           | 32            | 0.02                |
|                 |                |                      | Pacific sand lance            | 19            | 0.05                |
|                 |                |                      | Chinook salmon                | 9             | 0.42                |
|                 |                |                      | Sculpin                       | 3             | 0.12                |
|                 |                |                      | Shiner perch                  | 2             | 0.04                |
|                 |                |                      | Flatfish                      | 1             | 0.03                |
|                 |                |                      | Snake prickleback             | 1             | 0.01                |
|                 |                |                      | Poacher                       | 1             | trace               |
| 3               | 2              | Bowser               | <b>Pacific herring age-0+</b> | 524           | 4.06                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 2             | 0.04                |
|                 |                |                      | Plainfin midshipman           | 16            | 0.05                |
|                 |                |                      | Chinook salmon                | 6             | 0.35                |
|                 |                |                      | Snake prickleback             | 2             | 0.02                |
|                 |                |                      |                               |               |                     |
| 3               | 3              | Bowser               | <b>Pacific herring age-0+</b> | 2250          | 18.62               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 234           | 6.00                |
|                 |                |                      | Plainfin midshipman           | 27            | 0.59                |
|                 |                |                      | Juvenile walleye pollock      | 18            | 0.06                |
|                 |                |                      |                               |               |                     |
| 3               | 4              | Bowser               | <b>Pacific herring age-0+</b> | 3204          | 25.46               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 27            | 0.76                |
|                 |                |                      | Juvenile walleye pollock      | 1935          | 10.42               |
| 3               | 5              | Bowser               | <b>Pacific herring age-0+</b> | 4122          | 30.94               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 9             | 0.24                |
|                 |                |                      | Juvenile walleye pollock      | 18            | 0.09                |
| 4               | 1              | Henry Bay            | <b>Pacific herring age-0+</b> | 778           | 6.14                |
|                 |                |                      | Snake prickleback             | 48            | 0.06                |
|                 |                |                      | Squid                         | 22            | 0.09                |
|                 |                |                      | Plainfin midshipman           | 12            | 0.01                |
|                 |                |                      | Three-spine stickleback       | 4             | trace               |
| 4               | 2              | Henry Bay            | <b>Pacific herring age-0+</b> | 1480          | 13.27               |
|                 |                |                      | Snake prickleback             | 8             | 0.01                |
|                 |                |                      | Gunnel                        | 4             | 0.01                |

Table 4 continued...

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 4               | 3              | Henry Bay            | <b>Pacific herring age-0+</b> | 440           | 3.79                |
|                 |                |                      | Plainfin midshipman           | 38            | 0.04                |
|                 |                |                      | Snake prickleback             | 12            | 0.03                |
|                 |                |                      | Squid                         | 6             | 0.01                |
|                 |                |                      | Three-spine stickleback       | 4             | 0.01                |
| 4               | 4              | Henry Bay            | <b>Pacific herring age-0+</b> | 9177          | 76.78               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 21            | 0.39                |
|                 |                |                      | Gunnel                        | 21            | 0.10                |
| 4               | 5              | Henry Bay            | <b>Pacific herring age-0+</b> | 18495         | 154.61              |
| 5               | 1              | French Creek         | <b>Pacific herring age-0+</b> | 281           | 1.96                |
|                 |                |                      | Flatfish                      | 7             | 0.21                |
|                 |                |                      | Shiner perch                  | 4             | 0.03                |
|                 |                |                      | Tube-snout                    | 4             | 0.01                |
|                 |                |                      | Chinook salmon                | 2             | 0.11                |
|                 |                |                      | Crab                          | 2             | 0.50                |
|                 |                |                      | Ratfish                       | 2             | 1.50                |
|                 |                |                      | Pacific sand lance            | 2             | 0.01                |
|                 |                |                      | Plainfin midshipman           | 1             | 0.00                |
|                 |                |                      | Juvenile walleye pollock      | 1             | 0.01                |
| 5               | 2              | French Creek         | <b>Pacific herring age-0+</b> | 1485          | 12.44               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 10            | 0.28                |
|                 |                |                      | Coho salmon                   | 5             | 0.23                |
| 5               | 3              | French Creek         | <b>Pacific herring age-0+</b> | 265           | 2.38                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 8             | 0.27                |
|                 |                |                      | Chinook salmon                | 2             | 0.14                |
|                 |                |                      | Chum salmon                   | 1             | 0.09                |
| 5               | 4              | French Creek         | <b>Pacific herring age-0+</b> | 207           | 1.91                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 4             | 0.09                |
| 5               | 5              | French Creek         | <b>Pacific herring age-0+</b> | 308           | 2.93                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 2             | 0.04                |
|                 |                |                      | Chinook salmon                | 2             | 0.13                |
|                 |                |                      | Chum salmon                   | 2             | 0.28                |
|                 |                |                      | Coho salmon                   | 2             | 0.37                |

Table 4 continued...

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 6               | 1              | Trincomali Channel   | <b>Pacific herring age-0+</b> | 202           | 1.07                |
|                 |                |                      | Three-spine stickleback       | 2             | trace               |
|                 |                |                      | Coho salmon                   | 1             | 0.07                |
|                 |                |                      | Plainfin midshipman           | 1             | 0.07                |
|                 |                |                      | Pacific sand lance            | 1             | 0.00                |
|                 |                |                      | Shiner perch                  | 1             | 0.01                |
| 6               | 2              | Trincomali Channel   | <b>Pacific herring age-0+</b> | 472           | 2.60                |
| 6               | 3              | Trincomali Channel   | <b>Pacific herring age-0+</b> | 462           | 2.61                |
|                 |                |                      | Chinook salmon                | 2             | 0.05                |
| 6               | 4              | Trincomali Channel   | <b>Pacific herring age-0+</b> | 366           | 2.11                |
| 6               | 5              | Trincomali Channel   | <b>Pacific herring age-0+</b> | 2085          | 10.39               |
| 8               | 1              | Smelt Bay            | <b>Pacific herring age-0+</b> | 222           | 1.35                |
|                 |                |                      | Pacific sand lance            | 5             | 0.01                |
|                 |                |                      | Coho salmon                   | 2             | 0.03                |
|                 |                |                      | Juvenile walleye pollock      | 2             | 0.01                |
|                 |                |                      | Chinook salmon                | 1             | 0.08                |
| 8               | 2              | Smelt Bay            | <b>Pacific herring age-0+</b> | 213           | 1.39                |
|                 |                |                      | Juvenile walleye pollock      | 14            | 0.05                |
|                 |                |                      | Chinook salmon                | 3             | 0.44                |
|                 |                |                      | Pacific sand lance            | 3             | 0.01                |
|                 |                |                      | Coho salmon                   | 1             | 0.04                |
| 8               | 3              | Smelt Bay            | <b>Pacific herring age-0+</b> | 1245          | 7.56                |
|                 |                |                      | Chinook salmon                | 6             | 0.12                |
| 9               | 1              | Atrevida Reef        | <b>Pacific herring age-0+</b> | 10815         | 80.73               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 21            | 0.77                |
|                 |                |                      | Northern anchovy              | 21            | 0.30                |
| 9               | 2              | Atrevida Reef        | <b>Pacific herring age-0+</b> | 4680          | 37.61               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 312           | 9.18                |
|                 |                |                      | <b>Pacific herring age-2+</b> | 13            | 0.73                |
|                 |                |                      | Three-spine stickleback       | 169           | 0.12                |

Table 4 continued...

