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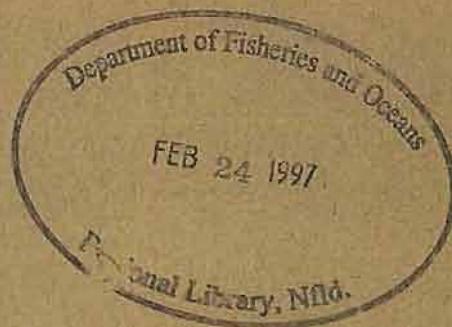


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**Cruise Details and Biological Information from  
the Pacific Ocean Perch Larval Surveys Aboard  
the R/V W. E. Ricker, April 16-30 1992, and June  
9-18 1993.**

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V9R 5K6



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**Canadian Data Report of  
Fisheries and Aquatic Science 984**



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CRUISE DETAILS AND BIOLOGICAL INFORMATION FROM THE  
PACIFIC OCEAN PERCH LARVAL SURVEYS ABOARD THE  
*R/V W.E. RICKER*, APRIL 16-30, 1992, AND JUNE 9-18, 1993.

by

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## ABSTRACT

Cornthwaite, A.M., W. Carolsfeld, G.E. Gillespie, B.M. Leaman, and R.D. Stanley. 1996. Cruise details and biological information from the Pacific ocean perch larval surveys aboard the *R/V W.E. RICKER*, April 16-30, 1992, and June 9-18, 1993. Can. Data Rep. Fish. Aquat. Sci. 984: 97 p.

Results of the 1992 and 1993 research cruises to investigate the geographic and bathymetric distribution of larvae of Pacific ocean perch (*Sebastodes alutus*) are presented. The study area consisted of stations at specific and variable depths along five transect lines in Queen Charlotte Sound. The same stations were sampled from 1991-1993 but, in each year, additional stations were established between the main transect lines to ensure complete detection of larvae. Four bottom trawl tows, 84 Tucker trawl tows, and 24 neuston net tows were completed during the 1992 cruise, while 74 Tucker trawl tows and one neuston net tow were completed during the 1993 cruise.

Biological samples were collected from adult *S. alutus* captured in conventional trawls. Larvae provisionally identified as *S. alutus* were extracted from plankton samples and preserved in alcohol for subsequent verification, genetic analysis, and age determination. Plankton samples were preserved for laboratory analyses. Larval composition and identification for samples was determined in the laboratory for *Sebastodes* and other fish larvae. Larval density was calculated for *S. alutus*.

The larval distribution for *S. alutus* in 1992 and 1993 confirms and extends the findings on the early life history of this species derived from the previous survey. Pacific ocean perch larvae are extruded at 250-500 m depth in the spring of the year and exhibit very gradual movement to shallower waters during subsequent months. The pattern of larval distribution with depth and time suggests that this species takes advantage of increased upwelling during the spring-summer transition to achieve directed transport into the areas of adult stock residence. This deepwater pattern differs greatly from the surface orientation of many spring-spawning groundfish.

## RÉSUMÉ

Cornthwaite, A. M., W. Carolsfeld, G.E. Gillespie Bruce Leaman, and R.D. Stanley. 1996.

Résultats des campagnes de recherche et information biologique sur les larves de sébaste à longue machoire (*Sebaste alutus*) abord du Bateau scientifique W. E. Ricker du 16 au 30 Avril 1992 et du 9 au 18 Juin 1993. Can. Data. Rep. Fish. Aquat. Sci. 984: 97p.

Nous présentons les résultats des campagnes de recherche de 1992 et 1993 visant la distribution géographique des larves de sébaste à longue machoire (*Sebaste alutus*). La zone d'étude se composait de stations disposées à des profondeurs spécifiques et variables le long de cinq transects tracés dans le bassin de la Reine-Chalotte. Les mêmes stations étaient échantillonnées depuis 1991-1993 mais, chaque année, on a fixé entre les lignes de transects des stations supplémentaires pour garantir une détection complète des larves. Pendant la campagne de 1992, on a effectué 4 traits au chalut de fond, 84 traits au chalut tucker et 24 traits à neuston, contre 74 traits au chalut Tucker et un trait au chalut à neuston en 1993.

Des échantillons de *S. alutus* ont été prélevés dans des prises faites au chalut conventionnel. Des larves provisoirement identifiées comme *S. alutus* ont été extraites des échantillons de plancton et conservées dans l'alcool en vue d'opérations subséquentes de vérification, d'analyse génétique et de mesure de l'âge. Les échantillons de plancton ont été conservés pour les analyses de laboratoire. On a déterminé au laboratoire la composition et l'identification des larves dans les échantillons, en recherchant *S. alutus* et les larves d'autres poissons. On a calculé la densité des larves de *S. alutus*.

La distribution des larves de *S. alutus* en 1992 et 1993 confirme et élargit les découvertes de la campagne précédente sur les premiers stades biologiques de l'espèce. Les larves de sébaste à longue machoire sont pondus à une profondeur de 250-500 m au printemps, et se déplacent très graduellement vers les eaux moins profondes pendant les mois suivants. Le schéma de la distribution des larves en fonction de la profondeur et du temps permet de penser que cette espèce profite de l'intensification des remontées d'eau pendant la transition printemps-été pour se faire transporté de façon directe vers les zones de résidence du stock adulte. Ce schéma de déplacement en eau profonde diffère nettement de l'orientation en surface de nombreux poissons de fond qui pondent au printemps.

## INTRODUCTION

Pacific ocean perch (*Sebastodes alutus*) is a major component of the British Columbia trawl fishery. Stocks of this species are characterized by large variation in reproductive success, with the age structure of the standing stock dominated by only a few cohorts (Archibald et al. 1981), although the conditions leading to successful recruitment of such cohorts are not well understood (Leaman 1990). The lack of knowledge on the early dispersion and habitat of *S. alutus* larvae and juveniles also hampers the analysis of stock and environmental influences on cohort strengths. For commercially valuable species such as *S. alutus*, knowledge of the reproductive patterns and early life history, or at least the ability to detect strong cohorts years before they recruit to the fishery, could be a valuable tool in the management of the fishery (Gillespie et al. 1992).

In 1991, the Stock Assessment and Recruitment Biology Program at the Pacific Biological Station initiated a 5-year investigation into the larval and juvenile stages of *S. alutus* stocks in Queen Charlotte Sound. The objectives of the investigation were to determine the areas of origin and dispersion of *S. alutus* larvae, characterize the oceanographic environments of these areas, and use these data to develop a quantitative model of the factors influencing cohort success and the process of recruitment into the adult stock units of Queen Charlotte Sound.

The first research cruise was conducted in March of 1991 and coincided with the beginning of parturition (larval release) for *S. alutus*. Larvae were sampled at a systematic grid of stations in Queen Charlotte Sound to determine changes in their density, and their geographic and bathymetric distribution throughout the month of March. The 1992 and 1993 research cruises occurred during successively later months in the year (April and June, respectively) and occupied the same sampling stations established during the 1991 cruise. The purpose of these two cruises was to continue tracking any movement of larvae from the deepwater spawning grounds toward their juvenile habitat. In all years, potential diel behavioural movement among depths was assessed by 24-h, multiple-depth sampling at a selected reference station.

## METHODS

### VESSEL AND NETS

The vessel used for the cruises was the *R/V W.E. RICKER*, a 57.3 m stern trawler. Conventional bottom trawl tows were made with an Atlantic Western IIIa bottom trawl, using 1200-kg, Polyvalent steel doors, and a combined bridle/sweep length of 46 m (Appendix Fig. 1). Plankton and fish larvae were collected with a three-opening 1 m<sup>2</sup> Tucker trawl and a 0.5 by 0.5 m neuston net, as in the 1991 Pacific ocean perch larval survey (Gillespie et al. 1992).

### STATION LOCATIONS

The sampling grid consisted of twenty stations along five transect lines, A-E, replicating the stations established for the 1991 larval survey (Table 1, Fig. 1; Gillespie et al. 1992). In 1992, one additional station was established approximately midway between D300 and C100, corresponding to the area of highest larval abundance. This station was labelled F300 and was not sampled in the following year. In 1993, 17 additional stations were established in the areas between transects B-E in order to determine whether larvae were dispersing in narrow bands between the transects. These stations are labelled G1-G14 in Fig. 1.

In both years, sampling procedures were similar to those in the 1991 survey (Gillespie et al. 1992). In 1992, four conventional trawl tows were carried out at Station C300. In both years, plankton samples were collected by Tucker trawl and neuston net tows. CTD data were collected at each of the original stations.

#### TUCKER AND NEUSTON SAMPLING

At each sampling station, the three-net Tucker trawl was deployed obliquely to depth, then towed horizontally at the target depth for 15 min, followed by an oblique retrieval to the surface. Deployment and retrieval were at cable speeds of 1 m/sec. Target towing speed was 1.5 kt during the entire tow. The range of actual speeds was 0.9-3.3 kt, with an average of 1.9 kt in 1992 and 1.6 kt in 1993. The first net was open during deployment. When the target depth was reached, a messenger was sent to close the first net and open the second net. A second messenger was sent after 15 min to close the second net and open the third net for the oblique retrieval. Each sample therefore consisted of two oblique tows and one horizontal tow at the target depth.

For all of the original stations except C300, and D300 in 1993, two Tucker trawls were carried out at target depths of 50 m below the surface and 50 m above the bottom, where depths permitted. For diel sampling at Station C300, the complete target depth series was occupied in a repeating sequence for 24 h at approximately 1 h intervals. In 1992, two 24-h surveys were carried out at Station C300, with target depths of 0 m, 25 m, and 50 m increments from 50-550 m. In 1993, one 24-h survey was carried out at C300, with target depths from 50-250 m only. Three Tucker trawls were carried out at Station D300 in 1993 at target depths of 25 m, 50 m, and 325 m. In 1992, three Tucker trawls were carried out at the additional station, F300, with target depths of 100 m, 200 m, and 250 m. In 1993, one Tucker trawl was carried out at each additional station, G1-G14, with a target depth of 50 m. One additional normal Tucker trawl and two high speed (> 2 kt) Tucker trawls were carried out at Station G9.

The neuston net was deployed approximately 5-10 m off the starboard quarter and secured to a towing point on the starboard rail for the duration of the tow. The net was towed at 1.5 kt for 15 min and deck lights were extinguished for all tows. In 1992, one neuston net tow was carried out at each of the original sampling stations. In 1993, one neuston net tow was carried out at Station D300 only.

#### SAMPLING OF TOWS

Species nomenclature used in this report follows Gillespie (1993). The 1992 conventional tows were sampled as in Gillespie et al. (1992). Adult Pacific ocean perch were sampled for fork length (to the nearest cm), sex, maturity, and sagittal otoliths for subsequent ageing in the laboratory. The codes used for rockfish maturity stages (Table 2) are those of Gillespie et al. (1992).

In both years, plankton samples were examined briefly at sea to determine the presence of *Sebastodes* larvae. Larvae provisionally identified as *S. alutus* were extracted from the plankton samples and stored in 90% ethanol for future verification, daily growth ring counts, and DNA analyses. The remainder of the plankton was preserved in 3.75% buffered formaldehyde for final identification and enumeration of larvae in the laboratory.

## CALCULATION OF LARVAL DENSITY

Larval density for Pacific ocean perch and other rockfish was calculated as the number of larvae per 1000 m<sup>3</sup> as:

$$D = \left( \frac{N_l}{V} \right) (1000)$$

$D$  = larvae per 1000 m<sup>3</sup>

$N_l$  = number of larvae in sample

$V$  = volume sampled (m<sup>3</sup>)

The volume sampled by the nets was calculated on the basis of flowmeter revolutions during a sample as:

$$V = (C)(R_f)(A)$$

$V$  = volume sampled (m<sup>3</sup>)

$C$  = General Oceanic flowmeter constant

$R_f$  = flowmeter revolutions

$A$  = mouth area of net (m<sup>2</sup>)

The General Oceanic flowmeter constant was 0.0363 m/revolution. This represents the average distance towed to make one revolution of the flowmeter. Several different flowmeters were used interchangeably during cruises and the constant used is an average of the values for all flowmeters (Bill Shaw, pers. comm.). The mouth area of the net was 1 m<sup>2</sup>.

## EFFECT OF VESSEL SPEED

In 1993, two normal speed ( $\leq 2.5$  kt) and two high speed ( $> 2.5$  kt) Tucker trawl tows were carried out at Station G9 to determine if increasing vessel speed affected larval capture. All four tows had a target depth of approximately 50 m, lasted approximately twenty minutes, and took place on the same day within a four hour time span. The two normal tows were carried out at approximately opposite headings, and each was paired with a fast tow at a similar heading.

## RESULTS

### CATCH

Four bottom trawls were completed during the 1992 cruise (Appendix Table 1). *S. diploproa* and *S. alutus* accounted for more than 80% of the total catch (Table 3). A total of 24 species of fish were captured in these tows (Appendix Table 2).

One hundred and eighty-three plankton tows were carried out during the two cruises. In 1992, 108 tows were completed, of which 84 used the three-stage Tucker trawl and 24 used the

neuston net (Appendix Tables 3 and 4). In 1993, 75 tows were completed, of which 74 used the Tucker trawl, and one used the neuston net (Appendix Tables 5 and 6). Tucker middle net samples from both years and the neuston sample from 1993 were processed in the laboratory. Diversity of larval fish captured was high, with more than five taxonomic orders represented in the catch (Appendix Table 7). Diversity was highest in 1993, when at least 28 species of larval fish other than *Sebastodes* spp. were identified. At least 19 species of larval rockfish were identified from the two cruises. No *Sebastodes* larvae were apparent in the initial examination at sea of the 1992 neuston samples. These neuston samples will be processed at a later date and the results presented in a subsequent report.

## OCEANOGRAPHIC DATA

In 1992 and 1993, 20 successful conductivity/temperature/depth probe (CTD) casts were made in the study area at the main sampling stations (Appendix Tables 8 and 9). The data logger recorded all parameters three times per second, but the data are summarized here by 10 m depth intervals. Comparison of CTD data from 1991-1993 shows that, as expected, temperature in the shallower depths (0-150 m) increased between early spring and early summer (Fig. 2). No temperature dependence in larval density distribution was evident when temperature at depth was compared with density at temperature. In 1991, larvae were encountered in a depth range of approximately 50-250 m, over which temperature remained constant at 7-8 °C. In 1992 and 1993, most larvae were encountered in the same depth range, but temperature had increased to 9-10 °C above 150 m, while remaining at 7-8 °C in deeper water. Plots of density vs. temperature (Fig. 3) therefore showed peaks at 7-8 °C in all years, and additional peaks at 9-10 °C in 1992 and 1993.

## BIOLOGICAL SAMPLES OF ADULT FISH

Biological samples of adult *S. alutus* were taken from the four conventional tows in 1992 (Table 4). The sample from haul 1, conducted at the beginning of the cruise, was 74% female. Of these, 73% were spent or resting (maturity stages 6 or 7), 19% were in advanced stages of development, carrying either fertilized eggs (stage 4) or eyed larvae (stage 5), and the remainder were immature (stages 1 or 2). The remaining hauls were taken at the end of the cruise and showed the progress of spawning during the period of the survey. The sample from haul 2 was all female, of which 37% were resting and the remainder were immature fish. Samples from haul 3 were 69% female, with 94% resting and the remainder immature. The sample from haul 4 was 76% percent female. Of these, 95% were spent or resting, 3% were carrying eyed larvae, and the remainder were immature.

## ANALYSIS OF PLANKTON SAMPLES

Plankton samples were examined from the 2nd Tucker trawl net, i.e. the target depth net, for both years. In addition, the neuston net sample was also examined in 1993. In 1992, *S. alutus* larvae were present in 61 samples (Table 5). *S. babcocki* larvae were present in nine samples, *S. crameri* were present in two samples, *S. paucispinis* in two samples, and one sample contained a *Sebastolobus alascanus* larva (Table 6). Numerically, *S. babcocki* were the most abundant of the other rockfish larvae encountered during 1992. Unidentifiable *Sebastodes* larvae were present in 103 samples (Table 7).

In 1993, *S. alutus* larvae were present in 22 samples (Table 8). Reliably identified *S. babcocki*, *S. helvomaculatus*, and *S. paucispinis* larvae were present in 25, 21, and five samples, respectively (Table 9). Forty-eight samples contained *Sebastes* larvae which could be identified only provisionally, of which *S. brevispinis* was the most abundant (Table 10). Thirty-seven samples contained *Sebastes* or Allosebastes larvae which could not be identified to species (Table 11). Fifty-four samples contained larvae of other fish, within which Myctophids formed the dominant group (Table 12).

Larval densities were averaged over each station, and grouped by tow depth into samples from greater than or less than 100 m. In 1992, 21 stations were sampled. Sixteen stations had samples from <100 m, of which seven had no *S. alutus* larvae, and nine had densities ranging from 1.35 to 461.10 larvae/1000 m<sup>3</sup> (Table 13). Seventeen stations had samples from >100 m, of which three had no *S. alutus* larvae, and 14 had densities ranging from 0.20 to 1033.50 larvae/1000 m<sup>3</sup> (Table 14). In 1993, 34 stations were sampled. Thirty-four stations had samples from <100m, of which 24 had no *S. alutus* larvae, and 10 had densities ranging from 0.50 to 11.50 larvae/1000 m<sup>3</sup> (Table 15). Sixteen stations had samples from >100 m, of which 13 had no *S. alutus* larvae, and 3 had densities ranging from 1.00 to 3.09 larvae/1000 m<sup>3</sup> (Table 16).

In 1991, low densities of larvae were encountered throughout the study grid, predominantly along the edge of the continental shelf near the area of parturition. This low density is correlated with the results from bottom trawl sampling showing that less than 10% of the adult females had completed parturition (Gillespie et al. 1992). The highest abundances of larvae were encountered in deeper tows (>100 m) (Figs. 4 and 5). In 1992, when the cruise coincided with the completion of parturition, larval densities were much higher overall than in 1991. The highest abundances were still located near the area of parturition and at depths >100 m, but there was also evidence of increased larval abundance nearer the mouths and in the centres of the gullies bordering Goose Island Bank (Figs. 6 and 7). *S. alutus* larvae were encountered to depths of at least 569 m in 1992. In 1993, lower larval densities were encountered than in either of the previous years. The highest abundances were encountered at depths <100 m, indicating an upward movement of larvae in the water column, but areal distribution was similar to that of 1992 (Figs. 8 and 9).

In 1991 and 1992, comparison of the early and late series densities at Station C300 show temporal changes in both distribution and density (Fig. 10). A marked increase in overall larval density was apparent between the early and late series in 1991, with late series larvae concentrated at the depth of parturition. In 1992, most larvae were located at the depth of parturition in the early series, while in the late series density had almost doubled and larvae were distributed more evenly between the >175 m and 125-174 m depth intervals.

Comparison of the proportions of total larval density in each depth interval at Station C300 among years showed a trend of increasingly shallower distribution with months after parturition (Fig. 11). In 1991 and 1992, the highest density of larvae was overwhelmingly in the >175 m depth range, although in 1992 a greater proportion than in 1991 was captured in the 125-174 m depth range. In 1991 a slightly higher proportion of the total than in 1992 was captured at >175 m, due to lower numbers of larvae in the shallowest samples. In 1993, the highest abundance of larvae was encountered in the 75-124 m depth range with very few larvae found at the normal depth of parturition, as in previous years.

Larval density at Station C300 for all years (1991-1993) showed diel differences in density and distribution (Fig. 12). In 1991, overall catch rates of larvae were higher nocturnally but the depth distribution of larvae was remarkably similar between day and night. In contrast, 1992 sampling showed a deeper centre of distribution nocturnally but with approximately equal density of larvae nocturnally in the centre of the diurnal distribution. The 200-m depth stratum showed the greatest diel difference in abundance during 1992. The diel distribution of larvae in 1993 can only be inferred due to small sample sizes in the Tucker trawls. Highest density was obtained in diurnal samples, centred in the 75 m stratum. Nocturnal samples showed only limited abundance in the 25-75 m range.

#### EFFECT OF VESSEL SPEED

The effect of vessel speed on larval capture can only be inferred due to the small number of tows in which this test was carried out and the small sample sizes in the tows. Comparison of data collected for samples from normal ( $\leq 2.5$  kt) and high speed ( $> 2.5$  kt) tows at Station G9 suggests that larval capture may increase when tow speed exceeds 2.5 kt (Table 17). However, as the average tow speed in each year was less than 2.5 kt, this effect should be negligible.

#### ACKNOWLEDGEMENTS

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Table 1. Approximate location of stations occupied by the *R/V W.E. RICKER* during the Pacific ocean perch larval surveys, April 16-30, 1992, and June 9-18, 1993.

Station No.	Approximate location
A200	51°59' N x 129°19' W
A300	51°50' N x 129°42' W
A400	51°39' N x 130°09' W
A2000	51°27' N x 130°40' W
B100	51°43' N x 129°29' W
B200	51°34' N x 129°51' W
B300	51°31' N x 129°59' W
B400	51°28' N x 130°04' W
C100	51°30' N x 129°28' W
C200	51°25' N x 129°42' W
C300	51°17' N x 130°00' W
C2000	51°07' N x 130°26' W
D100	51°30' N x 128°44' W
D200	51°25' N x 128°54' W
D300	51°18' N x 129°12' W
D400	51°08' N x 129°45' W
E100	51°09' N x 128°49' W
E200	51°01' N x 129°20' W
E300	50°56' N x 129°42' W
E2000	50°50' N x 129°54' W
F300	51°20' N x 129°27' W
G1	51°21' N x 128°53' W
G2	51°18' N x 128°52' W
G3	51°15' N x 128°51' W
G4	51°11' N x 128°51' W
G5	51°05' N x 129°31' W
G6	51°12' N x 129°41' W
G7	51°23' N x 130°02' W
G8	51°28' N x 129°54' W
G9	51°17' N x 129°34' W
G10	51°16' N x 129°20' W
G11	51°11' N x 129°16' W
G12	51°26' N x 128°55' W
G13	51°28' N x 128°55' W
G14	51°36' N x 128°56' W

Table 2. Description of rockfish gonad maturity stages.

Code	Gonad Condition	
	Females	Males
1	Immature (translucent, small)	Immature (translucent, string-like)
2	Developing (small, yellow eggs, opaque or translucent)	Developing (swelling, brown-white)
3	Developed (large yellow eggs, opaque)	—
4	Fertilized (large, orange-yellow eggs, translucent)	Developed (large, white, easily broken)
5	Embryos or larvae (includes eyed eggs)	Ripe (running sperm)
6	Spent (large, flaccid, red ovaries; a few larvae may be present)	Spent (flaccid, red)
7	Resting (moderate size, firm, red-grey ovaries)	Resting (ribbon-like, small brown)

Table 3. Catch weight (kg) and percent total catch of major species captured with conventional trawl gear, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Species	Weight (kg)	Percent of Total catch
<i>Sebastodes diploproa</i>	4582	45.18
<i>S. alutus</i>	4306	42.46
<i>S. reedi</i>	543	5.35
<i>S. crameri</i>	296	2.92
<i>Sebastolobus alascanus</i>	184	1.81
Other fish	230	2.27
Total	10141	100

Table 4. Length frequency and maturity summaries of Pacific ocean perch, *Sebastodes alutus*, captured by conventional trawl, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Area	060810		060802		051112		060810			
Date	April 18		April 27		April 27		April 27			
Depth (m)	286		259		540		265			
Tow No.	1		2		3		4		Total	
Length (cm)	M	F	M	F	M	F	M	F	M	F
19	-	-	-	1	-	-	-	-	-	1
20	-	-	-	0	-	-	-	-	-	0
21	-	-	-	3	-	-	-	-	-	3
22	-	-	-	0	-	-	-	-	-	0
23	-	-	-	1	-	-	-	-	-	1
24	-	-	-	1	-	-	-	-	-	1
25	-	-	-	4	-	-	-	-	-	4
26	-	-	-	1	-	-	-	-	-	1
27	-	-	-	1	-	-	-	-	-	1
28	-	-	-	4	-	-	-	-	-	4
29	-	-	-	4	-	-	-	-	-	4
30	-	-	-	5	-	-	-	-	-	5
31	1	-	-	3	-	-	1	-	2	4
32	0	-	-	3	-	-	0	1	0	6
33	0	2	-	1	1	2	1	0	2	5
34	2	4	-	6	3	2	1	1	6	13
35	2	4	-	2	5	3	1	1	8	10
36	4	7	-	5	3	4	3	6	10	22
37	7	2	-	3	3	4	3	11	13	20
38	12	16	-	5	6	12	6	7	2	40
39	5	15	-	4	8	10	5	7	18	36
40	2	15	-	1	9	7	4	8	15	31
41	0	9	-	1	3	18	5	12	8	0
42	1	11	-	0	3	35	0	17	3	3
43	-	9	-	0	-	-	2	11	2	32
44	-	3	-	1	-	-	-	4	0	15
45	-	2	-	-	-	-	-	7	1	16
46	-	1	-	-	-	-	-	5	-	9
47	-	-	-	-	-	-	-	1	-	1
48	-	-	-	-	-	-	-	1	-	1
Maturity										
1	7	0	-	8	5	1	3	0	15	9
2	0	8	-	30	11	5	8	2	19	45
3	0	0	-	0	0	0	0	0	0	0
4	0	2	-	0	0	0	0	0	0	2
5	0	17	-	0	0	0	0	3	0	20
6	0	12	-	0	0	0	0	3	0	15
7	29	61	-	22	28	94	21	92	78	269
Total	36	100	-	60	44	100	32	100	112	360

Table 5. Estimated larval counts for Pacific ocean perch, *Sebastodes alutus*, captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Tow No.	Station	Estimated Larval Count	Comments
7	E350	51	
8	E350	1	
11	B400	10	
12	B400	1	
14	C300	344	
15	C300	27	
16	C300	8	
18	C300	3	
19	C300	280	
21	C300	3	
23	C300	1	
26	C300	93	
27	C300	3	
28	C300	1	
29	C300	1	
30	C300	3	
31	C300	1016	
32	C300	8	
34	C300	2	
35	C300	1	
38	B300	940	
39	B300	270	
40	B200	28	
41	B200	5	
45	B100	3	
47	A200	4	
51	A300	38	
52	A400	10	
53	A400	5	
56	A2000	1	Oblique Tow.
60	C2000	1	
62	E2000	6	
63	E2000	40	
66	D400	77	
67	D400	528	
68	C200	6	
73	C100	6	
74	D300	40	
84	C300	42	
85	C300	907	
86	C300	100	
88	C300	15	
90	C300	792	
91	C300	189	
92	C300	17	
93	C300	3	
94	C300	4520	
95	C300	2942	
96	C300	123	
98	C300	7	
99	C300	5005	
100	C300	51	

Table 5. Continued.

