Vertical Distribution and Abundance of Epibenthos and Macrozooplankton in the Lower Fraser River Estuary

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VERTICAL DISTRIBUTION AND ABUNDANCE OF EPIBENTHOS AND MACROZOOPLANKTON IN THE LOWER FRASER ESTUARY

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ABSTRACT

Levings, C.D. 1980. Vertical distribution and abundance of epibenthos and macrozooplankton in the lower Fraser River estuary. Can. Data Rep. Fish. Aquat. Sci. 241: 59 p.

Data on the vertical distribution and abundance of fish larvae, epibenthic organisms and macrozooplankton in the lower Fraser River estuary are presented. Samples were obtained from February to September 1978 using a drift sampling technique and a large volume submersible pump. Simultaneous salinity and temperature measurements were obtained. Eighty taxa were recorded at four sites, namely North Arm, Steveston Island (South Arm) Sea Reach, Canoe Pass, and Roberts Bank. When the salt wedge was present at the Steveston Island station, typical marine organisms such as chaetognaths, salps, and calanoid copepods were found in the bottom and middle of the water column. Copepod abundance ranged from approximately 0.1 to 10 m^{-3} when salinity levels were <15°/oo, but when salinity was over 22°/oo, catches ranged up to 400 m^{-3}. A preliminary analysis of the data showed that most of the abundant taxa were at either surface or bottom samples, except for larval eulachon (*Thaleichthys pacificus*) which were distributed through the water column. At Roberts Bank, only 4 of the abundant taxa were heterogeneously distributed in the water column. At this location megalopa stages of *Cancer magister* were abundant (up to 13 m^{-2}) in pump samples in July and August.

A listing of temperature and salinity data is also provided.

RESUME

Levings, D. C. 1980. Vertical distribution and abundance of epibenthos and macrozooplankton in the lower Fraser River estuary. Can. Data Rep. Fish. Aquat. Sci. 241: 59 p.

On présente des données relatives à la distribution verticale et à l'abondance de larves de poissons, d'organismes épibenthiques et du macrozooplancton dans le bas estuaire du fleuve Fraser. Des échantillons ont été prélevés, de février à septembre 1978, en faisant appel à une technique d'échantillonnage par dérive et à une pompe immergée de fort débit. La salinité et la température ont aussi été mesurées par la même occasion. Une total de 80 taxa a été relevé à quatre emplacements, à savoir: le bras Nord, l'aval de l'île Steveston (bras Sud), la passe Canoe et le banc Roberts. Des organismes marins types comme des chaetognathes, des salpes et des copépodes célanoides ont été trouvés sur le fond et au milieu de la colonne d'eau à la station de l'île Steveston quand le coin d'eau salée était présent. La densité des copépodes variait d'environ 0,1 à 10 m^{-3} quand la salinité était inférieure à 15% et a atteint jusqu'à 400 m^{-3} quand la salinité était supérieure à 22%. Une analyse préliminaire des données a montré que la plupart des taxa abondants se trouvaient dans les échantillons de surface ou de fond, à l'exception des larves d'eulakanes (*Thaleichthys pacificus*) qui étaient réparties dans toute la masse d'eau. Seulement quatre des taxa abondants étaient répartis de facon hétérogène dans la colonne d'eau au banc Roberts. À cet endroit, les *Cancer magister* de stade mégalope étaient abondants, jusqu'à 13 m^{-3}, dans les échantillons prélevés à la pompe en juillet et août.

On trouvera aussi la liste des valeurs des températures et des salinités.

INTRODUCTION

Basic data on the abundance, temporal change, and diversity of planktonic and drift (or epibenthic) organisms were obtained at the Fraser estuary over the period February 1978 to September 1978. These organisms feature in the food webs of fish such as juvenile salmonids (e.g. Goodman 1975; Northcote et al. 1978). Data on the distribution of the food organisms are needed to help predict the impact of industrial activities such as river training walls. The lower river channels are highly stratified because of salt wedge effects (Ages 1979) and it was expected this might influence the vertical distribution of organisms. Simultaneous measurements of salinity and temperature were therefore obtained.

SAMPLING LOCATIONS

Data were obtained at the following locations: North Arm (49° 13.60; 123° 13.45, near upstream end of North Arm Jetty); Steveston Island (49° 07; 123° 10.70, inshore of buoy S19); Sea Reach (49° 06; 123° 09, abeam of a black beacon on the southwest side of Woodward Island); Canoe Pass (49° 05.12; 123° 07.50, upstream of Canoe Pass bridge, near confluence with Sea Reach); Roberts Bank (49° 01.05; 123° 09, in the dredged channel ("borrow pit") for Westshore Terminals. The stations at Steveston Island, Sea Reach, and Canoe Pass were sampled each month from February to September. Roberts Bank was sampled April to September, and the North Arm station was occupied in April and May only.

METHODS

A. Drift Sampling

A "drift net" was constructed by using a plankton net (500 μm) mesh mounted on a 50 cm diameter hoop fitted with a flowmeter (Fig. 2). The bridle of the net was then fitted to a swivel and attached to a line held vertically in the water with a concrete weight (up to 50 kg). The apparatus was lowered from R/V ACTIVE LASS (13 m) anchored at the respective locations. After the initial sampling, when it was found that catches increased dramatically after dark, most of the work was done between 1800 to 2400 h. Samples were obtained every 2 h during this period.

B. Submersible Pump Sampling

Obtaining samples at Roberts Bank with the above technique proved difficult as tidal flows were generally insufficient to hold the net open for proper sampling. A large volume submersible pump (1 hp; Paramount 3 SVWS) was therefore used to obtain samples. The pump had a simple 2-bladed vane design and an intake diameter of 17 cm. Discharge rate of the pump was approximately 0.56 m^3 min^{-1} at 5 m, through a 8 cm diameter line fitted with a ball-type flowmeter (Fischer/Porter). To reduce damage to organisms when retained on

sieves, the discharge line was connected with a header box as shown in Fig. 2. Water drained from this box through sieves (500 μm). In Table 1, the suffix P or N indicates whether the pump (P) or drift net (N) technique was used to obtain particular samples.

Samples were fixed in 5% formalin.

C. Depths Sampled

Samples were obtained at the surface (net hoop just below water), at 2 to 3 m off bottom (5 m at Roberts Bank), and 0.5 m off bottom. These depths are referred to as surface, middle, and bottom, respectively, in Table 1. Water depth at high tide at the various locations were as follows: North Arm - 5 m, Steveston - 8 m, Sea Reach - 6 m, Canoe Pass - 6 m, and Roberts Bank - 10 m. Sets or pumping sessions at each depth were of 10 min duration.

D. Temperature and Salinity Data

Observations on temperature and salinity at 1 m intervals were usually made coincident with biological sampling. A Beckman RS5-3 salinometer was used.

LABORATORY PROCEDURES

Samples were usually subsampled with a Folsam plankton splitter before organisms were identified and enumerated using a Wild M-5 stereomicroscope. Because of the project's emphasis on epibenthic forms, calanoid copepods were not identified to the generic or specific level. However, accurate identification of other planktonic taxa was performed.

PRELIMINARY RESULTS

Table 1 lists the fauna obtained, which includes 80 taxa. Tabulated catch data for each of the four locations are presented in Table 2. Depending on tide stage and river runoff, there was very marked stratification of communities at the lower river stations. When the salt wedge was present, typical marine organisms such as chaetognaths, salps, and calanoid copepods were strongly grouped with salinity levels in the bottom waters of the South Arm (Steveston Island station). Copepod abundance ranged from approximately 0.1 to 10 m^{-3} when salinity levels were $\leq 15^{o}/oo$, but when salinity was over $22^{o}/oo$, catches ranged up to 400 m^{-3} (Fig. 3).

Some preliminary statistical analyses using χ^2 tests were performed to investigate the vertical distribution of organisms at Steveston Island and Roberts Bank. Data on percent occurrence (presence-or-absence) at the various depths were used from samples obtained in April and May 1978.

At Steveston Island all of the major taxa, except for larval eulachon *Thaleichthys pacificus*, were most frequently taken, as judged by χ^2 tests, at either surface or bottom levels (Table 3). Freshwater cladocera were common in the surface, whereas marine calanoid copepods were localized in the salt wedge at the bottom, as mentioned above. Two species of gammarid amphipods showed different vertical distributions in the April samples at Steveston. *Eogammarus confervicolus* was more common in bottom samples whereas *Corophium salmonis* occurred most frequently at the surface (Table 3).

Only 4 of the 10 abundant taxa at Roberts Bank were heterogeneously distributed in the water column (Table 4). These taxa were *Lamprops* sp. (Cumacea), the amphipod *Pontogeneia* sp., and the medusae *Phialidium* sp. and *Tubularia* sp. The former two taxa are normally associated with bottom substrates but the medusae are not usually considered epibenthic. Salinity data from Roberts Bank showed little evidence of stratification (see below) so differences in the vertical distribution of organisms were probably maintained by biological processes. Megalopa stages of *Cancer magister* (identification courtesy of T.H. Butler, Pacific Biological Station) were very abundant (up to 13 m^{-2}) in pump samples from July and August. The megalopa were approximately 5 mm in length. Many could be seen clinging to eel grass floating past the anchored vessel.

WATER CHARACTERISTICS

Complete salinity and temperature data are given in Table 5, where all times are Pacific Standard Time. The depths given are relative to the vessel's hull, and are not corrected for tidal and river runoff effects.

A. Steveston Island

As expected, the river channel at this location was usually strongly stratified. The depth of the salt wedge was dependent on river flow and tide stage. Generally the salt wedge was thicker on flooding tides and at low runoff conditions (e.g. 78/4/4 and 78/5/26).

B. Sea Reach

Although this station was close to the main channel of the South Arm, the water column was less stratified than was the case at Steveston. This was probably because the salt wedge was prevented from penetrating the reach because of its relatively shallow depth. A salt wedge was observed at the site on 78/4/27 and 78/9/26, both times of relatively low runoff. There was an indication that brackish surface water was draining on falling tides from upriver, perhaps via Ladner Reach (e.g. 78/6/28).

C. Canoe Pass

Except for occasional traces of salt wedge water, (e.g. 78/2/15; 78/5/24) there was little evidence that "high" salinity water reached this station. Apparently because of topographic effects, saline water could not penetrate from the South Arm or from Roberts Bank. As at Sea Reach, there was some evidence of brackish surface water draining from upriver on falling tide.

D. Roberts Bank (Westshore Terminal Borrow Pit)

The vertical distribution of salinity at this station was generally uniform at 28 to 30°/oo. Some data were obtained close to freshet (May), so there was a possibility that brackish water from the river might have been present. However, the Westshore Terminal causeway must have deflected river water from the borrow pit station.

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Table 1. Species listing for organisms taken in "drift" and pump sampling at the lower Fraser estuary.

CNIDARIA

MEDUSAE

Hydra sp.
Aglantha digitale
Coryne sp.
Phialidium gregarium
Proboscidactyla flavicirrata
Hyperoche sp.
Rathkea octopunctata
Tubularia prolifer (Hybocodon)

SIPHONOPHORE

Muggiaea sp.

CTENOPHORE

Pleurobrachia bochei

MOLLUSCA

Unidentified gastropoda

BIVALVIA

Transenella sp.
Gastropteron pacificum
Spiratella sp.

ANNELIDA

Manayunkia sp.
Unidentified polychaetes
Armandia sp.
Eualus sp.
Tomopteris sp.
Eteone longa
Nereis sp.
Oligochaeta

ARTHROPODS

CRUSTACEA

CLADOCERA

Podon sp.
Evadne sp.

Ostracoda
Calanoids
Cyclopoids
Harpacticoids

Table 1 (cont'd)

MYSIDS

Archeomysis grebnitzkii
Neomysis mercedis
Acanthomysis macropsis
Juvenile mysids

TANAID

Unidentified tanaid

CUMACEA

Lamprops quadriplicata
Pseudodiastylis sp.
Cumella vulgaris
Diastylopsis tenuis

ISOPODA

Synidotea nebulosa
Synidotea sp.
Munna sp.
Pentidotea resecata
Idotea fewkesi
Gnorimorphaeroma sp.

AMPHIPODA

CAPRELLID

Caprella ferrea

HYPERIIDEA

Hyperia sp.
Parathemisto

GAMMARIDEA

Eogammarus confervicolus (Note: shown in printout as *Anisogammarus confervicolus*)
Anisogammarus pugettensis
Atylus tridens
Cyphocaris sp.
Paramoera sp.
Hyale sp.
Paraphoxus epistomus
Podoceropsis inaequistylis
Calliopius sp.
Parapleustes pugettensis
Pleusymptes subglaber
Ampithoe sp.
Anonyx sp.
Photis brevipes
Pontogeneia sp.
Synchelidium shoemakeri

Table 1 (cont'd)

Aoroides sp.
Megamphoxus sp.
Paraphoxus milleri
Ampelisca macrocephala
Corophium ascherusicum
C. spinicorne
C. salmonis
C. insidiosum
EUPHAUSIACEA
NATANTIA
Crangon franciscorum
Heptacarpus (juvenile)
Unidentifiable
REPTANTIA
Callianassidae larvae
Porcellanidae larvae
Paguridae larvae
Cancer magister megalops
C. magister nauplii
Decapod zoea sp.
Mysis sp.
Brachyuran juvenile

Table 2. Listing of abundance (number m^{-3}) of taxa taken in "drift" and pump sampling in the lower Fraser estuary. For Roberts Bank data, superscript N indicates samples obtained with drift net and superscript P indicates sampling by pump. All other areas were sampled with drift net only. A flowmeter was not used for North Arm sampling so data are for a standard 10 min drift net set.

STEVESTON 78/1/24

SPECIES	SURFACE 1206	MIDDLE 1153	BOTTOM 1136
THALEICHTHYS	<0.1	0.3	0.7
ANISOGAMMARUS	<0.1	0.3	0.4
CALANOIDA	0.4	15.9	17.6
CLADOCERA	<0.1	0.3	0.9
SAGITTA	0.0	0.0	0.8
OIKOPLEURA	0.0	0.0	0.8
CUMELLA	0.0	0.0	<0.1
OLIGOCHAETA	0.0	0.0	<0.1
COROPHIUM SA	<0.1	0.0	0.0

STEVESTON 78/2/15

SPECIES	SURFACE 1445	MIDDLE 1420	BOTTOM 1354	SURFACE 1459	MIDDLE 1433	BOTTOM 1408
THALEICHTHYS	<0.1	<0.1	0.2	<0.1	0.3	0.4
ANISOGAMMARUS	<0.1	0.1	0.3	<0.1	0.6	0.0
CYPHOCARIS	<0.1	<0.1	<0.1	0.0	0.3	<0.1
CALANOIDA	0.3	5.5	12.5	0.1	30.9	0.7
SAGITTA	0.0	0.2	1.5	0.0	0.0	0.0
CLADOCERA	<0.1	<0.1	0.0	<0.1	0.3	0.1
ATYLUS	0.0	<0.1	0.0	0.0	0.0	0.0
PARATHEMISTO	0.0	<0.1	0.0	0.0	0.0	0.0
OIKOPLEURA	0.0	0.1	0.0	0.0	0.6	0.0
LAMPROPS	0.0	<0.1	0.0	<0.1	0.3	0.0
HARPACTICOID	<0.1	0.0	0.0	<0.1	0.0	0.0
JUV MYSIDACE	<0.1	0.0	0.0	0.0	0.0	0.0

STEVESTON 78/3/15

SPECIES	SURFACE 0917	MIDDLE 1222	BOTTOM 1113	SURFACE 0930	MIDDLE 1235	BOTTOM 1137
THALEICHTHYS	1.2	0.1	0.2	0.2	0.3	0.6
OIKOPLEURA	0.0	0.0	0.1	0.1	0.1	0.1
FISH EGGS	0.0	0.4	0.6	0.0	0.0	0.4
CYPHOCARIS	0.0	<0.1	0.2	<0.1	0.2	0.9
CALANOIDA	0.0	2.9	4.9	6.4	5.9	6.2
CLADOCERA	0.6	0.1	0.6	<0.1	0.1	0.4
SAGITTA	0.0	<0.1	0.1	<0.1	0.0	0.2
DECAPOD ZOEA	0.0	4.8	4.4	0.2	3.2	5.1
TOMOPTERIS	0.0	0.0	0.0	0.0	0.2	0.2
COROPHIUM JU	<0.1	<0.1	0.0	0.0	0.0	<0.1
PARAMOERA	0.0	0.0	0.0	<0.1	0.0	<0.1
MUGGIAEA	0.0	<0.1	0.0	0.0	0.0	0.0
CUMELLA	0.0	0.0	0.0	0.0	<0.1	0.0
HARPACTICOID	0.0	0.0	0.0	<0.1	0.0	0.0
CRUSTACEA NA	0.0	0.0	0.0	1.1	0.0	0.0
ANISOGAMMARUS	<0.1	0.0	0.0	0.0	0.0	0.0
PARATHEMISTO	0.0	0.0	0.0	0.2	0.0	0.0