| <b>Transect</b> | <b>Station</b> | <b>Location Name</b> | <b>Species</b>                | <b>Number</b> | <b>Weight (Kg)*</b> |
|-----------------|----------------|----------------------|-------------------------------|---------------|---------------------|
| 9               | 3              | Atrevida Reef        | <b>Pacific herring age-0+</b> | 1820          | 15.05               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 155           | 4.72                |
|                 |                |                      | Three-spine stickleback       | 10            | 0.01                |
|                 |                |                      | Chum salmon                   | 5             | 0.11                |
| 9               | 4              | Atrevida Reef        | <b>Pacific herring age-0+</b> | 3699          | 32.56               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 126           | 4.00                |
|                 |                |                      | <b>Pacific herring age-2+</b> | 9             | 0.45                |
|                 |                |                      | Juvenile walleye pollock      | 18            | 0.06                |
|                 |                |                      | Three-spine stickleback       | 9             | 0.01                |
| 9               | 5              | Atrevida Reef        | <b>Pacific herring age-0+</b> | 1420          | 12.32               |
|                 |                |                      | <b>Pacific herring age-1+</b> | 40            | 1.29                |
|                 |                |                      | <b>Pacific herring age-2+</b> | 16            | 1.02                |
|                 |                |                      | Chum salmon                   | 20            | 2.30                |
|                 |                |                      | Juvenile walleye pollock      | 12            | 0.43                |
|                 |                |                      | Chinook salmon                | 8             | 0.61                |
| 10              | 1              | Cape Cockburn        | <b>Pacific herring age-0+</b> | 92            | 0.84                |
|                 |                |                      | <b>Pacific herring age-1+</b> | 2             | 0.05                |
|                 |                |                      | Juvenile walleye pollock      | 51            | 0.24                |
|                 |                |                      | Chinook salmon                | 21            | 0.48                |
|                 |                |                      | Three-spine stickleback       | 8             | 0.02                |
|                 |                |                      | Coho salmon                   | 3             | 0.08                |
| 10              | 2              | Cape Cockburn        | <b>Pacific herring age-0+</b> | 9             | 0.08                |
|                 |                |                      | Juvenile hake                 | 45            | 0.13                |
|                 |                |                      | Chinook salmon                | 5             | 0.14                |
|                 |                |                      | Coho salmon                   | 4             | 0.18                |
|                 |                |                      | Bay pipefish                  | 1             | trace               |
| 10              | 3              | Cape Cockburn        | Juvenile hake                 | 63            | 0.21                |
|                 |                |                      | Chinook salmon                | 1             | 0.02                |
|                 |                |                      | Squid                         | 1             | 0.03                |
| 10              | 4              | Cape Cockburn        | Juvenile hake                 | 138           | 0.35                |
|                 |                |                      | Coho salmon                   | 2             | 0.09                |
|                 |                |                      | Chinook salmon                | 1             | 0.04                |
|                 |                |                      | Bay pipefish                  | 1             | trace               |

Table 4 continued...

| Transect | Station | Location Name | Species                       | Number | Weight (Kg)* |
|----------|---------|---------------|-------------------------------|--------|--------------|
| 10       | 5       | Cape Cockburn | <b>Pacific herring age-0+</b> | 23     | 0.20         |
|          |         |               | <b>Pacific herring age-1+</b> | 1      | 0.04         |
|          |         |               | Chinook salmon                | 3      | 0.21         |
|          |         |               | Coho salmon                   | 2      | 0.06         |
|          |         |               | Shiner perch                  | 2      | 0.01         |
|          |         |               | Squid                         | 1      | 0.02         |
|          |         |               |                               |        |              |
| 11       | 1       | Secret Cove   | <b>Pacific herring age-0+</b> | 107    | 0.93         |
|          |         |               | <b>Pacific herring age-1+</b> | 15     | 0.29         |
|          |         |               | Capelin                       | 56     | 0.06         |
|          |         |               | Juvenile walleye pollock      | 30     | 0.11         |
|          |         |               | Three-spine stickleback       | 10     | 0.02         |
|          |         |               | Coho salmon                   | 7      | 0.12         |
|          |         |               | Northern anchovy              | 5      | 0.02         |
|          |         |               | Chinook salmon                | 1      | 0.01         |
|          |         |               |                               |        |              |
| 11       | 2       | Secret Cove   | <b>Pacific herring age-0+</b> | 132    | 1.15         |
|          |         |               | <b>Pacific herring age-1+</b> | 32     | 1.11         |
|          |         |               | <b>Pacific herring age-2+</b> | 4      | 0.22         |
|          |         |               | Juvenile walleye pollock      | 64     | 3.27         |
|          |         |               | Juvenile hake                 | 44     | 0.42         |
|          |         |               | Chinook salmon                | 2      | 0.04         |
|          |         |               | Coho salmon                   | 2      | 0.13         |
|          |         |               |                               |        |              |
| 11       | 3       | Secret Cove   | <b>Pacific herring age-0+</b> | 139    | 1.28         |
|          |         |               | <b>Pacific herring age-1+</b> | 19     | 0.53         |
|          |         |               | <b>Pacific herring age-2+</b> | 1      | 0.05         |
|          |         |               | Juvenile hake                 | 42     | 0.42         |
|          |         |               | Juvenile walleye pollock      | 7      | 0.25         |
|          |         |               | Three-spine stickleback       | 4      | 0.01         |
|          |         |               | Coho salmon                   | 2      | 0.16         |
|          |         |               |                               |        |              |
| 11       | 4       | Secret Cove   | <b>Pacific herring age-0+</b> | 40     | 0.38         |
|          |         |               | Coho salmon                   | 1      | 0.02         |
| 11       | 5       | Secret Cove   | <b>Pacific herring age-0+</b> | 40     | 0.37         |
|          |         |               | <b>Pacific herring age-1+</b> | 1      | 0.02         |
|          |         |               | <b>Pacific herring age-2+</b> | 1      | 0.05         |
|          |         |               | Juvenile hake                 | 114    | 0.27         |
|          |         |               | Coho salmon                   | 2      | 0.15         |
|          |         |               | Chinook salmon                | 1      | 0.07         |
|          |         |               | Squid                         | 2      | 0.01         |
|          |         |               |                               |        |              |

Table 5. Percent occurrence by species in purse seine sets for the Strait of Georgia juvenile herring survey in 2011 and 2012.

| Common Name                   | Scientific Name  | % occurrence* |      |
|-------------------------------|--|---------------|------|
|                               |  | 2011          | 2012 |
| <b>Pacific herring age-0+</b> | <i>Clupea pallasii</i> in year of birth  | 89.6          | 95.8 |
| <b>Pacific herring age-1+</b> | <i>Clupea pallasii</i> in first year   | 54.2          | 45.8 |
| <b>Pacific herring age-2+</b> | <i>Clupea pallasii</i> in second or more years   | 25.0          | 14.6 |
| Adult walleye pollock         | <i>Theragra chalcogramma</i>   | 8.3           | -    |
| Bay pipefish                  | <i>Syngnathus griseolineatus</i>   | 10.4          | 6.3  |
| Capelin                       |  | 2.1           | 2.1  |
| Chinook salmon                | <i>Oncorhynchus tshawytscha</i>  | 52.1          | 43.8 |
| Chum salmon                   | <i>Oncorhynchus keta</i>   | 37.5          | 8.3  |
| Coho salmon                   | <i>Oncorhynchus kisutch</i>  | 22.9          | 33.3 |
| Crab                          | <i>Metacarcinus magister</i>   | -             | 2.1  |
| Flatfish                      | <i>Parophyrus vetulus, Lepidopsetta bilineata, Platicthys stellatus, Citharichthys stigmaens</i> | 4.2           | 6.3  |
| Gunnel                        | <i>Apodichthys flavidus, Pholis laeta</i>  | 6.3           | 6.3  |
| Juvenile hake                 | <i>Merluccius productus</i>  | 22.9          | 12.5 |
| Juvenile walleye pollock      | <i>Theragra chalcogramma</i>   | 39.6          | 33.3 |
| <b>NO CATCH</b>               |  | 2.1           | -    |
| Northern anchovy              | <i>Engraulis mordax mordax</i>   | 16.7          | 8.3  |
| Pacific sand lance            | <i>Ammodytes hexapterus</i>  | 10.4          | 12.5 |
| Pink salmon                   | <i>Oncorhynchus gorbuscha</i>  | 22.9          | -    |
| Plainfin midshipman           | <i>Porichthys notatus</i>  | 20.8          | 16.7 |
| Poacher                       | <i>Agonus acipenserinus, Agonopsis emmelane</i>  | -             | 2.1  |
| Rattfish                      | <i>Hydrolagus colliei</i>  | -             | 2.1  |
| Sculpin                       | <i>Leptocottus armatus</i>   | 8.3           | 2.1  |
| Shiner perch                  | <i>Cymatogaster aggregata</i>  | 2.1           | 10.4 |
| Snake prickleback             | <i>Lumpenus sagitta</i>  | 2.1           | 10.4 |
| Spiny dogfish                 | <i>Squalus acanthias</i>   | 4.2           | -    |
| Squid                         | <i>Loligo opalescens, Gonatus fabricii</i>   | 14.6          | 12.5 |
| Three-spine stickleback       | <i>Gasterosteus aculeatus</i>  | 33.3          | 18.8 |
| Tube-snout                    | <i>Aulorhynchus flavidus</i>   | -             | 2.1  |

\* Jellyfish occurrence is not included due to the large quantities usually encountered and the inability to correctly quantify.