Tow No.	Station	Estimated Larval Count	Comments
101	C300	8	—
102	C300	285	—
103	C300	480	—
104	C300	361	—
105	C300	16	—
106	C300	77	—
107	F300	124	—
108	F300	1	—
109	F300	5	—

Table 6. Estimated larval counts for rockfish (*Sebastodes* spp. and *Sebastolobus* spp.) captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval cruise, April 16-30 1992.

Tow No.	Station	Species	Estimated Larval Count
18	C300	<i>Sebastodes babcocki</i>	3
33	C300	<i>S. babcocki</i>	375
40	B200	<i>S. babcocki</i>	5
41	B200	<i>S. babcocki</i>	22
45	B100	<i>S. babcocki</i>	1
47	A200	<i>S. babcocki</i>	2
85	C300	<i>S. babcocki</i>	5
98	C300	<i>S. babcocki</i>	5
99	C300	<i>S. babcocki</i>	6
106	C300	<i>S. crameri</i>	1
107	F300	<i>S. crameri</i>	18
56	A2000	<i>S. paucispinis</i>	2
105	C300	<i>S. paucispinis</i>	1
59	C2000	<i>Sebastolobus alascanus</i>	1

Table 7. Estimated larval counts for unidentifiable rockfish (*Sebastodes* spp.) captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Tow No.	Station	Estimated Larval Count	Comments
6	E200	9	Damaged specimen.
6	E200	33	Could be <i>S. mystinus</i> .
6	E200	1	Hypural spot.
7	E350	6	Could be <i>S. alutus</i> . (Damaged.)
11	B400	5	Could be <i>S. alutus</i> . (Damaged.)
11	B400	2	Head and dorsal spots.
14	C300	340	Damaged specimen.
15	C300	10	Could be <i>S. alutus</i> . (Damaged.)
16	C300	3	Damaged specimen.
16	C300	4	Nape spots.
18	C300	2	Damaged specimen.
18	C300	13	Hypural & nape spots.
19	C300	32	Damaged specimen.
24	C300	4	
26	C300	15	Could be <i>S. alutus</i> . (Damaged.)
29	C300	1	Damaged specimen.
31	C300	116	Could be <i>S. alutus</i> . (Damaged.)
31	C300	4	Hypural spots.
32	C300	3	Could be <i>S. alutus</i> . (Damaged.)
33	C300	29	Damaged specimen.
34	C300	2	Hypural, head, and nape spots.
35	C300	3	Hypural spots.
38	B300	92	Damaged specimen.
38	B300	8	Caudal pigment.
38	B300	24	Nape spots.
39	B300	565	Could be <i>S. reedi</i> .
39	B300	80	Damaged specimen.
40	B200	8	Damaged specimen., hypural spots
41	B200	1	Could be <i>S. reedi</i> .
44	B100	1	
45	B100	6	Hypural, head, and nape pigment.
45	B100	1	Could be <i>S. maliger</i> .
52	A400	4	Could be <i>S. alutus</i> . (Damaged.)
53	A400	1	Damaged specimen.
53	A400	3	Head spots.
53	A400	1	Could be <i>S. crameri</i> .
56	A2000	4	Hypural spots.
56	A2000	25	Lots of pigment.
56	A2000	1	Hypural and nape spots.
56	A2000	19	Head, nape, and dorsal row pigment.
57	A2000	2	Dorsal, head, and pectoral pigment.
58	A2000	1	Hypural and head spots.
58	A2000	1	Hypural spots.
59	C2000	4	Head and nape spots. (Damaged.)
60	C2000	5	Head and nape spots.
60	C2000	1	Hypural spots.
66	D400	31	Hypural spots.
66	D400	10	Damaged specimen.
67	D400	88	Damaged specimen.
67	D400	43	Head and nape spots.
67	D400	120	Caudal pigment
68	C200	3	Hypural spots. (Damaged.)

Table 7. Continued.

Tow No.	Station	Estimated Larval Count	Comments
68	C200	1	Could be <i>S. caurinus</i> .
69	C200	25	Could be <i>S. reedi/S. alutus</i> . (Damaged.)
69	C200	39	Damaged specimen.
69	C200	179	Could be <i>S. reedi</i> .
72	C100	47	Dorsal, head, nape, and gut pigment.
72	C100	7	Ventral gut pigment.
72	C100	2	P.A.V.M to anus, ventral gut pigment.
72	C100	3	Damaged specimen.
73	C100	34	Dorsal, head, and nape spots.
74	D300	6	Could be <i>S. alutus</i> . (Damaged.)
78	D200	2	Head, nape, and dorsal pigment.
79	D200	2	Could be <i>S. caurinus</i> .
80	D100	8	Head, nape, dorsal, and gut pigment.
81	D100	6	Dorsal, head, nape, and gut pigment.
84	C300	12	Hypural spot.
84	C300	6	Damaged specimen.
85	C300	40	Could be <i>S. alutus</i> . (Damaged.)
85	C300	21	Long line of P.A.V.M.
85	C300	5	Head/neck pigment; 2 mid-dorsal spots.
86	C300	1	Hypural spot.
88	C300	3	Hypural spots.
90	C300	100	Damaged specimen.
90	C300	8	Head and nape spots.
90	C300	1	Caudal pigment.
91	C300	17	Could be <i>S. alutus</i> . (Damaged.)
93	C300	3	Hypural spot.
94	C300	232	Could be <i>S. alutus</i> . (Damaged.)
94	C300	8	Nape spots.
94	C300	16	Caudal pigment.
96	C300	30	Damaged specimen.
96	C300	3	Hypural spot.
98	C300	4	Hypural, head, and nape spots.
99	C300	294	Could be <i>S. alutus</i> . (Damaged.)
99	C300	19	Head and nape spots.
99	C300	19	Caudal pigment.
100	C300	11	Damaged specimen.
100	C300	3	Hypural spots.
101	C300	8	Could be <i>S. reedi</i> .
102	C300	34	Damaged specimen.
102	C300	22	Caudal pigment.
102	C300	8	Head and caudal pigment.
103	C300	86	Damaged specimen.
103	C300	11	Head or nape pigment.
103	C300	21	Caudal pigment.
104	C300	90	Damaged specimen.
104	C300	3	Hypural spots.
105	C300	5	Damaged specimen.
105	C300	6	Chin, head, and nape/dorsal pigment.
106	C300	7	Damaged specimen.
107	F300	2	Head pigment
109	F300	1	Could be <i>S. caurinus</i> .

**Table 8:** Estimated larval counts for Pacific ocean perch, *Sebastodes alutus*, captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

Tow No.	Station	Estimated Larval Count	Comments
7	C300	9	—
7	C300	3	—
8	C300	4	—
13	C300	7	—
14	C300	2	—
20	C300	7	Provisional Identification.
21	C300	2	—
22	C2000	1	Provisional Identification.
23	C2000	8	One doubtful specimen.
25	A2000	2	Provisional Identification: (Bad shape.)
30	B300	1	—
31	B300	1	—
32	B200	4	—
43	C100	1	Provisional Identification.
44	C200	3	Provisional Identification: (Damaged.)
46	D400	16	Provisional Identification.
73	G6	9	—
76	G9	3	—
77	G9-R1	1	—
77	G9-R1	1	Provisional Identification.
77	G9-R1	3	Provisional Identification.
79	G9-R2	4	—

Table 9. Estimated larval counts for reliably identified rockfish (*Sebastodes sp.*) captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

Tow No.	Station	Species	Estimated Larval Count	Comments
4	C300	<i>S.babcocki</i>	1	—
6	C300	<i>S.babcocki</i>	2	—
8	C300	<i>S.babcocki</i>	1	—
11	C300	<i>S.babcocki</i>	5	—
13	C300	<i>S.babcocki</i>	1	—
16	C300	<i>S.babcocki</i>	6	—
18	C300	<i>S.babcocki</i>	1	—
19	C300	<i>S.babcocki</i>	1	—
20	C300	<i>S.babcocki</i>	15	—
21	C300	<i>S.babcocki</i>	1	—
23	C2000	<i>S.babcocki</i>	1	—
28	B400	<i>S.babcocki</i>	1	Specimens in bad shape.
29	B400	<i>S.babcocki</i>	1	Small specimens, in bad shape.
32	B200	<i>S.babcocki</i>	1	—
41	B100	<i>S.babcocki</i>	1	—
44	C200	<i>S.babcocki</i>	4	—
45	C200	<i>S.babcocki</i>	1	—
46	D400	<i>S.babcocki</i>	1	—
48	D400	<i>S.babcocki</i>	53	—
49	D400	<i>S.babcocki</i>	32	—
50	E30	<i>S.babcocki</i>	1	Specimen in bad shape.
57	E100	<i>S.babcocki</i>	1	—
61	G14	<i>S.babcocki</i>	1	—
73	G6	<i>S.babcocki</i>	13	—
73	G6	<i>S.babcocki</i>	1	—
21	C300	<i>S.helvomaculatus</i>	1	—
33	B200	<i>S.helvomaculatus</i>	5	—
34	A300	<i>S.helvomaculatus</i>	1	—
36	A200	<i>S.helvomaculatus</i>	15	—
37	A200	<i>S.helvomaculatus</i>	1	—
38	B100	<i>S.helvomaculatus</i>	2	—
38	B100	<i>S.helvomaculatus</i>	1	—
41	B100	<i>S.helvomaculatus</i>	1	Could also be <i>S. entomelas</i> .
41	B100	<i>S.helvomaculatus</i>	8	Provisional identification.
41	B100	<i>S.helvomaculatus</i>	5	—
42	C100	<i>S.helvomaculatus</i>	1	Specimen in very bad shape.
43	C100	<i>S.helvomaculatus</i>	1	—
43	C100	<i>S.helvomaculatus</i>	1	—
44	C200	<i>S.helvomaculatus</i>	2	—
48	D400	<i>S.helvomaculatus</i>	8	—
49	D400	<i>S.helvomaculatus</i>	3	—
50	E300	<i>S.helvomaculatus</i>	1	—
55	E200	<i>S.helvomaculatus</i>	11	—
61	G14	<i>S.helvomaculatus</i>	4	—
73	G6	<i>S.helvomaculatus</i>	3	—
73	G6	<i>S.helvomaculatus</i>	4	—
7	C300	<i>S.paucispinis</i>	1	—
23	C2000	<i>S.paucispinis</i>	1	—
46	D400	<i>S.paucispinis</i>	1	—
61	G14	<i>S.paucispinis</i>	1	—
73	G6	<i>S.paucispinis</i>	3	—

Table 10: Estimated larval counts for provisionally identified rockfish species (*Sebastodes spp.* and *Sebastolobus sp.*) captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

Tow No.	Station	Species	Estimated Larval Count	Comments
10	C300	<i>Sebastodes aleutianus</i>	3	—
35	A300	<i>S. aleutianus</i>	1	—
24	A2000	<i>S. brevispinis</i>	3	—
34	A300	<i>S. brevispinis</i>	3	—
45	C200	<i>S. brevispinis</i>	7	—
48	D400	<i>S. brevispinis</i>	1195	—
49	D400	<i>S. brevispinis</i>	1261	—
57	E100	<i>S. brevispinis</i>	6	—
61	G14	<i>S. brevispinis</i>	131	—
61	G14	<i>S. brevispinis</i>	44	—
62	G13	<i>S. brevispinis</i>	1	Specimen in bad shape.
64	D200	<i>S. brevispinis</i>	7	—
23	C2000	<i>S. diploproa</i>	2	—
32	B200	<i>S. diploproa</i>	10	—
33	B200	<i>S. diploproa</i>	6	—
43	C100	<i>S. diploproa</i>	11	—
44	C200	<i>S. diploproa</i>	106	—
44	C200	<i>S. diploproa</i>	5	—
44	C200	<i>S. diploproa</i>	47	—
45	C200	<i>S. diploproa</i>	6	—
50	E300	<i>S. diploproa</i>	37	—
50	E300	<i>S. diploproa</i>	13	Some specimens have missing tails.
52	E300	<i>S. diploproa</i>	1	—
55	E200	<i>S. diploproa</i>	9	—
70	G11	<i>S. diploproa</i>	1	Could also be <i>S. elongatus</i> .
73	G6	<i>S. diploproa</i>	38	—
77	G9-R1	<i>S. diploproa</i>	20	—
77	G9-R1	<i>S. diploproa</i>	15	Some specimens have damaged guts.
79	G9-R2	<i>S. diploproa</i>	20	—
2	D300	<i>S. elongatus</i>	4	—
23	C2000	<i>S. elongatus</i>	4	—
33	B200	<i>S. elongatus</i>	1	—
69	G4	<i>S. elongatus</i>	1	Specimen in bad shape.
70	G11	<i>S. elongatus</i>	1	Could also be <i>S. diploproa</i> .
75	G8	<i>S. elongatus</i>	1	—
3	C300	<i>S. flavidus</i>	1	—
44	C200	<i>S. flavidus</i>	1	—
61	G14	<i>S. flavidus</i>	10	—
8	C300	<i>S. maliger</i>	1	—
48	D400	<i>S. maliger</i>	3	—
49	D400	<i>S. maliger</i>	3	—
55	E200	<i>S. maliger</i>	1	—
59	D100	<i>S. maliger</i>	1	—
61	G14	<i>S. maliger</i>	1	—

Table 10. Continued.

Tow No.	Station	Species	Estimated Larval Count	Comments
61	G14	<i>S. maliger</i>	56	—
63	G12	<i>S. maliger</i>	1	—
64	D200	<i>S. maliger</i>	5	—
7	C300	<i>S. proriger</i>	7	—
10	C300	<i>S. proriger</i>	7	—
13	C300	<i>S. proriger</i>	8	—
13	C300	<i>S. proriger</i>	5	Damaged specimens.
14	C300	<i>S. proriger</i>	5	Damaged specimens.
17	C300	<i>S. proriger</i>	8	—
19	C300	<i>S. proriger</i>	1	—
20	C300	<i>S. proriger</i>	5	—
20	C300	<i>S. proriger</i>	12	—
20	C300	<i>S. proriger</i>	4	—
28	B400	<i>S. proriger</i>	6	—
36	A200	<i>S. proriger</i>	102	—
38	B100	<i>S. proriger</i>	7	—
38	B100	<i>S. proriger</i>	8	—
52	B100	<i>S. proriger</i>	16	Could also be <i>S. variegatus</i> .
61	G14	<i>S. proriger</i>	25	—
72	G5	<i>S. proriger</i>	4	—
76	G9	<i>S. proriger</i>	6	—
6	C300	<i>S. reedi</i>	1	—
8	C300	<i>S. reedi</i>	1	—
45	C200	<i>S. reedi</i>	1	—
47	D400	<i>S. reedi</i>	1	—
74	G7	<i>S. ruberrimus</i>	5	Provisional identification.
3	C300	<i>S. variegatus</i>	4	—
6	C300	<i>S. variegatus</i>	3	—
8	C300	<i>S. variegatus</i>	1	—
11	C300	<i>S. variegatus</i>	4	—
46	D400	<i>S. variegatus</i>	5	May be later stage of other species.
55	E200	<i>S. variegatus</i>	4	Could be <i>S. diploproa</i> / <i>S. elongatus</i> .
23	C2000	<i>S. zacentrus</i>	3	—
24	A2000	<i>S. zacentrus</i>	3	—
47	D400	<i>S. zacentrus</i>	1	—
57	E100	<i>S. zacentrus</i>	1	—
64	D200	<i>S. zacentrus</i>	1	Could be <i>S. entomelas</i> /other species?
29	B400	<i>Sebastolobus sp.</i>	1	—
13	C300	<i>S. alascanus</i>	1	—
32	B200	<i>S. alascanus</i>	1	—

Table 11. Larval counts for unidentifiable rockfish (*Allosebastes* sp. and *Sebastodes* sp.) captured aboard the *R/V W.E. RICKER*, June 9-18, 1993.

Tow No.	Station	Genus/Subgenus	Estimated Larval Count	Comments
3	C300	<i>Allosebastes</i>	2	----
4	C300	<i>Allosebastes</i>	1	----
12	C300	<i>Allosebastes</i>	4	Damaged specimens.
13	C300	<i>Allosebastes</i>	2	Ventral gut damaged.
16	C300	<i>Allosebastes</i>	9	Could be <i>S. brevispinis</i> .
25	A2000	<i>Allosebastes</i>	3	Could be <i>S. brevispinis</i> or <i>S. ruberrimus</i> .
33	B200	<i>Allosebastes</i>	13	Could be <i>S. brevispinis</i> or <i>S. variegatus</i> .
37	A200	<i>Allosebastes</i>	3	Damaged specimens.
18	C300	<i>Allosebastes</i>	6	Could be <i>S. variegatus</i> . (Damaged.)
30	B300	<i>Allosebastes</i>	1	Could be <i>S. brevispinis</i> .
49	D400	<i>Allosebastes</i>	333	May be <i>S. ruberrimus</i> / <i>S. brevispinis</i> . (Damaged)
49	D400	<i>Allosebastes</i>	5	Same as above but more developed?
2	D300	<i>Sebastes</i>	2	Damaged specimens.
3	C300	<i>Sebastes</i>	2	Damaged specimens.
7	C300	<i>Sebastes</i>	1	Damaged specimen.
8	C300	<i>Sebastes</i>	1	Damaged specimen.
10	C300	<i>Sebastes</i>	3	Could be two species. (Damaged)
11	C300	<i>Sebastes</i>	2	Damaged specimens.
12	C300	<i>Sebastes</i>	3	Damaged specimen.
12	C300	<i>Sebastes</i>	1	Damaged specimen.
16	C300	<i>Sebastes</i>	4	Damaged specimens.
17	C300	<i>Sebastes</i>	2	Damaged specimens.
21	C300	<i>Sebastes</i>	3	Damaged specimens.
23	C2000	<i>Sebastes</i>	3	Damaged specimens.
24	A2000	<i>Sebastes</i>	1	Could be <i>S. reedi</i> .
24	A2000	<i>Sebastes</i>	1	Damaged specimens.
25	A2000	<i>Sebastes</i>	5	Damaged specimens.
29	B400	<i>Sebastes</i>	2	Damaged specimens.
30	B300	<i>Sebastes</i>	1	Could be <i>S. reedi</i> or <i>S. diploproa</i> .
32	B200	<i>Sebastes</i>	3	Damaged specimens.
33	B200	<i>Sebastes</i>	1	Damaged specimens.
34	A300	<i>Sebastes</i>	1	Damaged specimens.
34	A300	<i>Sebastes</i>	10	Damaged specimens.
35	A300	<i>Sebastes</i>	2	Could be two species. (Damaged.)
38	B100	<i>Sebastes</i>	3	Damaged specimens.
52	B100	<i>Sebastes</i>	2	Damaged specimens.
44	C200	<i>Sebastes</i>	1	Damaged specimens.
44	C200	<i>Sebastes</i>	2	Could be two species. (Damaged.)
44	C200	<i>Sebastes</i>	1	Could be <i>S. helvomaculatus</i> .
45	C200	<i>Sebastes</i>	1	Damaged specimens.
46	D400	<i>Sebastes</i>	8	Damaged specimens.
47	D400	<i>Sebastes</i>	4	Damaged specimens.
48	D400	<i>Sebastes</i>	5	----
49	D400	<i>Sebastes</i>	32	----
49	D400	<i>Sebastes</i>	1	----
49	D400	<i>Sebastes</i>	1	----
49	D400	<i>Sebastes</i>	2	Could be <i>S. maliger</i> . (Damaged.)
49	D400	<i>Sebastes</i>	4	Could be <i>S. helvomaculatus</i> .
49	D400	<i>Sebastes</i>	1	Could be <i>S. helvomaculatus</i> .
52	E300	<i>Sebastes</i>	2	Damaged specimens.
57	E100	<i>Sebastes</i>	1	Damaged specimens.
60	D100	<i>Sebastes</i>	1	Damaged specimens.
61	G14	<i>Sebastes</i>	13	Damaged specimens.
59	G13	<i>Sebastes</i>	1	Could be <i>S. helvomaculatus</i> .
73	G6	<i>Sebastes</i>	2	Damaged specimens.

Table 12: Larval counts for fish other than rockfish captured aboard the *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

Tow No.	Station	Species	Estimated Larval Count	Comments
7	C300	Pacific herring	2	---
7	C300	Bathylagidae	2	---
13	C300	Bathylagidae	1	---
17	C300	Bathylagidae	2	---
21	C300	Bathylagidae	4	---
22	C2000	Bathylagidae	2	---
49	D400	Bathylagidae	6	---
31	B300	Barreleye	1	---
22	C2000	Pacific viperfish	4	---
23	C2000	Myctophidae	1	---
73	G6	Myctophidae	1	---
20	C300	<i>Lampanyctus</i> sp.	2	---
48	D400	<i>Lampanyctus</i> sp.	35	---
8	C300	Northern lanternfish	2	---
10	C300	Northern lanternfish	1	---
18	C300	Northern lanternfish	1	---
19	C300	Northern lanternfish	1	---
20	C300	Northern lanternfish	1	---
23	C2000	Northern lanternfish	5	---
29	B400	Northern lanternfish	1	---
38	B100	Northern lanternfish	2	---
52	B100	Northern lanternfish	66	---
44	C200	Northern lanternfish	6	---
45	C200	Northern lanternfish	2	---
46	D400	Northern lanternfish	32	---
48	D400	Northern lanternfish	48	---
64	D200	Northern lanternfish	2	---
72	G5	Northern lanternfish	6	---
73	G6	Northern lanternfish	11	---
76	G9	Northern lanternfish	42	---
77	G9-R1	Northern lanternfish	73	---
79	G9-R2	Northern lanternfish	56	---
80	G9-R2	Northern lanternfish	1	---
52	B100	Blue lanternfish	1	---
11	C300	Northern ronquil	1	---
49	D400	Northern ronquil	6	---
49	D400	Northern ronquil	2	---
32	B200	Stichaeidae	1	---
70	G11	Stichaeidae	1	---
72	G5	Stichaeidae	1	---
7	C300	Pacific sand lance	1	---
20	C300	Pacific sand lance	2	---
43	C100	Pacific sand lance	4	---
65	D200	Pacific sand lance	1	---
34	A300	Gobiidae	1	---
33	B200	Blackeye goby	1	---
21	C300	Sablefish	1	---
26	A400	Sablefish	1	---
30	B300	Sablefish	2	---
44	C200	Sablefish	4	---
45	C200	Sablefish	5	---
43	C100	Cottidae	1	---
44	C200	Cottidae	2	---
56	E200	Cottidae	3	---
60	D100	Cottidae	9	---
64	D200	Cottidae	1	---
66	G1	Cottidae	1	---
61	G14	<i>Artedius</i> sp.	2	---
67	G2	<i>Artedius</i> sp.	2	---

Table 12. Continued.