STEVESTON 78/4/4

SPECIES	SURFACE 1826	MIDDLE 1813	BOTTOM 1758	SURFACE 2031	MIDDLE 2014	BOTTOM 2000
THALEICHTHYS	0.1	0.7	3.0	0.1	1.1	0.4
NEOMYSI	0.0	0.7	4.5	0.1	0.2	1.9
ANISOGAMMARUS	0.0	0.1	1.8	0.1	0.8	1.9
CALANOIDA	0.6	31.8	48.7	0.7	36.4	89.4
CLADOCERA	0.1	0.0	0.8	0.9	0.7	0.0
CUMELLA	<1.0	0.2	1.5	0.0	0.0	0.3
LAMPROPS	0.0	2.0	4.3	<1.0	0.1	0.4
COROPHIUM SA	<1.0	0.0	0.0	<1.0	0.0	0.0
GNORIMOSPHAE	0.0	0.1	0.5	0.0	0.0	0.0
OIKOPLEURA	0.0	0.4	0.0	0.0	0.0	0.0
PARATHEMISTO	0.0	0.2	0.0	0.0	0.0	0.0
PARAPHOXUS	0.0	0.0	0.0	0.0	0.1	0.0

STEVESTON 78/4/4

SPECIES	SURFACE 2226	MIDDLE 2214	BOTTOM 2159	SURFACE 0026	MIDDLE 0014	BOTTOM 2358
THALEICHTHYS	0.4	0.4	0.3	0.5	1.0	1.6
NEOMYSIS	0.0	0.0	0.0	0.2	0.3	1.2
ANISOGAMMARUS	1.9	2.6	7.1	1.8	5.4	7.8
CALANOIDA	3.8	10.9	4.6	0.0	0.3	<1.0
CLADOCERA	0.4	0.6	0.3	0.4	0.1	0.0
COROPHIUM SA	0.1	0.4	0.0	24.0	0.2	0.3
EUPHAUSIACEA	0.0	0.0	0.3	0.0	0.0	0.0
MANAYUNKIA	0.0	0.1	0.0	0.0	0.0	0.0
HARPACTICOID	0.0	0.0	0.0	0.1	0.0	0.0
PLECOPTERA N	0.0	0.0	0.0	0.0	0.0	0.3
HYDRA	0.0	0.0	0.0	0.0	0.1	0.0

STEVESTON 78/4/26

SPECIES	SURFACE 1757	MIDDLE 1810	BOTTOM 1823	SURFACE 2000	MIDDLE 2025	BOTTOM 2040
PLEURONECTID	0.1	<0.1	<0.1	<0.1	0.0	0.0
THALEICHTHYS	<0.1	0.3	0.5	0.2	0.6	3.8
CLADOCERA	0.2	0.0	0.2	0.8	0.0	0.0
ANISOGAMMARUS	0.3	<0.1	5.8	0.6	0.4	26.5
COROPHIUM SA	0.2	<0.1	0.2	0.0	<0.1	0.0
ONCHORYNCHUS	0.0	<0.1	0.0	<0.1	<0.1	0.0
CALANOIDA	0.0	<0.1	<0.1	0.0	0.0	512.2
OLIGOCHAETA	0.0	<0.1	0.0	0.0	0.0	0.0
SPIRATELLA	0.0	<0.1	0.0	0.0	0.0	0.0
JUV MYSIDACE	0.0	<0.1	0.0	<0.1	0.0	0.0
NEOMYSIS	0.0	0.0	0.4	0.0	<0.1	24.0
GNORIMOSPHAE	0.0	0.0	<0.1	0.0	0.0	0.0
HYDRA	0.0	0.0	<0.1	0.0	0.0	0.0
CHIRONOMIDAE	0.0	0.0	0.2	<0.1	0.0	0.0
UNIDENT POLY	0.0	0.0	0.0	<0.1	0.0	0.0
CUMELLA	0.0	0.0	0.0	0.0	<0.1	1.3
CRANGON	0.0	0.0	0.0	0.0	0.0	1.3
SAGITTA	0.0	0.0	0.0	0.0	0.0	1.3
CRUSTACEA NA	0.0	0.0	0.0	0.0	0.0	5.1
OIKOPLEURA	0.0	0.0	0.0	0.0	0.0	13.9
UNIDENT MEDU	0.0	0.0	0.0	0.0	0.0	2.5
PARATHEMISTO	0.0	0.0	0.0	0.0	0.0	5.1
DECAPOD ZOEA	0.0	0.0	0.0	0.0	0.0	16.4
COROPHIUM JU	0.0	0.0	0.0	<0.1	0.0	0.0

STEVESTON 78/4/26

SPECIES	SURFACE 2200	MIDDLE 2213	BOTTOM 2225	SURFACE 0000	MIDDLE 0012	BOTTOM 0025
ANISOGAMMARUS	7.3	0.3	3.0	0.5	4.9	8.7
THALEICHTHYS	2.1	1.6	1.7	<0.1	1.3	0.0
NEOMYSIS	1.9	1.3	1.3	0.1	0.8	0.0
COROPHIUM JU	0.7	0.0	0.0	0.0	0.8	0.0
PLEURONECTID	0.3	0.0	0.0	0.0	0.0	0.0
CLADOCERA	0.3	1.1	0.0	0.4	0.0	0.0
CALANOIDA	0.0	23.6	373.4	6.3	199.2	187.3
DECAPOD ZOEA	0.0	2.5	0.4	0.3	4.1	0.0
OIKOPLEURA	0.0	5.5	8.6	0.6	0.8	0.0
CRUSTACEA NA	3.8	0.0	0.0	0.2	4.1	0.0
SPIRATELLA	0.0	0.5	0.0	<0.1	1.6	0.0
CUMELLA	0.0	<0.1	0.0	0.0	0.0	0.0
GNORIMOSPHAE	0.0	0.0	0.0	<0.1	0.0	0.0
OLIGOCHAETA	0.0	0.0	0.0	<0.1	0.0	0.0
NEREIS	0.0	0.0	0.0	<0.1	0.0	0.0
COROPHIUM SA	0.0	0.0	0.0	0.2	0.0	0.0
JUV MYSIDACE	0.0	0.0	0.0	0.0	4.1	0.0
FISH EGGS	0.0	0.0	0.0	0.0	0.8	0.0
CRANGON	0.0	0.0	0.0	0.0	0.0	<0.1
MUGGIAEA	0.0	0.0	0.0	0.0	0.0	2.5

STEVESTON 78/5/26

SPECIES	SURFACE 1715	MIDDLE 1727	BOTTOM 1740	SURFACE 1900	MIDDLE 1912	BOTTOM 1925
THALEICHTHYS	1.9	4.6	45.6	1.8	3.8	18.9
CALANOIDA	<0.1	0.1	0.2	0.2	0.0	0.3
COROPHIUM JU	<0.1	<0.1	0.9	0.0	0.4	0.2
HYDRA	<0.1	<0.1	0.5	0.0	<0.1	0.8
OLIGOCHAETA	<0.1	0.3	2.6	0.1	<0.1	1.4
CHIRONOMIDAE	<0.1	<0.1	0.5	0.0	<0.1	0.1
CLADOCERA	<0.1	<0.1	0.2	<0.1	0.3	0.0
MANAYUNKIA	0.0	0.1	0.0	0.0	0.0	0.0
HARPACTICOID	0.0	<0.1	0.0	<0.1	0.0	0.0
ANISOGAMMARUS	0.0	0.0	0.0	0.1	<0.1	0.2
JUV MYSIDACE	0.0	0.0	0.0	0.0	<0.1	0.0

STEVESTON 78/5/26

SPECIES	SURFACE 2145	MIDDLE 2115	BOTTOM 2128	SURFACE 2250	MIDDLE 2303	BOTTOM 2315
THALEICHTHYS	2.5	565.8	10.5	1.9	11.3	14.7
ANISOGAMMARUS	1.4	0.0	1.4	<0.1	0.2	11.6
NEOMYSIS	0.2	2.6	1.3	0.0	0.6	44.2
DECAPOD ZOEA	<0.1	0.0	0.1	0.0	0.0	6.3
CALANOIDA	0.3	0.0	0.6	0.0	0.0	98.9
CLADOCERA	<0.1	2.6	0.4	<0.1	0.0	0.0
CHIRONOMIDAE	<0.1	0.0	0.0	0.0	0.0	0.0
HARPACTICOID	0.2	0.0	0.0	<0.1	0.0	0.0
CRUSTACEA NA	0.0	0.0	0.1	0.0	0.0	0.0
CUMELLA	0.0	0.0	<0.1	0.0	<0.1	0.0
OLIGOCHAETA	0.0	0.0	<0.1	0.0	0.0	0.0
ONCHORYNCHUS	0.0	0.0	0.2	0.0	0.1	0.0
JUV MYSIDACE	0.0	0.0	0.0	<0.1	0.0	0.0
CRANGON	0.0	0.0	0.0	0.0	0.2	0.0
COROPHIUM JU	0.0	0.0	0.0	0.0	<0.1	0.0
PLEURONECTID	0.0	0.0	0.0	0.0	0.0	1.1
UNIDENT MEDU	0.0	0.0	0.0	0.0	0.0	1.5
PLEUROBRACHI	0.0	0.0	0.0	0.0	0.0	1.1
SPIRATELLA	0.0	0.0	0.0	0.0	0.0	1.1
PARATHEMISTO	0.0	0.0	0.0	0.0	0.0	3.2
OIKOPLEURA	0.0	0.0	0.0	0.0	0.0	2.1

STEVESTON 78/6/19

SPECIES	SURFACE 1646	MIDDLE 1705	BOTTOM 1721	SURFACE 1900	MIDDLE 1915	BOTTOM 1932
THALEICHTHYS	45.6	20.6	2.5	3.6	15.0	1.0
CALANOIDA	0.0	0.6	0.6	0.2	0.1	0.5
COROPHIUM SP	0.0	0.9	0.2	<0.1	0.0	<0.1
CLADOCERA	0.0	2.1	0.1	<0.1	0.0	0.5
NEOMYSIS	0.0	0.0	0.0	0.0	0.0	<0.1

STEVESTON 78/6/19

SPECIES	SURFACE 2104	MIDDLE 2106	BOTTOM 2131	SURFACE 2300	MIDDLE 2313	BOTTOM 2329
THALEICHTHYS	30.6	52.1	2.2	7.2	35.4	7.5
CALANOIDA	0.2	4.2	15.9	0.6	2.9	0.2
CLADOCERA	0.2	1.0	0.2	0.4	3.6	0.0
PARATHEMISTO	0.0	0.2	1.7	0.0	0.0	0.0
OLIGOCHAETA	0.0	0.1	0.0	1.0	1.5	0.0
NEOMYSIS	0.0	0.0	0.2	0.0	0.0	0.0
DECAPOD ZOEA	0.0	0.0	0.2	0.0	0.0	0.0

STEVESTON 78/7/24

SPECIES	SURFACE 1726	MIDDLE 1712	BOTTOM 1700	SURFACE 1925	MIDDLE 1913	BOTTOM 1900
THALEICHTHYS	0.0	0.1	<0.1	0.0	0.0	0.0
SIMULIIDAE L	<0.1	0.0	0.0	0.0	0.0	0.0
PLECOPTERA N	<0.1	0.1	0.0	0.0	0.0	0.0
CYCLOPOIDA	<0.1	0.0	0.0	0.0	0.0	<0.1
CLADOCERA	0.2	2.8	0.3	0.5	0.1	0.6
OLIGOCHAETA	<0.1	0.3	0.3	0.0	<0.1	<0.1
CALANOIDA	0.2	0.3	0.4	0.6	<0.1	0.2
GNORIMOSPHAE	<0.1	0.2	<0.1	<0.1	0.0	0.0
ANISOGAMMARUS	0.0	0.1	0.4	0.0	<0.1	<0.1
PARATHEMISTO	0.0	0.1	0.0	0.0	0.0	0.0
CHIRONOMIDAE	0.0	0.0	<0.1	0.0	0.0	0.0
EPHEMEROPTER	0.0	0.0	0.0	0.0	<0.1	0.0
NEOMYSIS	0.0	0.0	0.0	0.0	<0.1	<0.1
COROPHIUM SA	0.0	0.0	0.0	0.0	0.0	<0.1
CRANGON	0.0	0.0	0.0	0.0	0.0	<0.1

STEVESTON 78/7/24

SPECIES	SURFACE 2224	MIDDLE 2212	BOTTOM 2200	SURFACE 0025	MIDDLE 0013	BOTTOM 0000
CLADOCERA	1.4	0.2	0.3	0.0	0.2	0.0
CALANOIDA	0.2	<0.1	<0.1	0.1	0.4	4.9
THALEICHTHYS	0.0	<0.1	<0.1	<0.1	0.0	0.0
NEOMYSIS	0.0	0.2	1.0	0.0	<0.1	0.1
CUMELLA	0.0	0.0	<0.1	0.0	<0.1	0.3
ANISOGAMMARUS	0.0	<0.1	<0.1	<0.1	0.6	5.4
CRANGON	0.0	0.0	0.0	<0.1	0.0	0.0
GNORIMOSPHAE	0.0	0.0	0.0	<0.1	0.0	0.0
EPHEMEROPTER	0.0	0.0	0.0	<0.1	<0.1	0.0
PARATHEMISTO	0.0	0.0	0.0	0.0	<0.1	0.0
CANCER MEGAL	0.0	0.0	0.0	0.0	<0.1	0.0
DECAPOD ZOEA	0.0	0.0	0.0	0.0	<0.1	0.0
GASTEROSTEUS	0.0	0.0	0.0	0.0	<0.1	0.0
SAGITTA	0.0	0.0	0.0	0.0	0.0	0.5
PLEUROBRACHI	0.0	0.0	0.0	0.0	0.0	15.6
PHIALIDIUM	0.0	0.0	0.0	0.0	0.0	0.5

STEVESTON 78/8/23

SPECIES	SURFACE 1700	MIDDLE 1714	BOTTOM 1726	SURFACE 1926	MIDDLE 1914	BOTTOM 1900
ANISOGAMMARUS	0.3	0.6	0.5	5.9	2.5	<0.1
CALANOIDA	0.3	1.3	1.7	20.5	3.0	0.8
CLADOCERA	0.2	1.0	2.9	14.6	7.5	0.7
NEOMYSIS	2.8	1.4	0.0	26.3	2.5	0.9
COROPHIUM SP	<0.1	<0.1	0.0	2.9	0.5	<0.1
GNORIMOSPHAE	<0.1	<0.1	0.0	0.0	0.0	0.0
CUMELLA	<0.1	0.0	0.0	0.0	0.0	<0.1
HARPACTICOID	<0.1	<0.1	0.1	0.0	0.0	0.0
CHIRONOMIDAE	<0.1	0.0	0.0	0.0	0.0	0.0
THALEICHTHYS	0.0	0.0	0.1	0.0	0.0	0.0
CRANGON	0.0	0.0	0.0	0.0	0.0	0.1
COROPHIUM SA	0.0	0.0	0.0	0.0	0.0	<0.1

STEVESTON 78/9/27

SPECIES	SURFACE 1656	MIDDLE 1710	BOTTOM 1722	SURFACE 1900	MIDDLE 1916	BOTTOM 1929
ANISOGAMMARUS	0.3	0.0	0.0	<0.1	0.3	12.6
NEOMYSIS	<0.1	0.0	0.0	0.7	0.0	2.2
CALANOIDA	0.1	0.0	1.3	0.2	0.1	1.2
OSTRACODA	<0.1	0.0	<0.1	0.0	0.0	<0.1
CLADOCERA	0.0	<0.1	0.0	<0.1	0.0	0.2
HYPERIA	0.0	0.0	0.1	0.0	0.0	0.2
AGLANTHA	0.0	0.0	<0.1	0.0	0.0	0.0
PROBOSCIDACT	0.0	0.0	0.1	0.0	0.0	0.0
CUMELLA	0.0	0.0	0.0	<0.1	<0.1	0.0
EPHEMEROPTER	0.0	0.0	0.0	0.0	<0.1	0.0
PARAPHOXUS M	0.0	0.0	0.0	0.0	<0.1	0.0
CLUPEA	0.0	0.0	0.0	0.0	<0.1	0.0
GNORIMOSPHAE	0.0	0.0	0.0	0.0	0.0	0.2
COROPHIUM SP	0.0	0.0	0.0	0.0	0.0	<0.1