Table 6. Summary of the number of fish sampled, range of length, mean length, range of weight, mean weight, and standard deviations for two herring age classes. Total catch in numbers (N) and weight (Wt) of all herring by transect for the 2011 Strait of Georgia juvenile herring survey.

| <b>Age-0+</b>        |                 | <b>Length (mm)</b>    |              |             | <b>Weight (g)</b> |              |             | <b>N</b> | <b>Wt (kg)</b> |           |
|----------------------|-----------------|-----------------------|--------------|-------------|-------------------|--------------|-------------|----------|----------------|-----------|
| <b>Location Name</b> | <b>Transect</b> | <b>Number Sampled</b> | <b>Range</b> | <b>Mean</b> | <b>SD</b>         | <b>Range</b> | <b>Mean</b> |          |                | <b>SD</b> |
| Clarke Rock          | 1               | 116                   | 72-88        | 78          | 3.47              | 4.79-9.55    | 5.94        | 0.76     | 116            | 0.69      |
| Yellow Point         | 2               | 500                   | 66-91        | 74          | 3.70              | 4.09-10.04   | 5.49        | 0.78     | 9706           | 53.26     |
| Bowser               | 3               | 23                    | 83-97        | 89          | 3.60              | 7.19-10.81   | 8.55        | 0.97     | 44             | 0.38      |
| Henry Bay            | 4               | 180                   | 69-91        | 81          | 4.13              | 4.56-9.73    | 7.14        | 0.88     | 453            | 3.26      |
| French Creek         | 5               | 33                    | 77-91        | 84          | 3.73              | 5.93-10.60   | 7.93        | 1.01     | 145            | 1.15      |
| Trincomali Channel   | 6               | 499                   | 62-94        | 76          | 6.53              | 3.42-11.15   | 5.81        | 1.46     | 5927           | 33.70     |
| Smelt Bay            | 8               | 205                   | 68-96        | 77          | 4.25              | 4.54-10.89   | 6.33        | 0.97     | 513            | 3.23      |
| Atrevida Reef        | 9               | 38                    | 71-97        | 81          | 6.37              | 5.12-11.97   | 7.50        | 1.60     | 41             | 0.30      |
| Cape Cockburn        | 10              | 446                   | 70-96        | 83          | 4.76              | 5.33-11.47   | 8.00        | 1.27     | 1045           | 8.50      |
| Secret Cove          | 11              | 266                   | 66-94        | 81          | 6.62              | 4.08-10.91   | 7.49        | 1.57     | 759            | 5.03      |
| All Locations        |                 | 2306                  | 62-97        | 78          | 6.15              | 3.42-11.97   | 6.60        | 1.56     | 18749          | 109.51    |

Table 6 continued...

| <b>Age-1+</b>        |                 |                       | <b>Length (mm)</b> |             |           | <b>Weight (g)</b> |             |           | <b>N</b> | <b>Wt (kg)</b> |
|----------------------|-----------------|-----------------------|--------------------|-------------|-----------|-------------------|-------------|-----------|----------|----------------|
| <b>Location Name</b> | <b>Transect</b> | <b>Number Sampled</b> | <b>Range</b>       | <b>Mean</b> | <b>SD</b> | <b>Range</b>      | <b>Mean</b> | <b>SD</b> |          |                |
| Clarke Rock          | 1               | 12                    | 125-145            | 136         | 6.65      | 26.50-46.07       | 35.55       | 6.61      | 12       | 0.43           |
| Yellow Point         | 2               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Bowser               | 3               | 33                    | 98-147             | 132         | 11.80     | 10.52-45.92       | 30.81       | 7.99      | 56       | 1.79           |
| Henry Bay            | 4               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| French Creek         | 5               | 33                    | 110-147            | 135         | 8.30      | 20.77-50.62       | 36.30       | 6.91      | 265      | 9.77           |
| Trincomali Channel   | 6               | 1                     | 105                | 105         | -         | 13.96             | 13.96       | -         | 1        | 0.01           |
| Smelt Bay            | 8               | 1                     | 133                | 133         | -         | 32.23             | 32.23       | -         | 1        | 0.03           |
| Atrevida Reef        | 9               | 55                    | 107-147            | 126         | 11.28     | 16.80-51.09       | 28.57       | 8.32      | 145      | 4.10           |
| Cape Cockburn        | 10              | 68                    | 101-147            | 122         | 9.44      | 14.52-43.19       | 24.07       | 6.20      | 129      | 3.05           |
| Secret Cove          | 11              | 49                    | 98-144             | 120         | 11.07     | 12.48-39.23       | 22.46       | 6.59      | 81       | 1.81           |
| All Locations        |                 | 282                   | 98-147             | 125         | 11.90     | 10.52-51.09       | 27.20       | 8.54      | 690      | 21.00          |

| <b>Age-2+</b>        |                 |                       | <b>Length (mm)</b> |             |           | <b>Weight (g)</b> |             |           | <b>N</b> | <b>Wt (kg)</b> |
|----------------------|-----------------|-----------------------|--------------------|-------------|-----------|-------------------|-------------|-----------|----------|----------------|
| <b>Location Name</b> | <b>Transect</b> | <b>Number Sampled</b> | <b>Range</b>       | <b>Mean</b> | <b>SD</b> | <b>Range</b>      | <b>Mean</b> | <b>SD</b> |          |                |
| Clarke Rock          | 1               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Yellow Point         | 2               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Bowser               | 3               | 56                    | 149-186            | 163         | 8.83      | 39.29-95.17       | 59.50       | 10.91     | 111      | 6.57           |
| Henry Bay            | 4               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| French Creek         | 5               | 39                    | 148-174            | 157         | 6.81      | 45.02-78.00       | 57.91       | 8.62      | 351      | 20.33          |
| Trincomali Channel   | 6               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Smelt Bay            | 8               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Atrevida Reef        | 9               | 19                    | 148-169            | 156         | 5.82      | 41.97-60.35       | 52.18       | 5.21      | 43       | 2.30           |
| Cape Cockburn        | 10              | 19                    | 149-180            | 161         | 8.07      | 43.14-79.47       | 56.64       | 8.42      | 24       | 1.36           |
| Secret Cove          | 11              | 3                     | 148-163            | 153         | 8.66      | 45.37-57.98       | 50.33       | 6.72      | 3        | 0.15           |
| All Locations        |                 | 136                   | 148-186            | 160         | 8.26      | 39.29-95.17       | 57.42       | 9.49      | 532      | 30.70          |

Table 7. Summary of the number of fish sampled, range of length, mean length, range of weight, mean weight, and standard deviations for three herring age classes. Total catch in numbers (N) and weight (Wt) of all herring by transect for the 2012 Strait of Georgia juvenile herring survey.