Tow No.	Station	Species	Estimated Larval Count	Comments
59	D100	Puget Sound sculpin	1	
64	D200	Puget Sound sculpin	7	
65	D200	Puget Sound sculpin	3	
68	G3	Puget Sound sculpin	1	
59	D100	Roughback sculpin	5	
61	G14	Roughback sculpin	68	
72	G5	Sailfin sculpin	1	
30	B300	<i>Radulinus sp.</i>	1	
36	A200	<i>Radulinus sp.</i>	1	
38	B100	<i>Radulinus sp.</i>	2	
52	B100	<i>Radulinus sp.</i>	2	
59	D100	<i>Radulinus sp.</i>	1	
60	D100	<i>Radulinus sp.</i>	2	
64	D200	<i>Radulinus sp.</i>	2	
79	G9-R2	<i>Radulinus sp.</i>	1	
49	D400	Cabezon	3	
52	B100	Agonidae	18	
46	D400	Agonidae	1	
59	D100	Agonidae	2	
60	D100	Agonidae	2	
48	D400	Speckled Sanddab	48	
6	C300	Pleuronectidae	1	
28	B400	Pleuronectidae	1	
38	B100	Pleuronectidae	1	
44	C200	Pleuronectidae	1	
49	D400	Pleuronectidae	1	
59	D100	Pleuronectidae	3	
76	G9	Pleuronectidae	1	
77	G9-R1	Pleuronectidae	2	
79	G9-R2	Pleuronectidae	2	
12	C300	<i>Liparis sp.</i>	1	
17	C300	<i>Liparis sp.</i>	2	
23	C2000	<i>Liparis sp.</i>	1	
30	B300	<i>Liparis sp.</i>	1	
31	B300	<i>Liparis sp.</i>	1	
52	B100	<i>Liparis sp.</i>	3	
46	D400	<i>Liparis sp.</i>	3	
50	E300	<i>Liparis sp.</i>	1	
60	D100	<i>Liparis sp.</i>	2	
65	D200	<i>Liparis sp.</i>	1	
28	B400	Rex sole	1	
48	D400	Rex sole	3	
67	G2	Flathead sole	1	
23	C2000	Slender sole	1	
20	C300	Slender sole	1	
11	C300	Unidentified	1	
16	C300	Unidentified	1	
22	C2000	Unidentified	3	
23	C2000	Unidentified	4	
32	B200	Unidentified	1	
52	B100	Unidentified	2	
43	C100	Unidentified	4	
46	D400	Unidentified	1	
50	E300	Unidentified	1	
52	E300	Unidentified	1	
844	E2000	Unidentified	2	Mangled heads only.
55	E200	Unidentified	5	
57	E100	Unidentified	1	
59	G13	Unidentified	1	
65	D200	Unidentified	1	

Table 13. Pacific ocean perch (*Sebastodes alutus*) larval densities (larvae/1000 m<sup>3</sup>), at tow depths <100 m, averaged by station, and corrected for flow meter measured swept volumes. *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Station	Haul No.	Larvae/1000 m <sup>3</sup>
E100	1,2	0.00
E200	5	0.00
E350	8	1.80
B400	11	39.60
C300	16-18,22-24,28-30,33-35,84,89,92,93,98,101	56.46
B300	39	461.10
B200	41	4.40
B100	44,45	1.35
A200	47	4.00
A300	50	0.00
C200	69	0.00
C100	72,73	2.80
D300	75	0.00
D200	79	0.00
D100	80,81	0.00
F300	109	4.90

Table 14. Pacific ocean perch (*Sebastodes alutus*) larval densities (larvae/1000 m<sup>3</sup>), at tow depths >100 m, averaged by station, and corrected for flow meter measured swept volumes. *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Station	Haul No.	Larvae/1000 m <sup>3</sup>
E200	6	0.00
E350	7	77.30
B400	12	4.20
C300	14,15,19,21,26,27,31,32,85,86, 88, 90, 91, 94-96, 99, 100, 102-106	904.10
B300	38	1033.50
B200	40	23.90
A200	46	0.00
A300	51	33.90
A400	52,53	36.80
A2000	56-58	0.20
C2000	59,60	0.70
E2000	62,63	13.0
D400	66,67	237.40
C200	68	13.20
D300	74	46.10
D200	78	0.00
F300	107,108	44.90

Table 15. Pacific ocean perch (*Sebastodes alutus*) larval densities (larvae/1000 m<sup>3</sup>), at tow depths <100m, averaged by station, and corrected for flowmeter measured swept volumes. *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

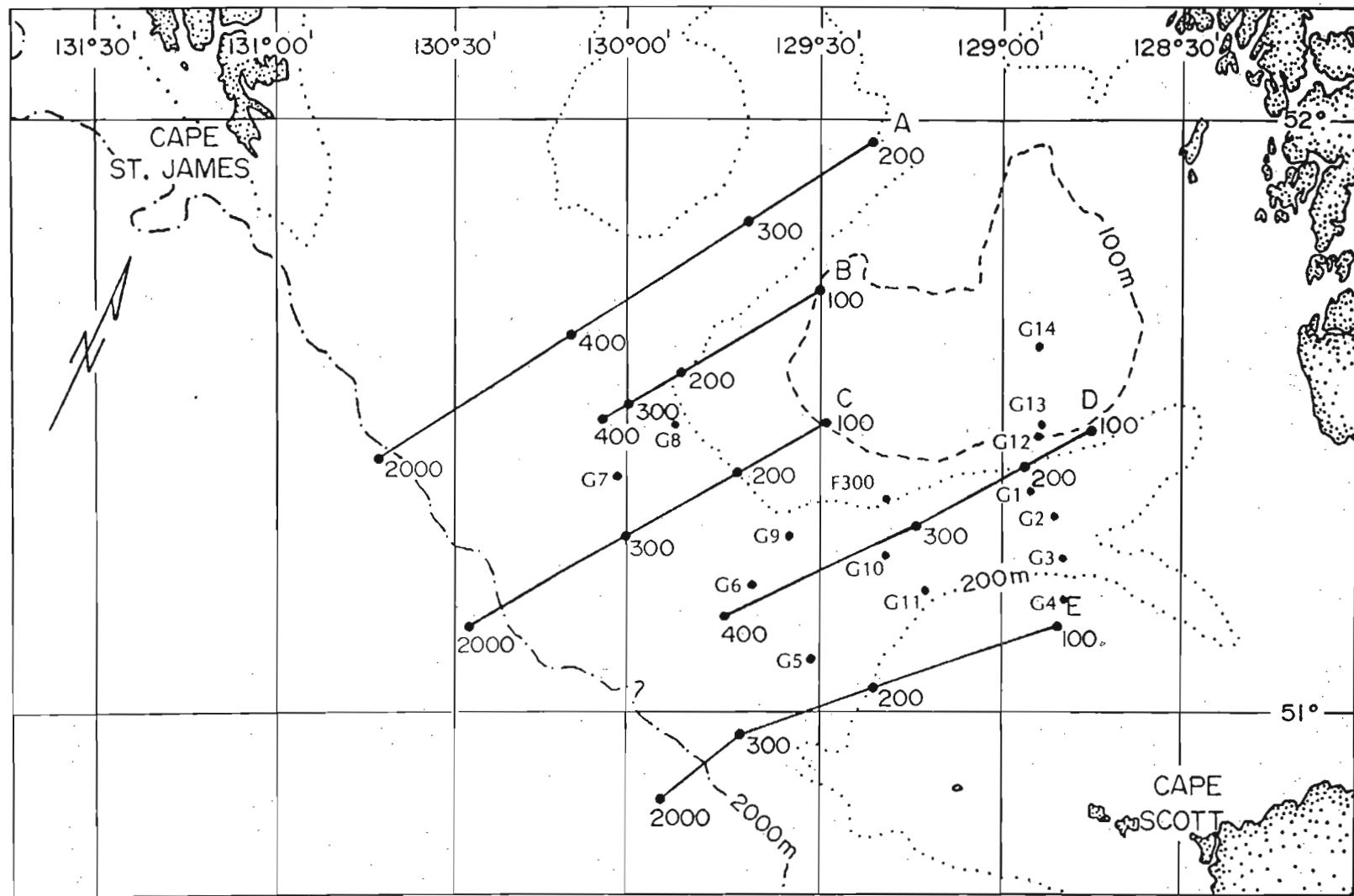
Station	Haul No.	Larvae/1000 m <sup>3</sup>
D300	2	0.00
C300	6,7,11,12,16,17,20	3.00
C2000	23	10.00
A2000	25	2.00
A400	26	0.00
B400	28	0.00
B300	30	1.00
B200	32	5.00
A300	34	0.00
A200	36	0.00
B100	38,41	0.00
C100	42,43	0.50
C200	44	3.00
D400	46,48	11.50
E300	50	0.00
E2000	53	0.00
E200	55	0.00
E100	57	0.00
D100	59,60	0.00
G14	61	0.00
G13	62	0.00
G12	63	0.00
D200	64	0.00
G1	66	0.00
G2	67	0.00
G3	68	0.00
G4	69	0.00
G11	70	0.00
G10	71	0.00
G5	72	0.00
G6	73	10.00
G7	74	0.00
G8	75	0.00
G9	76,77,79,80	2.75

Table 16. Pacific ocean perch (*Sebastodes alutus*) larval densities (larvae/1000 m<sup>3</sup>), at tow depths >100m, averaged by station, and corrected for flowmeter measured swept volumes. R/V W.E. RICKER, Pacific ocean perch larval survey, June 9-18, 1993.

Station	Haul No.	Larvae/1000 m <sup>3</sup>
D300	1	0.00
C300	3-5,8,10,13-15,18,19,21	3.09
C2000	22	1.00
A2000	24	0.00
A400	27	0.00
B400	29	0.00
B300	31	1.00
B200	33	0.00
A300	35	0.00
A200	37	0.00
C200	45	0.00
D400	47	0.00
E300	52	0.00
E2000	54	0.00
E100	58	0.00
D200	65	0.00

Table 17. Comparison of data collected at different vessel speeds at station G9, Pacific ocean perch larval survey, June 9-18, 1993.

Tow No.	Vessel Speed (kt)	Volume Sampled (m <sup>3</sup> )	Larval Count ( <i>S. alutus</i> )	Larvae/1000 m <sup>3</sup> ( <i>S. alutus</i> )	Larval Count (all <i>Sebastodes</i> )	Larvae/1000 m <sup>3</sup> (all <i>Sebastodes</i> )
76	1.4	818.45	3	3.67	9	11.00
77	3.0	862.60	5	5.80	40	46.37
79	2.8	1171.33	4	3.42	24	20.49
80	1.5	61.38	0	0	0	0



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Figure 1. Location of stations occupied by the *R/V W.E. RICKER* during the Pacific ocean perch larval survey, March 11-29, 1991, April 16-30, 1992, and June 9-18, 1993.

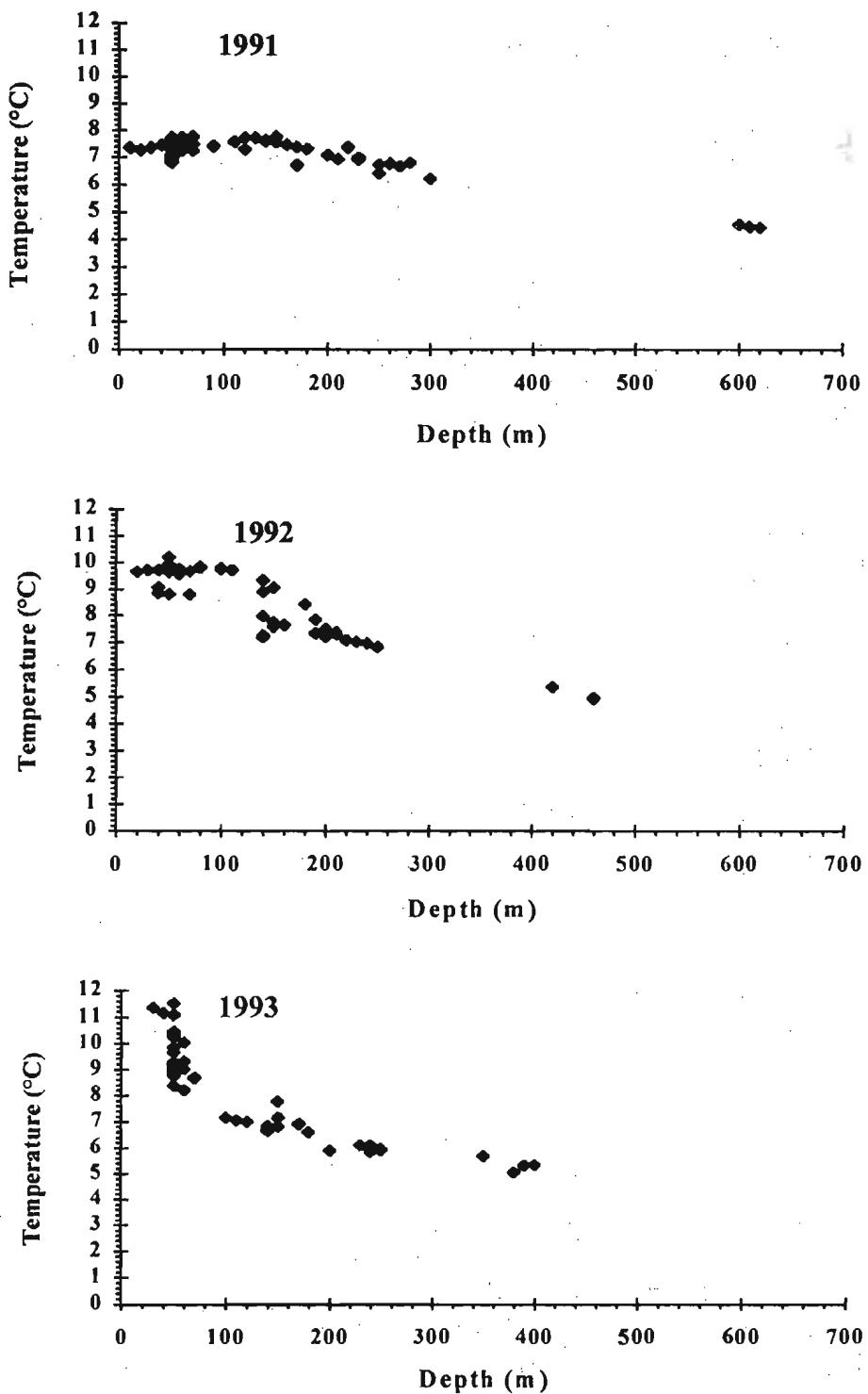


Figure 2. Temperature( $^{\circ}\text{C}$ ) at depth (m) from CTD data, R/V W.E. RICKER, Pacific ocean perch larval survey, March 11-29, 1991, April 16-30, 1992, and June 9-18, 1993.

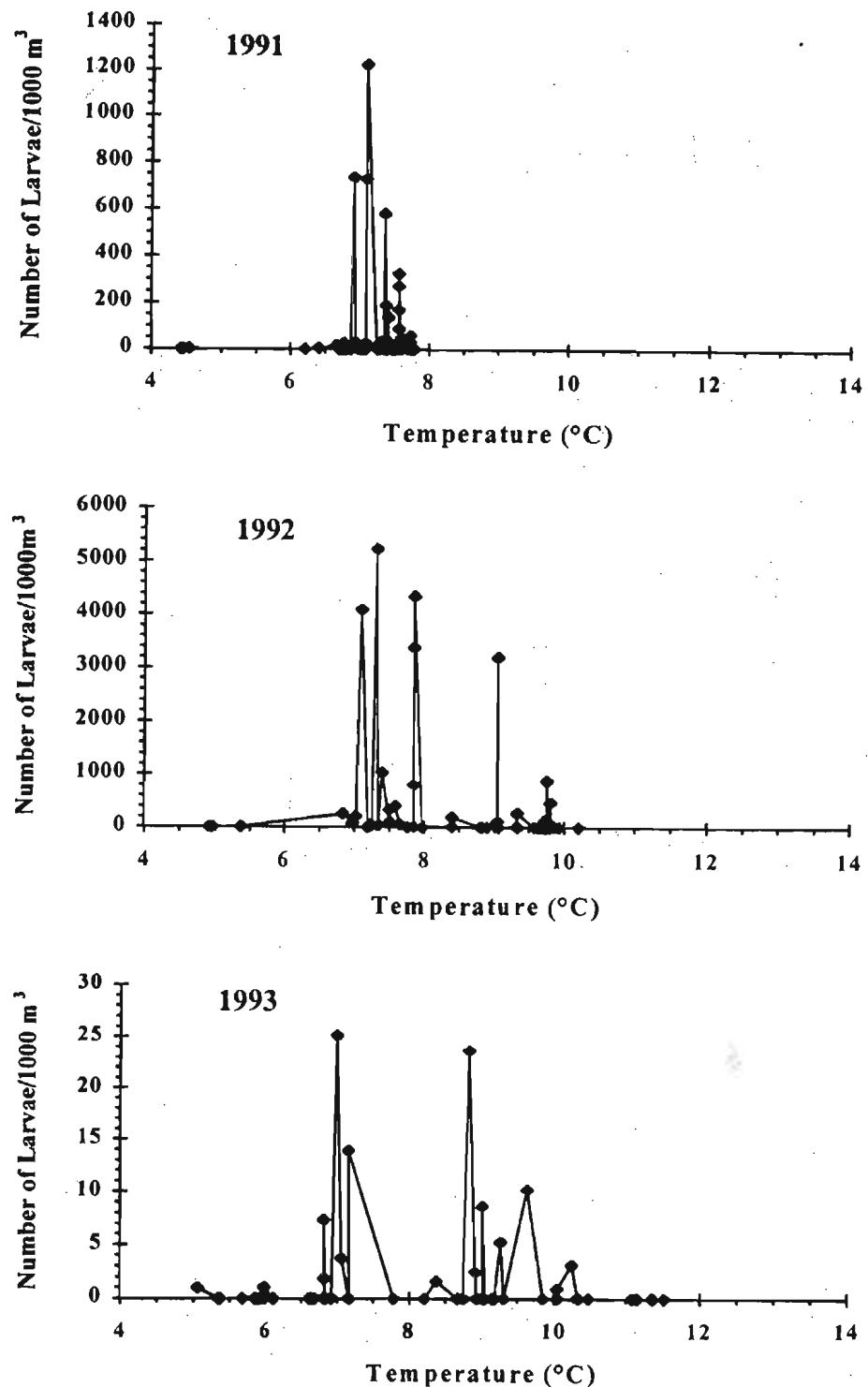


Figure 3. Number of larvae per 1000 m<sup>3</sup> by temperature (°C) at catch location for Pacific ocean perch, *Sebastodes alutus*, captured by Tucker trawl aboard the R/V W.E. RICKER, Pacific ocean perch larval survey, March 11-29, 1991, April 16-30, 1992, and June 9-18, 1993. (Note different scales on vertical axes.)

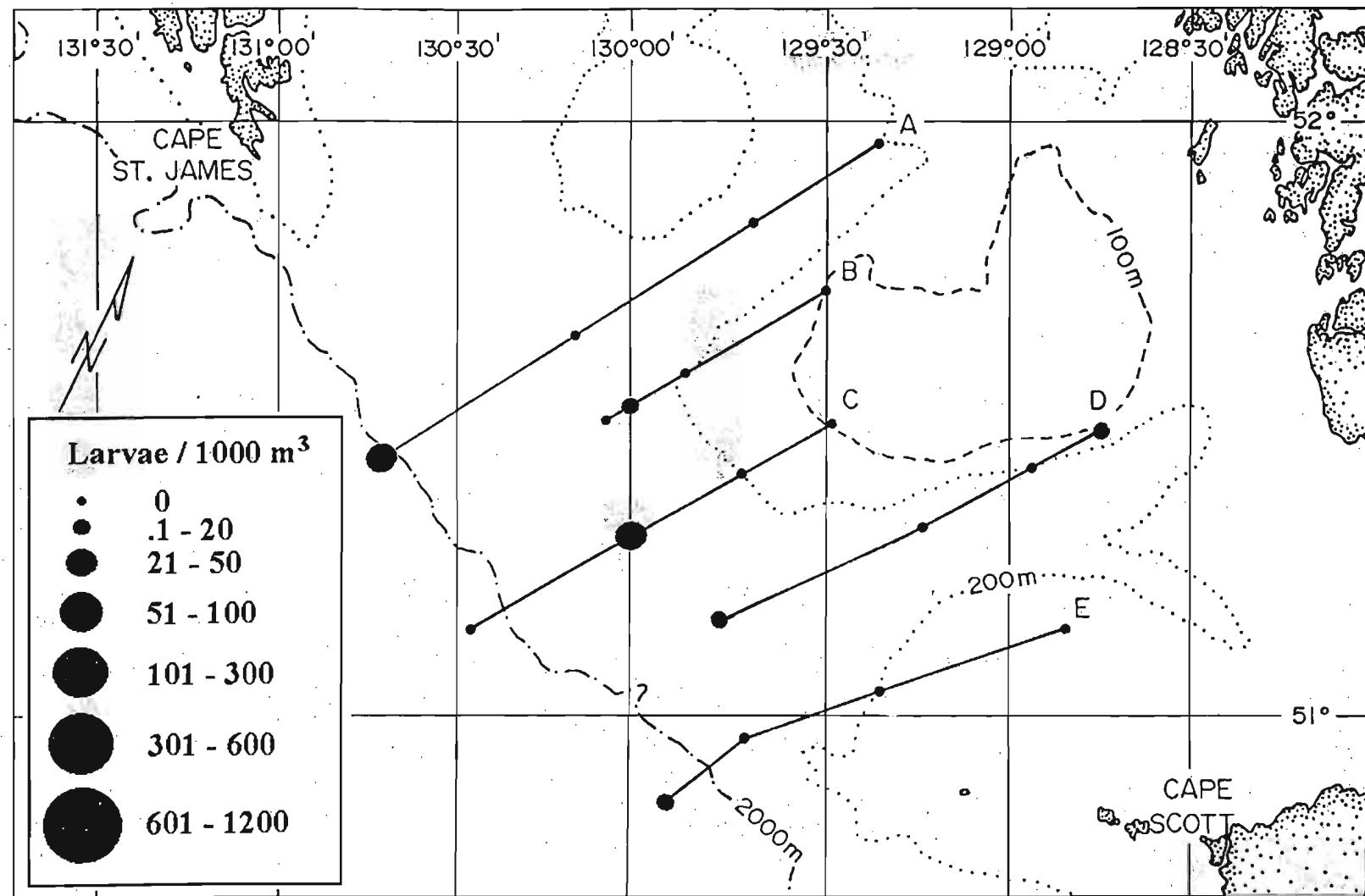


Figure 4. Larval density (Larvae/1000 m<sup>3</sup>) for Pacific ocean perch, *Sebastes alutus*, captured at <100 m, *R/V W.E. RICKER*, Pacific ocean perch larval survey, March 11-29, 1991.

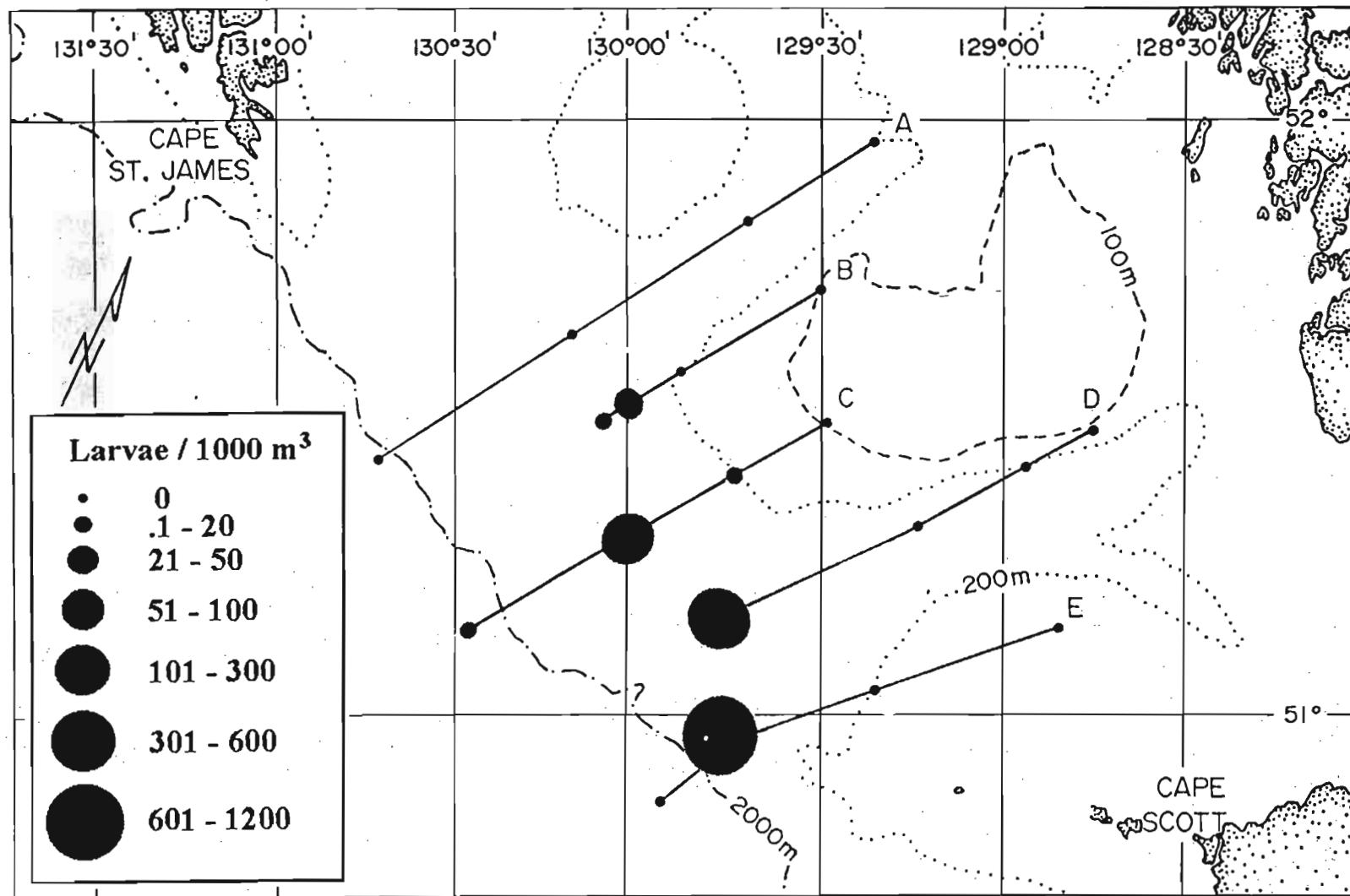


Figure 5. Larval density (Larvae/1000 m<sup>3</sup>) for Pacific ocean perch, *Sebastes alutus*, captured at >100 m, *R/V W.E. RICKER*, Pacific ocean perch larval survey, March 11-29, 1991.

