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SHRIMP SURVEY OFF THE WEST COAST OF VANCOUVER ISLAND
AND RESULTING MANAGEMENT ACTIONS – MAY 1998

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ABSTRACT

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This report forms part of a series that details the assessment and management actions undertaken in the shrimp trawl fisheries off the Pacific coast of Canada in 1998.

An area-swept shrimp trawl survey was undertaken in Pacific Fisheries Management Areas 23, 121, 123, 124, and 125 off the west coast of Vancouver Island in May, 1998. Area 23 was surveyed using three volunteer commercial shrimp vessels, while the other areas were surveyed with the DFO vessel W.E. Ricker. The fisheries in this area are primarily for the smooth pink shrimp, *Pandalus jordani*, however the sidestripe shrimp, *Pandalopsis dispar* is also caught in the southern offshore grounds and inside Barkley Sound. While Areas 124 and 125 have been surveyed generally on an annual basis since 1973, surveys have only been conducted in areas 121 and 123 since 1996. This was the first time that Area 23 was surveyed.

Vertical trap sets were used to evaluate the availability of shrimp to the trawl surveys. Biomass indices of shrimp by species were determined in select trawlable areas off the west coast of Vancouver Island. While the collection of shrimp data and the bycatch of halibut and eulachon were priorities over detailed information on bycatch, catch information on all species was generally collected. Landings of prawns, halibut or eulachon were minor.

For the offshore areas (21, 121, 23-7 to 23-11, 123, 124, and 125) a six-month season was chosen as an alternative to catch ceilings or a quota. For the inshore areas (subareas 23-1 to 23-6) a fixed exploitation rate of 33% was applied to the biomass estimates by species. Catch ceilings, quotas, and other management actions as a result of the surveys are discussed.

These survey data are part of a long term data base of survey indices to be combined with logbook data, biological sampling and other fishery data. Until a long term data base is available, the initial biomass indices will be used as an absolute estimate for the purpose of setting quotas. The assessment and management process will require a collaborative effort on the part of DFO and stakeholders.

RÉSUMÉ

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Ce rapport entre dans une série de travaux décrivant les évaluations et les mesures de gestion prises dans les pêches de la crevette sur la côte ouest du Canada en 1998.

Une campagne de chalutage scientifique par la méthode des aires balayées a été entreprise en mai 1998 dans les zones de gestion des pêches du Pacifique 23, 121, 123, 124 et 125, sur la côte ouest de l'île de Vancouver. La zone 23 a été couverte à l'aide de trois crevettiers commerciaux volontaires, tandis que les relevés des autres zones ont été menés à bord du navire du MPO *W.E. Ricker*. Dans cette région, la pêche vise surtout la crevette océanique *Pandalus jordani*, mais la crevette à flancs rayés, *Pandalopsis dispar*, est également capturée sur les bancs océaniques du sud et dans la baie Barkley. Tandis que les zones 124 et 125 sont généralement l'objet de relevés annuels depuis 1973, c'est depuis 1996 seulement qu'on fait des relevés dans les zones 121 et 123. C'est la première fois qu'on effectuait un relevé de la zone 23.

Des pêches verticales avec des pièges ont servi à évaluer la capturabilité des crevettes dans les campagnes de chalutage. Les indices de la biomasse de crevette, par espèce, ont été déterminés dans certains secteurs chalutables de la côte ouest de l'île de Vancouver. Les priorités de la campagne étaient la collecte de données sur les crevettes et les prises accessoires de flétan et d'eulakane plutôt que l'étude détaillée des prises accessoires, mais des données sur les captures ont en général été recueillies pour toutes les espèces. Les débarquements de crevette tachetée, de flétan et d'eulakane étaient minimes.

Pour les secteurs océaniques (zones 21, 121, 23-7 à 23-11, 123, 124 et 125), on a choisi une saison de six mois de préférence à des plafonds de capture ou à un quota. Pour les régions côtières (sous-zones 23-1 à 23-6), un taux fixe d'exploitation, correspondant à 33 % de l'estimation de la biomasse, a été établi pour chaque espèce. Nous analysons les plafonds de capture, les quotas et les autres mesures de gestion prises à la suite des relevés.