| <b>Age-0+</b>        |                 | <b>Number<br/>Sampled</b> | <b>Length (mm)</b> |             |           | <b>Weight (g)</b> |             |           | <b>N</b> | <b>Wt (Kg)</b> |
|----------------------|-----------------|---------------------------|--------------------|-------------|-----------|-------------------|-------------|-----------|----------|----------------|
| <b>Location Name</b> | <b>Transect</b> |                           | <b>Range</b>       | <b>Mean</b> | <b>SD</b> | <b>Range</b>      | <b>Mean</b> | <b>SD</b> |          |                |
| Clarke Rock          | 1               | 500                       | 68-98              | 85          | 5.88      | 4.92-13.46        | 8.45        | 1.74      | 31498    | 271.51         |
| Yellow Point         | 2               | 500                       | 57-97              | 77          | 5.89      | 2.64-11.36        | 6.44        | 1.29      | 19829    | 129.80         |
| Bowser               | 3               | 501                       | 71-103             | 84          | 4.15      | 4.96-14.34        | 7.89        | 1.13      | 10381    | 81.34          |
| Henry Bay            | 4               | 500                       | 75-105             | 84          | 4.75      | 5.81-15.89        | 8.32        | 1.30      | 30370    | 254.59         |
| French Creek         | 5               | 500                       | 73-98              | 86          | 5.02      | 5.65-12.87        | 8.60        | 1.35      | 2546     | 21.62          |
| Trincomali           | 6               | 501                       | 58-104             | 74          | 4.51      | 2.74-13.84        | 5.34        | 0.96      | 3587     | 18.78          |
| Smelt Bay            | 8               | 300                       | 70-92              | 78          | 3.17      | 4.63-10.04        | 6.18        | 0.69      | 1680     | 10.29          |
| Atrevida Reef        | 9               | 500                       | 76-100             | 84          | 3.79      | 5.80-13.89        | 8.24        | 1.14      | 22434    | 178.25         |
| Cape Cockburn        | 10              | 124                       | 77-97              | 87          | 4.08      | 6.22-12.59        | 8.94        | 1.20      | 124      | 1.11           |
| Secret Cove          | 11              | 353                       | 71-106             | 88          | 4.22      | 5.29-16.02        | 8.98        | 1.30      | 458      | 4.10           |
| All locations        |                 | 4279                      | 57-106             | 82          | 6.41      | 2.64-16.02        | 7.66        | 1.73      | 122907   | 971.39         |

Table 7 continued...

| <b>Age-1+</b>        |                 |                       | <b>Length (mm)</b> |             |           | <b>Weight (g)</b> |             |           |          |                |
|----------------------|-----------------|-----------------------|--------------------|-------------|-----------|-------------------|-------------|-----------|----------|----------------|
| <b>Location Name</b> | <b>Transect</b> | <b>Number Sampled</b> | <b>Range</b>       | <b>Mean</b> | <b>SD</b> | <b>Range</b>      | <b>Mean</b> | <b>SD</b> | <b>N</b> | <b>Wt (Kg)</b> |
| Clarke Rock          | 1               | 88                    | 117-151            | 139         | 6.61      | 21.06-52.66       | 40.24       | 6.42      | 5404     | 217.46         |
| Yellow Point         | 2               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Bowser               | 3               | 31                    | 111-136            | 123         | 7.43      | 19.49-36.17       | 25.73       | 4.61      | 272      | 7.04           |
| Henry Bay            | 4               | 1                     | 113                | 113         | -         | 18.53             | 18.53       | -         | 21       | 0.39           |
| French Creek         | 5               | 15                    | 110-153            | 129         | 11.47     | 17.61-53.41       | 29.31       | 9.08      | 24       | 0.68           |
| Trincomali           | 6               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Smelt Bay            | 8               | -                     | -                  | -           | -         | -                 | -           | -         | -        | -              |
| Atrevida Reef        | 9               | 80                    | 110-153            | 129         | 9.87      | 19.06-46.79       | 30.68       | 6.27      | 654      | 20.00          |
| Cape Cockburn        | 10              | 3                     | 112-141            | 125         | 14.73     | 18.26-38.74       | 28.10       | 10.26     | 3        | 0.08           |
| Secret Cove          | 11              | 51                    | 110-153            | 126         | 12.72     | 16.73-48.22       | 27.40       | 8.75      | 67       | 1.95           |
| All locations        |                 | 269                   | 110-153            | 131         | 11.01     | 16.73-53.41       | 32.46       | 8.90      | 6445     | 247.57         |

| <b>Age-2+</b>        |                 |                       | <b>Length (mm)</b> |             |           | <b>Weight (mm)</b> |             |           |          |                |
|----------------------|-----------------|-----------------------|--------------------|-------------|-----------|--------------------|-------------|-----------|----------|----------------|
| <b>Location Name</b> | <b>Transect</b> | <b>Number Sampled</b> | <b>Range</b>       | <b>Mean</b> | <b>SD</b> | <b>Range</b>       | <b>Mean</b> | <b>SD</b> | <b>N</b> | <b>Wt (Kg)</b> |
| Clarke Rock          | 1               | 2                     | 158-159            | 159         | 0.71      | 54.76-61.42        | 58.09       | 4.71      | 124      | 7.20           |
| Yellow Point         | 2               | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| Bowser               | 3               | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| Henry Bay            | 4               | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| French Creek         | 5               | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| Trincomali           | 6               | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| Smelt Bay            | 8               | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| Atrevida Reef        | 9               | 6                     | 156-174            | 167         | 6.63      | 50.27-75.94        | 60.19       | 10.66     | 38       | 2.20           |
| Cape Cockburn        | 10              | -                     | -                  | -           | -         | -                  | -           | -         | -        | -              |
| Secret Cove          | 11              | 4                     | 154-160            | 157         | 3.46      | 47.16-56.80        | 52.37       | 4.31      | 6        | 0.32           |
| All locations        |                 | 12                    | 154-174            | 162         | 6.94      | 47.16-75.94        | 57.23       | 8.50      | 168      | 9.72           |

Table 8. Grouping of organisms, by phylum with abbreviations from the 2011 plankton tows from the Strait of Georgia juvenile herring survey.

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|                      |  |
|----------------------|--|
| <b>Coelenterata</b>  |  |
| <b>COEL</b>          | Medusae - <i>Aequorea victoria</i>                                       |
| <b>SIPH</b>          | Siphonophores  |
| <b>Ctenophora</b>    |  |
| <b>CTEN</b>          | Ctenophores  |
| <b>Annelida</b>      |  |
| <b>POLY</b>          | Polychaetes  |
| <b>Mollusca</b>      |  |
| <b>GAST</b>          | Prosobranch gastropods   |
| <b>PELE</b>          | Pelecypods   |
| <b>Arthropoda</b>    |  |
| <b>AMPH</b>          | Amphipods  |
| <b>BARN</b>          | Barnacle, unknown stage  |
| <b>CLAD</b>          | Cladocerans; <i>Podon sp.</i> and <i>Evadne sp.</i>                      |
| <b>CNAU</b>          | Unidentified copepod nauplii   |
| <b>COPE</b>          | Copepods (see Table 9 for list of species)                               |
| <b>CRAM</b>          | Crab megalopea, including porcellinadea                                  |
| <b>CRAZ</b>          | Crab zoea, including porcellinadea                                       |
| <b>EUPA</b>          | Adult euphausiids; mainly <i>Euphausia pacifica</i>                      |
| <b>EUPL</b>          | Larval euphausiids; mainly <i>Euphausia pacifica</i>                     |
| <b>OSTR</b>          | Ostracods  |
| <b>SHRI</b>          | Shrimp zoea  |
| <b>TLON</b>          | <i>Thysanoessa longipes</i>  |
| <b>TSPI</b>          | <i>Thysanoessa spinifera</i>   |
| <b>Ectoprocta</b>    |  |
| <b>ECTO</b>          | Ectoprocts; mainly <i>Membranipora sp.</i> larvae                        |
| <b>Chaetognatha</b>  |  |
| <b>CHAE</b>          | Chaetognaths; mainly <i>Sagitta sp.</i>                                  |
| <b>Chordata</b>      |  |
| <b>FISHL</b>         | Fish larvae  |
| <b>LARV</b>          | Larvaceans; mainly <i>Oikopleura sp.</i> and some <i>Fritillaria sp.</i> |
| <b>Miscellaneous</b> |  |
| <b>EGGS</b>          | Unidentified eggs; either euphausiid or teleost                          |

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Table 9. Abbreviations for calanoid, cyclopoid, harpacticoid copepods identified in 2011 plankton samples from the Strait of Georgia juvenile herring survey.