STEVESTON 78/9/27

SPECIES	SURFACE 2103	MIDDLE 2114	BOTTOM 2125	SURFACE 2358	MIDDLE 0010	BOTTOM 0023
ANISOGAMMARUS	0.2	0.4	2.1	<0.1	0.6	5.7
CALANOIDA	0.3	0.1	0.2	0.2	<0.1	<0.1
CLADOCERA	0.1	0.1	<0.1	0.1	<0.1	0.2
NEOMYSIS	<0.1	0.2	1.6	<0.1	<0.1	1.6
CYCLOPOIDA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
CUMELLA	<0.1	<0.1	0.0	<0.1	<0.1	0.0
GNORIMOSPHAE	0.0	<0.1	<0.1	<0.1	<0.1	<0.1
PARAPHOXUS M	0.0	<0.1	<0.1	0.0	<0.1	<0.1
ACANTHOMYSIS	0.0	<0.1	<0.1	<0.1	<0.1	0.0
EPHEMEROPTER	0.0	<0.1	0.0	0.0	0.0	0.0
COROPHIUM SP	0.0	<0.1	0.0	0.0	0.0	0.0
ETEONE	0.0	0.0	<0.1	0.0	0.0	0.0
CRANGON	0.0	0.0	0.0	<0.1	<0.1	<0.1
COROPHIUM SA	0.0	0.0	0.0	0.0	<0.1	<0.1
OLIGOCHAETA	0.0	0.0	0.0	0.0	<0.1	0.0

CANOE PASS 78/1/24

SPECIES	SURFACE 1054	MIDDLE 1041	BOTTOM 1018
THALEICHTHYS	0.3	1.4	3.1
HARPACTICOID	<0.1	0.0	0.0
ANISOGAMMARUS	<0.1	<0.1	0.5
CALANOIDA	3.7	5.1	2.3
CLADOCERA	0.2	0.2	0.0
OIKOPLEURA	<0.1	0.0	0.0
COROPHIUM JU	<0.1	0.0	0.0
CUMELLA	<0.1	0.0	0.0
CHIRONOMIDAE	<0.1	0.0	0.0

CANOE PASS 78/2/15

SPECIES	SURFACE 1300	MIDDLE 1234	BOTTOM 1208	SURFACE 1314	MIDDLE 1247	BOTTOM 1222
THALEICHTHYS	0.7	1.2	1.5	0.4	1.9	1.2
CALANOIDA	0.4	0.0	0.4	0.7	1.0	1.5
CLADOCERA	<0.1	0.2	<0.1	0.1	0.1	0.0
HARPACTICOID	<0.1	0.0	0.0	0.0	0.0	<0.1
DECAPOD ZOEA	0.0	<0.1	<0.5	0.0	0.0	0.2
COROPHIUM JU	0.0	<0.1	<0.1	0.0	<0.1	<0.1
JUV MYSIDACE	0.0	<0.1	0.0	0.0	0.0	<0.1
ANISOGAMMARUS	0.0	<0.1	<0.1	0.0	<0.1	0.1
CYPHOCARIS	0.0	0.0	<0.1	<0.1	0.0	0.0

CANOE PASS 78/3/14

SPECIES	SURFACE 1233	MIDDLE 1030	BOTTOM 1001	SURFACE 1244	MIDDLE 1143	BOTTOM 1016
THALEICHTHYS	2.2	1.1	1.9	0.5	5.3	2.4
CLADOCERA	2.2	0.8	1.3	2.1	5.8	1.6
ANISOGAMMARUS	0.0	0.0	<0.1	<0.1	0.9	<0.1
COROPHIUM JU	0.0	0.0	<0.1	0.0	0.2	<0.1
HARPACTICOID	0.0	0.0	0.0	<0.1	0.0	0.0
CALANOIDA	0.0	0.0	0.0	0.0	3.1	<0.1
JUV MYSIDACE	0.0	0.0	0.0	0.0	0.0	<0.1

CANOE PASS 78/4/5

SPECIES	SURFACE 1831	MIDDLE 1827	BOTTOM 1803	SURFACE 2027	MIDDLE 2015	BOTTOM 2001
THALEICHTHYS	0.5	0.6	0.4	0.1	0.2	0.3
ANISOGAMMARUS	<1.0	0.2	0.6	4.5	11.8	4.3
CLADOCERA	0.7	0.4	0.2	2.0	2.7	0.6
COROPHIUM SA	1.1	1.6	0.7	5.0	13.0	3.9
NEOMYSIS	0.0	0.1	0.4	0.0	0.6	0.3
CRANGON	0.0	<1.0	<1.0	0.0	0.2	0.3
HARPACTICOID	<1.0	0.0	0.0	0.0	0.1	0.0

CANOE PASS 78/4/5

SPECIES	SURFACE 2225	MIDDLE 2213	BOTTOM 2200	SURFACE 0023	MIDDLE 0011	BOTTOM 2358
THALEICHTHYS	0.3	0.6	2.4	70.0	0.2	1.2
ANISOGAMMARUS	2.3	3.4	4.8	520.0	3.4	2.2
CLADOCERA	4.2	9.2	4.3	20.0	0.1	1.0
COROPHIUM SA	2.0	3.1	1.1	30.0	1.2	1.2
NEOMYSIS	0.0	0.3	0.5	20.0	0.1	1.4
CRANGON	0.0	0.0	0.2	0.0	0.0	0.0
HARPACTICOID	0.0	0.0	0.2	0.0	0.0	0.0
HYDRA	0.0	0.0	0.2	0.0	0.1	0.0
OLIGOCHAETA	0.1	0.0	0.0	0.0	0.0	0.0
GNORIMOSPHAE	0.0	0.0	0.0	10.0	0.0	0.0

CANOE PASS 78/4/25

SPECIES	SURFACE 1823	MIDDLE 1840	BOTTOM 1853	SURFACE 2003	MIDDLE 2015	BOTTOM 2028
NEOMYSIS	2.0	2.3	2.7	1.1	4.6	12.6
COROPHIUM SA	<0.1	0.0	0.4	0.0	0.0	4.2
THALEICHTHYS	<0.1	0.3	0.2	1.1	2.7	13.9
ANISOGAMMARUS	<0.1	0.2	4.8	2.3	13.1	47.4
PLEURONECTID	<0.1	0.1	0.2	0.6	1.3	2.1
JUV MYSIDACE	<0.1	0.0	0.0	0.0	0.0	0.0
CALANOIDA	0.3	0.4	0.3	0.0	0.2	0.0
CLADOCERA	0.2	0.5	0.5	1.3	1.3	2.1
HYDRA	<0.1	0.0	<0.1	0.0	0.0	0.0
GNORIMOSPHAE	<0.1	0.0	0.0	0.0	0.0	0.0
HARPACTICOID	<0.1	0.0	0.0	0.2	0.0	0.0
COROPHIUM JU	0.0	0.1	0.0	0.2	0.0	0.0
CRANGON	0.0	0.0	0.4	0.0	0.0	0.0
ONCHORYNCHUS	0.0	0.0	<0.1	0.0	0.0	0.0
CHIRONOMIDAE	0.0	0.0	0.0	0.0	0.0	1.1

CANOE PASS 78/5/24

SPECIES	SURFACE 1659	MIDDLE 1712	BOTTOM 1725	SURFACE 1900	MIDDLE 1912	BOTTOM 1924
THALEICHTHYS	3.0	31.8	10.8	57.9	25.7	43.7
CALANOIDA	0.3	1.4	0.0	0.0	0.0	0.2
DECAPOD ZOEA	0.2	0.6	0.0	2.6	0.0	<0.1
ANISOGAMMARUS	0.1	0.1	0.0	0.0	0.0	0.4
CRUSTACEA NA	0.1	0.7	0.0	0.0	0.0	0.0
CLADOCERA	0.1	0.2	0.0	0.0	0.0	0.3
HYDRA	0.1	0.2	0.3	0.0	0.0	0.0
OLIGOCHAETA	<0.1	1.5	0.8	0.0	0.0	0.0
JUV MYSIDACE	<0.1	1.1	0.0	0.0	0.0	0.0
HARPACTICOID	<0.1	0.2	0.0	0.0	0.0	0.0
LAMPROPS	<0.1	0.2	0.0	0.0	0.0	<0.1
CHIRONOMIDAE	0.0	0.1	0.1	0.0	0.0	0.2
COROPHIUM SA	0.0	0.0	0.1	0.0	0.0	0.0
COROPHIUM SP	0.0	0.0	0.1	0.0	0.0	0.0
UNIDENT POLY	0.0	0.0	0.0	2.6	0.0	0.0
COROPHIUM JU	0.0	0.0	0.0	0.0	0.0	0.2
DECAPOD MYSI	0.0	0.0	0.0	0.0	0.0	0.2

CANOE PASS 78/5/24

SPECIES	SURFACE 2100	MIDDLE 2113	BOTTOM 2126	SURFACE 2311	MIDDLE 2325	BOTTOM 2339
THALEICHTHYS	10.2	20.7	32.2	31.2	115.2	29.6
CALANOIDA	1.0	1.2	0.5	0.9	0.3	0.2
COROPHIUM JU	0.1	2.5	0.4	2.5	6.6	0.7
ANISOGAMMARUS	0.1	0.0	0.1	0.3	0.3	0.2
CLADOCERA	0.1	0.1	0.0	0.0	0.2	0.0
HYDRA	0.1	0.1	<0.1	0.0	0.0	0.0
HARPACTICOID	<0.1	0.0	<0.1	0.0	0.0	0.0
OLIGOCHAETA	0.0	0.2	0.5	0.0	0.8	0.0
CHIRONOMIDAE	0.0	0.0	<0.1	0.0	0.0	0.2

CANOE PASS 78/6/21

SPECIES	SURFACE 1725	MIDDLE 1735	BOTTOM 1750	SURFACE 1858	MIDDLE 1912	BOTTOM 1925
THALEICHTHYS	2.6	1.7	4.0	0.2	4.3	4.3
CLADOCERA	0.9	0.0	0.0	0.1	1.7	1.1
EPHEMEROPTER	0.0	0.0	0.2	0.0	0.0	0.0
OLIGOCHAETA	0.0	0.0	0.0	<0.1	<0.1	0.0
CALANOIDA	0.0	0.0	0.0	<0.1	0.4	0.2
COROPHIUM SA	0.0	0.0	0.0	<0.1	0.0	0.0
ONCHORYNCHUS	0.0	0.0	0.0	<0.1	0.0	0.0

CANOE PASS 78/6/21

SPECIES	SURFACE 2100	MIDDLE 2113	BOTTOM 2127	SURFACE 2300	MIDDLE 2313	BOTTOM 2321
THALEICHTHYS	4.1	20.5	13.3	43.9	0.8	15.3
CALANOIDA	1.2	3.4	1.7	13.5	0.2	14.4
CLADOCERA	0.2	1.2	0.0	0.0	<0.1	1.1
CHIRONOMIDAE	0.0	0.0	0.0	0.3	0.0	0.0
COROPHIUM SA	0.0	0.0	0.0	0.3	0.0	0.0
OLIGOCHAETA	0.0	0.0	0.0	0.3	0.0	0.0
HELEIDAE LAR	0.0	0.0	0.0	0.3	0.0	0.0

CANOE PASS 78/7/19

SPECIES	SURFACE 1926	MIDDLE 1912	BOTTOM 1858	SURFACE 2126	MIDDLE 2114	BOTTOM 2100
THALEICHTHYS	0.0	<0.1	<0.1	0.0	0.0	0.0
CLADOCERA	0.0	0.2	0.3	0.2	0.0	0.0
OLIGOCHAETA	<0.1	0.2	0.1	0.2	0.2	0.3
CALANOIDA	0.4	<0.1	0.1	1.3	0.3	0.5
EPHEMEROPTER	0.0	<0.1	0.0	0.2	0.0	0.0
CHIRONOMIDAE	0.0	<0.1	0.0	0.0	0.0	0.0
HYDRA	0.0	<0.1	0.0	0.2	0.0	0.0
CYCLOPOIDA	<0.1	0.0	0.0	0.0	0.0	0.0
GASTEROSTEUS	0.0	0.0	0.0	<0.1	0.0	0.0

CANOE PASS 78/7/19

SPECIES	SURFACE 2327	MIDDLE 2314	BOTTOM 2259
HYDRA	0.4	0.0	0.0
CHIRONOMIDAE	0.4	0.2	0.0
OLIGOCHAETA	0.4	0.0	0.6
PLECOPTERA N	0.0	0.0	0.2
CALANOIDA	0.0	0.0	0.2

CANOE PASS 78/8/21

SPECIES	SURFACE 1724	MIDDLE 1712	BOTTOM 1700	SURFACE 1924	MIDDLE 1912	BOTTOM 1900
NEOMYSIS	<0.1	0.0	0.1	0.2	0.6	4.2
CALANOIDA	1.8	1.0	0.5	1.2	0.8	2.4
CYCLOPOIDA	<0.1	<0.1	0.0	0.0	0.0	0.0
CLADOCERA	1.3	0.7	0.3	0.6	0.8	2.1
THALEICHTHYS	<0.1	0.0	0.0	0.0	0.0	0.0
EPHEMEROPTER	<0.1	0.0	0.0	0.0	<0.1	0.0
ATYLUS	0.0	0.0	<0.1	0.0	0.0	0.1
OLIGOCHAETA	0.0	0.0	0.0	<0.1	0.0	0.1
COROPHIUM SA	0.0	0.0	0.0	0.0	<0.1	0.2
HARPACTICOID	0.0	0.0	0.0	0.0	<0.1	0.0
CHIRONOMIDAE	0.0	0.0	0.0	0.0	<0.1	0.0

CANOE PASS 78/8/21

SPECIES	SURFACE 2127	MIDDLE 2115	BOTTOM 2100	SURFACE 2324	MIDDLE 2311	BOTTOM 2300
NEOMYSIS	<0.1	0.1	<0.1	<0.1	0.0	0.0
ANISOGAMMARUS	<0.1	0.0	0.0	0.0	0.0	0.0
CALANOIDA	1.3	1.6	0.4	0.9	3.4	1.1
CLADOCERA	0.5	0.9	<0.1	0.4	1.2	1.5
CYCLOPOIDA	0.1	0.0	0.0	0.0	0.0	0.0
CHIRONOMIDAE	<0.1	<0.1	0.0	<0.1	0.0	0.0
GNORIMOSPHAE	<0.1	0.0	0.0	0.0	0.0	0.0
COROPHIUM SA	<0.1	<0.1	0.0	<0.1	0.0	0.0
PLECOPTERA N	<0.1	0.0	0.0	0.0	0.0	0.0
GASTEROSTEUS	<0.1	0.0	0.0	0.0	0.0	0.0
CRANGON	0.0	<0.1	0.0	0.0	0.0	0.0
OLIGOCHAETA	0.0	<0.1	<0.1	<0.1	0.1	0.0
EPHEMEROPTER	0.0	0.0	0.0	<0.1	0.0	0.0

CANOE PASS 78/9/25

SPECIES	SURFACE 1713	MIDDLE 1727	BOTTOM 1739	SURFACE 1913	MIDDLE 1927	BOTTOM 1940
CYCLOPOIDA	<0.1	1.3	0.0	<0.1	<0.1	0.2
CALANOIDA	0.2	<0.1	0.3	0.2	0.6	0.3
CUMELLA	<0.1	0.0	0.0	0.0	0.0	0.0
CLADOCERA	1.4	1.3	1.5	0.6	0.8	0.4
OLIGOCHAETA	0.2	0.2	0.1	<0.1	0.2	0.2
NEOMYSIS	0.0	0.2	0.1	0.0	0.1	0.2
EPHEMEROPTER	0.0	<0.1	0.0	0.0	0.0	0.0
CHIRONOMIDAE	0.0	0.0	<0.1	<0.1	0.0	0.0

SEA REACH 78/3/14

SPECIES	SURFACE 1548	MIDDLE 1522	BOTTOM 1455	SURFACE 1600	MIDDLE 1534	BOTTOM 1508
THALEICHTHYS	0.8	5.4	7.5	0.2	4.8	2.7
HARPACTICOID	<0.1	<0.1	0.0	<0.1	0.0	0.0
ANISOGAMMARUS	<0.1	0.0	0.2	0.0	0.2	<0.1
CLADOCERA	4.6	5.2	3.7	5.9	4.8	2.1
COROPHIUM JU	0.0	<0.1	0.0	0.0	<0.1	0.0
CALANOIDA	0.0	0.0	0.5	0.0	0.2	0.2
CUMELLA	0.0	0.0	0.0	<0.1	0.0	0.0