Les données obtenues grâce aux relevés entrent dans une base de données à long terme qui rassemble des indices scientifiques en vue de les combiner aux informations des journaux de pêche, aux résultats des échantillonnages biologiques et à d'autres données sur les pêches. En attendant que la base soit suffisamment enrichie, les indices initiaux de la biomasse serviront d'estimations absolues pour l'établissement des quotas. Le processus d'évaluation et de gestion nécessitera un effort de collaboration de la part du MPO et des intervenants.

ASSESSMENT AND MANAGEMENT FRAMEWORK

This report forms part of a series of documents that outline the assessment data and management processes that were used in 1998 in the shrimp trawl fishery for specific areas along the British Columbia coastline. The shrimp trawl fishery takes place in a variety of areas ranging from large offshore grounds to small isolated inshore waters. These fisheries also vary with respect to the target species. There are seven species of shrimp that are harvested commercially in British Columbia and fisheries vary in complexity from single to multiple species fisheries. Many of these shrimp trawl fisheries are new or developing and there is little or no information available from which to assess the stocks.

A suite of management principles were developed for these fisheries, as a result of discussions and concerns outlined in PSARC assessments of inshore (Boutillier et al 1996) and offshore (Boutillier et al 1997) shrimp fisheries. The management systems adopted in 1998 varied depending on the nature and complexity of the fishery.

For the offshore fisheries in the southern and central regions off the west coast of Vancouver Island (WCVI), time and area closures were implemented. The recruitment process for these offshore fisheries appear to be strongly influenced by environmental factors which affect the strength and direction of surface currents. There also appears to be a strong south to north recruitment interdependence between grounds (Boutillier et al 1997).

For inshore fisheries and the remaining offshore areas, a fixed arbitrary, historically based or forecasted¹ catch ceiling was assigned to each shrimp management area. These catch ceilings can be adjusted inseason, if information from fishery independent biomass indices and catches indicate that the area can sustain fishing pressure either less than or greater than the initial levels. The biological reference point for sustainable fishing pressure that is used at this time is the biomass of the area multiplied by an exploitation rate of 33%.

The use of biological reference points discussed above is based on precautionary principles discussed in Boutillier et al (1996) and are designed to meet conservation and sustainable utilization goals in data limited situations. Over the long term, the management and assessment systems for these fisheries will undergo a number of changes that reflect a better understanding of these initial, hopefully conservative, thresholds. These changes will result from a management and assessment system which will be designed to collect information on a number of key issues including: the biotic and abiotic factors that affect the population, quantifying biological compensatory mechanisms, calculating depensatory mortality thresholds, evaluating factors affecting availability, developing survey designs which quantify shrimp abundances in untrawlable areas, and accounting for variations in availability to trawl surveys due to vertical migrations.

One of the key tools used in collection of the data that will address these issues is fishery independent area swept trawl surveys. Area swept trawl surveys are used to calculate biomass

¹ Forecasting only took place in Pacific Fishery Management Area 12 where there were fishery independent trawl surveys conducted the previous year (both in April and November 1997).

indices for these fisheries which provide trends in abundance. These trends when modelled with the catch history from the area will provide estimates of absolute abundance in the future. However, until a reliable long-term data base of survey indices and catches are available, the survey biomass indices will be used as an absolute estimate for the purpose of setting the biological reference point catch ceilings.

The management and assessment process is an iterative process which demands a constant building and learning. It will take years of careful assessment and testing of critical basic biological parameters such as: growth, mortality, recruitment, and appropriate levels of exploitation by area and species to address the issues as stated above. This will take a collaborative effort on the part of department and stakeholders to achieve meaningful results while adhering to precautionary principles.

INTRODUCTION

This report summarizes the data collection process, analysis, interpretation and resulting management actions of a fishery independent shrimp survey that was conducted May 4-17, 1998 off the WCVI in Pacific Fishery Management Areas 121, 123, 23, 124, and 125. Figure 1 shows the areas surveyed.