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| <b>Calanoid copepods</b> |  |
|--------------------------|--|
| <b>AETI</b>              | <i>Aetidius sp.</i>                      |
| <b>ALON</b>              | <i>Acartia longiremis</i>                |
| <b>CALA</b>              | <i>Calanus sp.</i>                       |
| <b>CMAR</b>              | <i>Calanus marshallae</i>                |
| <b>CPAC</b>              | <i>Calanus pacificus</i>                 |
| <b>EBUN</b>              | <i>Eucalanus bungii</i>                  |
| <b>EELO</b>              | <i>Eucalanus elongatus</i>               |
| <b>MPAC</b>              | <i>Metridia pacifica</i>                 |
| <b>PARA</b>              | <i>Paracalanus sp.</i>                   |
| <b>PPAR</b>              | <i>Paracalanus parvus</i>                |
| <b>PSEU</b>              | <i>Pseudocalanus sp.</i>                 |
| <b>SMIN</b>              | <i>Scolecithricella minor</i>            |
| <b>TDIS</b>              | <i>Tortanus discaudatus</i>              |
| <b>UCAL</b>              | Unidentified or mixed juvenile calanoids |

| <b>Cyclopoid copepods</b> |                           |
|---------------------------|---------------------------|
| <b>CANG</b>               | <i>Corycaeus anglicus</i> |
| <b>OATL</b>               | <i>Oithona atlantica</i>  |
| <b>OSIM</b>               | <i>Oithona similis</i>    |

| <b>Harpacticoid copepods</b> |                           |
|------------------------------|---------------------------|
| <b>UHAR</b>                  | Unidentified Harpacticoid |

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Table 10. Number of zooplankton per m<sup>3</sup> of water by set in samples from the 2011 Strait of Georgia juvenile herring survey. Species codes as shown in table 8 and 9.

| Location           | Tran | Stn | Volume (m <sup>3</sup> ) | AETI | ALON | AMPH | BARN | CALA | CANG  | CHAE | CLAD | CMAR |
|--------------------|------|-----|--------------------------|------|------|------|------|------|-------|------|------|------|
| Clarke Rock        | 1    | 1   | 15.752                   | 2.5  | 0.5  | 1.9  | 2.2  | -    | 34.0  | -    | -    | -    |
|                    |      | 3   | 14.476                   | -    | 1.1  | 4.8  | 0.1  | 4.4  | 20.4  | 0.1  | -    | -    |
| Yellow Point       | 2    | 1   | 13.905                   | -    | -    | 4.6  | 2.3  | 20.7 | 33.4  | -    | 2.3  | -    |
|                    |      | 4   | 13.786                   | -    | -    | 0.3  | 2.3  | 22.3 | 37.1  | -    | -    | -    |
| Bowser             | 3    | 1   | 13.789                   | -    | -    | 8.2  | 8.7  | -    | 8.7   | 0.1  | -    | -    |
|                    |      | 4   | 14.995                   | -    | -    | 57.6 | 2.1  | 3.3  | 25.6  | -    | -    | -    |
| Henry Bay          | 4    | 1   | 11.949                   | -    | -    | 1.3  | 0.3  | -    | 12.7  | -    | -    | -    |
|                    |      | 3   | 14.988                   | -    | -    | 3.9  | 1.1  | 0.7  | 29.4  | -    | -    | -    |
| French Creek       | 5    | 1   | 9.270                    | -    | -    | 2.6  | 0.4  | -    | 10.8  | -    | -    | -    |
|                    |      | 3   | 4.550                    | -    | -    | 20.2 | -    | 60.4 | -     | -    | -    | -    |
| Trincomali Channel | 6    | 1   | 6.352                    | -    | -    | -    | 81.6 | -    | 22.7  | -    | 12.6 | -    |
|                    |      | 3   | 13.032                   | -    | -    | 0.2  | 34.4 | -    | 31.9  | -    | 1.2  | -    |
| Smelt Bay          | 8    | 1   | 12.971                   | -    | -    | 5.3  | -    | 3.9  | 19.7  | -    | 1.2  | -    |
|                    |      | 2   | 13.598                   | -    | -    | 0.1  | -    | 11.5 | 18.8  | -    | -    | -    |
| Atrevida Reef      | 9    | 1   | 8.856                    | -    | 0.9  | 15.6 | 0.9  | 0.7  | 8.1   | -    | -    | -    |
|                    |      | 3   | 13.925                   | -    | -    | 36.8 | -    | 59.1 | -     | 2.3  | -    | -    |
| Cape Cockburn      | 10   | 3   | 17.980                   | -    | -    | 0.4  | 5.3  | 4.8  | 106.8 | 0.7  | -    | 0.1  |
|                    |      | 5   | 12.011                   | -    | -    | 0.2  | -    | 51.3 | 66.6  | 0.3  | -    | 0.1  |
| Secret Cove        | 11   | 1   | 11.792                   | -    | -    | -    | 9.5  | 8.1  | 95.0  | -    | 16.3 | -    |
|                    |      | 3   | 11.372                   | -    | -    | 2.8  | 8.4  | 9.2  | 78.8  | 0.4  | 22.5 | 0.7  |

Table 7 continued...

| Location           | Tran | Stn | CNAU | COEL | CPAC | CRAM | CRAZ | CTEN | EBUN | ECTO | EELO | EGGS | EUPA  |
|--------------------|------|-----|------|------|------|------|------|------|------|------|------|------|-------|
| Clarke Rock        | 1    | 1   | -    | 0.3  | 0.3  | 0.4  | 3.3  | 15.7 | -    | 0.5  | -    | 1.0  | -     |
|                    |      | 3   | -    | -    | 7.6  | -    | 1.1  | 5.7  | -    | -    | 0.6  | -    | 0.1   |
| Yellow Point       | 2    | 1   | 4.6  | 34.5 | 1.2  | 0.6  | 4.6  | 51.2 | -    | -    | -    | -    | -     |
|                    |      | 4   | -    | 9.0  | 47.3 | 0.3  | 4.9  | 32.8 | -    | -    | -    | -    | -     |
| Bowser             | 3    | 1   | -    | 5.4  | -    | -    | -    | 5.4  | -    | -    | -    | 0.6  | -     |
|                    |      | 4   | -    | 6.4  | 27.7 | -    | 2.1  | -    | -    | -    | -    | -    | 0.1   |
| Henry Bay          | 4    | 1   | -    | 0.5  | -    | -    | 2.4  | 8.6  | -    | -    | -    | -    | -     |
|                    |      | 3   | -    | 0.9  | -    | -    | 2.1  | 14.3 | -    | -    | -    | -    | -     |
| French Creek       | 5    | 1   | -    | 0.9  | -    | -    | -    | 62.1 | -    | -    | -    | -    | -     |
|                    |      | 3   | -    | 2.6  | 30.8 | -    | -    | 82.6 | 0.9  | -    | -    | -    | -     |
| Trincomali Channel | 6    | 1   | -    | 2.0  | -    | 0.2  | 0.9  | 4.7  | -    | -    | -    | -    | -     |
|                    |      | 3   | -    | 2.7  | -    | 0.2  | 9.5  | 2.0  | -    | -    | -    | -    | -     |
| Smelt Bay          | 8    | 1   | -    | 4.8  | -    | 0.1  | 0.2  | 14.3 | -    | -    | -    | -    | -     |
|                    |      | 2   | -    | 6.8  | -    | 0.3  | 11.0 | 21.3 | -    | -    | -    | 0.1  | -     |
| Atrevida Reef      | 9    | 1   | -    | 13.1 | -    | -    | 0.3  | 5.5  | -    | -    | -    | -    | -     |
|                    |      | 3   | -    | 3.4  | -    | -    | -    | 2.3  | -    | -    | 32.4 | -    | 103.6 |
| Cape Cockburn      | 10   | 3   | -    | 0.7  | 1.6  | -    | 0.2  | 1.1  | 1.4  | -    | 0.3  | -    | -     |
|                    |      | 5   | -    | 0.8  | 0.7  | 0.2  | 1.2  | 3.0  | 0.5  | -    | -    | -    | -     |
| Secret Cove        | 11   | 1   | -    | 5.8  | -    | -    | 6.1  | 75.6 | -    | -    | -    | -    | -     |
|                    |      | 3   | -    | 2.8  | 3.2  | -    | 0.4  | 40.8 | 1.1  | -    | 0.2  | -    | 4.2   |