CANOE PASS 78/9/25

SPECIES	SURFACE 2200	MIDDLE 2215	BOTTOM 2229	SURFACE 0000	MIDDLE 0011	BOTTOM 0025
NEOMYSIS	<0.1	0.4	0.7	0.2	0.9	0.6
ANISOGAMMARUS	<0.1	<0.1	0.0	0.0	0.0	0.0
CALANOIDA	0.4	0.1	0.4	0.2	0.2	0.2
CYCLOPOIDA	0.1	0.0	<0.1	<0.1	0.0	<0.1
CLADOCERA	0.8	0.7	1.2	0.5	0.5	1.0
CHIRONOMIDAE	<0.1	0.0	0.0	0.0	0.0	0.0
OLIGOCHAETA	0.0	<0.1	0.1	0.0	0.0	0.0
COROPHIUM SA	0.0	0.0	<0.1	0.0	0.0	0.0
COROPHIUM SP	0.0	0.0	<0.1	0.0	0.0	0.0
EPHEMEROPTER	0.0	0.0	<0.1	0.0	<0.1	0.0

SEA REACH 78/3/29

SPECIES	SURFACE 1919	MIDDLE 1858	BOTTOM 1840	SURFACE 2220	MIDDLE 2205	BOTTOM 2145
ONCHORYNCHUS	<0.1	0.0	0.0	0.0	0.0	0.0
THALEICHTHYS	<0.1	0.2	0.3	3.2	2.9	24.2
ANISOGAMMARUS	<0.1	<0.1	1.5	0.6	3.3	2.6
CALANOIDA	<0.1	0.0	0.0	0.0	0.0	0.0
CLADOCERA	0.8	1.6	1.0	1.6	1.3	0.3
COROPHIUM SA	0.6	0.0	0.3	<0.1	0.8	0.0
NEOMYSIS	<0.1	0.4	0.7	0.0	0.9	0.8
CRANGON	<0.1	<0.1	<0.1	0.0	0.0	<0.1
COROPHIUM JU	0.0	0.2	0.0	0.0	0.0	0.0
GNORIMOSPHAE	0.0	0.0	0.0	0.0	0.0	<0.1

SEA REACH 78/3/30

SPECIES	SURFACE 0336	MIDDLE 0332	BOTTOM 0311	SURFACE 0820	MIDDLE 0803	BOTTOM 0750
THALEICHTHYS	<0.1	0.3	0.0	0.9	1.3	1.6
HARPACTICOID	<0.1	0.0	0.0	0.1	<0.1	0.0
ANISOGAMMARUS	3.0	3.2	0.0	0.8	2.5	0.6
CLADOCERA	1.2	1.9	0.0	1.4	2.6	0.0
COROPHIUM SA	0.5	0.0	0.0	0.0	0.0	0.5
NEOMYSIS	0.2	0.6	0.0	0.0	0.1	0.0
ONCHORYNCHUS	0.0	<0.1	0.0	0.0	0.0	0.0
GNORIMOSPHAE	0.0	<0.1	0.0	0.0	0.0	0.0
PLECOPTERA N	0.0	<0.1	0.0	0.0	0.0	0.0
EPHEMEROPTER	0.0	<0.1	0.0	0.0	0.0	0.0
COROPHIUM SA	0.0	2.9	0.0	<0.1	<0.1	0.8
CUMELLA	0.0	0.0	0.0	<0.1	0.0	0.0

SEA REACH 78/3/30

SPECIES	SURFACE 1040	MIDDLE 1018	BOTTOM 1000	SURFACE 1252	MIDDLE 1238	BOTTOM 1225
ANISOGAMMARUS	2.3	2.9	10.2	<0.1	0.1	0.2
CLADOCERA	1.0	1.2	1.8	0.7	1.2	0.0
COROPHIUM JU	<0.1	0.0	0.0	<0.1	<0.1	0.0
THALEICHTHYS	0.0	1.1	3.7	<0.1	0.0	0.0
CALANOIDA	0.0	<0.1	8.0	<0.1	0.4	0.4
DECAPOD ZOEA	0.0	<0.1	0.0	0.0	0.0	0.0
COROPHIUM SA	0.0	0.0	0.2	0.0	0.0	0.0
HYALE	0.0	0.0	0.2	0.0	0.0	0.0

SEA REACH 78/3/30

SPECIES	SURFACE 1555	MIDDLE 1545	BOTTOM 1527	SURFACE 1844	MIDDLE 1829	BOTTOM 1810
HARPACTICOID	0.2	0.0	0.0	0.0	0.0	<0.1
ANISOGAMMARUS	0.2	0.4	0.0	0.0	0.2	1.2
CLADOCERA	7.9	11.2	0.0	7.3	16.3	6.0
CHIRONOMIDAE	0.0	0.2	0.0	0.0	0.0	0.0
LAMPROPS	0.0	0.2	0.0	0.0	0.0	0.0
CALANOIDA	0.0	1.1	0.0	0.1	0.0	0.7
THALEICHTHYS	0.0	0.0	0.0	0.1	1.2	1.2
COROPHIUM SA	0.0	0.0	0.0	0.0	0.4	1.3

SEA REACH 78/4/27

SPECIES	SURFACE 1757	MIDDLE 1810	BOTTOM 1823	SURFACE 1957	MIDDLE 2010	BOTTOM 2025
THALEICHTHYS	0.2	0.2	0.8	0.3	0.1	0.6
ANISOGAMMARUS	0.3	<0.1	5.4	0.5	4.9	6.8
GNORIMOSPHAE	<0.1	0.0	0.0	0.0	0.0	0.0
CALANOIDA	0.6	<0.1	0.3	<0.1	0.2	0.0
CLADOCERA	0.3	0.4	0.3	0.2	0.3	0.0
NEOMYSIS	<0.1	0.0	1.3	0.0	0.1	0.4
ONCHORYNCHUS	0.0	<0.1	0.0	0.0	0.3	0.1
HARPACTICOID	0.0	<0.1	0.0	0.0	0.0	0.0
COROPHIUM SA	0.0	0.1	1.8	0.1	0.4	0.0
OLIGOCHAETA	0.0	0.0	0.5	0.0	0.0	0.0
HYDRA	0.0	0.0	0.0	<0.1	0.0	0.2
CHIRONOMIDAE	0.0	0.0	0.0	0.0	0.0	0.2

SEA REACH 78/4/27

SPECIES	SURFACE 2157	MIDDLE 2210	BOTTOM 2225	SURFACE 2357	MIDDLE 0009	BOTTOM 0021
THALEICHTHYS	0.2	0.6	0.5	0.7	0.3	1.1
ANISOGAMMARUS	0.3	0.9	13.7	3.5	3.2	65.8
CLADOCERA	0.3	<0.1	0.3	0.3	0.5	0.5
COROPHIUM SA	0.4	1.0	0.8	1.4	1.5	4.2
NEOMYSIS	<0.1	0.6	3.7	0.2	0.1	3.7
CRANGON	0.0	<0.1	<0.1	<0.1	0.1	0.3
GNORIMOSPHAE	0.0	<0.1	0.0	0.0	<0.1	0.5
EPHEMEROPTER	0.0	<0.1	0.0	0.0	0.0	0.0
CALANOIDA	0.0	<0.1	0.0	<0.1	<0.1	7.9
ONCHORYNCHUS	0.0	0.0	0.0	0.0	0.1	0.0
CHIRONOMIDAE	0.0	0.0	0.0	0.0	0.1	0.0

SEA REACH 78/5/25

SPECIES	SURFACE 1712	MIDDLE 1724	BOTTOM 1737	SURFACE 1900	MIDDLE 1912	BOTTOM 1925
CALANOIDA	0.4	0.4	1.3	0.4	0.4	0.3
THALEICHTHYS	0.1	3.3	15.2	7.5	19.9	34.1
CLADOCERA	<0.1	0.1	0.5	0.2	0.6	0.0
COROPHIUM JU	0.0	0.8	1.1	0.0	0.0	0.1
ANISOGAMMARUS	0.0	0.3	0.0	0.0	0.0	0.0
NEOMYSIS	0.0	<0.1	0.2	0.0	0.0	0.0
OLIGOCHAETA	0.0	<0.1	1.0	0.2	0.4	0.1
HYDRA	0.0	0.1	0.3	0.2	0.3	0.0
FISH EGGS	0.0	0.2	0.0	0.0	0.0	0.0
CHIRONOMIDAE	0.0	<0.1	0.0	0.0	0.0	0.0
CRANGON	0.0	<0.1	0.0	0.0	0.0	0.0
JUV MYSIDACE	0.0	0.0	0.0	0.0	0.1	0.0

SEA REACH 78/6/20

SPECIES	SURFACE 1658	MIDDLE 1713	BOTTOM 1725	SURFACE 1859	MIDDLE 1911	BOTTOM 1924
THALEICHTHYS	0.3	3.1	11.3	0.3	2.6	0.0
CALANOIDA	0.3	<0.1	1.8	1.1	0.2	0.0
CYCLOPOIDA	<0.1	0.0	0.0	0.0	0.0	0.0
COROPHIUM SP	<0.1	0.0	0.0	<0.1	0.0	0.0
CLADOCERA	0.5	<0.1	2.6	1.4	1.2	0.0
SIMULIIDAE L	0.0	<0.1	0.0	0.0	0.0	0.0
OLIGOCHAETA	0.0	<0.1	1.6	0.0	<0.1	0.0
ANISOGAMMARUS	0.0	0.0	0.0	0.0	<0.1	0.0
CHIRONOMIDAE	0.0	0.0	0.0	0.0	<0.1	0.0
HARPACTICOID	0.0	0.0	0.0	0.0	<0.1	0.0
EPHEMEROPTER	0.0	0.0	0.0	0.0	<0.1	0.0

SEA REACH 78/6/20

SPECIES	SURFACE 2112	MIDDLE 2132	BOTTOM 2058	SURFACE 2300	MIDDLE 2313	BOTTOM 2326
COLEOPTERA L	6.1	0.0	0.0	0.0	0.0	0.0
CHIRONOMIDAE	0.6	0.0	0.0	0.0	0.0	0.5
THALEICHTHYS	1.0	5.1	2.8	7.8	3.8	3.7
CLADOCERA	0.7	1.4	0.1	0.0	1.4	0.0
CYCLOPOIDA	0.1	0.0	0.0	0.0	0.0	0.0
CALANOIDA	0.3	0.8	0.1	0.7	0.3	0.3
COROPHIUM SA	0.0	0.4	0.0	0.2	0.7	0.4
OLIGOCHAETA	0.0	0.9	0.0	0.3	0.8	0.8
HARPACTICOID	0.0	0.0	0.0	<0.1	0.0	0.0
ANISOGAMMARUS	0.0	0.0	0.0	0.3	0.0	0.0
COLEOPTERA L	0.0	0.0	0.0	4.7	0.0	0.0
EPHEMEROPTER	0.0	0.0	0.0	<0.1	0.0	0.0
COLLEMBOLA	0.0	0.0	0.0	0.2	0.0	0.0

SEA REACH 78/7/20

SPECIES	SURFACE 1725	MIDDLE 1712	BOTTOM 1700	SURFACE 1923	MIDDLE 1911	BOTTOM 1900
CHIRONOMIDAE	<0.1	0.0	0.3	0.0	0.0	0.3
CYCLOPOIDA	<0.1	0.0	0.0	0.0	0.0	0.0
ANISOGAMMARUS	<0.1	0.0	0.0	0.0	0.0	0.0
COROPHIUM SA	<0.1	0.0	0.0	0.0	0.0	0.0
CLADOCERA	<0.1	0.1	0.0	0.0	0.7	0.3
GNORIMOSPHAE	<0.1	0.0	0.0	1.8	0.0	0.0
CALANOIDA	0.1	0.0	0.0	1.8	0.0	0.3
HYDRA	0.0	0.1	0.3	0.0	0.0	0.0
SIMULIIDAE L	0.0	0.0	0.0	0.9	0.0	0.3
DECAPOD ZOEA	0.0	0.0	0.0	0.9	0.0	0.0
COROPHIUM JU	0.0	0.0	0.0	0.0	0.0	0.3

SEA REACH 78/8/22

SPECIES	SURFACE 1722	MIDDLE 1710	BOTTOM 1656	SURFACE 1921	MIDDLE 1909	BOTTOM 1857
CLADOCERA	3.4	3.3	1.0	1.0	0.5	1.0
OLIGOCHAETA	0.4	0.2	0.0	<0.1	<0.1	0.7
NEOMYSIS	0.8	4.8	0.7	0.9	0.0	<0.1
CALANOIDA	5.3	2.8	1.4	1.1	1.3	8.1
COROPHIUM SA	0.0	1.3	0.0	<0.1	0.2	0.3
GNORIMOSPHAE	0.0	0.8	0.1	<0.1	0.3	0.0
CRANGON	0.0	1.3	<0.1	0.0	<0.1	<0.1
PARAMOERA	0.0	0.0	0.0	<0.1	0.0	0.0
CYCLOPOIDA	0.4	0.0	0.2	<0.1	0.0	0.7
ANISOGAMMARUS	0.0	0.0	0.0	0.0	<0.1	<0.1
COLECPTERA L	0.0	0.0	0.0	0.0	<0.1	0.0

SEA REACH 78/8/22

SPECIES	SURFACE 2122	MIDDLE 2110	BOTTOM 2057	SURFACE 2324	MIDDLE 2312	BOTTOM 2300
ANISOGAMMARUS	12.5	36.8	5.7	<0.1	0.2	0.2
CLADOCERA	25.0	63.5	50.2	0.3	0.7	0.0
CALANOIDA	37.5	42.1	2.6	0.8	1.2	2.2
COLEOPTERA L	0.0	5.3	0.0	0.0	0.0	0.0
COROPHIUM SA	0.0	68.4	1.2	0.1	0.2	0.1
NEOMYSIS	0.0	26.3	8.4	<0.1	0.1	0.1
GNORIMOSPHAE	0.0	15.8	0.8	<0.1	0.0	0.0
LEPTOCOTTUS	0.0	0.0	0.2	0.0	0.0	0.0
EPHEMEROPTER	0.0	0.0	0.2	0.0	<0.1	0.0
CRANGON	0.0	0.0	1.1	0.0	<0.1	0.1
CYCLOPOIDA	0.0	0.0	0.0	<0.1	0.0	0.0
CHIRONOMIDAE	0.0	0.0	0.0	0.0	<0.1	0.0
OLIGOCHAETA	0.0	0.0	0.0	0.0	0.1	0.2

SEA REACH 78/9/26

SPECIES	SURFACE 1659	MIDDLE 1711	BOTTOM 1724	SURFACE 1900	MIDDLE 1913	BOTTOM 1925
CALANOIDA	<0.1	0.3	0.2	0.9	0.1	1.0
CLADOCERA	<0.1	0.9	0.7	0.3	0.9	2.4
EPHEMEROPTER	0.0	<0.1	0.0	0.0	0.0	0.0
CYCLOPOIDA	0.0	<0.1	0.0	<0.1	0.0	0.0
NEOMYSIS	0.0	0.0	0.2	0.2	0.2	14.8
ANISOGAMMARUS	0.0	0.0	0.0	<0.1	<0.1	0.7
GNORIMOSPHAE	0.0	0.0	0.0	<0.1	<0.1	0.5
OLIGOCHAETA	0.0	0.0	0.0	0.0	<0.1	0.0

SEA REACH 78/9/26

SPECIES	SURFACE 2100	MIDDLE 2113	BOTTOM 2125	SURFACE 2255	MIDDLE 2307	BOTTOM 2320
NEOMYSIS	0.1	1.3	25.4	0.2	2.3	40.0
ANISOGAMMARUS	<0.1	0.1	0.0	0.2	0.2	32.1
CALANOIDA	0.2	0.2	2.6	<0.1	<0.1	0.0
CLADOCERA	0.2	1.0	4.1	0.2	0.2	2.6
CYCLOPOIDA	<0.1	<0.1	0.0	<0.1	<0.1	0.0
CRANGON	<0.1	0.0	0.0	<0.1	0.0	0.0
GNORIMOSPHAE	0.0	0.2	0.5	<0.1	<0.1	<0.1
EPHEMEROPTER	0.0	<0.1	0.0	0.0	0.0	0.0
HARPACTICOID	0.0	<0.1	0.0	0.0	0.0	0.0
CHIRONOMIDAE	0.0	<0.1	0.0	<0.1	0.0	0.0
COROPHIUM SA	0.0	0.0	0.0	0.0	<0.1	0.1