The WCVI shrimp fishery is managed mainly using area and time closures although there is a component of the inshore fishery in Area 23 (Subareas 23-4, 23-5, and 23-6) which is managed to a catch ceiling. These inshore Area 23 Subareas were treated separately from the offshore fishery because separate inshore and offshore shrimp stocks were identified using parasite markers (Thompson and Margolis 1987). The more seaward Subareas of Area 23 were managed with the offshore stocks as there appeared to be a strong mixing of the stocks in this area. With the data that is available, it is not feasible to separate with absolute certainty the inshore stocks from the offshore component in the mixed stock fishery in Barkley Sound. The management option available to the managers to protect these discrete inshore resident stocks was to break up the area and manage the inshore portion of it in a more precautionary manner than the offshore component. In the 1980's, it was recognized by segments of the industry that these were discrete stocks when they argued for special permits to fish portions of inshore Barkley Sound.

The main target species for this WCVI region is *Pandalus jordani* (smooth pink) but there is an incidental catch of *Pandalopsis dispar* (sidestripe) mainly in Areas 23 and 123. Thompson and Margolis (1987) also found that there were indications of discrete stocks of sidestripes within Area 23.

The fisheries off the WCVI have undergone some huge fluctuations in catches, varying by area and year as seen in Figure 2.

OBJECTIVES

The objectives of this annual survey were to provide biomass indices of shrimp by species for the shrimp trawl fisheries off the WCVI, and to test sampling techniques to evaluate the availability of shrimp to the trawl survey. To do this there were two survey techniques used:

1. An area swept trawl survey to determine the fishable biomass index of shrimp by species in the various trawlable areas.
2. Vertical trap sets placed in select trawlable area to estimate the proportion of the shrimp stock by species off bottom and not accessible to the trawl.

METHODS

AREA SWEPT TRAWL SURVEY

Since 1973, there have been a series of area swept trawl surveys conducted in PFMA's 124 and 125. Surveys were generally completed in the spring (May²) for each area, on a more or less annual basis³. In addition to the annual spring surveys, in 1977 and 1978 post-fishery fall (September) surveys were also completed. Following large catches in 1995 (Figure 2), the survey was expanded into Areas 121 and 123 in 1996. In 1998, the survey was again expanded to include the inshore areas of Area 23.

The purpose of the surveys was to provide unbiased indices of the populations. The survey was designed to sample the populations in a systematic manner which allowed estimation of where the shrimp are located on the grounds and their relative density in the area. The systematic survey in the offshore areas was established using grid patterns based on Loran lines, e.g. Y lines, 20 microseconds apart; and Z lines, 10 microseconds apart⁴. Inner and outer boundaries were determined by fishing this grid system until shrimp catches were negligible or the bottom became too rough to trawl. Trawl tows in Area 23 were also spaced systematically over the fishing grounds, however the systematic pattern was set by superimposing a 0.25 square nautical mile grid over the area.

A critical factor in developing reliable survey biomass indices is to ensure that the sampling effort remains as consistent as possible over time. This has meant that the gear has in many ways not kept up with the technological changes that industry has experienced in terms of net designs and the web material used in the trawl.

Even with attempting to keep the sampling effort constant, there were still changes over time.

Sampling trawl

The sampling trawl used in the offshore surveys has changed once. From 1973 to 1976, the survey was conducted using a semi-balloon trawl fitted with a bobbin and roller groundline and towed using wooden flat doors (Butler et al. 1973). In 1976, the trawl was changed to a National Marine Fisheries Service (NMFS) high-rising shrimp sampling trawl fished towed with steel Vee Doors (Boutillier et al. 1976). During the 1976 survey, comparative tows between the high rise and the semi-balloon trawl were made and the NMFS trawl was found to be 1.4 times more efficient per unit area swept (Boutillier et al. 1976). All historical data has been adjusted to reflect the use of the NMFS trawl as the standard sampling gear. The gear itself may have

² In 1987 the survey was conducted in August.