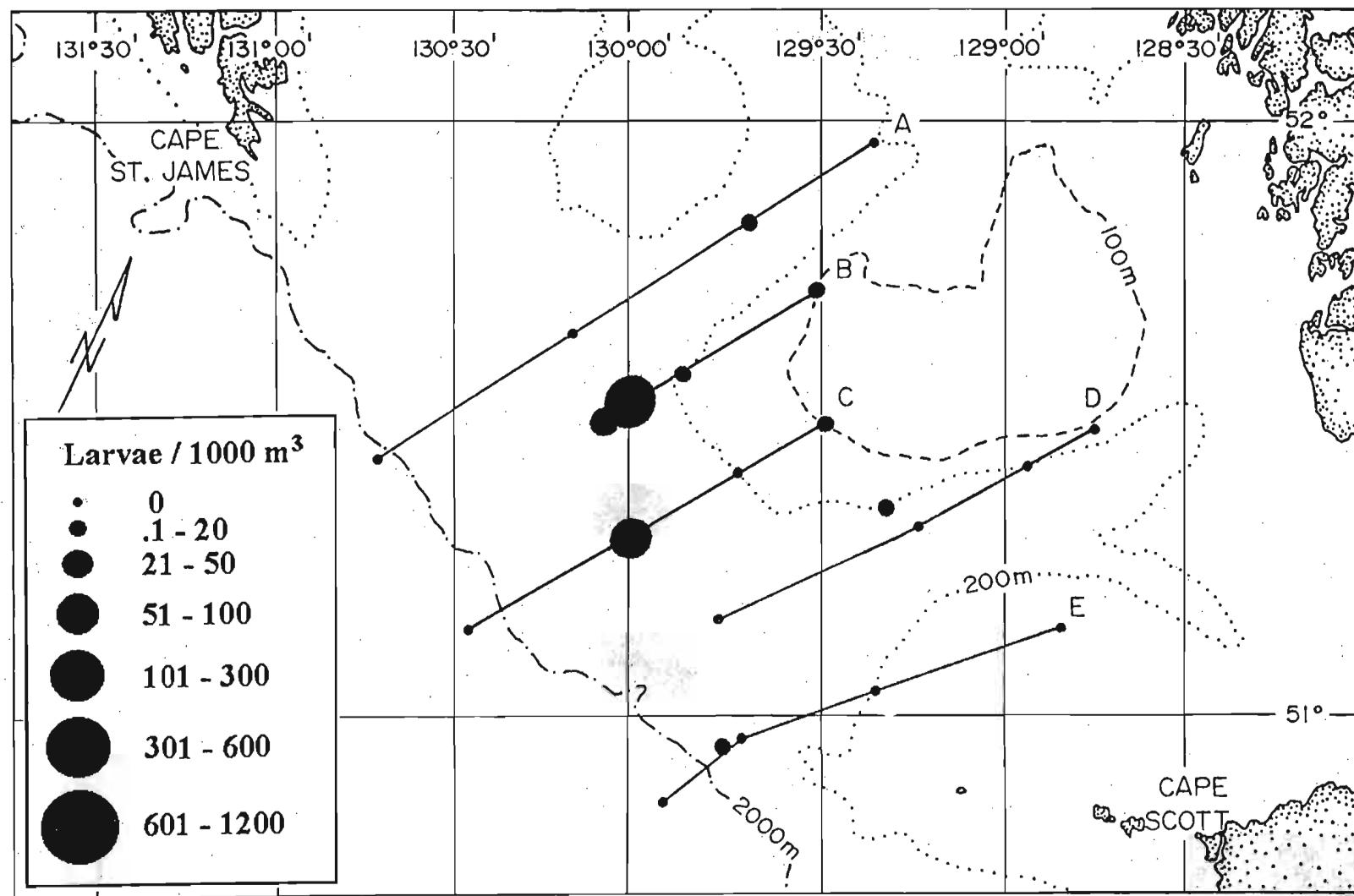
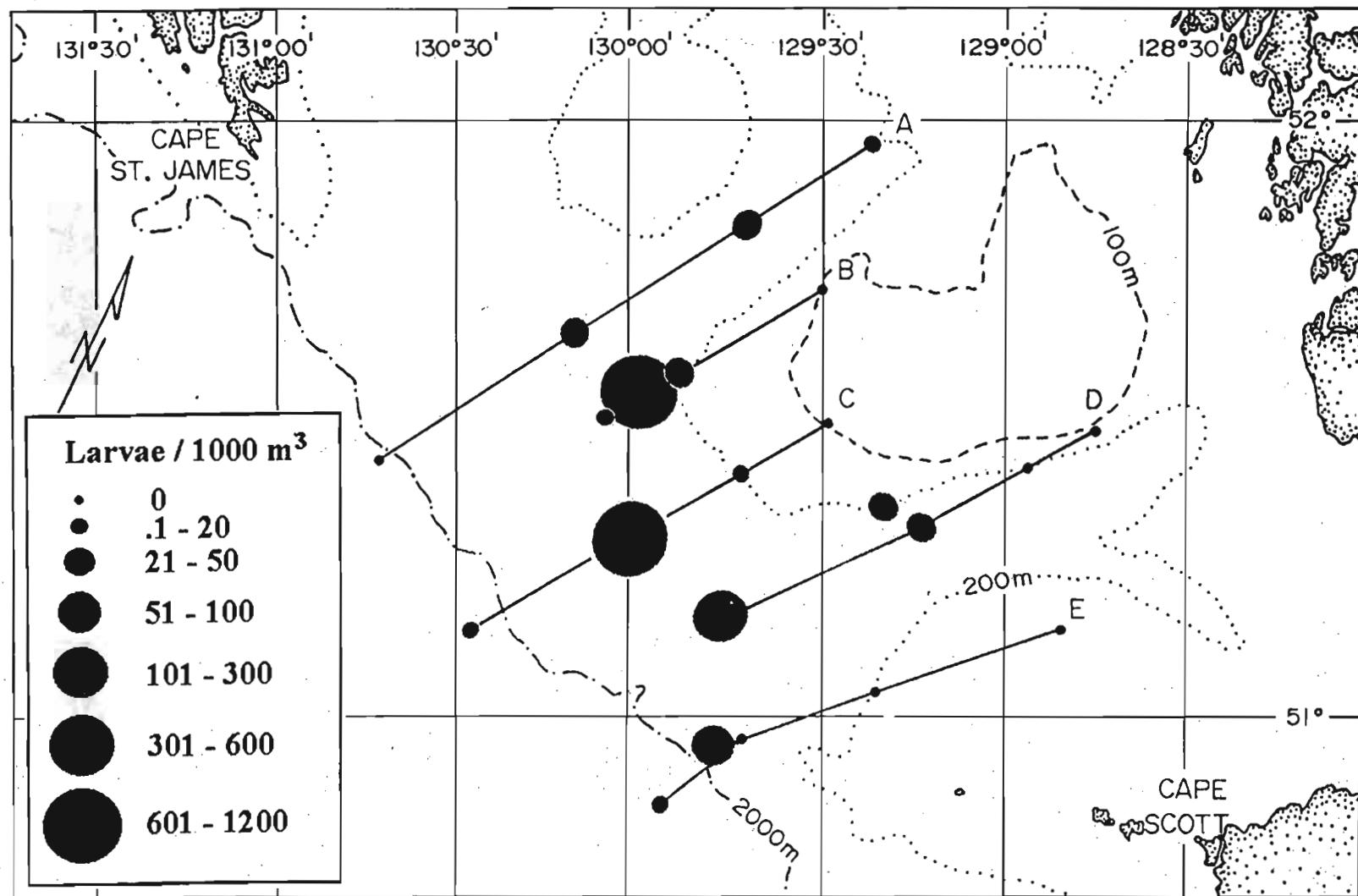
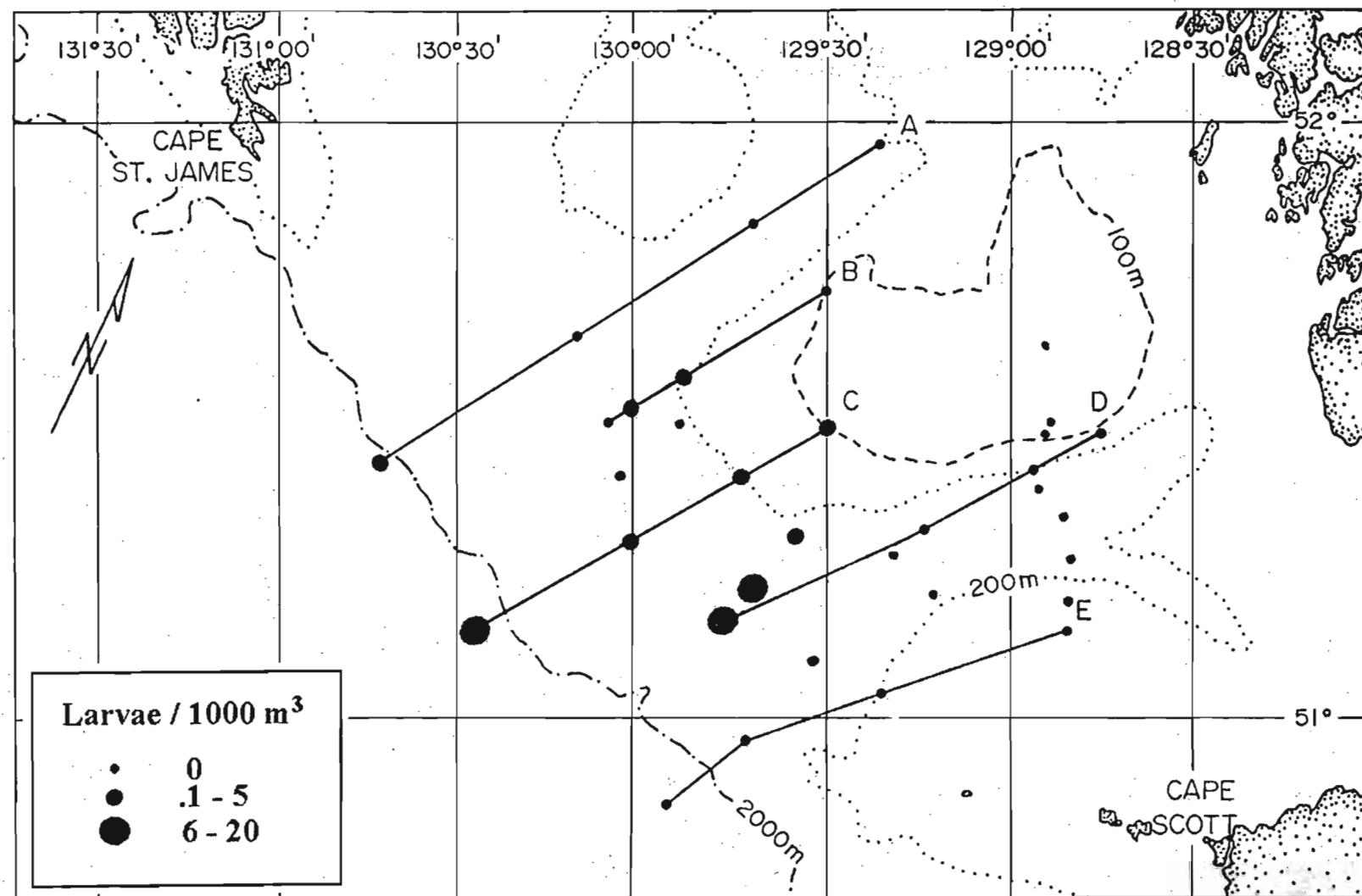


Figure 6. Larval density (Larvae/1000 m<sup>3</sup>) for Pacific ocean perch, *Sebastes alutus*, captured at <100 m, R/V W.E. RICKER, Pacific ocean perch larval survey, April 16-30, 1992.



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Figure 7. Larval density (Larvae/1000 m<sup>3</sup>) for Pacific ocean perch, *Sebastes alutus*, captured at >100 m, *R/V W.E. RICKER*, Pacific ocean perch larval survey; April 16-30, 1992.



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Figure 8. Larval density (Larvae/1000 m<sup>3</sup>) for Pacific ocean perch, *Sebastes alutus*, captured at <100 m, *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

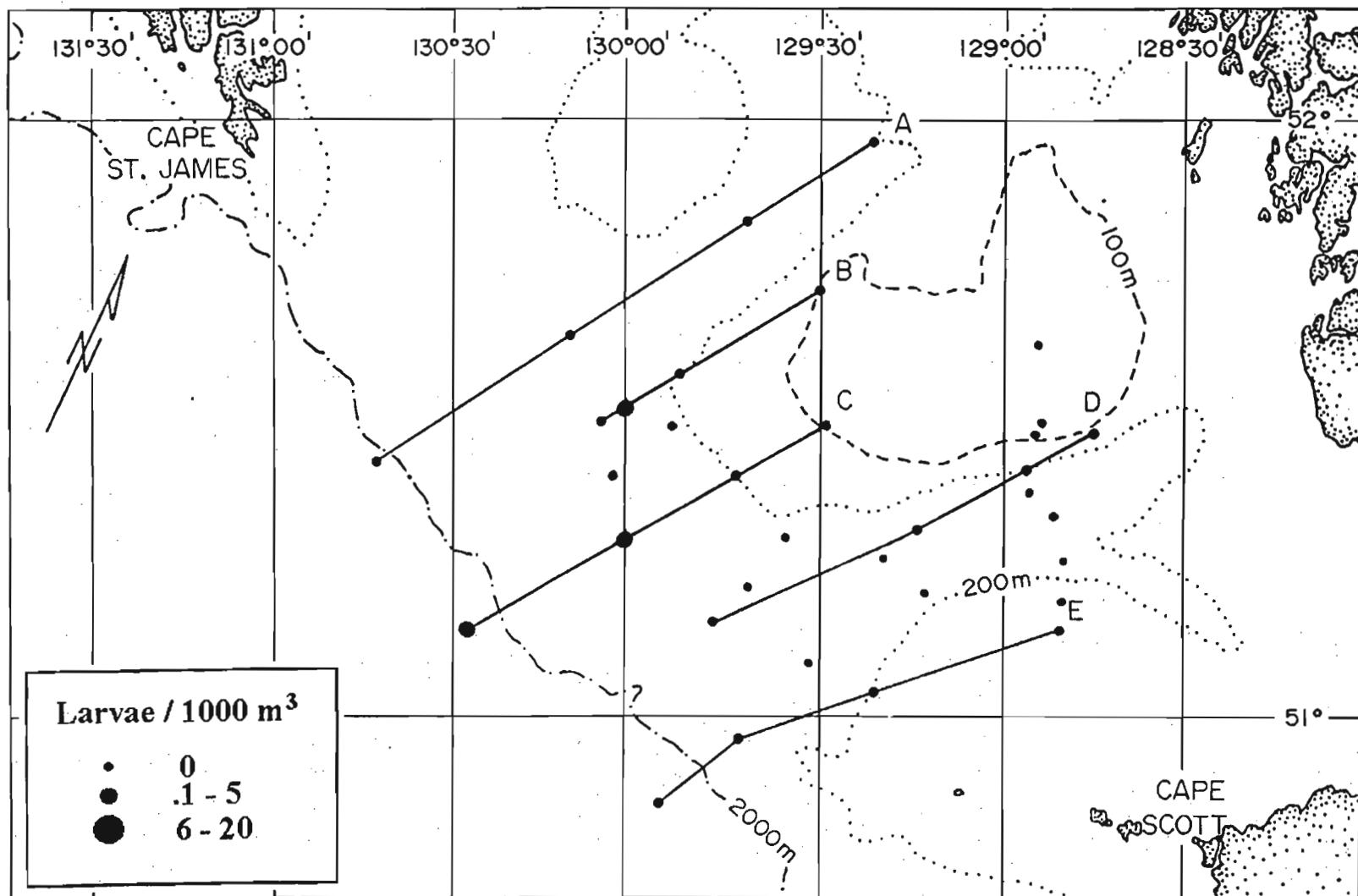


Figure 9. Larval density (Larvae/1000 m<sup>3</sup>) for Pacific ocean perch, *Sebastes alutus*, captured at >100 m, R/V W.E. RICKER, Pacific ocean perch larval survey, June 9-18, 1993.

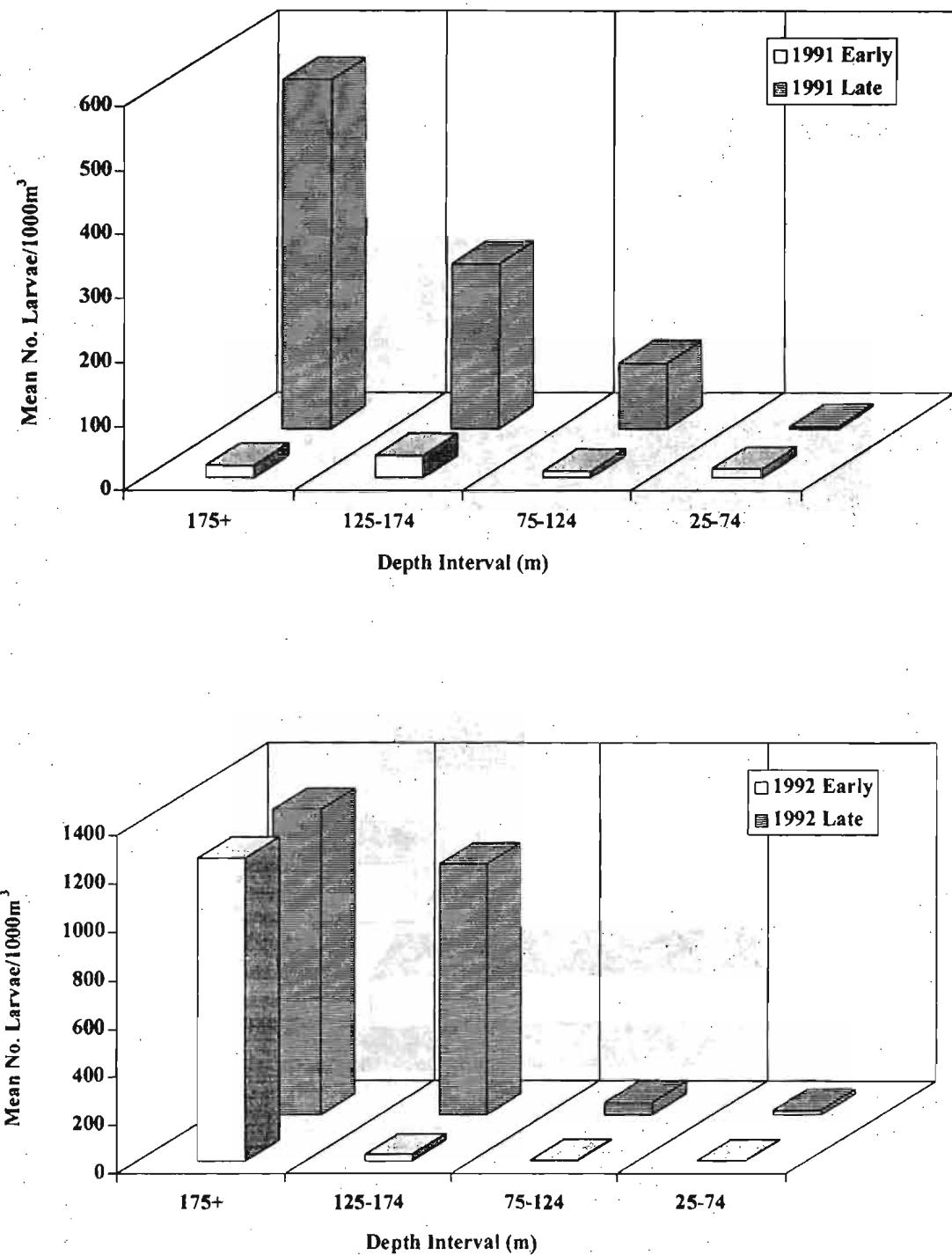


Figure 10. Mean number of larvae per 1000m<sup>3</sup> at each depth interval for Pacific ocean perch, *Sebastodes alutus*, station C300 Early and Late series, R/V W.E. RICKER, Pacific ocean perch larval survey, March 13-15 and March 23, 1991, April 20 and April 25-26, 1992.

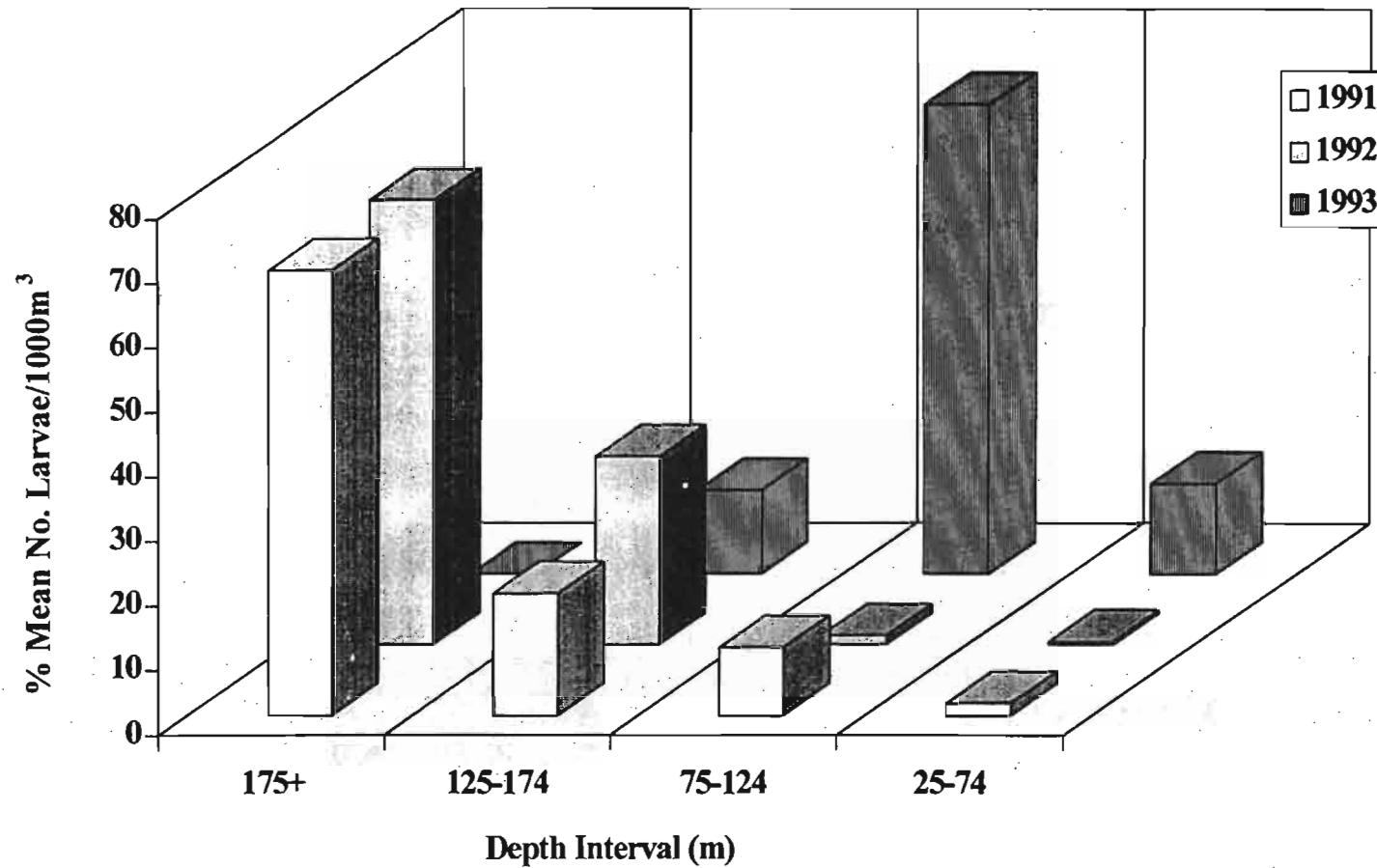


Figure 11. Proportion of the mean number of larvae per  $1000\text{m}^3$  at each depth interval for Pacific ocean perch, *Sebastodes alutus*, at station C300, *R/V W.E. RICKER*, Pacific ocean perch larval survey, March 11-29, 1991, April 16-30, 1992, and June 9-18, 1993.