NORTH ARM 78/4/12

SPECIES	SURFACE 1815	SURFACE 1827	SURFACE 1845	SURFACE 1855	SURFACE 1910	SURFACE 1925
THALEICHTHYS	1.0	6.0	1.0	0.0	0.0	1.0
CRUSTACEA NA	1.0	26.0	4.0	2.0	5.0	14.0
CALANOIDA	12.0	336.0	20.0	4.0	18.0	36.0
CUMELLA	2.0	1.0	0.0	0.0	0.0	1.0
ANISOGAMMARUS	1.0	0.0	1.0	0.0	0.0	0.0
DECAPOD ZOEA	1.0	24.0	1.0	4.0	5.0	5.0
HARPACTICOID	1.0	2.0	3.0	0.0	0.0	1.0
SPIRATELLA	0.0	4.0	1.0	0.0	0.0	1.0
MUGGIAEA	0.0	1.0	0.0	0.0	1.0	3.0
OIKOPLEURA	0.0	2.0	0.0	1.0	2.0	3.0
AGLANTHA	0.0	1.0	0.0	0.0	0.0	0.0
SAGITTA	0.0	1.0	0.0	0.0	0.0	0.0
GNORIMOSPHAE	0.0	2.0	0.0	0.0	0.0	0.0
TUBULARIA	0.0	3.0	0.0	0.0	0.0	4.0
DECAPOD MYSI	0.0	3.0	0.0	0.0	0.0	0.0
COROPHIUM SA	0.0	0.0	0.0	1.0	0.0	0.0

NORTH ARM 78/4/12

SPECIES	SURFACE 2005	SURFACE 2017	SURFACE 2022	SURFACE 2045	SURFACE 2105	SURFACE 2115
THALEICHTHYS	138.0	35.0	156.0	22.0	15.0	32.0
CALANOIDA	350.0	136.0	920.0	98.0	165.0	764.0
SPIRATELLA	8.0	3.0	1.0	4.0	6.0	20.0
LAMPROPS	54.0	146.0	12.0	1.0	1.0	0.0
CUMELLA	3.0	8.0	1.0	1.0	0.0	4.0
DECAPOD ZOEA	5.0	42.0	350.0	71.0	92.0	268.0
CRUSTACEA NA	39.0	8.0	20.0	6.0	8.0	0.0
OIKOPLEURA	7.0	0.0	16.0	2.0	4.0	32.0
TUBULARIA	5.0	0.0	0.0	0.0	0.0	0.0
GNORIMOSPHAE	2.0	0.0	0.0	1.0	1.0	4.0
PARATHEMISTO	3.0	2.0	1.0	0.0	0.0	0.0
DECAPOD MYSI	3.0	5.0	0.0	0.0	2.0	0.0
PHIALIDIUM	1.0	0.0	0.0	0.0	0.0	0.0
HARPACTICOID	0.0	2.0	0.0	0.0	0.0	0.0
ARCHEOMYSIS	0.0	5.0	0.0	0.0	0.0	0.0
ANISOGAMMARUS	0.0	6.0	5.0	0.0	1.0	8.0
CALLIOPIUS	0.0	1.0	1.0	0.0	0.0	0.0
ATYLUS	0.0	0.0	1.0	1.0	0.0	0.0
MUGGIAEA	0.0	0.0	2.0	0.0	0.0	0.0
AGLANTHA	0.0	0.0	0.0	0.0	1.0	0.0
MANAYUNKIA	0.0	0.0	0.0	0.0	0.0	12.0

NORTH ARM 78/5/16

SPECIES	MIDDLE 1900	MIDDLE 1914	MIDDLE 1932	MIDDLE 1945	MIDDLE 2003	MIDDLE 2017
OIKOPLEURA	11.0	3.5	1.1	8.0	3.4	0.0
CRUSTACEA NA	2.2	1.9	0.6	1.6	1.5	1.0
THALEICHTHYS	1.6	0.3	1.2	0.4	5.2	7.2
CLADOCERA	2.2	1.4	0.6	1.3	9.2	22.3
CALANOIDA	1.6	0.7	0.2	0.0	0.7	1.1
UNIDENT MEDU	0.9	1.9	0.0	0.0	0.0	0.0
JUV MYSIDACE	1.3	0.3	0.0	0.0	0.6	0.3
HYDRA	0.0	1.9	0.0	0.0	0.0	0.0
DECAPOD ZOEA	0.0	0.1	0.0	0.0	0.2	1.3
SPIRATELLA	0.0	0.2	0.0	0.0	0.0	0.0
FISH EGGS	0.0	3.1	0.0	0.0	0.0	0.0
PARAPLEUSTES	0.0	0.0	<0.1	0.0	0.0	0.1
ANISOGAMMARUS	0.0	0.0	0.0	0.1	0.1	0.0
COROPHIUM JU	0.0	0.0	0.0	<0.1	0.0	0.0
HARPACTICOID	0.0	0.0	0.0	0.1	0.1	0.4
CALLIOPIUS	0.0	0.0	0.0	0.1	0.0	0.0
CUMELLA	0.0	0.0	0.0	0.0	0.1	1.4
PODOCEROPSIS	0.0	0.0	0.0	0.0	<0.1	0.6
AMPITHOE	0.0	0.0	0.0	0.0	<0.1	0.0
LAMPROPS	0.0	0.0	0.0	0.0	0.0	0.1

NORTH ARM 78/5/16

SPECIES	MIDDLE 2100	MIDDLE 2115	MIDDLE 2146	MIDDLE 2201	MIDDLE 2233	MIDDLE 2247
OIKOPLEURA	8.9	102.6	19.2	53.8	115.8	589.5
THALEICHTHYS	2.4	7.9	5.0	3.0	13.2	9.0
DECAPOD ZOEA	0.4	2.6	0.4	0.0	0.0	0.0
CRUSTACEA NA	11.7	131.6	20.9	6.8	0.0	6.0
LAMPROPS	16.8	50.0	0.0	0.0	0.0	6.0
CUMELLA	0.2	2.6	2.2	1.5	2.0	0.0
UNIDENT MEDU	1.6	7.9	2.2	2.3	1.3	0.0
CALANOIDA	4.5	57.9	11.3	7.5	12.5	6.0
HARPACTICOID	0.6	0.0	0.0	1.1	1.3	0.0
SPIRATELLA	0.2	5.3	0.0	0.0	0.0	0.0
ATYLUS	0.4	0.0	0.0	0.4	0.0	0.0
PARAMOERA	0.2	0.0	0.0	0.0	0.0	0.0
CALLIOPIUS	0.2	2.6	0.3	0.0	0.0	0.0
CLADOCERA	35.4	231.6	30.9	30.0	158.0	150.4
AMPITHOE	0.0	0.0	0.1	0.0	0.0	0.0
ANISOGAMMARUS	0.0	0.0	1.1	0.0	3.3	0.0
PARAPLEUSTES	0.0	0.0	0.0	0.0	0.7	0.0
JUV MYSIDACE	1.6	5.3	0.9	0.0	2.0	0.0

NORTH ARM 78/6/14

SPECIES	SURFACE 2105	SURFACE 2120	SURFACE 2135	SURFACE 2147
THALEICHTHYS	5.0	84.0	132.0	18.0
OIKOPLEURA	1.0	4.0	12.0	6.0
CALANOIDA	115.0	1920.0	400.0	328.0
LAMPROPS	1.0	52.0	8.0	0.0
CALLIOPIUS	4.0	0.0	1.0	4.0
DECAPOD ZOEA	43.0	148.0	208.0	96.0
ATYLUS	1.0	0.0	1.0	98.0
CRUSTACEA NA	7.0	60.0	8.0	58.0
ANISOGAMMARUS	1.0	0.0	6.0	16.0
MUGGIAEA	1.0	8.0	4.0	22.0
SPIRATELLA	1.0	8.0	12.0	26.0
CUMELLA	0.0	16.0	0.0	14.0
GNORIMOSPHAE	0.0	4.0	4.0	0.0
DECAPOD MYSI	0.0	24.0	0.0	0.0
PARATHEMISTO	0.0	12.0	0.0	0.0
PARAMOERA	0.0	0.0	4.0	0.0
UNIDENT MEDU	0.0	0.0	12.0	0.0
ARCHEOMYSIS	0.0	0.0	4.0	0.0

NORTH ARM 78/5/16

SPECIES	MIDDLE 1701	MIDDLE 1725	MIDDLE 1747	MIDDLE 1758	MIDDLE 1817	MIDDLE 1831
CALANOIDA	0.3	0.5	0.1	1.0	0.4	0.3
CLADOCERA	4.1	2.5	2.0	7.7	4.1	5.2
OIKOPLEURA	0.3	0.3	0.0	0.4	0.0	0.0
CRUSTACEA NA	0.3	0.0	0.0	0.2	0.0	0.1
JUV MYSIDACE	0.9	0.0	0.0	0.0	<0.1	0.0
ANISOGAMMARUS	3.8	0.5	<0.1	0.0	<0.1	0.0
CALLIOPIUS	0.0	0.2	0.0	0.0	0.0	0.0
HARPACTICOID	0.0	0.3	0.0	0.2	<0.1	0.1
THALEICHTHYS	0.0	1.2	0.0	3.2	0.4	0.2
DECAPOD ZOEA	0.0	0.0	0.0	0.0	0.0	0.1

ROBERTS BANK 78/4/20

SPECIES	SURFACE^{P} 1248	MIDDLE^{P} 1333	SURFACE^{N} 1411	MIDDLE^{N} 1436	BOTTOM^{N} 1500	SURFACE^{P} 1835
AMPITHOE	0.4	0.0	0.0	0.0	0.0	0.0
UNIDENT POLY	0.4	0.0	0.0	0.0	0.0	0.0
DECAPOD ZOEA	0.7	73.4	3.7	34.6	36.6	15.1
CALANOIDA	39.5	575.7	124.5	192.5	128.2	26.8
DECAPOD MYSI	0.7	8.5	2.8	6.0	8.2	0.0
PARATHEMISTO	0.0	2.8	0.0	1.5	0.0	0.0
PLEUROBRACHI	0.0	0.0	0.9	0.0	0.0	0.0
SPIRATELLA	0.0	0.0	2.7	0.0	1.8	1.4
OIKOPLEURA	0.0	0.0	1.8	6.0	10.1	0.0
GASTROPTERON	0.0	0.0	0.0	0.0	0.0	0.5

ROBERTS BANK 78/4/20

SPECIES	SURFACE^{P} 1850	SURFACE^{N} 1920	MIDDLE^{N} 1940	BOTTOM^{N} 2000	SURFACE^{N} 2235	MIDDLE^{N} 2300
MUGGIAEA	0.7	0.0	0.0	0.0	0.0	0.0
SAGITTA	0.7	0.3	0.6	0.0	0.0	0.0
PARATHEMISTO	0.7	0.0	0.0	0.0	0.0	0.0
UNIDENT MEDU	1.4	0.0	0.0	0.0	0.0	0.0
CALANOIDA	76.2	38.3	105.9	122.8	0.0	208.8
SPIRATELLA	7.1	8.9	8.8	2.1	2.4	36.7
DECAPOD ZOEA	3.4	2.9	9.9	28.8	5.2	73.4
DECAPOD MYSI	4.9	1.3	4.1	12.6	5.6	169.3
THALEICHTHYS	0.0	0.3	0.0	0.0	0.0	0.0
GNORIMOSPHAE	0.0	0.0	1.2	0.0	0.7	0.0
PARAPLEUSTES	0.0	0.0	0.6	0.0	3.1	0.0
OIKOPLEURA	0.0	0.0	1.2	6.3	0.0	5.6
GASTROPTERON	0.0	0.0	0.0	0.2	0.0	0.0
LAMPROPS	0.0	0.0	0.0	0.2	1.2	5.6
CYCLOPOIDA	0.0	0.0	0.0	0.0	27.3	0.0
PONTOGENEIA	0.0	0.0	0.0	0.0	5.2	22.6
ANISOGAMMARUS	0.0	0.0	0.0	0.0	0.0	2.8
CUMELLA	0.0	0.0	0.0	0.0	0.0	5.6
AMPITHOE	0.0	0.0	0.0	0.0	0.0	2.8

ROBERTS BANK 78/4/20

SPECIES	SURFACE^{N} 2340	MIDDLE^{N} 2355	BOTTOM^{N} 0010	SURFACE^{P} 0450	MIDDLE^{P} 0520	SURFACE^{N} 0550
PHIALIDIUM	8.8	1.8	0.0	0.0	0.0	0.0
TUBULARIA	4.4	12.8	0.0	0.0	0.0	1.5
PARAPHOXUS	4.4	0.0	0.0	0.0	0.0	0.0
PONTOGENEIA	8.8	0.0	0.0	0.2	0.0	12.6
CALANOIDA	517.5	316.7	282.9	4.2	145.3	356.4
SPIRATELLA	17.5	22.0	13.5	0.5	5.6	51.1
DECAPOD ZOEA	21.9	91.5	144.8	0.5	2.8	46.6
OIKOPLEURA	4.4	141.0	16.8	0.0	0.0	4.5
DECAPOD MYSI	43.9	164.8	212.2	1.4	11.3	91.7
ATYLUS	0.0	3.7	0.0	0.2	0.0	0.0
MUGGIAEA	0.0	1.8	0.0	0.0	0.0	0.0
LAMPROPS	0.0	11.0	3.4	0.2	0.0	3.0
SAGITTA	0.0	1.8	0.0	0.0	0.0	0.0
CORYNE	0.0	14.7	0.0	0.0	0.0	0.0
CUMELLA	0.0	1.8	0.0	0.0	0.0	0.0
THALEICHTHYS	0.0	3.7	10.1	0.0	0.0	0.0
UNIDENT MEDU	0.0	0.0	6.7	0.0	0.0	0.0
CALLIOPIUS	0.0	0.0	0.0	7.3	0.2	0.0
SYNIDOTEA	0.0	0.0	0.0	0.2	0.0	0.0
GNORIMOSPHAE	0.0	0.0	0.0	0.0	0.2	0.0
HARPACTICOID	0.0	0.0	0.0	0.0	1.4	0.0

ROBERTS BANK 78/4/21

SPECIES	MIDDLE^{N} 0609	BOTTOM^{N} 0628	SURFACE^{N} 0755	MIDDLE^{N} 0814	BOTTOM^{N} 0835
MUGGIAEA	0.4	1.0	0.0	0.0	0.0
CALANOIDA	61.2	129.3	122.6	26.4	371.9
SPIRATELLA	23.8	20.1	10.6	0.0	0.0
DECAPOD ZOEA	3.2	5.0	1.0	100.7	0.0
OIKOPLEURA	1.8	0.0	1.0	1.1	0.0
DECAPOD MYSI	4.3	11.0	1.5	2.2	252.6
PLEUROBRACHI	0.0	<0.1	0.0	0.0	0.0
SAGITTA	0.0	1.0	0.0	0.0	0.0
HARPACTICOID	0.0	1.0	0.0	0.0	0.0
CALLIOPIUS	0.0	0.0	1.0	0.0	0.0
PARAMOERA	0.0	0.0	0.0	2.8	0.0
THALEICHTHYS	0.0	0.0	0.0	0.6	0.0
UNIDENT MEDU	0.0	0.0	0.0	0.6	7.0