³ Surveys were not completed in 1974, 1984, and 1986 for PFMA 124 and in 1974, 1984, 1986, 1989, and 1991 for PFMA 125.

⁴ In the early years the grid was based on 1L1 and 1L0 loran line grid.

changed over time due to repairs and stretching⁵. There is no information at the present time to determine how this would effect the standardized effort, however over the last six years a net sonar on the headline of the trawl has been used to monitor the trawl's dimensions and performance during almost every tow. Any substantial changes in the trawl's opening dimensions are readily picked up and appropriate actions and adjustments can be made. In response to concerns by the industry about the old stretched gear, a newly built NMFS shrimp trawl was used for the majority of the tows in the 1998 survey.

The Area 23 portion of the 1998 survey was conducted with CanTrawl beam trawls. From the gear information, the effective mouth opening of each beam trawl was determined by consulting with net manufacturers on their estimated opening. In 1997, many of the manufacturers had participated in testing scale models of their trawls in a specially designed evaluation tank on the east coast of Canada. The effective net opening was calculated to be 0.6 meters shorter than the beam length, which ranged from 14.6 to 16.2 m. All nets used were high-rise beam trawls which were estimated to open approximately 4-5 meters. Some of the vessels participating in the survey had taken the initiative to use separator gear in their nets in their commercial operations to reduce the by-catch. It was felt that this equipment might reduce the catch of shrimp and therefore for the purposes of the survey, the separator gear was removed from the trawls. Therefore this data does not reflect bycatch impact estimates of animals caught in the shrimp trawl fishery.

Vessels

Most of the offshore surveys have been conducted using the research vessels G.B.Reed (1973-1985) and W.E.Ricker (1987-present). Exceptions to this were: a multiple vessel survey in the fall of 1977, aboard the F.V. Gypsy Traveller, Deliverance, Pacific Trident and Crino D'Oro; a fall survey in 1978 aboard the F.V. Ocean King; and a spring survey in 1989 aboard the F.V. Sharlene K. Differences in fishing power that may have occurred because of differences in vessel power, warp size, etc., and have not been measured or adjusted for in any way.

In 1998, the offshore component of the survey was again conducted using the W.E.Ricker, however, the expanded inshore survey, in Area 23, was conducted with three commercial vessels: the Lady Luoma (Capt. James Bowker), Sonora II (Capt. Joe Garcia) and Trident Isle (Capt. Robert Bowker). Prior to the May 1998 survey, logbook records of the fishermen participating in the survey were examined and compared to see if there were significant differences between the effective fishing power of each vessel. When two vessels fished the same area on the same day, pair wise comparisons were made between the catch per unit effort (CPUE) distributions for the area to determine if they were significantly different. No comparisons between these vessels and the W.E.Ricker were made.

⁵ Concerns expressed by fishers Guy Whyte and Joe Garcia during their participation in the May 1997 survey.

Sample duration and distance

All tows were of 30 minutes duration, unless shortened due to snags, etc. The distance travelled was calculated using the technology of the day. In the early years, this was start and stop loran locations while today a much more accurate differential global positioning systems (DGPS) is used.

Timing of the survey

As mentioned above whenever possible the surveys were conducted in May of each year. Keeping the timing consistent has a number of benefits associated with it, in terms of the direct comparison of the size at age information, the exposure time for natural mortality, and possibly the distributional characteristics. The exceptions to this were a single survey in August 1987, and repeat post fishery surveys in September of 1977 and 1978. Surveys were always conducted during daylight hours to reduce the problems associated with the known diurnal vertical migration of some shrimp species at night. The distribution of these shrimp has been documented for *P. borealis* by Barr (1970) and for *P. jordani* by Beardsley (1973) both overnight and throughout the day. Boutillier et al. (1997) reported on catches from sets of vertical traps from an survey in PFMA 12 in April, 1997. These trap catches showed that a substantial proportion of pink shrimp (which in this case were for *P. borealis eous*) in some areas were quite high off the bottom even during daylight hours. To address this issue in 1998, vertical trap sets were used in Areas 23 and 123, to determine if the shrimp were available to the trawl or whether they were off the bottom.