Table 7 continued...

| Location           | Tran | Stn | EUPL | FISHL | GAST | LARV | MPAC  | OATL | OSIM | OSTR | PARA | PELE | POLY |
|--------------------|------|-----|------|-------|------|------|-------|------|------|------|------|------|------|
| Clarke Rock        | 1    | 1   | -    | -     | 1.0  | 1.5  | 1.8   | 3.0  | -    | 0.1  | -    | -    | -    |
|                    |      | 3   | -    | -     | -    | 1.1  | 10.2  | 1.1  | -    | 1.8  | -    | -    | -    |
| Yellow Point       | 2    | 1   | 1.2  | -     | 4.6  | 15.0 | -     | -    | 2.3  | -    | -    | -    | 3.5  |
|                    |      | 4   | -    | -     | -    | 27.9 | -     | -    | -    | -    | -    | -    | 0.3  |
| Bowser             | 3    | 1   | -    | 0.1   | -    | 26.1 | 0.8   | -    | 11.0 | -    | -    | 1.7  | -    |
|                    |      | 4   | -    | -     | 2.1  | 32.0 | 496.2 | -    | 19.2 | 2.1  | -    | -    | 2.1  |
| Henry Bay          | 4    | 1   | -    | -     | 4.0  | 6.7  | -     | -    | 1.7  | 0.8  | -    | -    | 0.7  |
|                    |      | 3   | -    | -     | 6.9  | 13.9 | 0.1   | -    | 4.8  | -    | -    | -    | -    |
| French Creek       | 5    | 1   | -    | -     | 3.9  | 1.3  | -     | -    | -    | -    | -    | -    | -    |
|                    |      | 3   | -    | 0.9   | -    | -    | 17.6  | -    | -    | 3.5  | 1.1  | -    | -    |
| Trincomali Channel | 6    | 1   | -    | -     | -    | 27.7 | -     | -    | -    | -    | -    | 17.6 | 0.2  |
|                    |      | 3   | -    | -     | -    | 16.0 | -     | -    | 1.2  | -    | -    | -    | 2.5  |
| Smelt Bay          | 8    | 1   | 1.2  | -     | 9.9  | 24.7 | -     | -    | -    | -    | -    | 4.9  | 2.5  |
|                    |      | 2   | -    | 0.1   | 4.7  | 9.4  | -     | -    | 1.2  | -    | -    | -    | -    |
| Atrevida Reef      | 9    | 1   | -    | -     | 14.5 | 12.6 | 0.6   | -    | 7.2  | -    | -    | -    | 0.1  |
|                    |      | 3   | -    | -     | 9.2  | 9.2  | 776.7 | -    | 4.6  | -    | -    | -    | 4.6  |
| Cape Cockburn      | 10   | 3   | 0.2  | -     | 10.7 | -    | 1.0   | -    | 12.5 | 6.0  | -    | -    | 12.9 |
|                    |      | 5   | -    | -     | 8.0  | 16.0 | 2.9   | -    | 18.6 | -    | -    | -    | -    |
| Secret Cove        | 11   | 1   | 1.4  | -     | 4.1  | 35.3 | -     | -    | 5.4  | -    | 73.3 | -    | -    |
|                    |      | 3   | -    | -     | -    | 87.2 | 82.0  | -    | 2.8  | -    | -    | -    | 1.1  |

Table 7 continued...

| Location           | Tran | Stn | PPAR  | PSEU | SHRI | SIPH  | SMIN | TDIS | TLON | TSPI | UCAL | UHAR |
|--------------------|------|-----|-------|------|------|-------|------|------|------|------|------|------|
| Clarke Rock        | 1    | 1   | 8.4   | 3.1  | -    | -     | 0.5  | -    | -    | -    | -    | -    |
|                    |      | 3   | 6.6   | 8.8  | -    | 0.6   | 1.1  | -    | -    | -    | -    | -    |
| Yellow Point       | 2    | 1   | 34.5  | 3.5  | 2.3  | 153.6 | -    | -    | -    | -    | -    | -    |
|                    |      | 4   | 67.3  | -    | 0.9  | 33.1  | -    | -    | -    | -    | -    | -    |
| Bowser             | 3    | 1   | 40.8  | 17.6 | -    | 0.1   | -    | -    | -    | -    | -    | 0.6  |
|                    |      | 4   | 66.2  | 98.0 | 2.1  | -     | -    | -    | -    | -    | 10.7 | -    |
| Henry Bay          | 4    | 1   | 12.7  | 2.3  | 1.1  | 2.9   | -    | 2.0  | -    | -    | 0.7  | -    |
|                    |      | 3   | 20.1  | 9.1  | -    | 8.8   | -    | -    | -    | -    | -    | -    |
| French Creek       | 5    | 1   | 36.2  | -    | -    | -     | -    | -    | -    | -    | -    | -    |
|                    |      | 3   | 390.3 | 35.2 | -    | 0.9   | -    | -    | -    | -    | -    | -    |
| Trincomali Channel | 6    | 1   | 20.2  | -    | 0.5  | -     | -    | -    | -    | -    | -    | -    |
|                    |      | 3   | 35.6  | 9.8  | 0.6  | 0.2   | -    | -    | -    | -    | 3.7  | -    |
| Smelt Bay          | 8    | 1   | 144.6 | 4.5  | 0.1  | -     | -    | -    | -    | -    | -    | -    |
|                    |      | 2   | 101.9 | 14.3 | 2.1  | -     | -    | -    | -    | -    | -    | -    |
| Atrevida Reef      | 9    | 1   | 143.2 | 28.7 | -    | -     | -    | -    | -    | 0.1  | -    | -    |
|                    |      | 3   | 404.9 | 59.7 | -    | -     | -    | -    | -    | 2.1  | -    | -    |
| Cape Cockburn      | 10   | 3   | 174.9 | 48.5 | 0.1  | -     | -    | -    | 0.1  | 7.2  | -    | -    |
|                    |      | 5   | 220.6 | 44.5 | 0.2  | -     | -    | -    | -    | 0.1  | -    | -    |
| Secret Cove        | 11   | 1   | 16.3  | 10.9 | -    | -     | -    | -    | -    | -    | -    | -    |
|                    |      | 3   | 257.2 | 16.9 | 0.4  | -     | -    | -    | -    | -    | -    | -    |

Table 11. Grouping of organisms, by phylum with abbreviations from the 2012 plankton tows from the Strait of Georgia juvenile herring survey.

|                      |  |
|----------------------|--|
| <b>Coelenterata</b>  |  |
| <b>COEL</b>          | Medusae - <i>Aequorea victoria</i>                                       |
| <b>SIPH</b>          | Siphonophores  |
| <b>Ctenophora</b>    |  |
| <b>CTEN</b>          | Ctenophores  |
| <b>Annelida</b>      |  |
| <b>POLY</b>          | Polychaetes  |
| <b>Mollusca</b>      |  |
| <b>GAST</b>          | Prosobranch gastropods   |
| <b>PELE</b>          | Pelecypods   |
| <b>Arthropoda</b>    |  |
| <b>AMPH</b>          | Amphipods  |
| <b>BARN</b>          | Barnacle, unknown stage  |
| <b>CLAD</b>          | Cladocerans; <i>Podon sp.</i> and <i>Evadne sp.</i>                      |
| <b>COPE</b>          | Copepods (see Table 12 for list of species)                              |
| <b>CRAM</b>          | Crab megalopea, including porcillinadea                                  |
| <b>CRAZ</b>          | Crab zoea, including porcillinadea                                       |
| <b>CUMA</b>          | <i>Cumacea sp.</i>   |
| <b>EUPA</b>          | Adult euphausiids; mainly <i>Euphausia pacifica</i>                      |
| <b>EUPH</b>          | <i>Euphausia pacifica</i> ; any size                                     |
| <b>EUPL</b>          | Larval euphausiids; mainly <i>Euphausia pacifica</i>                     |
| <b>MYSI</b>          | Mysids   |
| <b>OSTR</b>          | Ostracods  |
| <b>SHRI</b>          | Shrimp zoea  |
| <b>TSPI</b>          | <i>Thysanoessa spinifera</i>   |
| <b>Ectoprocta</b>    |  |
| <b>ECTO</b>          | Ectoprocts; mainly <i>Membranipora sp.</i> larvae                        |
| <b>Chaetognatha</b>  |  |
| <b>CHAE</b>          | Chaetognaths; mainly <i>Sagitta sp.</i>                                  |
| <b>Chordata</b>      |  |
| <b>FISHL</b>         | Fish larvae  |
| <b>LARV</b>          | Larvaceans; mainly <i>Oikopleura sp.</i> and some <i>Fritillaria sp.</i> |
| <b>Miscellaneous</b> |  |
| <b>EGGS</b>          | Unidentified eggs; either euphausiid or teleost                          |