ROBERTS BANK 78/5/23

SPECIES	SURFACE^{N} 1812	MIDDLE^{N} 1841	BOTTOM^{N} 1828	SURFACE^{N} 2000	MIDDLE^{N} 2014	BOTTOM^{N} 2029
CALANOIDA	186.5	188.8	61.1	53.4	376.1	203.5
UNIDENT MEDU	769.9	0.0	136.8	6.5	0.0	0.0
SPIRATELLA	6.0	0.0	4.2	0.0	2.8	0.0
CLADOCERA	18.1	16.0	8.4	0.0	0.0	0.0
SAGITTA	114.3	0.0	0.0	0.0	0.0	0.0
CRUSTACEA NA	30.1	30.4	10.5	3.2	22.5	17.5
PARAPLEUSTES	6.0	0.0	0.0	0.0	0.0	0.0
DECAPOD ZOEA	0.0	28.8	44.2	246.2	210.5	98.2
LAMPROPS	0.0	4.8	8.4	0.0	5.6	5.3
TUBULARIA	0.0	175.0	0.0	0.0	95.4	19.3
DECAPOD MYSI	0.0	40.0	0.0	16.2	25.3	8.8
JUV MYSIDACE	0.0	8.0	35.8	3.2	0.0	0.0
RATHKEA	0.0	1.6	0.0	0.0	5.6	0.0
ATYLUS	0.0	1.6	4.2	0.0	0.0	0.0
PHIALIDIUM	0.0	8.0	0.0	0.0	2.8	0.0
OIKOPLEURA	415.0	38.4	14.7	1.6	47.7	7.0
PLEUROBRACHI	0.0	0.0	2.1	0.0	0.0	0.0
UNIDENT POLY	0.0	0.0	2.1	0.0	0.0	0.0
JUV MYSIDACE	0.0	0.0	0.0	11.2	0.0	17.5
PROBOSCIDACT	0.0	0.0	0.0	0.0	5.6	0.0
CORYNE	0.0	0.0	0.0	0.0	2.8	3.5
OSTRACODA	0.0	0.0	0.0	0.0	5.6	0.0
CALLIANASSID	0.0	0.0	0.0	0.0	0.0	1.8
THALEICHTHYS	0.0	0.0	0.0	0.0	0.0	1.8

ROBERTS BANK 78/5/23

SPECIES	SURFACE N 2159	MIDDLE N 2213	BOTTOM N 2226	SURFACE N 2358	MIDDLE N 0033	BOTTOM N 0048
CALANOIDA	183.6	197.1	53.9	54.0	199.0	15.4
DECAPOD ZOEA	48.9	212.4	33.4	44.6	91.9	20.4
CRUSTACEA NA	9.0	30.6	0.5	4.6	34.5	10.5
DECAPOD MYSI	22.6	0.0	0.0	20.0	76.6	1.4
LAMPROPS	2.3	0.0	11.3	1.4	19.1	8.4
TUBULARIA	5.3	0.0	0.0	0.0	516.8	14.0
PONTOGENEIA	0.8	0.0	0.8	1.1	0.0	0.7
THALEICHTHYS	2.3	15.3	3.2	10.9	19.1	5.6
CUMELLA	3.8	59.3	0.0	5.6	3.8	1.4
OSTRACODA	0.8	0.0	0.3	0.0	0.0	0.0
OIKOPLEURA	3.0	15.3	1.8	0.0	49.8	3.5
CORYNE	0.8	0.0	0.0	0.0	3.8	0.0
JUV MYSIDACE	0.0	68.9	0.3	0.0	3.8	2.1
SAGITTA	0.0	3.8	0.0	0.0	0.0	0.0
UNIDENT MEDU	7.7	0.0	0.0	0.0	0.0	0.0
CLADOCERA	0.0	13.4	0.0	0.0	26.8	0.0
SPIRATELLA	0.0	15.3	0.0	0.0	0.0	0.0
BRACHYURA JU	0.0	9.6	0.0	0.0	0.0	0.0
ATYLUS	0.0	9.6	0.5	4.2	0.0	4.2
PARAMOERA	0.0	9.6	0.0	0.0	0.0	0.0
SYNCHELIDIUM	0.0	9.6	1.3	0.0	3.8	0.7
ARMANDIA	0.0	6.7	0.0	0.4	0.0	0.0
PSEUDODIASTY	0.0	0.0	0.5	1.1	0.0	0.0
PLEUSYMPTES	0.0	0.0	4.5	0.0	0.0	3.5
ANONYX	0.0	0.0	2.6	0.0	0.0	0.0
JUVENILE SHR	0.0	0.0	8.9	0.0	0.0	0.0
PHOTIS	0.0	0.0	0.5	1.1	0.0	5.6
WESTWOODILLA	0.0	0.0	0.5	0.0	0.0	2.1
PLEUROBRACHI	0.0	0.0	0.3	0.0	3.8	0.0
PAGURIDAE LA	0.0	0.0	0.3	0.0	0.0	0.0
BRACHYURA JU	0.0	0.0	0.8	0.7	0.0	0.0
EUPHAUSIACEA	0.0	0.0	0.3	0.0	0.0	0.0
ISCHYROCERUS	0.0	0.0	0.0	3.5	0.0	0.0
SYNIDOTEA	0.0	0.0	0.0	5.6	0.0	0.0
ANISOGAMMARUS	0.0	0.0	0.0	0.7	0.0	0.7
CRANGCN	0.0	0.0	0.0	0.4	3.8	0.0
OSTRACODA	0.0	0.0	0.0	0.4	0.0	0.0
PARAPHOXUS	0.0	0.0	0.0	0.4	0.0	0.0
PHIALIDIUM	0.0	0.0	0.0	0.0	34.5	1.4
RATHKEA	0.0	0.0	0.0	0.0	183.9	0.0
AOROIDES	0.0	0.0	0.0	0.0	3.8	0.0
MUNNA	0.0	0.0	0.0	0.0	0.0	0.7
SYNIDOTEA	0.0	0.0	0.0	0.0	0.0	1.4
CAPRELLA	0.0	0.0	0.0	0.0	0.0	0.7

ROBERTS BANK 78/7/25

SPECIES	SURFACE[P] 1756	MIDDLE[P] 1820	BOTTOM[P] 1910	SURFACE[P] 2000	MIDDLE[P] 2027
CUMELLA	<0.1	0.0	0.0	0.0	0.0
PLEUROBRACHI	0.0	0.6	0.2	0.0	1.1
DECAPOD ZOEA	0.0	0.4	1.7	0.8	0.6
MUGGIAEA	0.0	0.2	0.0	0.0	0.0
PORCELLANIDA	0.0	<0.1	0.0	0.0	0.0
PARATHEMISTO	0.0	0.5	0.4	0.4	0.3
CAPRELLA	0.0	<0.1	<0.1	1.0	0.0
ATYLUS	0.0	0.0	<0.1	0.0	0.0
CALANOIDA	0.0	0.0	<0.1	0.0	<0.1
CLADOCERA	0.0	0.0	0.0	<0.1	0.0
CANCER MEGAL	0.0	0.0	0.0	3.2	<0.1
PENTIDOTEA	0.0	0.0	0.0	0.2	0.0
IDOTEA	0.0	0.0	0.0	0.6	0.0
OLIGOCHAETA	0.0	0.0	0.0	<0.1	0.0
BRACHYURA JU	0.0	0.0	0.0	0.0	0.1
HEPTACARPUS	0.0	0.0	0.0	0.0	<0.1

ROBERTS BANK 78/7/25

SPECIES	SURFACE^{N} 2055	MIDDLE^{N} 2116	BOTTOM^{N} 2140	SURFACE^{P} 2200	MIDDLE^{P} 2230	BOTTOM^{P} 2255
PLEUROBRACHI	0.8	10.0	4.3	0.4	0.1	1.4
PHIALIDIUM	1.2	5.1	2.9	0.4	0.0	0.0
CANCER MEGAL	0.1	0.0	0.8	0.9	1.0	1.3
DECAPOD ZOEA	0.1	0.4	0.4	6.8	0.7	1.4
CALANOIDA	0.5	2.3	3.4	8.5	3.4	2.3
OIKOPLEURA	0.3	0.1	0.1	0.0	0.0	0.0
PARATHEMISTO	0.1	2.3	0.8	0.3	0.5	0.8
ANISOGAMMARUS	<0.1	0.0	0.0	0.0	0.0	0.0
ATYLUS	<0.1	0.0	0.0	0.2	0.6	0.5
PROBOSCIDACT	0.0	1.8	0.5	0.0	0.0	0.0
MUGGIAEA	0.0	1.2	0.3	0.0	0.0	0.0
DECAPOD MYSI	0.0	0.8	0.7	2.4	0.5	0.3
ANISOGAMMARU	0.0	0.1	0.2	0.4	0.7	0.9
BRACHYURA JU	0.0	0.1	0.1	0.0	0.0	0.2
LAMPROPS	0.0	0.0	0.4	0.5	<0.1	0.0
OPHIUROIDEA	0.0	0.0	<0.1	0.0	0.0	0.0
SYNIDOTEA	0.0	0.0	0.1	0.0	0.0	0.3
CUMELLA	0.0	0.0	0.1	0.2	0.0	<0.1
AMPITHOE	0.0	0.0	0.1	0.2	0.0	0.4
HEPTACARPUS	0.0	0.0	0.1	0.0	0.2	1.4
OSTRACODA	0.0	0.0	0.0	1.1	0.0	0.4
PORCELLANIDA	0.0	0.0	0.0	0.2	0.0	0.0
COROPHIUM SA	0.0	0.0	0.0	<0.1	0.0	0.1
COROPHIUM JU	0.0	0.0	0.0	0.0	0.2	0.0
CYCLOPOIDA	0.0	0.0	0.0	0.0	<0.1	0.0
CYPHOCARIS	0.0	0.0	0.0	0.0	0.1	0.0
NEREIS	0.0	0.0	0.0	0.0	<0.1	<0.1
PONTOGENEIA	0.0	0.0	0.0	0.0	0.0	0.9
CAPRELLA	0.0	0.0	0.0	0.0	0.0	0.1
JUV MYSIDACE	0.0	0.0	0.0	0.0	0.0	0.3
ARMANDIA	0.0	0.0	0.0	0.0	0.0	<0.1
EVALUS	0.0	0.0	0.0	0.0	0.0	<0.1

ROBERTS BANK 78/V111/28

SPECIES	SURFACE[P] 1855	MIDDLE[P] 1832	BOTTOM[P] 1755	SURFACE[P] 2100	MIDDLE[P] 2030	BOTTOM[P] 2000
DECAPOD MYSI	<0.1	<0.1	0.0	0.3	1.6	0.5
IDOTEA	0.1	0.0	0.0	0.0	0.0	0.0
PARATHEMISTO	<0.1	0.0	0.0	0.0	0.0	0.0
DECAPOD ZOEA	0.3	1.8	3.3	1.5	18.3	3.0
PLEUROBRACHI	0.0	<0.1	0.0	0.0	0.0	<0.1
CALANOIDA	0.0	0.0	<0.1	0.0	<0.1	0.0
GNORIMOSPHAE	0.0	0.0	0.2	<0.1	0.0	0.0
HYPERIA	0.0	0.0	0.4	<0.1	0.0	0.4
ANISOGAMMARUS	0.0	0.0	0.0	<0.1	0.0	0.0
CANCER MEGAL	0.0	0.0	0.0	0.8	0.0	0.0
OSTRACODA	0.0	0.0	0.0	0.5	0.2	0.0
CUMELLA	0.0	0.0	0.0	<0.1	0.0	0.0
CYCLOPOIDA	0.0	0.0	0.0	<0.1	0.0	0.0
ARMANDIA	0.0	0.0	0.0	0.2	0.0	0.0
AMPITHOE	0.0	0.0	0.0	<0.1	0.0	0.0

ROBERTS BANK 78/8/28

SPECIES	SURFACE[N] 2300	MIDDLE[N] 2340	BOTTOM[P] 2215
SYNCHELIDIUM	4.6	1.3	49.0
CANCER MEGAL	13.2	4.0	0.0
DECAPOD ZOEA	14.5	35.1	1.7
THALEICHTHYS	0.3	0.0	0.0
OPHIUROIDEA	0.3	0.0	5.1
BIVALVIA	0.3	0.0	81.3
AMPITHOE	0.7	0.0	0.0
PHOTIS	1.0	0.0	47.4
LAMPROPS	2.3	0.4	3.4
CUMELLA	6.3	7.0	0.9
ANISOGAMMARUS	19.7	4.0	1.7
ATYLUS	1.3	0.4	0.4
OSTRACODA	0.3	0.0	4.2
MUNNA	0.3	0.0	3.4
COROPHIUM IN	2.6	0.4	0.0
DECAPOD MYSI	2.6	11.4	0.0
GNORIMOSPHAE	1.3	0.0	0.0
CALLIANASSID	0.3	0.0	0.0
CALANOIDA	1.6	29.8	0.0
JUVENILE SHR	0.0	5.3	0.0
SAGITTA	0.0	0.4	0.0
CAPRELLA	0.0	1.3	6.8
CALLIOPIUS	0.0	2.6	0.0
PONTOGENEIA	0.0	0.9	0.4
PROBOSCIDACT	0.0	0.9	0.0
PARATHEMISTO	0.0	0.4	0.9
PSEUDODIASTY	0.0	2.2	3.4
BRACHYURA JU	0.0	1.3	0.0
SPIRATELLA	0.0	0.4	0.0
CRUSTACEA NA	0.0	0.4	0.0
ANONYX	0.0	0.0	11.0
UNIDENT POLY	0.0	0.0	6.8
SYNIDOTEA	2.6	3.5	16.0
DIASTYLOPSIS	0.0	0.0	5.5
CRANGON	0.0	0.0	2.5
JUV MYSIDACE	0.0	0.0	2.1
FORAMINIFERA	0.0	0.0	4.2
TANAIDACEA	0.0	0.0	1.7
MEGAMPHOXUS	0.0	0.0	12.7
AOROIDES	0.0	0.0	2.5
AMPELISCA	0.0	0.0	0.4
PLEUSYMPTES	0.0	0.0	35.9
COROPHIUM AS	0.0	0.0	1.7
ISCHYROCERUS	0.0	0.0	0.9

Table 3. Vertical distribution of abundant taxa from April 1978 sampling at Steveston Island. Length of the bars is proportional to percent occurrence (presence-or-absence). Column on far right shows χ^2 values to test for homogeneity among the 3 depths; * indicates $p \leq 0.05$.

STEVESTON ISLAND APRIL 1978

TAXA	DEPTH 0-1 m	4-6 m	8-10 m	χ^2
Thaleichthys				0.64
Neomysis mercedis				10.5*
Eogammarus confervicolus				4.0*
Cumella vulgaris				7.2*
Lamprops spp.				2.4*
Corophium salmonis				24.2*
Calanoid copepods				7.7*
Oikopleura				20.1*
Parathemisto				6.9*
Pleuronectid larvae				6.9*
Spiratella				22.8*
Sagitta				14.2*
Decapod zoea				7.4*
Cladocera				8.2*
	(13 samples)	(13 samples)	(8 samples)	

Table 4. Vertical distribution of abundant taxa from April and May 1978 at Roberts Bank. Length of the bars is proportional to percent occurrence. Column on far right shows χ^2 values to test for homogeneity among the 3 depths; * indicates $p < 0.05$.

ROBERTS BANK APRIL-MAY 1978

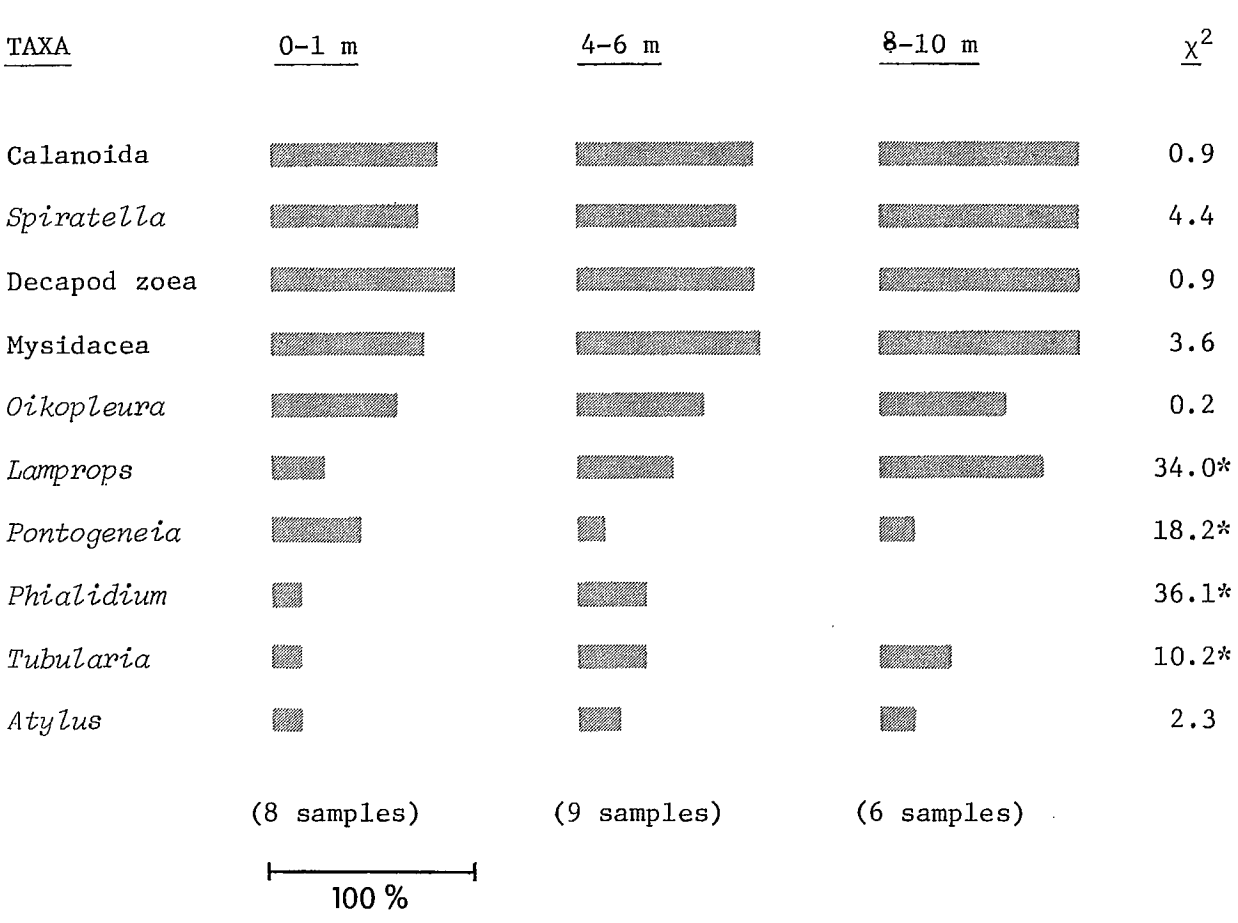

Table 5. Listing of temperature (^{o}C) and salinity S^{o}/oo) data at various stations in the lower Fraser River estuary. All times are PST.