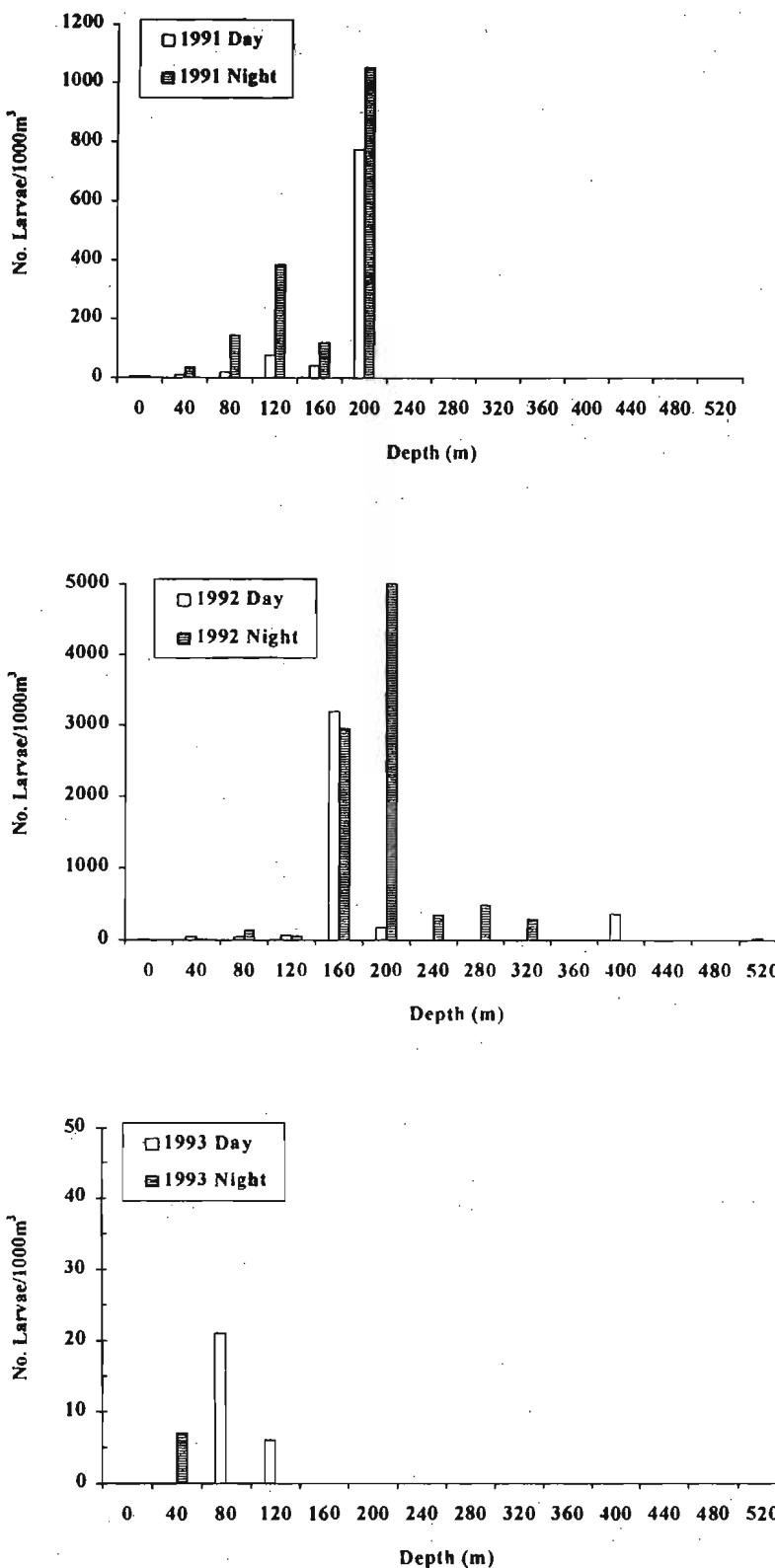


Figure 12. Diel density (larvae per 1000m<sup>3</sup>) by depth for Pacific ocean perch, *Sebastodes alutus*, at station C300, R/V W.E. RICKER, Pacific ocean perch larval survey, March 11-29, 1991, April 16-30, 1992, and June 9-18, 1993. (Note different scales on vertical axes.)

Appendix Table 1. Bridge log information for conventional trawl tows, *R/V W.E RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Tow Number		1	2	3	4
Date		April 18	April 27	April 27	April 27
Area	(Major, Minor)	5B, 08	5B, 08	5A, 11	5B, 08
Start Time	(PDT)	0840	0901	1159	1558
Duration	(min)	81	30	24	31
Start Position					
	N. Lat.	51°18.1'	51°18.0'	51°13.8'	51°17.9'
	W. Long.	130°01.3'	129°26.9'	129°36.8'	130°01.2'
Finish Position					
	N. Lat.	51°15.4'	51°16.2'	51°12.7'	51°16.7'
	W. Long.	129°56.9'	129°26.9'	129°38.0'	129°59.5'
Tow Distance	(km)	9.6	—	—	—
	(naut. mi.)	5.2	—	—	—
Direction	(° True)	143	191	000	135
Bottom Depth	(m)	297-275	242-276	274-274	298
	(fm)	162-150	132-151	150-150	163
Modal Depth	(m)	286	259	276	298
Gear Type		BT	BT	BT	BT
Tide		—	—	—	—
Total Catch	(kg)	9090	246	540	265
Remarks		Usable	Usable	Usable	Usable

Appendix Table 1. Continued.

Tow Number		1	2	3	4
Date		April 18	April 27	April 27	April 27
Area	(Major, Minor)	5B, 08	5B, 08	5A, 11	5B, 08
Arrowtooth flounder		trace	31	18	3
Dover sole		32	4	trace	1
Pacific halibut		-	-	5	-
Petrale sole		64	-	-	5
Rex sole		trace	trace	4	6
Other Flatfish		-	-	trace	-
<i>Sebastodes alutus</i>		3662	129	435	80
<i>S. babcocki</i>		trace	5	4	2
<i>S. borealis</i>		-	-	6	-
<i>S. brevispinis</i>		trace	-	4	-
<i>S. crameri</i>		289	-	6	1
<i>S. diploproa</i>		4401	38	9	134
<i>S. helvomaculatus</i>		trace	-	2	1
<i>S. paucispinis</i>		-	-	4	-
<i>S. proriger</i>		trace	-	1	-
<i>S. reedi</i>		514	-	-	29
<i>Sebastolobus alascanus</i>		128	25	29	2
Other Rockfish		-	-	-	trace
Eulachon		-	2	-	-
Sablefish		-	9	13	1
Other Roundfish		trace	-	trace	-
Spiny dogfish		trace	2	-	-
Spotted ratfish		trace	1	trace	-
Other Selachii		-	-	-	-
Total catch	(kg)	9090	246	540	265

Appendix Table 2. Scientific and common names of fishes captured by conventional trawls, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Rockfish	<i>Sebastes alutus</i>	Pacific ocean perch
	<i>S. babcocki</i>	Redbanded rockfish
	<i>S. borealis</i>	Shortraker rockfish
	<i>S. brevispinis</i>	Silvergray rockfish
	<i>S. crameri</i>	Darkblotched rockfish
	<i>S. diploproa</i>	Splitnose rockfish
	<i>S. helvomaculatus</i>	Rosethorn rockfish
	<i>S. paucispinis</i>	Bocaccio
	<i>S. proriger</i>	Redstripe rockfish
	<i>S. reedi</i>	Yellowmouth rockfish
	<i>S. zacentrus</i>	Sharpchin rockfish
	<i>Sebastolobus alascanus</i>	Shortspine thornyhead
Flatfish	<i>Atheresthes stomias</i>	Arrowtooth flounder
	<i>Eopsetta jordani</i>	Petrale sole
	<i>Glyptocephalus zachirus</i>	Rex sole
	<i>Hippoglossus stenolepis</i>	Halibut
	<i>Lyopsetta exilis</i>	Slender sole
	<i>Microstomus pacificus</i>	Dover sole
Selachii	<i>Hydrolagus colliei</i>	Spotted ratfish
	<i>Squalus acanthias</i>	Spiny dogfish
Other Fish	<i>Anoplopoma fimbria</i>	Sablefish
	<i>Codus macrocephalus</i>	Pacific cod
	<i>Malacobottus zonurus</i>	Darkfin Sculpin
	<i>Thaleichthys pacificus</i>	Eulachon

**Appendix Table 3. Bridge log information for Tucker trawl tows, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.**

Plankton Tow Number	1	2	5	6	
Date	April 17	April 17	April 17	April 17	
Station Number	E100	E100	E200	E200	
Start Time (PDT)	1520	1555	1945	2038	
Duration (min)	21	25	26	38	
Start Position					
N. Lat.	51°08.8'	51°08.4'	51°04.5'	51°00.5'	
W. Long.	128°49.6'	128°51.1'	129°19.1'	129°20.6'	
Finish Position					
N. Lat.	51°08.5'	51°08.1'	51°01.0'	51°00.2'	
W. Long.	128°50.4'	128°52.5'	129°20.1'	129°21.7'	
Tow Distance (naut. mi.)	0.5	0.8	0.7	0.8	
Direction (° True)	240	240	240	294	
Vessel Speed (kt)	1.8	1.8	1.8	1.2	
Bottom Depth (m)	97-99	99-101	178-180	180	
Modal Depth (m)	98	100	179	180	
Net Events					
Net 2	Time Open	1525	1603	1952	2052
	Depth (m)	53	65	46	140
Net 3	Time Open	1540	1618	2007	2108
	Depth (m)	48	61	37	140
Flowmeter Readings					
Start	Net 1	756790	773213	788108	800930
	Net 2	170692	177632	202439	225358
	Net 3	128629	138237	153692	167914
Finish	Net 1	773213	788040	800930	831174
	Net 2	177632	202437	225358	242040
	Net 3	138237	153692	167914	186675
BMLP #'s	Net 1	301	304	309	312
	Net 2	302	305	310	313
	Net 3	303	306	311	314
Remarks					

Appendix Table 3. Continued

Plankton Tow Number		7	8	11	12
Date		April 18	April 18	April 18	April 18
Station Number		E300	E300	B400	B400
Start Time (PDT)		0007	0140	1512	1548
Duration (min)		48	23	21	50
Start Position					
	N. Lat.	50°55.6'	50°55.0'	51°27.8'	51°28.0'
	W. Long.	129°43.4'	129°47.0'	130°05.0'	130°05.7'
Finish Position					
	N. Lat.	50°55.3'	50°54.9'	51°30.0'	51°28.0'
	W. Long.	129°45.1'	129°48.1'	130°05.4'	130°06.8'
Tow Distance (naut. mi.)		1.1	0.9	0.5	1.4
Direction (° True)		68	270	280	225
Vessel Speed (kt)		1.5	1.5	1.5	1.6
Bottom Depth (m)		1400-1320	1530-1920	508-440	461-400
Modal Depth (m)		1360	1725	474	431
Net Events					
Net 2	Time Open	0025	0145	1515	1559
	Depth (m)	235	50	49	423
Net 3	Time Open	0042	0200	1530	1615
	Depth (m)	230	67	51	408
Flowmeter Readings					
Start	Net 1	831174	873024	893251	909269
	Net 2	242040	260208	275117	282065
	Net 3	186675	205566	220901	244834
Finish	Net 1	873024	893251	909269	930028
	Net 2	260208	275117	282065	288477
	Net 3	205566	220901	224834	232902
BMLP #'s	Net 1	327	316	321	324
	Net 2	328	317	322	325
	Net 3	315	318	323	326
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	14	15	16	17	
Date	April 20	April 20	April 20	April 20	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	0427	0553	0759	0848	
Duration (min)	59	36	29	25	
Start Position					
N. Lat.	51°16.6'	51°17.9'	51°16.6'	51°17.3'	
W. Long.	130°01.1'	130°00.1'	130°00.4'	129°59.7'	
Finish Position					
N. Lat.	51°18.9'	51°17.2'	51°17.1'	51°17.1'	
W. Long.	130°00.4'	130°00.1'	129°59.4'	130°00.3'	
Tow Distance (naut. mi.)	2.0	1.3	0.8	0.3	
Direction (° True)	010	180	040	219	
Vessel Speed (kt)	2.0	2.1	1.0	1.2	
Bottom Depth (m)	341-274	280-291	299	293-295	
Modal Depth (m)	307	286	299	294	
Net Events					
Net 2	Time Open	0447	0603	0805	0854
	Depth (m)	250	181	84	49
Net 3	Time Open	0503	0619	0820	0908
	Depth (m)	250	157	92	42
Flowmeter Readings					
Start	Net 1	927618	974121	999462	017573
	Net 2	293250	330904	339796	364608
	Net 3	232835	277285	285775	306914
Finish	Net 1	974121	999462	017513	029410
	Net 2	330904	399796	364608	371077
	Net 3	277285	285775	306914	315846
BMLP #'s	Net 1	330	333	336	339
	Net 2	331	334	337	340
	Net 3	332	335	338	341
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	18	19	21	22	
Date	April 20	April 20	April 20	April 20	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	0925	1034	1228	1325	
Duration (min)	23	37	33	30	
Start Position					
N. Lat.	51°16.9'	51°17.9'	51°17.9'	51°16.8'	
W. Long.	130°00.5'	129°59.3'	129°59.3'	130°00.6'	
Finish Position					
N. Lat.	51°16.3'	51°17.1	51°17.3'	51°16.2'	
W. Long.	130°00.9	129°59.4	130°00.0'	130°01.2'	
Tow Distance (naut. mi.)	0.7	0.8	1.0	0.8	
Direction (° True)	207	184	220	220	
Vessel Speed (kt)	1.7	1.3	1.5	1.8	
Bottom Depth (m)	296-312	269-283	273-288	308-363	
Modal Depth (m)	308	276	281	336	
Net Events					
Net 2	Time Open	0930	1045	1238	1334
	Depth (m)	27	203	186	95
Net 3	Time Open	0945	1102	1252	1349
	Depth (m)	23	181	103	101
Flowmeter Readings					
Start	Net 1	017573	043666	067849	095460
	Net 2	364608	392598	416321	426877
	Net 3	306914	328344	340505	351675
Finish	Net 1	043666	067849	095460	116984
	Net 2	392598	416321	426877	444524
	Net 3	328344	340505	351675	366175
BMLP #'s	Net 1	342	345	349	352
	Net 2	343	346	350	353
	Net 3	344	347	351	354
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	23	24	26	27
Date	April 20	April 20	April 20	April 20
Station Number	C300	C300	C300	C300
Start Time (PDT)	1430	1511	1628	1729
Duration (min)	24	21	50	37
Start Position				
N. Lat.	51°17.9'	51°17.1'	51°17.0'	51°15.9'
W. Long.	129°58.9'	130°00.1'	130°00.0'	130°01.4'
Finish Position				
N. Lat.	51°17.4'	51°16.5'	51°15.7'	51°16.9'
W. Long.	129°59.6'	130°00.9'	130°01.7'	130°00.3'
Tow Distance (naut. mi.)	0.7	0.7	1.7	1.3
Direction (° True)	220	220	220	040
Vessel Speed (kt)	1.8	2.1	2.0	2.1
Bottom Depth (m)	270-283	297-327	297-440	422-302
Modal Depth (m)	277	312	369	362
Net Events				
Net 2	Time Open	1436	1514	1644
	Depth (m)	52	30	200
Net 3	Time Open	1452	1529	1702
	Depth (m)	50	24	200
Flowmeter Readings				
Start	Net 1	116984	140470	156792
	Net 2	444524	455217	465081
	Net 3	366175	372285	381903
Finish	Net 1	140470	156792	217993
	Net 2	455217	465081	491421
	Net 3	372285	381903	398379
BMLP #'s	Net 1	355	358	362
	Net 2	356	359	363
	Net 3	357	360	364
Remarks				

Appendix Table 3. Continued

Plankton Tow Number	28	29	30	31
Date	April 20	April 20	April 20	April 20
Station Number	C300	C300	C300	C300
Start Time (PDT)	1815	1857	1930	1958
Duration (min)	31	23	20	45
Start Position				
N. Lat.	51°17.1'	51°17.9'	51°16.8'	51°15.9'
W. Long.	130°00.1'	129°59.4'	130°00.4'	130°01.4'
Finish Position				
N. Lat.	51°17.8'	51°17.1'	51°16.2'	51°17.3'
W. Long.	129°59.5'	130°00.1'	130°01.3'	130°00.4'
Tow Distance (naut. mi.)	1.0	0.8	0.7	1.6
Direction (° True)	040	210	220	027
Vessel Speed (kt)	2.0	2.4	2.1	2.2
Bottom Depth (m)	302-277	274-294	302-366	344-288
Modal Depth (m)	290	284	334	316
Net Events				
Net 2	Time Open	1822	1901	1931
	Depth (m)	96	49	22
Net 3	Time Open	1838	1917	1945
	Depth (m)	96	49	22
Flowmeter Readings				
Start	Net 1	242897	260129	276043
	Net 2	510616	523324	548501
	Net 3	427513	454544	466035
Finish	Net 1	260129	276043	286981
	Net 2	523324	548501	567660
	Net 3	454544	466035	476182
BMLP #'s	Net 1	368	371	374
	Net 2	369	372	375
	Net 3	370	373	376
Remarks				

Appendix Table 3. Continued

Plankton Tow Number	32	33	34	35	
Date	April 20	April 20	April 20	April 20	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	2051	2138	2220	2256	
Duration (min)	39	29	26	21	
Start Position					
N. Lat.	51°17.7'	51°18.1'	51°17.1'	51°16.3'	
W. Long.	130°00.2'	129°59.4'	130°00.5'	130°00.8'	
Finish Position					
N. Lat.	51°18.1'	51°17.3'	51°16.2'	51°17.0'	
W. Long.	129°59.2'	130°00.4'	130°01.2'	130°00.2'	
Tow Distance (naut. mi.)	0.9	1.0	1.0	0.8	
Direction (° True)	062	218	206	058	
Vessel Speed (kt)	1.4	2.0	2.3	2.3	
Bottom Depth (m)	286-266	272-291	305-330	330-294	
Modal Depth (m)	276	282	318	312	
Net Events					
Net 2	Time Open	2103	2146	2226	2300
	Depth (m)	143	106	43	25
Net 3	Time Open	2119	2201	2241	2316
	Depth (m)	125	83	38	26
Flowmeter Readings					
Start	Net 1	321047	348857	376329	392667
	Net 2	594100	611446	611764	636545
	Net 3	504173	538695	538695	569268
Finish	Net 1	348857	376329	392677	404635
	Net 2	611446	611764	636845	654150
	Net 3	538695	551628	569268	589626
BMLP #'s	Net 1	380	383	386	389
	Net 2	381	384	387	390
	Net 3	382	385	388	391
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	38	39	40	41	
Date	April 21	April 21	April 21	April 21	
Station Number	B300	B300	B200	B200	
Start Time (PDT)	0142	0347	0512	0600	
Duration (min)	48	32	38	27	
Start Position					
N. Lat.	51°30.6'	51°30.1'	51°33.9'	51°33.5'	
W. Long.	130°00.0'	129°58.9'	129°51.0'	129°52.5'	
Finish Position					
N. Lat.	51°30.2'	51°31.6'	51°33.4'	51°33.7'	
W. Long.	130°01.7'	129°57.2'	129°52.8'	129°50.9'	
Tow Distance (naut. mi.)	1.6	1.1	1.2	0.9	
Direction (° True)	240	220	220	040	
Vessel Speed (kt)	2.0	2.1	1.7	1.9	
Bottom Depth (m)	260-333	249-224	188-195	189	
Modal Depth (m)	297	237	192	189	
Net Events					
Net 2	Time Open	0157	0354	0521	0605
	Depth (m)	208	82	163	51
Net 3	Time Open	0214	0410	0537	0622
	Depth (m)	183	100	122	46
Flowmeter Readings					
Start	Net 1	404635	455079	471493	499140
	Net 2	654150	698875	715006	747162
	Net 3	589626	663295	709844	728296
Finish	Net 1	441899	471493	499140	516769
	Net 2	679204	715006	747162	778707
	Net 3	618365	709844	728296	747928
BMLP #'s	Net 1	394	397	400	403
	Net 2	395	398	401	404
	Net 3	396	399	402	405
Remarks					

Appendix Table 3. Continued

47

Plankton Tow Number	44	45	46	47
Date	April 21	April 21	April 21	April 21
Station Number	B100	B100	A200	A200
Start Time (PDT)	0918	0956	1213	1319
Duration (min)	25	23	42	25
Start Position				
N. Lat.	51°43.0'	51°44.7'	51°59.0'	51°59.1'
W. Long.	129°29.0'	129°29.4'	129°19.7'	129°18.7'
Finish Position				
N. Lat.	51°44.1'	51°45.8'	51°58.8'	51°59.5'
W. Long.	129°29.2'	129°29.5'	129°21.9'	129°17.3'
Tow Distance (naut. mi.)	1.1	0.9	1.4	1.0
Direction (° True)	005	004	270	065
Vessel Speed (kt)	2.6	2.3	2.0	2.5
Bottom Depth (m)	90-94	120-164	194-202	188-182
Modal Depth (m)	92	142	198	185
Net Events				
Net 2	Time Open	0924	1102	1229
	Depth (m)	55	46	169
Net 3	Time Open	0940	1118	1245
	Depth (m)	71	57	146
Flowmeter Readings				
Start	Net 1	516769	532871	548786
	Net 2	778707	807546	838688
	Net 3	747928	762001	774656
Finish	Net 1	532871	548786	579806
	Net 2	807546	838688	872805
	Net 3	762001	774656	802573
BMLP #'s	Net 1	408	411	414
	Net 2	409	412	415
	Net 3	410	413	416
Remarks				

Appendix Table 3. Continued

Plankton Tow Number	50	51	52	53	
Date	April 21	April 21	April 21	April 21	
Station Number	A300	A300	A400	A400	
Start Time (PDT)	1645	1718	2030	2111	
Duration (min)	30	45	33	62	
Start Position					
N. Lat.	51°50.9'	51°50.4'	51°39.0'	51°38.6'	
W. Long.	129°40.1'	129°41.3'	130°08.6'	130°09.2'	
Finish Position					
N. Lat.	51°50.4'	51°49.5'	51°38.6'	51°38.0'	
W. Long.	129°41.2'	129°42.9'	130°09.1'	130°11.3'	
Tow Distance (naut. mi.)	1.1	1.5	0.6	1.6	
Direction (° True)	238	238	231	245	
Vessel Speed (kt)	2.2	1.9	1.2	1.6	
Bottom Depth (m)	272-281	281-291	322-422	450-494	
Modal Depth (m)	277	286	372	472	
Net Events					
Net 2	Time Open	1648	1732	2038	2136
	Depth (m)	48	193	163	421
Net 3	Time Open	1704	1747	2054	2154
	Depth (m)	48	150	167	421
Flowmeter Readings					
Start	Net 1	592131	606458	606500	606940
	Net 2	900325	926998	957900	962405
	Net 3	814415	824609	852935	859725
Finish	Net 1	606458	606500	606940	633061
	Net 2	926998	957900	962405	973472
	Net 3	824609	852935	859725	888735
BMLP #'s	Net 1	422	425	428	431
	Net 2	423	426	429	432
	Net 3	424	427	430	433
Remarks					

Appendix Table 3. Continued

49

Plankton Tow Number	56	57	58	59
Date	April 22	April 22	April 22	April 22
Station Number	A2000	A2000	A2000	C2000
Start Time (PDT)	0218	0422	0520	0931
Duration (min)	82	38	77	81
Start Position				
N. Lat.	51°26.6'	51°26.8'	51°27.4'	51°06.6'
W. Long.	130°42.6'	130°27.3'	130°40.2'	130°25.6'
Finish Position				
N. Lat.	51°26.1'	51°27.1'	51°27.6'	51°05.3'
W. Long.	130°48.3'	130°40.0'	130°44.3'	130°28.4'
Tow Distance (naut. mi.)	2.7	1.0	2.3	2.2
Direction (° True)	260	080	275	233
Vessel Speed (kt)	2.0	1.6	1.8	1.6
Bottom Depth (m)	>1000	>1000	>1000	>1000
Modal Depth (m)	>1000	>1000	>1000	>1000
Net Events				
Net 2	Time Open	0252	0432	0550
	Depth (m)	516	136	459
Net 3	Time Open	0307	0447	0605
	Depth (m)	450	222	459
Flowmeter Readings				
Start	Net 1	633061	661093	681356
	Net 2	973472	029694	049965
	Net 3	888735	018945	039423
Finish	Net 1	661093	681356	734291
	Net 2	029694	049965	084277
	Net 3	018945	039423	085905
BMLP #'s	Net 1	436	439	442
	Net 2	437	440	443
	Net 3	438	441	444
Remarks				