Table 12. Abbreviations for calanoid, cyclopoid, harpacticoid copepods identified in 2012 plankton samples from the Strait of Georgia juvenile herring survey.

| <b><u>Calanoid copepods</u></b>     |  |
|-------------------------------------|--|
| <b>AETI</b>                         | <i>Aetidius sp.</i>                      |
| <b>ALON</b>                         | <i>Acartia longiremis</i>                |
| <b>CALA</b>                         | <i>Calanus sp.</i>                       |
| <b>CMAR</b>                         | <i>Calanus marshalle</i>                 |
| <b>CPAC</b>                         | <i>Calanus pacificus</i>                 |
| <b>EBUN</b>                         | <i>Eucalanus bungii</i>                  |
| <b>ELON</b>                         | <i>Epilabidocera longipedata</i>         |
| <b>METR</b>                         | <i>Metridia sp.</i>                      |
| <b>MPAC</b>                         | <i>Metridia pacifica</i>                 |
| <b>OBOR</b>                         | <i>Oncaea borealis</i>                   |
| <b>PPAR</b>                         | <i>Paracalanus parvus</i>                |
| <b>PSEU</b>                         | <i>Pseudocalanus sp.</i>                 |
| <b>SMIN</b>                         | <i>Scolecithricella minor</i>            |
| <b>TDIS</b>                         | <i>Tortanus discaudatus</i>              |
| <b>UCAL</b>                         | Unidentified or mixed juvenile calanoids |
| <b><u>Cyclopoid copepods</u></b>    |  |
| <b>CANG</b>                         | <i>Corycaeus anglicus</i>                |
| <b>OATL</b>                         | <i>Oithona atlantica</i>                 |
| <b>OSIM</b>                         | <i>Oithona similis</i>                   |
| <b><u>Harpacticoid copepods</u></b> |  |
| <b>UHAR</b>                         | Unidentified Harpacticoid                |

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Table 13. Number of zooplankton per m<sup>3</sup> of water by set in samples from the 2012 Strait of Georgia juvenile herring survey. Species codes as shown in table 11 and 12.

| Location           | Tran | Stn | Volume (m <sup>3</sup> ) | AETI | ALON | AMPH | BARN  | CALA | CANG | CHAE | CLAD  | CMAR |
|--------------------|------|-----|--------------------------|------|------|------|-------|------|------|------|-------|------|
| Clarke Rock        | 1    | 1   | 2.821                    | -    | -    | -    | 34.7  | -    | 45.4 | -    | -     | -    |
|                    |      | 3   | 3.898                    | -    | -    | 0.8  | 16.4  | 36.9 | 24.6 | -    | -     | 0.3  |
| Yellow Point       | 2    | 1   | 11.339                   | -    | -    | -    | 1.4   | -    | 36.7 | -    | 22.6  | -    |
|                    |      | 4   | 11.429                   | 2.8  | -    | 0.7  | 8.4   | 35.7 | 81.2 | -    | 2.8   | -    |
| Bowser             | 3    | 1   | 5.365                    | -    | -    | -    | 129.7 | -    | 4.5  | -    | 11.9  | -    |
|                    |      | 3   | 10.837                   | -    | -    | 1.2  | 10.3  | 7.0  | 5.9  | -    | -     | 0.1  |
| Henry Bay          | 4    | 1   | 3.561                    | -    | -    | 1.1  | 359.5 | -    | 18.0 | -    | 18.0  | -    |
|                    |      | 3   | 6.918                    | -    | -    | 0.3  | 513.4 | -    | 23.1 | -    | 4.6   | -    |
| French Creek       | 5    | 1   | 2.734                    | -    | 35.1 | -    | 1.1   | 23.4 | 35.1 | -    | -     | -    |
|                    |      | 3   | 4.955                    | -    | 6.5  | 3.8  | 26.0  | 20.8 | 29.1 | -    | -     | -    |
| Trincomali Channel | 6    | 1   | 13.175                   | -    | -    | 5.1  | 131.2 | -    | 58.3 | -    | 126.3 | -    |
|                    |      | 3   | 12.759                   | -    | 2.5  | -    | 163.0 | 3.1  | 55.2 | -    | 30.1  | -    |
| Smelt Bay          | 8    | 1   | 8.975                    | -    | 8.9  | -    | 23.3  | -    | 17.8 | -    | 25.0  | -    |
|                    |      | 2   | 9.538                    | -    | 23.5 | 2.3  | 17.0  | -    | 23.5 | 0.2  | 13.4  | -    |
| Atrevida Reef      | 9    | 1   | 10.808                   | -    | 1.5  | 1.7  | 1.7   | -    | 1.5  | -    | -     | -    |
|                    |      | 3   | 13.569                   | 10.6 | 1.2  | 25.9 | -     | -    | 15.3 | -    | -     | -    |
| Cape Cockburn      | 10   | 3   | 17.762                   | -    | 0.9  | 9.0  | -     | 10.8 | -    | 0.5  | -     | -    |
|                    |      | 5   | 15.159                   | -    | -    | 0.4  | -     | 0.1  | 5.3  | -    | -     | -    |
| Secret Cove        | 11   | 1   | 2.731                    | -    | -    | 0.7  | 20.1  | 2.9  | 35.1 | -    | -     | -    |
|                    |      | 3   | 5.600                    | -    | 8.6  | 1.1  | 2.9   | 13.6 | 34.3 | 0.9  | -     | 0.2  |

Table 13 continued...