Station: Canoe Pass
Date: 78-2-15
Time: 1222

Depth (m)	S‰	T°C
0	3.7	3.9
1	4.5	4.3
2	5.3	3.7
3	5.5	3.8
4	5.8	3.8
5	11.3	4.7

Station: Steveston I.
Date: 78-2-15
Time: 1408

Depth (m)	S‰	T°C
0	2.1	3.7
1	3.3	3.8
2	7.4	4.1
3	19.2	5.4
4	27.6	6.8
5	27.8	7.1
6	28.0	7.0
7	28.2	6.6
8	28.5	7.0

Station: Canoe Pass
Date: 78-3-14
Time: 1330

Depth (m)	S‰	T°C
0	2.9	5.2
1	3.2	5.1
2	3.3	5.0
3	3.2	5.0
4	3.3	5.1
5	3.1	5.1
6	3.2	5.0
7	3.2	5.0

Station: Sea Reach
Date: 78-3-14
Time: 1446

Depth (m)	S‰	T°C
0	2.5	4.8
1	2.3	5.1
2	2.3	5.1
3	2.3	5.0
4	2.5	5.0
5	2.5	5.0

Station: Steveston I.
Date: 78-3-15
Time: 0950

Depth (m)	S‰	T°C
0	1.9	4.7
1	2.1	4.7
2	10.2	5.3
3	11.7	5.8
4	14.8	6.2
5	20.5	6.2
6	29.3	7.3
7	29.6	7.3
8	29.4	7.4
9	29.5	7.1
10	28.6	7.5

Station: Sea Reach
Date: 78-3-29
Time: 2020

Depth (m)	S‰	T°C
0	0.2	6.5
1	0.4	6.3
2	0.5	6.2
3	0.9	5.7
4	0.8	6.3
5	1.0	5.9
6	1.3	6.4

Station: Sea Reach
Date: 78-3-29
Time: 2230

Depth (m)	S‰	T°C
0	1.1	5.6
1	1.7	6.2
2	2.0	6.5
3	2.7	6.3
4	2.8	6.0
5	3.0	6.4
6	3.0	6.5

Station: Steveston I.
Date: 78-4-4
Time: 1800

Depth (m)	S‰	T°C
0	0.3	5.3
1	0.7	5.3
2	0.7	5.3
3	3.9	5.6
4	7.5	5.8
5	24.0	8.0
6	25.8	8.3

Station: Steveston I.
Date: 78-4-5
Time: 0030

Depth (m)	S‰	T°C
0	0.4	5.5
1	0.7	5.1
2	0.8	5.1
3	1.5	5.5
4	1.7	5.3
5	1.8	5.2
6	2.0	5.3

Station: Canoe Pass
Date: 78-4-5
Time: 1815

Depth (m)	S‰	T°C
0	1.6	5.8
1	1.9	6.5
2	2.6	6.6
3	1.9	5.9
4	2.1	6.5
5	2.4	6.4

Station: Canoe Pass
Date: 78-4-5
Time: 2400

Depth (m)	S‰	T°C
0	2.0	5.0
1	2.6	6.0
2	2.6	6.0
3	1.9	6.1
4	2.3	6.0

Station: North Arm
Date: 78-4-12
Time: 1835

Depth (m)	S‰	T°C
0	22.6	8.4
1	28.0	8.3
2	28.2	8.3
3	28.3	8.3
4	nd	nd
5	28.9	8.2

Station: North Arm
Date: 78-4-12
Time: 1845

Depth (m)	S‰	T°C
0	17.8	10.8
1	16.5	10.5
2	17.5	10.4
3	20.0	9.7
4	nd	nd
5	26.2	8.9

Station: North Arm
Date: 78-4-12
Time: 1855

Depth (m)	S‰	T°C
0	17.8	10.3
1	22.8	9.3
2	24.0	9.3
3	24.1	9.3
4	nd	nd
5	27.1	8.9

Station: North Arm
Date: 78-4-12
Time: 1910

Depth (m)	S‰	T°C
0	18.9	8.7
1	21.9	8.4
2	22.1	8.6
3	25.9	8.6
4	nd	nd
5	26.9	8.8

Station: North Arm
Date: 78-4-12
Time: 1930

Depth (m)	S‰	T°C
0	19.1	9.9
1	22.3	9.4
2	24.2	8.8
3	25.5	8.8
4	nd	nd
5	27.1	8.7

Station: North Arm
Date: 78-4-12
Time: 2220

Depth (m)	S‰	T°C
0	18.5	9.3
1	25.8	9.2
2	25.8	9.0
3	27.3	8.4
4	nd	nd
5	28.2	8.2

Station: North Arm
Date: 78-4-12
Time: 2205

Depth (m)	S‰	T°C
0	24.8	9.0
1	25.3	8.7
2	26.1	8.9
3	26.3	8.8
4	nd	nd
5	24.9	7.8

Station: North Arm
Date: 78-4-12
Time: 2235

Depth (m)	S‰	T°C
0	18.2	9.2
1	26.3	8.7
2	26.9	8.9
3	27.1	8.5
4	nd	nd
5	29.2	7.7

Station: North Arm
Date: 78-4-12
Time: 2245

Depth (m)	S‰	T°C
0	19.5	8.9
1	23.7	9.0
2	26.2	8.7
3	27.1	8.5
4	nd	nd
5	29.2	8.3

Station: Roberts Bank
Date: 78-4-20
Time: 1214

Depth (m)	S‰	T°C
0	28.3	9.5
1	28.3	8.9
2	28.7	9.3
3	28.4	8.9
4	28.9	9.3
5	28.8	9.3
6	28.6	9.0
7	28.7	8.9
8	28.8	8.9
9	28.8	8.7
10	28.7	9.0
11	28.6	8.9

Station: Canoe Pass
Date: 78-4-25
Time: 1823

Depth (m)	S‰	T°C
0	0.6	8.8
1	0.7	8.8
2	0.7	8.4
3	0.4	8.7
4	0.7	9.0

Station: Canoe Pass
Date: 78-4-25
Time: 2350

Depth (m)	S‰	T°C
0	1.2	8.6
1	0.9	8.9
2	1.0	8.8
3	1.1	9.0
4	0.7	8.6
5	0.9	8.5

Station: Steveston I.
Date: 78-4-26
Time: 1745

Depth (m)	S‰	T°C
0	0.3	9.4
1	0.2	9.1
2	0.4	9.1
3	0.4	8.7
4	0.4	9.1
5	0.3	8.9
6	0.4	8.8
7	0.4	8.8
8	0.5	8.8

Station: Steveston I.
Date: 78-4-26
Time: 2350

Depth (m)	S‰	T°C
0	1.7	8.8
1	2.2	9.1
2	4.3	8.8
3	18.1	9.6
4	21.0	9.2
5	22.3	9.1
6	25.5	8.8
7	27.2	8.8

Station: Sea Reach
Date: 78-4-27
Time: 1750

Depth (m)	S‰	T°C
0	0.9	9.2
1	1.0	8.9
2	1.2	9.0
3	1.4	9.2
4	1.6	9.0
5	1.7	8.9
6	1.8	9.2

Station: Sea Reach
Date: 78-4-27
Time: 0024

Depth (m)	S‰	T°C
0	1.1	8.9
1	1.2	8.9
2	1.7	9.3
3	3.3	8.9
4	5.4	9.2
5	10.2	9.0
6	12.3	9.1
7	16.8	9.0

Station: North Arm
Date: 78-5-16
Time: 1730

Depth (m)	S‰	T°C
0	5.7	11.9
1	6.9	12.2
2	13.4	10.8
3	16.0	10.6
4	15.5	10.7
5	15.7	10.7
6	15.4	10.8

Station: North Arm
Date: 78-5-16
Time: 1745

Depth (m)	S‰	T°C
0	15.5	11.0
1	15.4	11.1
2	15.4	10.8
3	15.5	10.5
4	15.8	10.3
5	15.7	10.3
6	15.8	9.8

Station: North Arm
Date: 78-5-16
Time: 1825

Depth (m)	S‰	T°C
0	15.5	10.8
1	15.4	11.0
2	15.6	10.9
3	15.4	10.7
4	15.5	10.4
5	15.6	10.2
6	15.7	9.8

Station: Roberts Bank
Date: 78-5-23
Time: 1745

Depth (m)	S‰	T°C
0	28.3	11.8
1	28.7	11.5
2	28.7	11.5
3	28.9	11.3
4	29.1	10.9
5	29.2	10.7
6	29.2	10.4
7	29.3	10.6
8	29.5	10.2
9	29.5	10.5
10	29.8	10.1

Station: Roberts Bank
Date: 78-5-23
Time: 1935

Depth (m)	S‰	T°C
0	28.0	11.1
1	28.6	11.0
2	29.7	10.1
3	29.8	9.9
4	29.6	9.9
5	29.9	9.3
6	29.9	9.6
7	30.0	9.6
8	30.0	9.6
9	30.0	9.6
10	30.1	9.7

Station: Roberts Bank
Date: 78-5-23
Time: 2340

Depth (m)	S‰	T°C
0	27.3	12.5
1	27.7	11.5
2	29.1	11.4
3	29.0	10.8
4	29.1	10.9
5	29.4	11.2
6	29.4	10.9
7	29.9	10.3
8	30.1	10.4
9	30.2	11.0
10	30.4	9.8

Station: Steveston I.
Date: 78-5-26
Time: 1700

Depth (m)	S‰	T°C
0	0.0	11.5
1	0.2	11.9
2	0.4	11.7
3	0.6	12.1
4	0.5	11.7
5	0.5	12.0
6	0.4	11.0

Station: Steveston I.
Date: 78-5-26
Time: 1900

Depth (m)	S‰	T°C
0	0.5	11.7
1	0.5	11.9
2	0.6	11.9
3	0.3	11.8
4	0.6	12.0
5	0.6	11.9
6	0.6	11.6
7	0.4	12.0

Station: Steveston I.
Date: 78-5-26
Time: 2100

Depth (m)	S‰	T°C
0	0.8	10.9
1	0.6	11.8
2	0.4	11.6
3	0.8	12.0
4	0.5	11.6
5	1.3	11.2
6	4.8	11.3
7	8.6	11.2
8	16.8	10.8

Station: Steveston I.
Date: 78-5-26
Time: 2245

Depth (m)	S‰	T°C
0	0.3	11.1
1	0.3	12.1
2	1.0	11.9
3	2.5	11.4
4	7.5	11.6
5	9.3	12.1
6	13.8	12.0
7	20.6	11.6
8	26.0	10.4
9	27.2	10.0

Station: Steveston I.
Date: 78-6-19
Time: 1700

Depth (m)	S‰	T°C
0	0.4	15.1
1	0.4	15.3
2	0.6	15.0
3	0.5	15.1
4	0.5	14.9
5	0.5	15.0
6	0.5	15.0
7	0.5	14.8

Station: Steveston I.
Date: 78-6-19
Time: 2104

Depth (m)	S‰	T°C
0	0.5	14.9
1	0.5	14.8
2	0.5	14.8
3	0.6	14.9
4	0.6	14.9
5	0.8	14.7
6	1.2	14.8
7	1.8	14.8

Station: Sea Reach
Date: 78-6-20
Time: 1700

Depth (m)	S‰	T°C
0	1.8	15.5
1	1.8	15.0
2	1.8	15.0
3	1.3	15.8
4	1.6	15.8
5	1.8	15.8
6	1.8	15.8
7	1.8	16.0
8	1.8	16.1

Station: Sea Reach
Date: 78-6-20
Time: 2135

Depth (m)	S‰	T°C
0	1.3	15.3
1	1.1	16.0
2	1.1	15.4
3	0.9	15.9
4	0.8	15.8
5	1.0	16.0
6	0.8	16.0
7	1.3	16.1
8	0.8	15.3

Station: Canoe Pass
Date: 78-8-21
Time: 1845

Depth (m)	S‰	T°C
0	0.4	18.2
1	0.4	18.2
2	0.4	18.4
3	0.4	18.0
4	0.4	18.0
5	0.5	17.8

Station: Canoe Pass
Date: 78-8-21
Time: 1845

Depth (m)	S‰	T°C
0	0.4	18.8
1	0.4	18.0
2	0.4	17.8
3	0.4	18.0
4	0.5	17.7
5	0.4	17.8
6	0.4	18.1

Station: Canoe Pass
Date: 78-8-21
Time: 2045

Depth (m)	S‰	T°C
0	0.5	17.2
1	0.5	17.0
2	0.5	17.4
3	0.5	17.3
4	0.5	17.6
5	0.6	17.3
6	0.5	17.4
7	0.5	17.5
8	0.4	17.5
9	0.5	17.7
10	0.6	17.4

Station: Canoe Pass
Date: 78-8-21
Time: 2130

Depth (m)	S‰	T°C
0	0.4	17.4
1	0.4	17.4
2	0.4	17.3
3	0.4	17.4
4	0.5	17.8
5	0.4	17.8
6	0.4	17.2
7	0.4	17.3
8	0.4	17.6
9	0.5	17.7

Station: Sea Reach
Date: 78-8-22
Time: 1710

Depth (m)	S‰	T°C
0	0.2	18.3
1	0.2	18.3
2	0.2	18.2
3	0.2	18.2
4	0.2	18.1
5	0.0	18.2
6	0.1	18.2

Station: Sea Reach
Date: 78-8-22
Time: 1900

Depth (m)	S‰	T°C
0	0.1	17.5
1	0.1	17.6
2	0.1	17.8
3	0.1	17.7
4	0.0	17.4
5	0.0	17.6
6	0.2	17.7
7	0.0	17.4

Station: Sea Reach
Date: 78-8-22
Time: 2100

Depth (m)	S‰	T°C
0	0.4	17.1
1	0.4	17.7
2	0.3	17.1
3	0.4	17.1
4	0.4	17.3
5	0.5	17.7
6	0.3	17.7
7	0.3	17.7

Station: Sea Reach
Date: 78-8-22
Time: 2300

Depth (m)	S ‰	T°C
0	0.4	17.4
1	0.5	17.8
2	0.4	17.9
3	0.5	17.8
4	0.4	17.6
5	0.5	17.7
6	0.5	17.6
7	0.6	17.8

Station: Steveston I.
Date: 78-8-23
Time: 1745

Depth (m)	S ‰	T°C
0	1.0	16.6
1	1.1	16.6
2	1.1	16.7
3	1.2	16.7
4	1.3	16.5
5	1.4	16.9
6	1.4	16.7

Station: Steveston I.
Date: 78-8-23
Time: 1900

Depth (m)	S ‰	T°C
0	1.1	16.7
1	1.4	16.5
2	1.3	16.3
3	1.8	16.6
4	2.0	16.6
5	2.8	16.5
6	3.5	16.1

Station: Steveston I.
Date: 78-8-23
Time: 2100

Depth (m)	S‰	T°C
0	1.2	16.7
1	1.2	16.7
2	2.0	16.2
3	2.5	16.7
4	2.6	16.3
5	2.7	16.2
6	6.5	15.9