Appendix Table 3. Continued

Plankton Tow Number	60	62	63	66
Date	April 22	April 22	April 22	April 22
Station Number	C2000	E2000	E2000	D400
Start Time (PDT)	1107	1603	1732	2114
Duration (min)	41	81	36	55
Start Position				
N. Lat.	51°05.4'	50°50.0'	50°51.1'	51°07.1'
W. Long.	130°28.0'	129°54.1'	129°57.7'	129°39.6'
Finish Position				
N. Lat.	51°05.9'	50°51.2'	50°51.2'	51°06.6'
W. Long.	130°25.7'	129°57.7'	129°56.0'	129°41.9'
Tow Distance (naut. mi.)	1.5	1.7	1.2	1.6
Direction (° True)	075	280	100	250
Vessel Speed (kt)	2.2	1.3	1.9	1.7
Bottom Depth (m)	>1000	>1000	>1000	371-463
Modal Depth (m)	>1000	>1000	>1000	417
Net Events				
Net 2	Time Open	1121	1629	1742
	Depth (m)	154	569	143
Net 3	Time Open	1137	1644	1758
	Depth (m)	275	580	143
Flowmeter Readings				
Start	Net 1	795945	820492	871866
	Net 2	112483	131940	169398
	Net 3	123401	147675	182197
Finish	Net 1	820492	871866	895592
	Net 2	131940	169398	202529
	Net 3	147675	182197	198922
BMLP #'s	Net 1	448	452	455
	Net 2	449	453	456
	Net 3	450	454	457
Remarks				

Appendix Table 3. Continued

Plankton Tow Number	67	68	69	72	
Date	April 22	April 23	April 23	April 23	
Station Number	D400	C200	C200	C100	
Start Time (PDT)	2224	0110	0200	0420	
Duration (min)	35	35	33	25	
Start Position					
N. Lat.	51°06.9'	51°25.2'	51°24.9'	51°30.2'	
W. Long.	129°41.2'	129°42.1'	129°42.9'	129°26.5'	
Finish Position					
N. Lat.	51°07.7'	51°24.6'	51°26.0'	51°30.6'	
W. Long.	129°39.6'	129°43.4'	129°40.9'	129°27.9'	
Tow Distance (naut. mi.)	1.2	1.3	1.2	0.8	
Direction (° True)	051	240	060	280	
Vessel Speed (kt)	2.1	2.2	2.0	1.9	
Bottom Depth (m)	460-320	174-186	178-169	77	
Modal Depth (m)	390	180	174	77	
Net Events					
Net 2	Time Open	2233	0120	0209	0426
	Depth (m)	150	149	95	40
Net 3	Time Open	2249	0137	0227	0441
	Depth (m)	154	118	85	46
Flowmeter Readings					
Start	Net 1	927930	953277	983520	004059
	Net 2	232501	268501	280984	324189
	Net 3	216844	238792	249321	271615
Finish	Net 1	953277	983520	004059	020459
	Net 2	268501	280984	324188	351842
	Net 3	238792	249321	271615	285491
BMLP #'s	Net 1	463	466	469	474
	Net 2	464	467	470	475
	Net 3	465	468	471	476
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	73	74	75	78	
Date	April 23	April 23	April 23	April 23	
Station Number	C100	D300	D300	D200	
Start Time (PDT)	0455	0730	0822	1112	
Duration (min)	23	41	23	35	
Start Position					
N. Lat.	51°30.7'	51°17.9'	51°17.1'	51°24.3'	
W. Long.	129°28.4'	129°12.0'	129°10.2'	128°56.1'	
Finish Position					
N. Lat.	51°31.2'	51°17.2'	51°16.7'	51°23.8'	
W. Long.	129°29.8'	129°10.6'	129°09.4'	128°57.8'	
Tow Distance (naut. mi.)	0.9	1.0	0.6	0.5	
Direction (° True)	280	120	124	239	
Vessel Speed (kt)	2.3	1.5	1.1	0.9	
Bottom Depth (m)	77-86	259-264	262	192-198	
Modal Depth (m)	82	262	262	195	
Net Events					
Net 2	Time Open	0459	0740	0826	1124
	Depth (m)	50	187	49	144
Net 3	Time Open	0514	0757	0842	1141
	Depth (m)	48	201	54	94
Flowmeter Readings					
Start	Net 1	020459	038211	059781	074854
	Net 2	351842	381000	404889	411086
	Net 3	285491	300158	320453	325715
Finish	Net 1	038211	059781	074854	094308
	Net 2	381000	404889	411086	440467
	Net 3	300158	320453	325715	340654
BMLP #'s	Net 1	477	480	483	488
	Net 2	478	481	484	489
	Net 3	479	482	485	490
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	79	80	81	83
Date	April 23	April 23	April 23	April 25
Station Number	D200	D100	D100	C300
Start Time (PDT)	1200	1411	1446	1042
Duration (min)	25	22	29	26
Start Position				
N. Lat.	51°23.0'	51°29.9'	51°29.3'	51°17.1'
W. Long.	128°58.4'	128°43.8'	128°42.6'	129°59.9'
Finish Position				
N. Lat.	51°23.2'	51°29.6'	51°28.6'	51°18.0'
W. Long.	128°59.7'	128°43.1'	128°41.6'	129°59.4'
Tow Distance (naut. mi.)	0.8	0.7	0.9	0.9
Direction (° True)	240	140	140	020
Vessel Speed (kt)	2.0	1.8	2.1	1.5
Bottom Depth (m)	204-212	005-108	131-165	291-272
Modal Depth (m)	208	057	148	282
Net Events				
Net 2	Time Open	1206	1415	1452
	Depth (m)	65	43	69
Net 3	Time Open	1223	1431	1508
	Depth (m)	55	27	69
Flowmeter Readings				
Start	Net 1	094308	111328	124953
	Net 2	440467	450955	457405
	Net 3	340654	349002	355338
Finish	Net 1	111328	124953	141481
	Net 2	450955	457405	485287
	Net 3	349002	355338	368495
BMLP #'s	Net 1	491	494	497
	Net 2	492	495	498
	Net 3	493	496	499
Remarks				Unusable - Net Malfunction

Appendix Table 3. Continued

Plankton Tow Number	84	85	86	88	
Date	April 25	April 25	April 25	April 25	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	1123	1200	1326	1533	
Duration (min)	20	38	41	39	
Start Position					
N. Lat.	51°18.0'	51°17.2'	51°17.7'	51°16.9'	
W. Long.	129°59.9'	130°00.2'	129°58.8'	130°01.3'	
Finish Position					
N. Lat.	51°17.6'	51°16.2'	51°17.2'	51°18.1'	
W. Long.	130°00.7'	130°01.5'	130°01.8'	130°00.2'	
Tow Distance (naut. mi.)	0.7	0.6	1.4	1.3	
Direction (° True)	218	210	260	045	
Vessel Speed (kt)	2.0	2.0	2.1	2.0	
Bottom Depth (m)	274-295	287-412	270-345	322-268	
Modal Depth (m)	285	350	308	295	
Net Events					
Net 2	Time Open	1126	1210	1341	1540
	Depth (m)	54	193	136	103
Net 3	Time Open	1142	1226	1356	1555
	Depth (m)	50	150	132	96
Flowmeter Readings					
Start	Net 1	151914	163228	187178	230265
	Net 2	489768	510915	544014	617967
	Net 3	389118	402846	427176	497908
Finish	Net 1	163228	187178	213379	247599
	Net 2	510915	544014	577561	643185
	Net 3	402846	427176	469033	514482
BMLP #'s	Net 1	501	504	507	510
	Net 2	502	505	508	511
	Net 3	503	506	509	512
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	89	90	91	92	
Date	April 25	April 25	April 25	April 25	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	1630	1728	1818	1922	
Duration (min)	23	42	32	48	
Start Position					
N. Lat.	51°18.6'	51°18.9'	51°17.6'	51°17.4'	
W. Long.	129°59.6'	129°59.4'	130°01.0'	129°59.5'	
Finish Position					
N. Lat.	51°19.3'	51°17.9'	51°17.2'	51°16.9'	
W. Long.	129°58.9'	130°00.7'	130°01.9'	130°00.2'	
Tow Distance (naut. mi.)	0.7	1.1	0.9	0.8	
Direction (° True)	050	200	210	200	
Vessel Speed (kt)	1.8	1.6	1.8	1.6	
Bottom Depth (m)	268-259	266-288	302-340	283-299	
Modal Depth (m)	264	277	321	291	
Net Events					
Net 2	Time Open	1634	1739	1827	1930
	Depth (m)	48	193	176	98
Net 3	Time Open	1649	1756	1842	1945
	Depth (m)	48	185	195	85
Flowmeter Readings					
Start	Net 1	247599	259447	284550	303817
	Net 2	643185	665882	696903	707104
	Net 3	514482	530146	558169	573771
Finish	Net 1	259447	284550	303817	323327
	Net 2	665882	696903	707104	717765
	Net 3	530146	558169	573771	586286
BMLP #'s	Net 1	513	516	519	522
	Net 2	514	517	520	523
	Net 3	515	518	521	524
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	93	94	95	96	
Date	April 25	April 25	April 25	April 25	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	2026	2057	2153	2236	
Duration (min)	23	48	37	29	
Start Position					
N. Lat.	51°17.8'	51°17.5'	51°17.9'	51°17.5'	
W. Long.	129°58.7'	130°00.2'	130°02.2'	130°00.2'	
Finish Position					
N. Lat.	51°17.6'	51°17.0'	51°17.3'	51°17.6'	
W. Long.	129°59.8'	130°02.6'	130°00.6'	129°58.6'	
Tow Distance (naut. mi.)	0.8	1.6	1.1	1.2	
Direction (° True)	254	254	102	105	
Vessel Speed (kt)	2.0	2.0	1.7	2.5	
Bottom Depth (m)	269-283	284-372	355-288	288-277	
Modal Depth (m)	276	328	322	283	
Net Events					
Net 2	Time Open	2031	2114	2205	2244
	Depth (m)	55	215	154	108
Net 3	Time Open	2046	2130	2220	2250
	Depth (m)	65	241	167	98
Flowmeter Readings					
Start	Net 1	323327	335098	366687	386983
	Net 2	717765	738228	768684	793978
	Net 3	586286	600926	635132	655965
Finish	Net 1	335098	366687	386983	407931
	Net 2	738228	768684	793978	820020
	Net 3	600926	635132	655965	675493
BMLP #'s	Net 1	525	528	531	534
	Net 2	526	529	532	535
	Net 3	527	530	533	536
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	98	99	100	101	
Date	April 25	April 26	April 26	April 26	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	2338	0018	0107	0151	
Duration (min)	24	43	36	36	
Start Position					
N. Lat.	51°16.8'	51°16.6'	51°17.7'	51°18.1'	
W. Long.	130°00.3'	130°01.0'	129°59.6'	129°58.5'	
Finish Position					
N. Lat.	51°16.5'	51°17.6'	51°18.2'	51°17.2'	
W. Long.	130°01.5'	129°59.9'	129°58.5'	130°00.3'	
Tow Distance (naut. mi.)	0.8	1.4	1.2	1.0	
Direction (° True)	240	055	050	225	
Vessel Speed (kt)	2.0	—	2.0	2.0	
Bottom Depth (m)	303-358	330-280	277-266	266-294	
Modal Depth (m)	331	305	272	280	
Net Events					
Net 2	Time Open	2344	0034	0119	0202
	Depth (m)	55	205	145	98
Net 3	Time Open	0000	0050	0135	0218
	Depth (m)	58	213	165	101
Flowmeter Readings					
Start	Net 1	407931	424270	445938	461418
	Net 2	820020	820239	846619	858702
	Net 3	675493	690058	716395	727784
Finish	Net 1	424270	445938	461418	490750
	Net 2	820239	846619	858702	888295
	Net 3	690058	716395	727784	754925
BMLP #'s	Net 1	538	541	544	547
	Net 2	539	542	545	548
	Net 3	540	543	546	549
Remarks					

Appendix Table 3. Continued

Plankton Tow Number	102	103	104	105
Date	April 26	April 26	April 26	April 26
Station Number	C300	C300	C300	C300
Start Time (PDT)	0243	0405	0610	0831
Duration (min)	64	88	82	102
Start Position				
N. Lat.	51°16.9'	51°17.0'	51°17.3'	51°18.0'
W. Long.	130°02.2'	130°00.8'	130°04.0'	130°05.6'
Finish Position				
N. Lat.	51°17.0'	51°17.2'	51°18.3'	51°19.3'
W. Long.	130°05.4'	130°06.0'	130°08.0'	130°11.1'
Tow Distance (naut. mi.)	1.6	3.2	2.7	3.7
Direction (° True)	270	270	295	291
Vessel Speed (kt)	—	2.2	2.0	2.2
Bottom Depth (m)	361-575	308-600	424-673	530-968
Modal Depth (m)	468	454	549	749
Net Events				
Net 2	Time Open	0305	0443	0640
	Depth (m)	304	300	450
Net 3	Time Open	0323	0500	0656
	Depth (m)	341	300	402
Flowmeter Readings				
Start	Net 1	490750	530656	597553
	Net 2	888295	928445	984815
	Net 3	727784	799301	872405
Finish	Net 1	530656	597553	673602
	Net 2	928445	984815	035976
	Net 3	799301	872405	937314
BMLP #'s	Net 1	550	553	556
	Net 2	551	554	557
	Net 3	552	555	558
Remarks				

Appendix Table 3. Continued

Plankton Tow Number	106	107	108	109	
Date	April 26	April 26	April 26	April 26	
Station Number	C300	F300	F300	F300	
Start Time (PDT)	1114	1504	1722	1805	
Duration (min)	48	56	34	26	
Start Position					
N. Lat.	51°17.5'	51°17.3'	51°20.4'	51°19.7'	
W. Long.	129°59.1'	129°27.4'	129°26.8'	129°27.0'	
Finish Position					
N. Lat.	51°16.8'	51°15.9'	51°20.0'	51°19.1'	
W. Long.	130°01.0'	129°28.3'	129°26.1'	129°27.3'	
Tow Distance (naut. mi.)	1.8	1.4	1.0	0.6	
Direction (° True)	225	200	200	200	
Vessel Speed (kt)	2.0	1.5	1.8	1.4	
Bottom Depth (m)	274-322	260-271	200-206	211-226	
Modal Depth (m)	298	266	203	219	
Net Events					
Net 2	Time Open	1128	1523	1731	1810
	Depth (m)	230	246	188	96
Net 3	Time Open	1146	1539	1746	1825
	Depth (m)	201	246	188	96
Flowmeter Readings					
Start	Net 1	755798	790846	831329	855871
	Net 2	098931	109490	148587	160247
	Net 3	017073	034644	071331	082200
Finish	Net 1	790846	831329	855871	872596
	Net 2	109490	148587	160247	188122
	Net 3	034644	071331	082200	096696
BMLP #'s	Net 1	562	565	568	571
	Net 2	563	566	569	572
	Net 3	564	567	570	573
Remarks					

**Appendix Table 4.** Bridge log information for Neuston trawl tows, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.

Plankton Tow Number	3	4	9	10
Date	April 17	April 17	April 18	April 18
Station Number	E100	E200	E300	B400
Start Time (PDT)	1636	1917	0214	1440
Duration (min)	17	17	14	11
Start Position				
N. Lat.	51°07.8'	51°01.0'	50°55.0'	51°28.1'
W. Long.	128°53.1'	129°19.8'	129°48.8'	130°03.6'
Finish Position				
N. Lat.	51°07.5'	51°01.5'	50°55.0'	51°27.9'
W. Long.	128°54.4'	129°18.9'	129°49.8'	130°04.5'
Tow Distance (naut. mi.)	0.7	0.8	0.7	0.8
Direction (° True)	240	070	270	230
Vessel Speed (kt)	2.5	2.8	3.0	-
Bottom Depth (m)	101-102	179-177	-	620-628
Modal Depth (m)	102	178	-	624
Flowmeter Readings				
Start	540242	585481	635885	686406
Finish	585481	634525	686408	750648
BMLP #	307	308	319	320
Remarks				

Appendix Table 4. Continued

Plankton Tow Number	13	20	25	36
Date	April 20	April 20	April 20	April 20
Station Number	C300	C300	C300	C300
Start Time (PDT)	0358	1121	1605	2330
Duration (min)	17	17	15	14
Start Position				
N. Lat.	51°17.0'	51°16.8'	51°17.7'	51°17.5'
W. Long.	130°00.4'	129°59.4'	129°58.9'	129°59.7'
Finish Position				
N. Lat.	51°16.4'	51°16.2'	51°17.2'	51°18.1'
W. Long.	130°00.9'	129°59.8'	129°59.7'	129°59.0'
Tow Distance (naut. mi.)	0.7	0.7	0.7	0.7
Direction (° True)	240	212	220	025
Vessel Speed (kt)	2.8	2.5	2.8	2.9
Bottom Depth (m)	300-336	294-305	272-288	291-272
Modal Depth (m)	318	300	280	282
Flowmeter Readings				
Start	750623	799936	840274	888579
Finish	799924	840291	888581	908804
BMLP #	329	348	361	392
Remarks				

Appendix Table 4. Continued

Plankton Tow Number	37	42	43	48
Date	April 21	April 21	April 21	April 21
Station Number	B300	B200	B100	A200
Start Time (PDT)	0120	0634	0844	1352
Duration (min)	16	15	16	14
Start Position				
N. Lat.	51°31.1'	51°34.0'	51°42.8'	51°59.5'
W. Long.	129°58.8'	129°50.0'	129°29.3'	129°17.5'
Finish Position				
N. Lat.	51°30.7'	51°34.3'	51°42.2'	51°59.1'
W. Long.	129°59.7'	129°49.3'	129°30.2'	129°18.5'
Tow Distance (naut. mi.)	0.8	0.8	0.8	0.8
Direction (° True)	220	040	223	255
Vessel Speed (kt)	3.0	3.2	3.5	3.0
Bottom Depth (m)	247-255	187-179	92-99	182-187
Modal Depth (m)	251	183	96	185
Flowmeter Readings				
Start	908934	959353	020533	674964
Finish	959345	020522	630581	140877
BMLP #	393	406	407	420
Remarks				

Appendix Table 4. Continued

Plankton Tow Number	49	54	55	61
Date	April 21	April 21	April 22	April 22
Station Number	A300	A400	A2000	C2000
Start Time (PDT)	1624	2228	0154	1158
Duration (min)	16	16	18	15
Start Position				
N. Lat.	51°50.4'	51°38.3'	51°27.0'	51°06.0'
W. Long.	129°41.6'	130°10.3'	130°40.4'	130°25.1'
Finish Position				
N. Lat.	51°50.8'	51°38.8'	51°26.7'	51°06.4'
W. Long.	129°40.1'	130°08.6'	130°42.0'	130°23.9'
Tow Distance (naut. mi.)	0.6	1.2	0.8	0.8
Direction (° True)	060	026	250	060
Vessel Speed (kt)	3.0	2.7	3.0	3.0
Bottom Depth (m)	279-274	486-336	1800	>1800
Modal Depth (m)	277	411	1800	>1800
Flowmeter Readings				
Start	140877	203362	270301	324443
Finish	203371	270301	324455	389443
BMLP #	421	434	435	451
Remarks				

Appendix Table 4. Continued

Plankton Tow Number	64	65	70	71
Date	April 22	April 22	April 23	April 23
Station Number	E2000	D400	C200	C100
Start Time (PDT)	1820	2049	0244	0402
Duration (min)	15	16	16	15
Start Position				
N. Lat.	50°51.0'	51°07.8'	51°26.2'	51°30.1'
W. Long.	129°55.3'	129°38.0'	129°40.1'	129°27.5'
Finish Position				
N. Lat.	50°50.6'	51°07.4'	51°26.6'	51°30.2'
W. Long.	129°54.4'	129°39.0'	129°38.8'	129°26.6'
Tow Distance (naut. mi.)	0.8	0.8	0.8	0.6
Direction (° True)	125	240	060	090
Vessel Speed (kt)	3.0	3.0	3.0	2.6
Bottom Depth (m)	>1000	261-311	166-163	80
Modal Depth (m)	>1000	286	165	80
Flowmeter Readings				
Start	389443	443631	500059	557769
Finish	443631	500055	557769	605103
BMLP #	458	459	472	473
Remarks		Off Station		

Appendix Table 4. Continued

Plankton Tow Number	76	77	82	97
Date	April 23	April 23	April 23	April 25
Station Number	D300	D200	D100	C300
Start Time (PDT)	0856	1046	1524	2316
Duration (min)	16	20	16	18
Start Position				
N. Lat.	51°16.9'	51°25.0'	51°28.2'	51°17.3'
W. Long.	129°08.9'	128°54.4'	128°41.0'	129°59.0'
Finish Position				
N. Lat.	51°17.6'	51°24.5'	51°27.7'	51°16.9'
W. Long.	129°08.5'	128°55.8'	128°40.5'	130°00.1'
Tow Distance (naut. mi.)	0.7	1.0	0.8	0.8
Direction (° True)	021	211	140	239
Vessel Speed (kt)	2.6	3.1	3.0	3.0
Bottom Depth (m)	262-264	189-192	175-191	293-302
Modal Depth (m)	263	191	183	298
Flowmeter Readings				
Start	605103	651170	709394	769395
Finish	651187	713780	713815	783040
BMLP #	486	487	500	537
Remarks				

**Appendix Table 5.** Bridge log information for Tucker trawl tows, *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-30, 1993.