| Location           | Tran | Stn | COEL  | CPAC | CRAM | CRAZ | CTEN | CUMA | EBUN | ECTO  | EGGS | ELON | EUPA  |
|--------------------|------|-----|-------|------|------|------|------|------|------|-------|------|------|-------|
| Clarke Rock        | 1    | 1   | 6.4   |      | 0.7  | 0.4  | 25.5 |      |      | 5.7   |      |      |       |
|                    |      | 3   | 0.3   | 0.8  |      |      | 4.6  |      | 1.3  |       | 24.6 |      | 1.3   |
| Yellow Point       | 2    | 1   | 10.1  |      |      | 3.0  | 8.8  |      |      |       | 1.4  |      | 0.1   |
|                    |      | 4   | 13.6  | 2.8  | 0.7  | 0.7  | 12.6 |      |      |       |      |      | 0.2   |
| Bowser             | 3    | 1   | 0.4   |      |      | 1.1  | 0.2  |      |      | 4.5   |      |      |       |
|                    |      | 3   | 2.0   | 0.3  | 0.1  | 0.2  | 3.7  |      | 0.2  |       |      |      | 0.2   |
| Henry Bay          | 4    | 1   | 130.3 |      | 1.7  | 2.2  | 20.2 |      |      | 18.0  |      |      |       |
|                    |      | 3   | 48.9  |      | 0.6  | 0.3  | 4.0  |      |      | 32.4  |      |      |       |
| French Creek       | 5    | 1   | 142.6 |      |      |      | 10.6 |      |      |       |      |      |       |
|                    |      | 3   |       | 0.4  |      |      | 3.2  |      | 0.2  | 25.8  |      |      |       |
| Trincomali Channel | 6    | 1   | 3.4   |      | 0.3  | 6.4  | 2.3  | 0.1  |      | 4.9   | 0.1  |      |       |
|                    |      | 3   | 4.4   |      |      | 1.3  | 2.5  |      |      | 2.5   |      |      |       |
| Smelt Bay          | 8    | 1   | 0.9   |      |      | 0.1  | 0.6  |      | 0.3  |       |      |      |       |
|                    |      | 2   | 24.5  | 4.0  |      |      | 0.6  |      | 0.6  |       |      |      | 2.3   |
| Atrevida Reef      | 9    | 1   | 3.1   |      | 0.2  | 0.2  | 9.4  |      |      | 17.8  | 1.5  |      |       |
|                    |      | 3   | 1.2   |      |      |      |      |      | 1.2  |       | 3.5  |      | 133.2 |
| Cape Cockburn      | 10   | 3   |       |      |      |      | 5.0  |      | 66.7 |       | 28.8 |      | 2.3   |
|                    |      | 5   | 0.3   |      |      |      | 11.9 |      | 2.9  | 2.6   | 0.3  |      | 0.1   |
| Secret Cove        | 11   | 1   | 5.9   |      | 0.4  | 0.4  | 18.3 |      | 1.1  | 111.3 | 23.4 |      |       |
|                    |      | 3   | 0.4   |      |      |      | 0.2  | 6.3  | 1.4  | 17.1  | 37.1 | 0.2  | 0.2   |

Table 13 continued...

| Location           | Tran | Stn | EUPH | EUPL | FISHL | GAST | LARV   | METR | MPAC | MYSI | OATL | OBOR | OSIM  |
|--------------------|------|-----|------|------|-------|------|--------|------|------|------|------|------|-------|
| Clarke Rock        | 1    | 1   | -    | -    | -     | -    | 2569.2 | -    | -    | -    | -    | -    | 28.4  |
|                    |      | 3   | -    | -    | -     | -    | 2274.2 | -    | 0.3  | -    | -    | -    | 82.1  |
| Yellow Point       | 2    | 1   | -    | -    | -     | -    | 94.5   | -    | -    | -    | -    | -    | 1.4   |
|                    |      | 4   | -    | -    | -     | -    | 198.8  | -    | -    | -    | -    | -    | 2.8   |
| Bowser             | 3    | 1   | -    | 1.5  | -     | 7.5  | 498.0  | -    | -    | -    | -    | -    | -     |
|                    |      | 3   | 0.8  | 0.1  | -     | -    | 133.6  | -    | 0.5  | -    | -    | 0.7  | 6.6   |
| Henry Bay          | 4    | 1   | -    | -    | 0.6   | 18.0 | 1851.2 | -    | -    | -    | -    | -    | 107.8 |
|                    |      | 3   | -    | -    | -     | -    | 763.2  | -    | 0.3  | -    | -    | -    | -     |
| French Creek       | 5    | 1   | -    | -    | -     | 11.7 | 1439.5 | -    | -    | -    | -    | -    | 117.0 |
|                    |      | 3   | -    | 0.2  | -     | 6.5  | 552.2  | -    | 8.1  | -    | -    | -    | 138.8 |
| Trincomali Channel | 6    | 1   | -    | -    | -     | 19.4 | 213.7  | -    | -    | -    | -    | -    | 4.9   |
|                    |      | 3   | -    | -    | -     | 25.1 | 323.5  | -    | -    | -    | -    | -    | -     |
| Smelt Bay          | 8    | 1   | -    | 5.3  | -     | -    | 201.5  | -    | -    | -    | -    | -    | 17.8  |
|                    |      | 2   | -    | 3.4  | 0.2   | -    | 463.0  | -    | -    | -    | -    | -    | 3.4   |
| Atrevida Reef      | 9    | 1   | -    | -    | 0.2   | 13.3 | 151.0  | -    | -    | 0.2  | -    | -    | 14.8  |
|                    |      | 3   | -    | -    | -     | -    | 79.0   | -    | 49.5 | -    | 9.4  | -    | -     |
| Cape Cockburn      | 10   | 3   | -    | 0.9  | -     | -    | 20.7   | 5.4  | -    | -    | 16.2 | -    | 30.6  |
|                    |      | 5   | -    | -    | -     | -    | 3.7    | 0.2  | -    | -    | -    | -    | 3.4   |
| Secret Cove        | 11   | 1   | -    | 5.9  | -     | 11.7 | 1060.3 | -    | -    | -    | -    | -    | 123.0 |
|                    |      | 3   | -    | -    | -     | -    | 517.2  | -    | 0.5  | -    | -    | -    | 88.6  |

Table 13 continued...

| Location           | Tran | Stn | OSTR | PELE | POLY | PPAR  | PSEU | SHRI | SIPH  | SMIN | TSPI | UCAL | UHAR |
|--------------------|------|-----|------|------|------|-------|------|------|-------|------|------|------|------|
| Clarke Rock        | 1    | 1   | -    | -    | 17.0 | 130.4 | -    | 0.4  | 0.4   | -    | -    | 34.0 | -    |
|                    |      | 3   | -    | -    | -    | 321.7 | 28.2 | 0.3  | 1.0   | -    | -    | -    | -    |
| Yellow Point       | 2    | 1   | -    | -    | -    | 5.6   | 1.4  | 1.2  | 87.7  | -    | -    | 0.2  | -    |
|                    |      | 4   | -    | -    | 8.4  | 92.4  | -    | 3.8  | 118.6 | -    | -    | -    | -    |
| Bowser             | 3    | 1   | -    | -    | -    | 17.9  | -    | 2.4  | 12.9  | -    | -    | -    | -    |
|                    |      | 3   | -    | -    | 0.7  | 30.3  | -    | 2.8  | 6.9   | -    | 0.2  | -    | -    |
| Henry Bay          | 4    | 1   | -    | -    | 55.0 | 197.7 | -    | 4.5  | 200.0 | -    | -    | 55.0 | -    |
|                    |      | 3   | -    | -    | 13.9 | 41.6  | -    | 1.2  | 87.3  | -    | -    | 0.6  | -    |
| French Creek       | 5    | 1   | -    | 11.7 | 70.2 | 105.3 | -    | 13.2 | 50.1  | -    | -    | -    | -    |
|                    |      | 3   | -    | -    | -    | 165.5 | 3.2  | -    | 27.0  | -    | 0.4  | -    | -    |
| Trincomali Channel | 6    | 1   | 0.6  | -    | 9.8  | 53.4  | 19.4 | 10.6 | 2.7   | -    | -    | 19.4 | -    |
|                    |      | 3   | -    | -    | 7.6  | 172.4 | 10.0 | 2.7  | 13.2  | -    | -    | 0.2  | -    |
| Smelt Bay          | 8    | 1   | -    | -    | -    | 90.9  | -    | -    | 3.1   | -    | -    | -    | -    |
|                    |      | 2   | -    | -    | 0.2  | 140.9 | -    | 2.3  | 261.9 | -    | -    | 13.6 | 3.4  |
| Atrevida Reef      | 9    | 1   | -    | -    | -    | 75.5  | -    | 4.8  | 7.0   | -    | 1.3  | 4.4  | 4.4  |
|                    |      | 3   | -    | -    | -    | 41.3  | 1.2  | -    | -     | -    | -    | 10.6 | -    |
| Cape Cockburn      | 10   | 3   | -    | -    | 10.4 | 67.6  | 25.2 | -    | 0.5   | -    | -    | 3.6  | -    |
|                    |      | 5   | -    | -    | -    | 12.9  | 13.9 | -    | 0.1   | 0.8  | -    | -    | -    |
| Secret Cove        | 11   | 1   | -    | -    | -    | 99.6  | 20.5 | -    | 23.1  | 11.7 | -    | -    | -    |
|                    |      | 3   | -    | -    | 1.8  | 138.6 | 11.4 | 0.2  | 26.8  | -    | -    | -    | -    |