Station: Steveston I.
Date: 78-8-23
Time: 2330

Depth (m)	S‰	T°C
0	0.7	16.6
1	1.0	16.8
2	1.4	16.3
3	3.6	16.5
4	7.7	16.0
5	14.3	14.9
6	24.3	12.6

Station: Roberts Bank
Date: 78-8-28
Time: 1830

Depth (m)	S‰	T°C
0	28.6	14.1
1	28.7	13.6
2	29.1	12.3
3	29.6	11.7
4	28.9	11.7
5	29.5	11.2
6	30.3	10.9

Station: Roberts Bank
Date: 78-8-28
Time: 2030

Depth (m)	S‰	T°C
0	24.9	16.2
1	25.5	14.5
2	28.7	13.1
3	29.1	12.2
4	29.1	12.2
5	29.5	11.6
6	30.7	10.8
7	30.2	10.1
8	30.5	10.3
9	30.6	10.3

Station: Roberts Bank
Date: 78-8-28
Time: 2245

Depth (m)	S‰	T°C
0	24.4	16.5
1	26.3	14.2
2	29.0	11.6
3	28.9	11.5
4	29.6	11.3
5	30.0	10.3
6	30.8	10.3
7	30.7	10.6
8	30.8	10.0
9	30.6	10.3

Station: Canoe Pass
Date: 78-9-25
Time: 1715

Depth (m)	S‰	T°C
0	1.0	12.8
1	0.9	13.3
2	1.1	13.0
3	1.0	13.3
4	1.1	13.4
5	0.6	13.4
6	1.1	13.3
7	0.8	13.0
8	1.0	12.9
9	0.8	13.0

Station: Canoe Pass
Date: 78-9-25
Time: 1915

Depth (m)	S‰	T°C
0	0.9	13.1
1	0.8	13.2
2	1.0	13.1
3	0.8	13.0
4	0.8	13.0
5	0.8	13.0
6	0.9	13.0
7	0.9	13.0

Station: Canoe Pass
Date: 78-9-25
Time: 2100

Depth (m)	S‰	T°C
0	2.1	13.1
1	2.1	12.8
2	1.9	13.0
3	1.9	12.8
4	1.7	13.1
5	2.0	13.1
6	1.8	13.2

Station: Canoe Pass
Date: 78-9-25
Time: 2330

Depth (m)	S‰	T°C
0	1.8	13.0
1	2.1	13.0
2	2.2	12.8
3	2.4	13.0
4	2.4	12.7
5	2.1	13.0
6	2.3	13.0
7	2.2	12.0

Station: Sea Reach
Date: 78-9-26
Time: 1700

Depth (m)	S‰	T°C
0	1.3	13.7
1	2.1	13.7
2	2.0	13.7
3	2.1	12.7
4	3.3	13.2
5	6.2	12.9
6	9.2	12.3
7	11.6	12.2
8	12.7	12.3

Station: Sea Reach
Date: 78-9-26
Time: 1900

Depth (m)	S‰	T°C
0	1.8	14.5
1	2.0	14.0
2	1.8	14.3
3	1.8	14.0
4	2.5	13.7
5	7.0	13.2
6	12.5	12.7
7	14.6	11.8

Station: Sea Reach
Date: 78-9-26
Time: 2100

Depth (m)	S‰	T°C
0	0.9	13.8
1	1.0	13.9
2	1.0	13.8
3	1.1	13.8
4	2.7	13.8
5	10.0	12.9
6	12.0	12.2
7	14.3	12.2

Station: Sea Reach
Date: 78-9-26
Time: 2250

Depth (m)	S‰	T°C
0	2.0	13.7
1	2.2	13.5
2	2.3	13.1
3	2.5	13.4
4	3.3	13.2
5	7.3	13.1
6	10.8	12.8
7	18.8	12.0
8	19.3	12.1

Station: Steveston I.
Date: 78-9-27
Time: 1700

Depth (m)	S‰	T°C
0	0.7	14.3
1	1.1	13.8
2	1.7	14.0
3	4.2	13.8
4	6.3	13.5
5	10.8	13.5
6	22.7	11.9
7	27.4	11.4
8	27.8	11.4

Station: Steveston I.
Date: 78-9-27
Time: 1900

Depth (m)	S‰	T°C
0	0.5	13.9
1	0.6	14.0
2	1.1	13.9
3	1.1	13.7
4	1.9	13.9
5	2.9	13.5
6	5.6	13.6
7	16.3	12.8
8	21.7	12.0
9	25.4	11.5

Station: Steveston I.
Date: 78-9-27
Time: 2300

Depth (m)	S‰	T°C
0	0.0	13.6
1	1.7	13.5
2	1.4	13.7
3	1.9	13.5
4	2.5	14.8
5	3.5	13.7
6	8.8	13.2
7	12.7	12.5

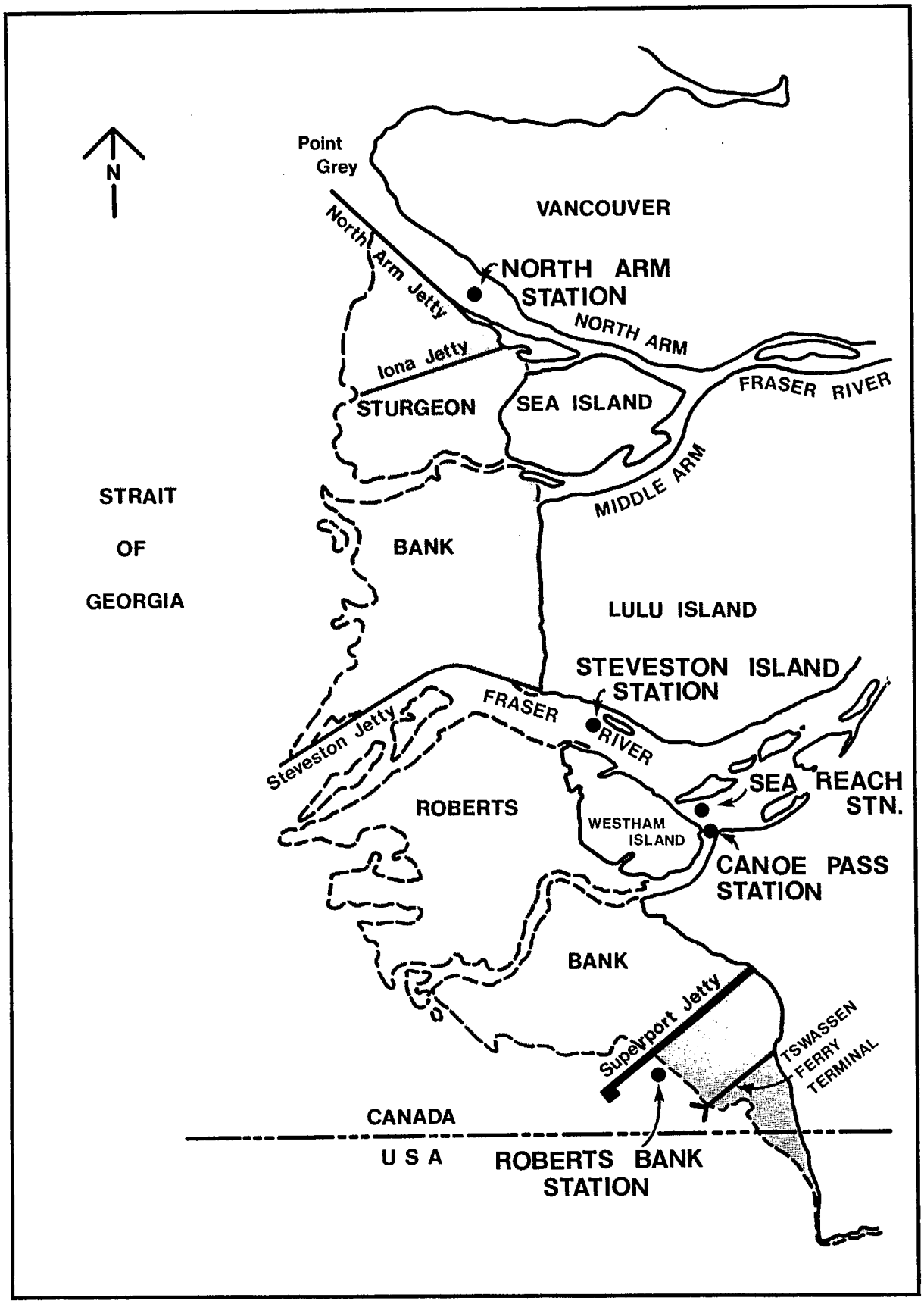

Fig. 1. Chart of the study area showing sampling locations at North Arm, South Arm, Sea Reach, Canoe Pass, and Roberts Bank.

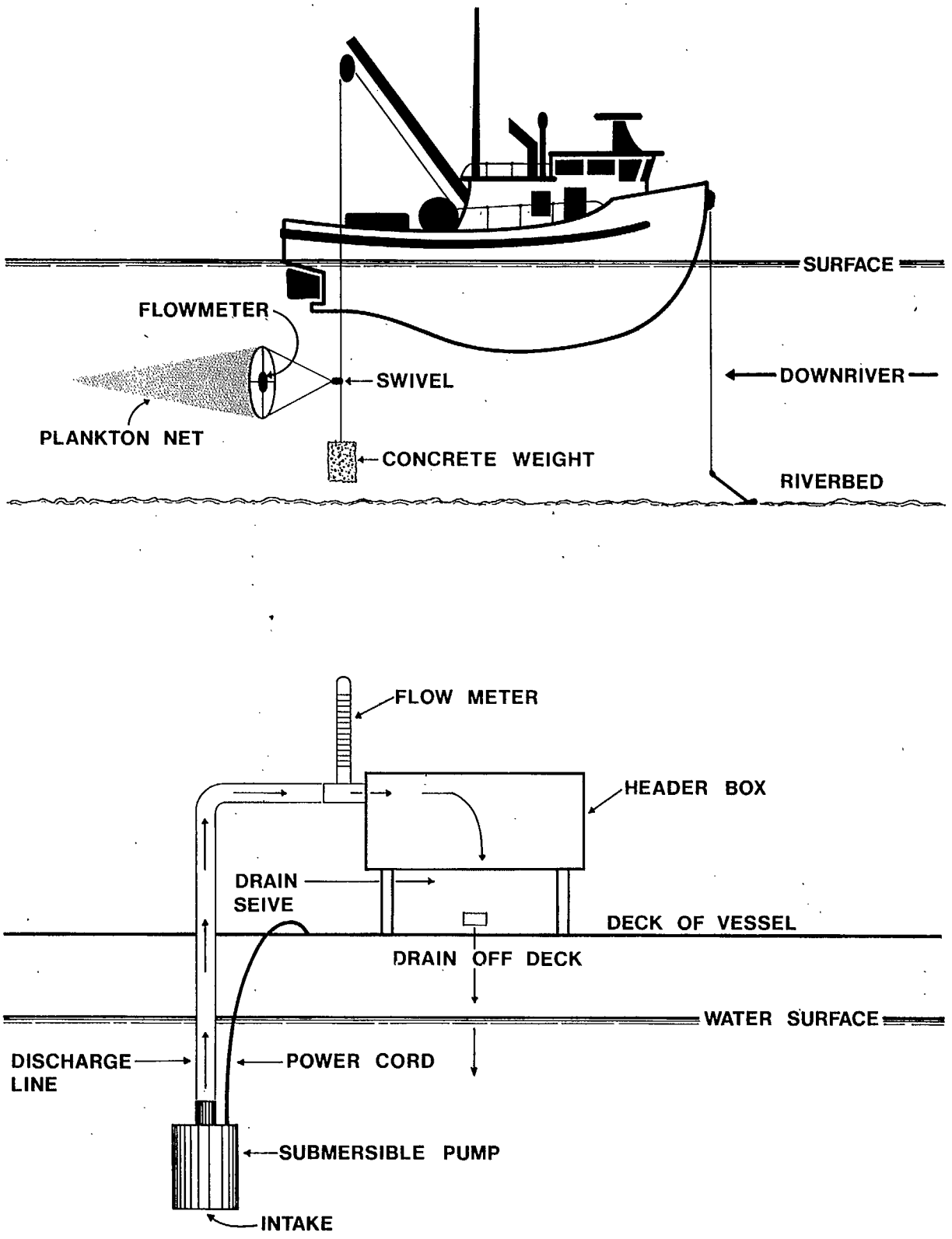

Fig. 2. Diagrams showing apparatus for drift (upper panel) and pump (lower) sampling.

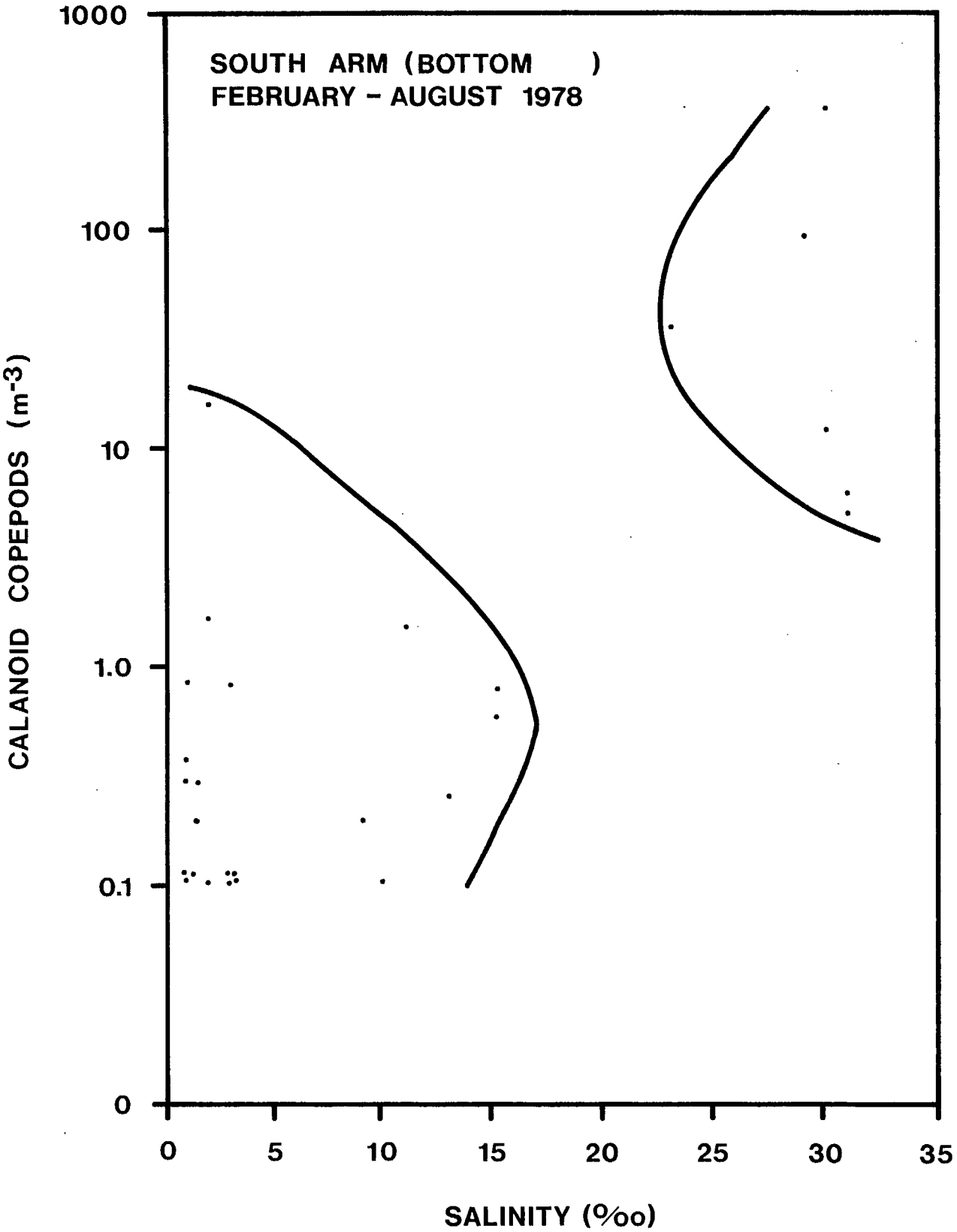

Fig. 3. Relationship of calanoid copepod catches (number m^{-3}) and salinity (‰) in near-bottom samples at the Steveston Island (South Arm) station. Data from February to August 1978 are included.