Plankton Tow Number	1	2	3	4	
Date	June 11	June 11	June 11	June 11	
Station Number	D300	D300	C300	C300	
Start Time (PDT)	0050	0200	0618	0710	
Duration (min)	41	21	32	45	
Start Position					
N. Lat.	51°18.1'	51°17.7'	51°17.0'	51°16.7'	
W. Long.	129°12.1'	129°12.8'	130°00.6'	130°00.9'	
Finish Position					
N. Lat.	51°17.6'	51°16.1'	51°16.7'	51°16.7'	
W. Long.	129°12.8'	129°12.1'	130°01.9'	129°59.9'	
Tow Distance (naut. mi.)	0.7	0.7	—	—	
Direction (° True)	230	055	270	090	
Vessel Speed (kt)	1.0	2.1	1.3	1.7	
Bottom Depth (m)	257-262	261	305-363	324-302	
Modal Depth (m)	260	261	334	313	
Net Events					
Net 2	Time Open	0103	0204	0630	
	Depth (m)	240	52	233	
Net 3	Time Open	0118	0219	0645	
	Depth (m)	234	52	230	
Flowmeter Readings					
Start	Net 1	000000	021119	033348	062865
	Net 2	000000	007684	012399	018816
	Net 3	000052	013512	023860	040527
Finish	Net 1	021119	033348	062865	070623
	Net 2	007684	012399	018816	022667
	Net 3	013512	023860	040527	059782
BMLP #'s	Net 1	701	704	707	710
	Net 2	702	705	708	711
	Net 3	703	706	709	712
Remarks	Net 1 flowmeter wire broken				

Plankton Tow Number	5	6	7	8	
Date	June 11	June 11	June 11	June 11	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	0838	0937	1020	1235	
Duration (min)	27	22	27	31	
Start Position					
N. Lat.	51°16.8'	51°16.7'	51°16.9'	51°17.1'	
W. Long.	129°59.2'	130°01.7'	130°00.3'	129°59.8'	
Finish Position					
N. Lat.	51°16.6'	51°17.0'	51°17.2'	51°17.1'	
W. Long.	130°00.4'	130°01.0'	129°59.1'	129°58.7'	
Tow Distance (naut. mi.)	0.8	0.5	0.7	0.8	
Direction (° True)	270	070	075	090	
Vessel Speed (kt)	1.4	1.5	1.7	1.1	
Bottom Depth (m)	291-311	356-316	294-277	291-272	
Modal Depth (m)	301	336	286	282	
Net Events					
Net 2	Time Open	0845	0942	1025	1243
	Depth (m)	108	57	99	152
Net 3	Time Open	0900	0956	1041	1300
	Depth (m)	101	57	99	145
Flowmeter Readings					
Start	Net 1	070623	084964	099619	112394
	Net 2	022667	046462	054690	078448
	Net 3	059782	070509	078660	088634
Finish	Net 1	084964	099619	112394	112476
	Net 2	046462	054690	078448	093492
	Net 3	070509	078660	088634	097350
BMLP #'s	Net 1	713	716	719	722
	Net 2	714	717	720	723
	Net 3	715	718	721	724
Remarks					

Plankton Tow Number	10	11	12	13
Date	June 11	June 11	June 11	June 11
Station Number	C300	C300	C300	C300
Start Time (PDT)	1411	1515	1603	1755
Duration (min)	42	21	27	25
Start Position				
N. Lat.	51°17.1'	51°17.1'	51°17.1'	51°17.3'
W. Long.	129°59.4'	129°59.3'	130°00.2'	129°58.8'
Finish Position				
N. Lat.	51°17.2'	51°16.9'	51°17.0'	51°17.1'
W. Long.	129°57.9'	129°59.7'	129°58.8'	129°59.4'
Tow Distance (naut. mi.)	0.8	0.5	0.9	-
Direction (° True)	089	260	090	270
Vessel Speed (kt)	1.1	2.0	2.0	1.3
Bottom Depth (m)	287-271	284-293	294-281	278-288
Modal Depth (m)	279	289	288	283
Net Events				
Net 2	Time Open	1426	1518	1610
	Depth (m)	244	59	71
Net 3	Time Open	1443	1534	1626
	Depth (m)	262	59	73
Flowmeter Readings				
Start	Net 1	122476	158285	171492
	Net 2	93492	114842	121204
	Net 3	97350	110223	114730
Finish	Net 1	158285	171492	180325
	Net 2	114842	121204	141303
	Net 3	110223	114730	127126
BMLP #'s	Net 1	725	728	731
	Net 2	726	729	732
	Net 3	727	730	733
Remarks				

## Appendix 5. Continued.

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Plankton Tow Number	14	15	16	17	
Date	June 11	June 11	June 11	June 11	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	1838	1938	2202	2235	
Duration (min)	32	34	22	26	
Start Position					
N. Lat.	51°17.0'	51°17.0'	51°16.9'	51°17.0'	
W. Long.	129°59.7'	129°58.0'	129°58.5'	129°59.7'	
Finish Position					
N. Lat.	51°17.0'	51°17.1'	51°16.9'	51°17.1'	
W. Long.	129°57.8'	129°59.4'	129°59.3'	130°00.6'	
Tow Distance (naut. mi.)	—	1.0	0.5	0.6	
Direction (° True)	—	280	275	280	
Vessel Speed (kt)	—	2.1	1.5	1.4	
Bottom Depth (m)	294-271	272-288	273-289	294-305	
Modal Depth (m)	283	280	281	300	
Net Events					
Net 2	Time Open	1849	1951	2206	2240
	Depth (m)	154	184	53	100
Net 3	Time Open	1906	2006	2221	2257
	Depth (m)	150	161	66	98
Flowmeter Readings					
Start	Net 1	196916	215955	238713	252321
	Net 2	148972	178865	187530	194900
	Net 3	132642	150072	159941	164969
Finish	Net 1	215955	238713	252321	273196
	Net 2	178865	187530	194900	204770
	Net 3	150072	159941	164969	172442
BMLP #'s	Net 1	737	740	743	746
	Net 2	738	741	744	747
	Net 3	739	742	745	748
Remarks					

Plankton Tow Number	18	19	20	21	
Date	June 11	June 12	June 12	June 12	
Station Number	C300	C300	C300	C300	
Start Time (PDT)	2330	0022	0124	0213	
Duration (min)	35	43	20	26	
Start Position					
N. Lat.	51°17.1'	51°17.1'	51°17.1'	51°17.1'	
W. Long.	130°01.1'	129°59.1'	129°59.7'	129°59.2'	
Finish Position					
N. Lat.	51°17.0'	51°16.9'	51°17.1'	51°17.0'	
W. Long.	129°59.3'	130°00.3'	129°58.7'	130°00.0'	
Tow Distance (naut. mi.)	1.6	0.8	0.7	0.6	
Direction (° True)	090	270	090	270	
Vessel Speed (kt)	2.7	1.1	3.3	1.3	
Bottom Depth (m)	311-286	283-303	288-275	283-295	
Modal Depth (m)	299	293	282	289	
Net Events					
Net 2	Time Open	2341	0036	0127	0219
	Depth (m)	150	251	55	105
Net 3	Time Open	2356	0053	0142	0235
	Depth (m)	150	278	49	105
Flowmeter Readings					
Start	Net 1	273196	296652	320064	328555
	Net 2	204770	229794	235513	257859
	Net 3	172442	193370	200634	207508
Finish	Net 1	296652	320064	328555	340466
	Net 2	229794	235513	257859	272664
	Net 3	193370	200634	207508	217163
BMLP #'s	Net 1	749	752	755	758
	Net 2	750	753	756	759
	Net 3	751	754	757	760
Remarks					

Plankton Tow Number	22	23	24	25	
Date	June 12	June 12	June 12	June 12	
Station Number	C2000	C2000	A2000	A2000	
Start Time (PDT)	0530	0700	1032	1231	
Duration (min)	69	23	61	22	
Start Position					
N. Lat.	51°07.2'	51°08.3'	51°27.1'	51°27.6'	
W. Long.	130°26.0'	130°23.8'	130°39.8'	130°38.5'	
Finish Position					
N. Lat.	51°08.3'	51°08.1'	51°28.8'	51°27.5'	
W. Long.	130°23.7'	130°24.2	130°38.1'	130°37.4'	
Tow Distance (naut. mi.)	—	—	2.0	0.7	
Direction (° True)	090	—	000	090	
Vessel Speed (kt)	1.8	1.4	2.0	1.8	
Bottom Depth (m)	>2000	>2000	>1000	1000	
Modal Depth (m)	>2000	>2000	>1000	1000	
Net Events					
Net 2	Time Open	0602	0704	1057	1235
	Depth (m)	382	47	391	50
Net 3	Time Open	0617	0720	1113	1251
	Depth (m)	400	43	382	51
Flowmeter Readings					
Start	Net 1	340466	390725	399455	464284
	Net 2	272664	301134	322693	357484
	Net 3	217163	253180	263271	298967
Finish	Net 1	390725	399445	464284	475536
	Net 2	301134	322693	357484	380058
	Net 3	253180	263271	298967	308368
BMLP #'s	Net 1	761	764	767	770
	Net 2	762	765	768	771
	Net 3	763	766	769	772
Remarks					

Plankton Tow Number	26	27	28	29
Date	June 12	June 12	June 12	June 12
Station Number	A400	A400	B400	B400
Start Time (PDT)	1532	1604	1827	1911
Duration (min)	21	43	22	57
Start Position				
N. Lat.	51°39.3'	51°39.7'	51°27.8'	51°29.5'
W. Long.	130°09.4'	130°09.9'	130°04.0'	130°01.7'
Finish Position				
N. Lat.	51°39.7'	51°39.4'	51°28.2'	51°28.0'
W. Long.	130°10.1'	130°08.5'	130°03.5'	130°03.1'
Tow Distance (naut. mi.)	—	—	—	—
Direction (° True)	290	—	040	235
Vessel Speed (kt)	1.4	1.7	1.7	—
Bottom Depth (m)	305	305-324	586-644	560
Modal Depth (m)	305	315	615	560
Net Events				
Net 2	Time Open	1535	1618	1831
	Depth (m)	50	236	51
Net 3	Time Open	1550	1635	1846
	Depth (m)	54	252	53
Flowmeter Readings				
Start	Net 1	475536	488610	515547
	Net 2	380058	385871	395925
	Net 3	308368	313197	323325
Finish	Net 1	488610	515547	528318
	Net 2	385871	395925	406129
	Net 3	313197	323325	330894
BMLP #'s	Net 1	773	776	779
	Net 2	774	777	780
	Net 3	775	778	781
Remarks				

Plankton Tow Number	30	31	32	33	
Date	June 12	June 12	June 12	June 13	
Station Number	B300	B300	B200	B200	
Start Time (PDT)	2109	2141	2347	0027	
Duration (min)	20	43	21	35	
Start Position					
N. Lat.	51°28.6'	51°29.8'	51°34.0'	51°34.3'	
W. Long.	130°00.5'	130°00.2'	129°51.4'	129°52.6'	
Finish Position					
N. Lat.	51°29.8'	51°28.9'	51°34.1'	51°35.0'	
W. Long.	130°00.1'	130°01.8'	129°52.4'	129°52.3'	
Tow Distance (naut. mi.)	0.4	1.2	0.7	-	
Direction (° True)	040	240	270	-	
Vessel Speed (kt)	1.0	-	1.7	-	
Bottom Depth (m)	408-302	325-550	192-198	198-205	
Modal Depth (m)	355	438	195	202	
Net Events					
Net 2	Time Open	2112	2157	2351	0036
	Depth (m)	47	251	53	166
Net 3	Time Open	2127	2212	0006	0055
	Depth (m)	49	241	44	129
Flowmeter Readings					
Start	Net 1	560378	566778	594430	603550
	Net 2	432717	449924	477359	498341
	Net 3	370651	377532	398559	407440
Finish	Net 1	566778	594430	603550	649373
	Net 2	449924	477359	498341	503346
	Net 3	377532	398559	407440	416481
BMLP #'s	Net 1	785	788	791	794
	Net 2	786	789	792	795
	Net 3	787	790	793	796
Remarks					

Plankton Tow Number	34	35	36	37
Date	June 13	June 13	June 13	June 13
Station Number	A300	A300	A200	A200
Start Time (PDT)	0306	0338	0627	0708
Duration (min)	20	42	20	32
Start Position				
N. Lat.	51°50.0'	51°50.2'	51°58.4'	51°58.6'
W. Long.	129°42.7'	129°43.8'	129°21.0'	129°20.6'
Finish Position				
N. Lat.	51°50.1'	51°50.2'	51°58.7'	51°58.3'
W. Long.	129°43.9'	129°42.8'	129°20.3'	129°21.5'
Tow Distance (naut. mi.)	0.8	—	—	—
Direction (° True)	275	095	—	240
Vessel Speed (kt)	1.2	—	—	—
Bottom Depth (m)	287	275-282	201-198	201-202
Modal Depth (m)	287	279	200	202
Net Events				
Net 2	Time Open	0308	0353	0630
	Depth (m)	54	194	46
Net 3	Time Open	0324	0410	0645
	Depth (m)	53	249	47
Flowmeter Readings				
Start	Net 1	649373	662075	681139
	Net 2	503346	508903	512441
	Net 3	416481	420510	426471
Finish	Net 1	662075	681139	697080
	Net 2	508903	512441	533827
	Net 3	420510	426471	432644
BMLP #'s	Net 1	797	800	803
	Net 2	798	801	804
	Net 3	799	802	805
Remarks				

Plankton Tow Number	38	41	42	43	
Date	June 13	June 13	June 13	June 13	
Station Number	B100	B100	C100	C100	
Start Time (PDT)	0939	1125	1333	1401	
Duration (min)	23	24	20	24	
Start Position					
N. Lat.	51°42.6'	51°41.8'	51°29.2'	51°29.4'	
W. Long.	129°30.1'	129°30.7'	129°28.3'	129°29.3'	
Finish Position					
N. Lat.	51°42.1'	51°42.2'	51°29.3'	51°30.3'	
W. Long.	129°30.4'	129°30.4'	129°29.0'	129°29.9'	
Tow Distance (naut. mi.)	0.5	0.5	0.7	1.0	
Direction (° True)	210	015	270	292	
Vessel Speed (kt)	1.5	1.2	2.1	2.9	
Bottom Depth (m)	98-99	97-98	99-98	97-93	
Modal Depth (m)	99	98	99	95	
Net Events					
Net 2	Time Open	0943	1130	1336	1406
	Depth (m)	52	91	55	60
Net 3	Time Open	0959	1146	1351	1422
	Depth (m)	56	83	58	53
Flowmeter Readings					
Start	Net 1	712380	731152	742345	750662
	Net 2	553440	578153	600672	605303
	Net 3	444208	496515	502892	504927
Finish	Net 1	728349	742345	750662	764732
	Net 2	559665	600672	605303	635969
	Net 3	449746	502892	504927	512475
BMLP #'s	Net 1	809	812	815	818
	Net 2	810	813	816	819
	Net 3	811	814	817	820
Remarks					

Plankton Tow Number	44	45	46	47	
Date	June 13	June 13	June 13	June 13	
Station Number	C200	C200	D400	D400	
Start Time (PDT)	1603	1708	2015	2055	
Duration (min)	20	29	19	43	
Start Position					
N. Lat.	51°23.4'	51°24.3'	51°07.7'	51°07.7'	
W. Long.	129°45.0'	129°46.8'	129°44.4'	129°46.1'	
Finish Position					
N. Lat.	51°23.8'	51°25.1'	51°07.7'	51°07.7'	
W. Long.	129°45.9'	129°47.5'	129°43.8'	129°44.8'	
Tow Distance (naut. mi.)	—	—	0.4	0.8	
Direction (° True)	300	300	090	090	
Vessel Speed (kt)	2.0	1.6	1.3	1.1	
Bottom Depth (m)	198-195	197-191	386-365	496-406	
Modal Depth (m)	197	194	376	451	
Net Events					
Net 2	Time Open	1607	1716	2018	2111
	Depth (m)	47	138	49	400
Net 3	Time Open	1621	1731	2034	2126
	Depth (m)	34	140	49	356
Flowmeter Readings					
Start	Net 1	764732	772738	784189	785964
	Net 2	635969	662519	682963	701569
	Net 3	512475	520813	529263	533378
Finish	Net 1	772738	784189	785964	820720
	Net 2	662519	682963	701569	706083
	Net 3	520813	529263	533378	539978
BMLP #'s	Net 1	821	824	827	830
	Net 2	822	825	828	831
	Net 3	823	826	829	832
Remarks					

Plankton Tow Number	48	50	52	53	
Date	June 13	June 14	June 14	June 14	
Station Number	D400	E300	E300	E2000	
Start Time (PDT)	2153	0103	0248	0516	
Duration (min)	17	22	34	23	
Start Position					
N. Lat.	51°07.7'	50°56.2'	50°57.7'	50°50.4'	
W. Long.	129°44.5'	129°40.7'	129°43.3'	129°53.6'	
Finish Position					
N. Lat.	51°07.6'	50°56.4'	50°57.9'	50°50.5'	
W. Long.	129°44.0'	129°40.0'	129°42.5'	129°52.7'	
Tow Distance (naut. mi.)	0.3	—	—	—	
Direction (° True)	090	—	—	115	
Vessel Speed (kt)	1.0	—	—	1.4	
Bottom Depth (m)	387-374	260-268	>1000	>2000	
Modal Depth (m)	381	264	>1000	>2000	
Net Events					
Net 2	Time Open	2154	0107	0300	0521
	Depth (m)	26	58	171	62
Net 3	Time Open	2209	0122	0315	0536
	Depth (m)	26	53	185	69
Flowmeter Readings					
Start	Net 1	820720	825140	854630	868055
	Net 2	706083	723946	758851	767994
	Net 3	539978	543002	623374	634038
Finish	Net 1	825140	843826	868055	885329
	Net 2	723946	728913	767994	776798
	Net 3	543002	548113	634038	642464
BMLP #'s	Net 1	833	837	840	843
	Net 2	834	838	841	844
	Net 3	835	839	842	845
Remarks					

Plankton Tow Number	54	55	56	57
Date	June 14	June 14	June 14	June 14
Station Number	E2000	E200	E200	E100
Start Time (PDT)	0550	0920	0950	1258
Duration (min)	58	20	43	20
Start Position				
N. Lat.	50°50.5'	51°01.3'	51°01.8'	51°09.1'
W. Long.	129°52.4'	129°19.9'	129°20.8'	128°48.9'
Finish Position				
N. Lat.	50°50.7'	51°01.6'	51°02.4'	51°09.3'
W. Long.	129°50.3'	129°20.5'	129°21.9'	128°48.5'
Tow Distance (naut. mi.)	—	0.6	0.9	0.5
Direction (° True)	110	300	300	032
Vessel Speed (kt)	1.6	1.7	1.7	1.5
Bottom Depth (m)	2000+	182-187	190-201	98
Modal Depth (m)	2000+	185	196	98
Net Events				
Net 2	Time Open	0612	0923	1000
	Depth (m)	396	47	151
Net 3	Time Open	0630	0938	1016
	Depth (m)	291	44	154
Flowmeter Readings				
Start	Net 1	885329	934376	958510
	Net 2	776798	790209	798573
	Net 3	642464	669059	674820
Finish	Net 1	934376	958510	980058
	Net 2	790209	798573	820065
	Net 3	669059	674820	688182
BMLP #'s	Net 1	846	849	852
	Net 2	847	850	853
	Net 3	848	851	854
Remarks				

Plankton Tow Number	58	59	60	61	
Date	June 14	June 14	June 14	June 14	
Station Number	E100	D100	D100	G14	
Start Time (PDT)	1331	1614	1719	1848	
Duration (min)	25	20	21	17	
Start Position					
N. Lat.	51°09.4'	51°29.5'	51°29.3'	51°35.6'	
W. Long.	128°48.3'	128°44.3'	128°44.3'	128°55.7'	
Finish Position					
N. Lat.	51°09.7'	51°28.8'	51°28.7'	51°36.0'	
W. Long.	128°48.1'	128°44.2'	128°44.4'	128°55.0'	
Tow Distance (naut. mi.)	0.3	—	—	—	
Direction (° True)	023	—	—	040	
Vessel Speed (kt)	1.0	1.6	1.4	1.4	
Bottom Depth (m)	99-101	77-122	99-125	45	
Modal Depth (m)	100	100	112	45	
Net Events					
Net 2	Time Open	1336	1617	1723	1849
	Depth (m)	182	39	65	32
Net 3	Time Open	1350	1632	1734	1904
	Depth (m)	182	43	63	28
Flowmeter Readings					
Start	Net 1	983797	999789	004877	013376
	Net 2	836084	842817	864667	881576
	Net 3	694537	698329	706040	714435
Finish	Net 1	999789	004877	013376	019264
	Net 2	842817	864667	881276	894178
	Net 3	698329	706040	714435	718302
BMLP #'s	Net 1	858	861	864	867
	Net 2	859	862	865	868
	Net 3	860	863	867	869
Remarks					

Plankton Tow Number	62	63	64	65	
Date	June 14	June 14	June 14	June 14	
Station Number	G13	G12	D200	D200	
Start Time (PDT)	1951	2035	2133	2224	
Duration (min)	20	21	22	31	
Start Position					
N. Lat.	51°27.9'	51°26.3'	51°25.0'	51°24.5'	
W. Long.	128°54.9'	128°55.0'	128°54.2'	128°55.1'	
Finish Position					
N. Lat.	51°28.3'	51°26.8'	51°24.6'	51°25.1'	
W. Long.	128°54.6'	128°54.5'	128°54.9'	128°54.1'	
Tow Distance (naut. mi.)	0.5	0.5	0.7	0.6	
Direction (° True)	030	035	180	050	
Vessel Speed (kt)	1.0	1.0	1.8	1.7	
Bottom Depth (m)	102-90	155-140	194-200	201-193	
Modal Depth (m)	96	148	197	197	
Net Events					
Net 2	Time Open	1955	2039	2138	2233
	Depth (m)	50	49	49	153
Net 3	Time Open	2010	2054	2153	2248
	Depth (m)	49	51	39	129
Flowmeter Readings					
Start	Net 1	019264	022196	040615	048405
	Net 2	881276	906907	914296	939323
	Net 3	714435	721742	726330	732538
Finish	Net 1	022196	040615	048405	063396
	Net 2	906907	914296	939323	962483
	Net 3	721742	726330	732538	742971
BMLP #'s	Net 1	870	873	876	879
	Net 2	871	874	877	880
	Net 3	872	875	878	881
Remarks					

Plankton Tow Number	66	67	68	69	
Date	June 14	June 15	June 15	June 15	
Station Number	G1	G2	G3	G4	
Start Time (PDT)	2333	0047	0150	0246	
Duration (min)	24	20	20	22	
Start Position					
N. Lat.	51°21.2'	51°17.7'	51°14.5'	51°11.3'	
W. Long.	128°53.4'	128°51.9'	128°51.0'	128°50.7'	
Finish Position					
N. Lat.	51°21.6'	51°18.0'	51°14.7'	51°11.0'	
W. Long.	128°52.8'	128°52.0'	128°50.8'	128°50.5'	
Tow Distance (naut. mi.)	0.5	0.3	0.6	0.4	
Direction (° True)	045	348	059	140	
Vessel Speed (kt)	1.5	1.0	1.8	1.1	
Bottom Depth (m)	235-231	225-227	193-195	117-125	
Modal Depth (m)	233	226	194	121	
Net Events					
Net 2	Time Open	2338	0050	0153	0250
	Depth (m)	48	55	51	56
Net 3	Time Open	2354	0105	0207	0305
	Depth (m)	54	47	48	51
Flowmeter Readings					
Start	Net 1	063396	073685	084810	096579
	Net 2	962483	983467	992638	000152
	Net 3	742971	750296	754319	758390
Finish	Net 1	073665	084810	096579	109819
	Net 2	983467	992638	000152	006020
	Net 3	750296	754319	758390	762624
BMLP #'s	Net 1	882	885	888	891
	Net 2	883	886	889	892
	Net 3	884	887	890	893
Remarks					

Plankton Tow Number	70	71	72	73
Date	June 15	June 15	June 15	June 15
Station Number	G11	G10	G5	G6
Start Time (PDT)	0454	0554	0742	0924
Duration (min)	22	16	21	23
Start Position				
N. Lat.	51°10.6'	51°15.6'	51°04.4'	51°12.1'
W. Long.	129°16.0'	129°20.4'	129°30.9'	129°41.1'
Finish Position				
N. Lat.	51°11.2'	51°16.0'	51°04.9'	51°11.7'
W. Long.	129°16.9'	129°20.1'	129°31.5'	129°41.9'
Tow Distance (naut. mi.)	-	-	-	0.7
Direction (° True)	-	010	-	245
Vessel Speed (kt)	1.9	1.5	1.7	1.8
Bottom Depth (m)	294-299	286-285	414	400
Modal Depth (m)	297	286	414	400
Net Events				
Net 2	Time Open	0458	0557	0745
	Depth (m)	45	59	51
Net 3	Time Open	0513	0608	0801
	Depth (m)	49	61	48
Flowmeter Readings				
Start	Net 1	109819	118243	130634
	Net 2	006020	026118	029252
	Net 3	762624	772542	775179
Finish	Net 1	118243	130634	138296
	Net 2	026118	029252	049367
	Net 3	772542	775179	780560
BMLP #'s	Net 1	894	897	900
	Net 2	895	898	901
	Net 3	896	899	902
Remarks				

Plankton Tow Number	74	75	76	77
Date	June 15	June 15	June 15	June 15
Station Number	G7	G8	G9	G9
Start Time (PDT)	1216	1332	1600	1733
Duration (min)	22	24	20	23
Start Position				
N. Lat.	51°22.8'	51°27.4'	51°16.6'	51°16.5'
W. Long.	130°02.3'	129°53.9'	129°33.6'	129°33.2'
Finish Position				
N. Lat.	51°22.9'	51°27.6'	51°17.0'	51°16.4'
W. Long.	130°03.1	129°54.9'	129°34.6'	129°31.7'
Tow Distance (naut. mi.)	0.5	0.6	—	—
Direction (° True)	281	279	285	115
Vessel Speed (kt)	1.4	1.7	1.4	3.0
Bottom Depth (m)	413-514	234-235	252-235	257
Modal Depth (m)	464	235	244	257
Net Events				
Net 2	Time Open	1219	1338	1603
	Depth (m)	61	59	46
Net 3	Time Open	1235	1353	1617
	Depth (m)	57	50	39
Flowmeter Readings				
Start	Net 1	148277	160010	177064
	Net 2	072940	076084	079289
	Net 3	789752	792948	798823
Finish	Net 1	160010	177064	184157
	Net 2	076084	079289	101836
	Net 3	792948	798823	804739
BMLP #'s	Net 1	906	909	912
	Net 2	907	910	913
	Net 3	908	911	914
Remarks			Normal Speed	High Speed

Plankton Tow Number		79	80
Date		June 15	June 15
Station Number		G9	G9
Start Time (PDT)		1855	1929
Duration (min)		23	20
Start Position			
N. Lat.		51°16.4'	51°17.5'
W. Long.		129°32.8'	129°34.2'
Finish Position			
N. Lat.		51°17.5'	51°17.5'
W. Long.		129°34.2'	129°33.7'
Tow Distance (naut. mi.)			
Direction (° True)		310	140
Vessel Speed (kt)		2.8	1.5
Bottom Depth (m)		259-232	233
Modal Depth (m)		246	233
Net Events			
Net 2	Time Open	1859	1932
	Depth (m)	45	48
Net 3	Time Open	1914	1947
	Depth (m)	37	47
Flowmeter Readings			
Start	Net 1	200685	215846
	Net 2	133643	165911
	Net 3	865744	881504
Finish	Net 1	215846	225573
	Net 2	165911	167602
	Net 3	881504	884069
BMLP #'s	Net 1	918	921
	Net 2	919	922
	Net 3	920	923
Remarks		High Speed	Normal Speed

**Appendix Table 6. Bridge log information for Neuston net tow, *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-30, 1993.**

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Plankton Tow Number	49
Date	June 13
Station Number	D400
Start Time (PDT)	2255
Duration (min)	16
Start Position	
N. Lat.	51°07.6'
W. Long.	129°44.0'
Finish Position	
N. Lat.	51°07.5'
W. Long.	129°42.4'
Tow Distance (naut. mi.)	0.8
Direction (° True)	095
Vessel Speed (kt)	3.5
Bottom Depth (m)	380-390
Modal Depth (m)	385
Flowmeter Readings	
Start	024783
Finish	110606
BMLP #	836
Remarks	

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Appendix Table 7. Scientific and Common names of larval fish captured by Tucker trawl, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992, and June 9-30, 1993.