VERTICAL TRAP SURVEY

Nightly diurnal vertical migration has been observed for several species of shrimp (Barr 1967, 1970 and Beardsley 1973). To eliminate the effects of this known nocturnal off-bottom migration and ensure that we maximize the shrimp available to trawl, the area swept trawl survey was conducted only during daylight hours. In an effort to estimate the proportion of shrimp available to the bottom trawls, a string of fine mesh (7-10 mm) Pardiac traps (23.25 cm diameter by 10.25 cm high) was set vertically in the water column from the bottom to 40 m off bottom during the daylight hours that the trawl portion of the survey was conducted. Traps were spaced along the groundline at distances 0, 5, 10, 20, 30, and 40 m off bottom. The traps were then sampled to determine the number of shrimp caught at various heights off bottom. These catch rates were then used to estimate the proportion of the shrimp that were available to trawl at the time that the survey was conducted. Three strings of vertical traps were set in each of two days in two areas, Area 123 and Area 23. These areas were chosen because of their high concentrations of shrimp. All other areas had insufficient concentrations of shrimp to indicate the necessity to sample further.

MAPPING

Locations of shrimp trawl activity in Area 23 were identified from the commercial shrimp harvest log data for the years 1995 and 1996 and substantiated independently through a meeting with fishers participating in the survey. Tow locations were incorporated into CompuGrid, the proprietary raster-based geographic information system (GIS) utilized by DFO, Shellfish StAD, and displayed in relation to land mass, Pacific Fishery Management Areas (PFMA) and depth contours. Masks were drawn around the areas of most concentrated effort (clusters of location points), using the 50m and 200m contour lines as rough guides. The masks were captured digitally and incorporated into the GIS. These masks were adjusted when tows were made outside the reference contours.

FIELD DATA

All data was collected in a standard format which included details on the: sequential tow number⁶, time and date, duration, PMFA, latitude and longitude of the start and finish of the tow, direction of the tow, distance travelled, depth, remarks on usability, and detailed catch information on weight by species (for target shrimp species #/kg information was also collected). Biological samples of 100 shrimp by species were collected from each tow for later processing by size and sex. The weight of all non-targeted invertebrates and fish was recorded in most cases by species.

CALCULATION OF INDICES AND AGE CLASS ESTIMATES

For the target shrimp species, estimates of each year class abundance and their mean sizes (by carapace length and weight) were obtained from the survey data by collecting a small, random sample of shrimp from each tow. The sample was processed to determine the number of shrimp per kilogram and the size (carapace length) and sex of the individual shrimp in each sample. From each tow the total weight of shrimp was calculated along with the position and length of each tow. The samples for all the tows were combined and the resulting histogram and length frequency distribution was analysed after Schnute and Fournier (1980). The cut-points for each age class were calculated from the mean and the standard deviations of the age class length frequencies. Each cut-point was estimated by proportioning the difference between two age class mean sizes by the standard deviations around the mean for each age class. The calculated cut-points were then used to calculate the proportion by age for each tow so that the number per standard area towed could be calculated. The biomass and the individual year-class abundance indices were modelled for the area by interpolating the distribution from the sample tow density using a bicubic spline interpolation procedure. The total area of fishable grounds for a known area was mapped and the area was divided into 90,000 square meter areas. The towable area within this large area was identified by blocking out untowable boundary points which were determined from problem areas found in all previous surveys. The centre point of a tow was

⁶ Each vessel started its tows with a different sequence of numbers e.g. the W.E.Ricker numbered its tows from 0-199 and the Trident Isle's tows were numbered from 200-299.

assigned to the appropriate grid cell along with the weight and age-class densities. The blank grid cells were then filled in with interpolated values and the biomass indices were calculated by adding the values in each grid within the larger boundaries of the total potential area. All the biomass and age class index calculations were made within the Compugrid GIS software package.

RESULTS

EFFORT STANDARDIZATION

When the historic catch rates from the beam trawl vessels were compared to one another, there was a consistent difference between vessels. As a result the catch rates (kg/m^2 towed) for the two vessels with the historically lower catch rates were adjusted upwards by factors of 1.2 and 1.4.