<b>Rockfishes</b>	<i>Sebastodes aleutianus</i> (1993) <i>S. alutus</i> (1992/1993) <i>S. babcocki</i> (1992/1993) <i>S. brevispinis</i> (1993) <i>S. caurinus</i> (1992) <i>S. crameri</i> (1992) <i>S. diploproa</i> (1993) <i>S. elongatus</i> (1993) <i>S. flavidus</i> (1993) <i>S. helvomaculatus</i> (1993) <i>S. maliger</i> (1992/1993) <i>S. mystinus</i> (1992) <i>S. paucispinis</i> (1992/1993) <i>S. proriger</i> (1993) <i>S. reedi</i> (1992/1993) <i>S. ruberrimus</i> (1993) <i>S. variegatus</i> (1993) <i>S. zacentrus</i> (1993) <i>Sebastolobus sp.</i> (1993) <i>S. alascanus</i> (1992/1993)	Rougheye rockfish Pacific ocean perch Redbanded rockfish Silvergray rockfish Copper rockfish Darkblotched rockfish Splitnose rockfish Greenstriped rockfish Yellowtail rockfish Rosethorn rockfish Quillback rockfish Blue rockfish Boccacio Redstripe rockfish Yellowmouth rockfish Yelloweye rockfish Harlequin rockfish Sharpchin rockfish Thornyheads Shortspine thornyhead
<b>Other Scorpaeniformes</b>	<i>Anaplopoma simbria</i> Agonidae Cottidae <i>Artedius sp.</i> <i>Chitonotus pugetensis</i> <i>Nautichthys oculofasciatus</i> <i>Radulinus sp.</i> <i>Ruscarius meanyi</i> <i>Scorpaenichthys marmoratus</i> <i>Liparis sp.</i>	Sablefish Poachers Sculpins ---- Roughback sculpin Sailfin sculpin ---- Puget Sound sculpin Cabezon Snailfishes
<b>Myctiformes</b>	Myctophidae <i>Lampanyctus sp.</i> <i>Stenobrachius leucopsarus</i> <i>Tarletonbeania crenularis</i>	Lanternfishes ---- Northern lanternfish Blue lanternfish
<b>Perciformes</b>	Gobiidae <i>Coryphopterus nicholsi</i> <i>Ammodytes hexapterus</i> <i>Ronquilus jordani</i> Stichaeidae	Gobies Blackeye goby Pacific sandlance Northern ronquil Picklebacks
<b>Flatfishes</b>	<i>Citharachthys stigmaeus</i> Pleurnectidae <i>Glyptocephalus zachirus</i> <i>Hypoglossoides elassodon</i> <i>Lyopsetta exilis</i>	Speckled sanddab Righteye Flounders Rex sole Flathead sole Slender sole
<b>Other Fish</b>	<i>Clupea pallasi</i> Bathylagidae <i>Macropinna microstoma</i> <i>Chauliodus macouni</i>	Pacific herring Deepsea smelts Barreleye Pacific viperfish

Note: Year captured is indicated for Rockfishes; all other fish were captured in 1993.

**Appendix Table 8. Temperature depth summary, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992.**

Station Number	E100	E200	E300	B400
N. Lat.	51°09.0'	51°01.0'	50°56.0'	51°28.1'
W. Long.	128°49.0'	129°19.9'	129°42.3'	130°03.9'
Date	April 17	April 17	April 17	April 18
Time	1403	1806	2225	1314
Depth (m)		Temperature (°C)		
Surface	9.75	9.51	9.60	9.79
10	9.73	9.81	10.0	9.78
20	9.73	9.81	9.99	9.75
30	9.72	9.87	9.94	9.72
40	9.71	9.84	9.94	9.79
50	9.71	9.63	9.92	9.83
60	9.69	9.03	9.63	9.87
70	9.67	8.95	9.52	9.86
80	9.69	9.07	9.38	9.82
90		9.08	8.92	9.64
100		9.16	8.45	9.57
110		9.11	7.76	9.46
120		9.04	7.85	9.14
130		8.95	7.90	8.74
140		8.90	7.69	8.37
150		8.68	7.68	8.04
160			7.63	7.67
170			7.57	7.56
180			7.44	7.45
190			7.36	7.30
200			7.27	7.27
210			7.15	7.01
220			7.11	6.86
230			7.06	6.74
240			6.97	6.70
250			6.95	6.70
260			6.90	6.69
270			6.80	6.63
280			6.64	6.53
290			6.56	6.52
300			6.36	6.51
310			6.30	6.48
320				6.41
330				6.35
340				6.04
350				5.95
360				5.79
370				5.66
380				5.61
390				5.57
400				5.55
410				5.50
420				5.37
430				5.31
440				5.26
450				5.18
460				5.15
470				5.15
480				5.12
490				5.08
500				5.04
Last Reading				
Temperature (°C)	9.68	8.65	6.09	5.01
Depth (m)	86	152	316	503

Appendix Table 8. Continued.

Station Number	C300	B300	B200	B100
N. Lat.	51°17.0'	51°31.0'	51°34.0'	51°43.0'
W. Long.	129°59.9'	129°58.9'	129°50.9'	129°29.0'
Date	April 20	April 21	April 21	April 21
Time	0547	0009	0359	0733
Depth (m)		Temperature (°C)		
Surface	9.62	9.36	9.62	9.73
10	9.62	9.36	9.63	9.73
20	9.66	9.36	9.65	9.73
30	9.71	9.47	9.65	9.73
40	9.71	9.58	9.73	9.74
50	9.73	9.70	9.81	9.75
60	9.75	9.73	9.82	9.57
70	9.77	9.76	9.81	9.43
80	9.84	9.80	9.79	
90	9.81	9.81	9.74	
100	9.75	9.82	9.69	
110	9.72	9.77	9.48	
120	9.56	9.63	9.05	
130	9.48	9.50	8.72	
140	9.33	9.30	8.67	
150	9.05	8.92	8.63	
160	8.82	8.74		
170	8.57	8.43		
180	8.40	8.23		
190	7.85	8.03		
200	7.50	7.50		
210	7.31	7.39		
220	7.09			
230	7.02			
240	6.85			
250	6.83			
260				
270				
280				
290				
300				
310				
320				
330				
340				
350				
360				
370				
380				
390				
400				
410				
420				
430				
440				
450				
460				
470				
480				
490				
500				
Last Reading				
Temperature (°C)	6.82	7.37	8.63	9.42
Depth (m)	253	216	150	71

Appendix Table 8. Continued.

Station Number	A200	A300	A400	A2000
N. Lat.	51°59.0'	51°50.1'	51°39.0'	51°27.0'
W. Long.	129°19.1'	129°41.9'	130°08.9'	130°40.0'
Date	April 21	April 21	April 21	April 22
Time	1100	1511	1917	0035
Depth (m)		Temperature (°C)		
Surface	9.73	10.01	9.07	9.40
10	9.72	9.81	9.03	9.41
20	9.70	9.82	8.98	9.40
30	9.70	9.81	9.07	9.32
40	9.74	9.75	9.59	9.31
50	9.73	9.76	9.71	9.21
60	9.72	9.76	9.70	9.12
70	9.65	9.77	9.62	8.85
80	9.29	9.71	9.51	8.60
90	9.15	9.43	9.41	8.11
100	9.05	8.90	8.96	7.78
110	8.98	8.75	8.89	7.31
120	8.68	8.75	8.35	7.10
130	8.65	8.57	8.09	7.14
140	8.05	8.18	8.01	7.19
150	7.63	8.04	7.89	7.18
160	7.47	7.76	7.65	7.10
170		7.82	7.52	7.05
180		7.39	7.39	6.98
190		7.28	7.30	6.89
200		7.21	7.23	6.77
210		7.17	7.16	6.65
220		7.17	6.97	6.63
230		7.14	6.89	6.54
240		6.99	6.88	6.41
250		6.95	6.89	6.33
260		6.78	6.89	6.21
270			6.86	6.09
280			6.74	6.05
290				6.00
300				5.91
310				5.81
320				5.73
330				5.64
340				5.60
350				5.49
360				5.45
370				5.40
380				5.31
390				5.29
400				5.20
410				5.16
420				5.14
430				5.07
440				5.03
450				4.97
460				4.92
470				4.88
480				4.86
490				4.81
500				
Last Reading				
Temperature (°C)	7.47	6.78	6.74	4.97
Depth (m)	160	260	280	493

Appendix Table 8. Continued.

Station Number	C2000	E2000	D400	C200
N. Lat.	51°07.0'	50°50.0'	51°07.9'	51°25.2'
W. Long.	130°26.0'	129°54.1'	129°37.9'	129°24.0'
Date	April 22	April 22	April 22	April 22
Time	1136	1444	1937	2355
Depth (m)		Temperature (°C)		
Surface	9.67	10.42	9.17	9.13
10	9.66	10.13	9.10	9.13
20	9.50	10.11	9.10	9.07
30	9.48	10.05	9.06	9.01
40	9.36	10.03	9.18	8.89
50	9.03	9.97	8.96	9.55
60	8.75	9.85	9.03	9.64
70	8.60	9.32	9.06	9.50
80	8.30	9.10	8.59	9.76
90	8.36	8.83	8.53	9.80
100	8.00	8.24	8.34	9.78
110	8.38	8.16	8.10	9.59
120	8.44	7.84	7.99	9.53
130	8.23	7.42	7.84	9.44
140	8.00	7.25	7.63	9.30
150	7.75	7.21	7.58	
160	7.61	7.21	7.50	
170	7.53	7.22	7.46	
180	7.31	7.19	7.39	
190	7.34	7.03	7.33	
200	7.22	6.83	7.26	
210	7.09	6.80	7.06	
220	6.95	6.59	6.89	
230	6.69	6.57	6.76	
240	6.56	6.52		
250	6.50	6.45		
260	6.35	6.41		
270	6.23	6.36		
280	6.03	6.24		
290	6.04	6.23		
300	6.10	6.18		
310	6.01	6.03		
320	5.96	5.91		
330	5.90	5.91		
340	5.88	5.74		
350	8.72	5.72		
360	5.58	5.67		
370	5.51	5.56		
380	5.32	5.44		
390	5.29	5.40		
400	5.27	5.37		
410	5.14	5.32		
420	5.13	5.25		
430	5.10	5.15		
440	5.07	5.19		
450	5.01	5.20		
460	4.96	5.14		
470	4.91	5.10		
480	4.88	5.07		
490	4.87	4.99		
500	4.86	4.96		
Last Reading				
Temperature (°C)	4.85	4.93	6.75	9.07
Depth (m)	501	505	231	147

Appendix Table 8. Continued.

Station Number	C100	D300	D200	D100
N. Lat.	51°29.9'	51°18.0'	51°25.0'	51°30.0'
W. Long.	129°28.0'	129°12.1'	128°54.1'	128°44.1'
Date	April 23	April 23	April 23	April 23
Time	0250	0617	0934	1304
Depth (m)		Temperature (°C)		
Surface	9.20	9.07	8.99	9.07
10	9.14	9.07	8.98	9.06
20	8.87	8.86	9.05	9.09
30	8.84	9.10	9.07	9.08
40	8.84	9.80	9.07	9.06
50	8.81	10.20	9.03	
60	8.79	10.16	9.01	
70	8.80	10.09	8.81	
80		9.88	8.76	
90		9.64	8.67	
100		9.15	8.48	
110		8.86	8.29	
120		8.60	8.07	
130		8.41	7.98	
140		8.26	7.97	
150		8.00	7.90	
160		7.89	7.85	
170		7.67		
180		7.50		
190		7.34		
200		7.15		
210		6.99		
220		6.84		
230				
240				
250				
260				
270				
280				
290				
300				
310				
320				
330				
340				
350				
360				
370				
380				
390				
400				
410				
420				
430				
440				
450				
460				
470				
480				
490				
500				
Last Reading				
Temperature (°C)	8.80	6.63	7.85	9.01
Depth (m)	70	229	160	45

Appendix Table 9. Temperature depth summary, *R/V W.E. RICKER*, Pacific ocean perch larval survey, June 9-18, 1993.

Station Number	D300	C300	C2000	A2000
N. Lat.	51°18.00'	51°17.08'	51°07.09'	51°27.10'
W. Long.	129°12.01'	130°00.05'	130°26.05'	130°40.04'
Date	June 11	June 11	June 12	June 12
Time	0024	0552	0459	0945
Depth (m)		Temperature (°C)		
Surface	12.24	12.11	12.56	12.63
10	12.22	12.10	12.53	12.58
20	12.24	11.92	11.78	11.87
30	12.25	11.83	11.72	10.75
40	12.14	11.37	10.49	9.80
50	11.52	10.33	9.64	8.92
60	10.11	9.02	8.99	8.79
70	9.96	8.67	8.18	8.37
80	9.26	8.13	7.62	7.87
90	9.15	7.20	7.35	7.62
100	9.07	7.16	7.46	7.59
110	8.68	7.06	7.34	7.51
120	8.18	7.00	6.85	7.45
130	7.71	6.90	6.49	7.33
140	7.40	6.83	6.37	6.83
150	7.26	6.82	6.30	6.77
160	7.18	6.87	6.16	6.73
170	7.08	6.78	6.11	6.67
180	6.94	6.61	6.09	6.65
190	6.82	6.64	5.99	6.62
200	6.71	6.41	5.94	6.56
210	6.61	6.27	5.91	6.45
220	6.46	6.22	5.84	6.42
230	6.19	6.10	5.78	6.37
240	6.11	5.98	5.68	6.31
250	6.08	5.92	5.81	6.16
260		5.87	5.80	6.05
270		5.71	5.68	6.02
280		5.64	5.60	5.93
290			5.73	5.84
300			5.61	5.77
310			5.56	5.75
320			5.46	5.72
330			5.27	5.65
340			5.09	5.64
350			5.34	5.53
360			5.17	5.52
370			5.08	5.42
380			5.06	5.37
390			5.07	5.34
400			4.87	5.26
410			4.84	5.19
420			4.85	5.16
430			4.79	5.10
440			4.79	5.06
450			4.77	5.03
460			4.63	5.00
470			4.62	4.95
480			4.57	4.93
490			4.46	4.92
500			4.42	4.89
Last Reading				
Temperature (°C)	6.08	5.63	4.42	4.89
Depth (m)	252.5	286.1	500.2	506.0

Appendix Table 9. Continued.

Station Number	A400	B400	B300	B200
N. Lat.	51°39.17'	51°28.01'	51°29.77'	51°34.01'
W. Long.	130°09.16'	130°28.01'	130°00.50'	129°51.03'
Date	June 12	June 12	June 12	June 12
Time	1517	1800	2049	2330
Depth (m)		Temperature (°C)		
Surface	12.41	12.56	12.54	13.38
10	11.41	11.77	12.18	13.33
20	10.89	10.85	10.79	12.81
30	10.53	10.47	10.45	9.95
40	10.07	9.87	8.96	9.57
50	9.18	9.05	8.38	9.27
60	9.09	8.80	8.14	8.93
70	8.89	8.80	8.06	7.97
80	8.61	8.68	7.87	7.56
90	8.48	8.46	7.47	7.41
100	8.06	8.26	7.24	7.26
110	7.85	7.50	6.66	7.07
120	7.72	6.94	6.61	6.97
130	7.33	6.73	6.60	6.70
140	6.93	6.67	6.60	6.39
150	6.76	6.63	6.54	6.31
160	6.61	6.79	6.38	6.25
170	6.54	6.68	6.50	
180	6.42	6.50	6.32	
190	6.37	6.45	6.25	
200	6.21	6.35	6.23	
210	6.16	6.26	6.17	
220	6.09	6.23	6.12	
230	5.97	6.18	6.02	
240	5.85	6.12	6.00	
250	5.78	6.06	5.98	
260	5.63	5.99	5.94	
270	5.54	5.95	5.94	
280	5.53	5.92	5.93	
290	5.51	5.84	5.93	
300	5.50	5.82	5.90	
310		5.79	5.81	
320		5.76	5.80	
330		5.76	5.77	
340		5.74	5.76	
350		5.68	5.72	
360		5.63	5.61	
370		5.58		
380		5.50		
390		5.44		
400		5.43		
410		5.40		
420		5.37		
430		5.29		
440		5.24		
450		5.21		
460		5.15		
470		5.09		
480		5.08		
490		5.05		
500		5.00		
Last Reading				
Temperature (°C)	5.48	5.01	5.58	6.23
Depth (m)	300.6	500.3	365.7	169.4

Appendix Table 9. Continued.

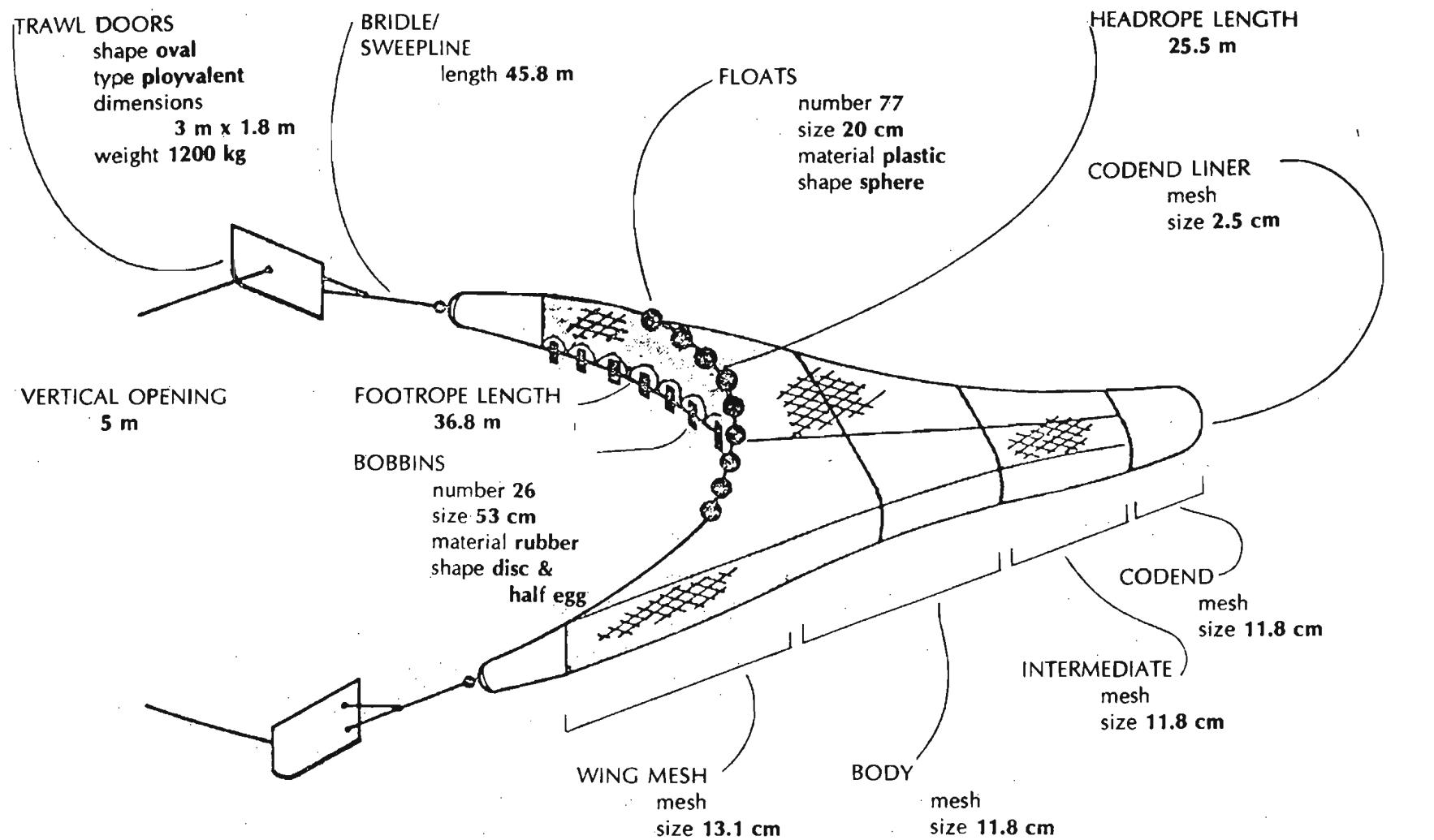
Station Number	A300	A200	B100	C100
N. Lat.	51°49.96'	51°58.48'	51°42.76'	51°29.40'
W. Long.	129°42.34'	129°20.70'	129°30.34'	129°27.98'
Date	June 13	June 13	June 13	June 13
Time	0248	0608	0926	1317
Depth (m)		Temperature (°C)		
Surface	12.55	12.13	12.27	13.00
10	12.10	11.69	11.72	12.78
20	11.30	11.75	11.48	12.38
30	11.16	11.25	10.36	12.09
40	10.38	9.27	10.02	11.98
50	9.15	8.75	9.85	11.37
60	8.91	8.61	9.75	10.05
70	8.67	8.59	9.74	9.59
80	8.49	8.26		9.48
90	8.32	8.00		
100	8.20	7.71		
110	8.00	7.48		
120	7.85	7.30		
130	7.47	6.94		
140	7.26	6.68		
150	6.97	6.43		
160	6.93	6.27		
170	6.34	6.11		
180	6.02			
190	5.97			
200	5.90			
210	5.81			
220	5.70			
230	5.66			
240	5.52			
250	5.51			
260	5.50			
270	5.50			
280				
290				
300				
310				
320				
330				
340				
350				
360				
370				
380				
390				
400				
410				
420				
430				
440				
450				
460				
470				
480				
490				
500				
Last Reading				
Temperature (°C)	6.25	5.39	6.32	4.92
Depth (m)	275.0	178.0	78.3	88.8

Appendix Table 9. Continued.

Station Number	C200	D400	E300	E2000
N. Lat.	51°23.39'	51°07.96'	50°56.08'	50°50.24'
W. Long.	129°44.90'	129°44.58'	129°40.81'	129°53.75'
Date	June 13	June 13	June 14	June 14
Time	1547	1958	0047	0453
Depth (m)		Temperature (°C)		
Surface	13.03	12.91	12.49	12.25
10	13.02	12.88	12.16	12.27
20	12.03	12.21	11.80	12.11
30	11.91	11.36	11.58	11.65
40	11.11	9.28	11.12	10.38
50	10.25	8.84	10.17	8.80
60	8.87	8.64	9.31	8.21
70	8.54	8.36	8.45	8.33
80	8.16	8.10	7.91	8.08
90	7.87	7.94	7.85	8.09
100	7.58	7.74	7.77	7.93
110	7.35	7.63	7.46	7.81
120	7.12	7.58	7.19	7.71
130	6.95	7.33	7.12	7.65
140	6.64	7.26	7.08	7.59
150	6.57	7.22	7.11	7.35
160	6.49	7.15	7.04	7.23
170	6.40	7.12	6.92	7.11
180	6.33	7.08	6.86	7.05
190	6.26	6.95	6.84	6.97
200		6.83	6.74	6.73
210		6.69	6.62	6.59
220		6.54	6.62	6.53
230		6.48	6.51	6.37
240		6.43	6.50	6.32
250		6.38	6.50	6.08
260		6.31	6.50	6.04
270		6.24		5.96
280		6.13		5.90
290		6.10		5.86
300		6.07		5.82
310		6.05		5.84
320		6.01		5.84
330		5.94		5.62
340		5.83		5.71
350		5.78		5.72
360		5.44		5.72
370				5.71
380				5.59
390				5.41
400				5.36
410				5.28
420				5.26
430				5.23
440				5.20
450				5.19
460				5.15
470				5.12
480				5.02
490				4.97
500				4.92
Last Reading				
Temperature (°C)	6.25	5.39	6.32	4.92
Depth (m)	191.0	367.1	268.5	500.7

Appendix Table 9. Continued.

Station Number	E200	E100	D100	D200
N. Lat.	51°01.01'	51°08.92'	51°29.57'	51°25.1'
W. Long.	129°19.9'	128°48.99'	128°44.33'	128°54.22'
Date	June 14	June 14	June 14	June 14
Time	0905	1246	1605	2135
Depth (m)		Temperature (°C)		
Surface	13.10	11.23	12.78	12.17
10	13.10	11.22	12.65	12.18
20	12.93	9.68	12.14	11.72
30	12.44	9.20	11.35	11.35
40	11.43	8.97	11.15	11.26
50	10.48	8.93	10.75	11.08
60	10.06	8.86	10.55	10.32
70	9.72	8.48		9.63
80	9.36	7.89		8.88
90	8.89	7.85		9.67
100	8.62			9.69
110	8.20			9.07
120	7.80			8.87
130	7.44			8.64
140	7.36			8.15
150	7.16			7.78
160	6.91			7.01
170				6.72
180				6.41
190				
200				
210				
220				
230				
240				
250				
260				
270				
280				
290				
300				
310				
320				
330				
340				
350				
360				
370				
380				
390				
400				
410				
420				
430				
440				
450				
460				
470				
480				
490				
500				
Last Reading				
Temperature (°C)	6.84	7.85	10.42	6.39
Depth (m)	167	90.5	61.3	182.8



Appendix Figure 1. Net dimensions and characteristics for bottom trawl net Atlantic Western IIIa, *R/V W.E. RICKER*, Pacific ocean perch larval survey, April 16-30, 1992, and June 9-18, 1993.