AREA SWEPT TRAWL SURVEY

The total area surveyed is shown in Table 1.

The catch by species for the entire survey is shown in Appendix Table 1. Detailed catch records for the offshore and inshore areas are seen in Appendix Tables 2 and 3 respectively.

VERTICAL TRAP SURVEY

The vertical trap sets did not catch any shrimp. The bottom traps, in each of the 6 sets, contained only hagfish, which probably excluded entry of all other animals. All other traps on these strings of gear were completely empty.

LENGTH AT AGE ESTIMATES

The size and proportion of both species of shrimp are shown in Table 2. Note that prior to age 3 the sidestripe shrimp in area 23 are larger than those in area 123.

SURVEY INDICES AND BIOMASS ESTIMATES

Table 3 provides the survey biomass indices, the total commercial catch to the date of the survey, the combined biomass estimates, the calculated quota for the inside 23 quota area (23-4, 23-5, 23-6) and the remaining quota. Figures 3 and 4 provide a history of the survey indices for areas 124 and 125 respectively. A comparison of area 121/123/23 combined is seen in Figure 5, however, it must be remembered that the inside 23 area was not surveyed in 1996 and 1997 so the estimates for those years are probably severe underestimates of the biomass in the area as the estimated biomass would have tended to zero for the unsurveyed portions.

Eulachon were caught in 138 of the 162 tows, and made up 1.73% of the catch. Biomass estimates of eulachon are shown in Table 4.

CONCLUSIONS

Areas 124 and 125 off the WCVI continue to show severe declines in abundance in the magnitude of the declines experienced in the late 1970's and early 1980's. The more southerly areas 121/123/23 are overall in better shape however they are also experiencing severe declines in the order of 3 to 5 fold decreases over the last 3 years. As pointed out by Boutillier et al. (1997) these southerly areas appear to be critical to the recruitment and health of the stocks in the more northerly offshore areas.

There appear to be larger 1+ and 2+ sidestripes in the inshore areas compared to the offshore areas. This may indicate two factors at work : 1) there is restricted exchange of shrimp in the inshore areas and the offshore areas especially with respect to sidestripes and 2) the shrimp stocks on the inshore areas are showing classic signs of fishery induced compensatory mechanisms i.e. increased growth rates.

Considering the changes in the sampling design in 1998 with the inclusion of tows in Barkley Sound, a better comparison of survey indices is required. Re-evaluation of the 1996/97, Area 121/123/23 survey estimates may be possible by extrapolating survey estimates for the unsurveyed years in Area 23 through a comparison of georeferenced standardized commercial catches at the time of the survey. This comparison will be conducted at a later date once the commercial log information is verified and complete.

MANAGEMENT ACTIONS

There have been major offshore fisheries with large otter vessels, with major abundances of shrimp and landings in the mid 1970's (peak report of 11.1 million lb. or 5035 t) and again in the late 1980's and 1990's.

Small inshore fisheries, primarily beam trawl, have also taken place in more protected waters of Barkley Sound. At one point , 1986-1991, as many as five permits were issued to non-S licenced vessels to fish in areas where the traditional S-fleet did not harvest. This was a small boat fishery by local residents to supply shrimp to local markets in Port Alberni, and they had letters of support from S-liscence holders fishing in the area. Boutillier and Harling (1985) presented some of the results of monitoring of shrimp fisheries in Barkley Sound.

Southey et al. (1998) presented a fishery update that outlined the catch history and catch ceilings for newly shrimp management areas (SMA's) for the 1997/98 season. In summary, the catch records for the WCVI are not very reliable in terms of the area of catch and the quantities landed. The historical catch and effort landings for the WCVI are complicated by the combination

catch records for the WCVI are not very reliable in terms of the area of catch and the quantities landed. The historical catch and effort landings for the WCVI are complicated by the combination of fish slips from offshore areas and inshore areas (official annual statistics do not separate offshore areas, i.e. landings in Area 123 are reported as from Area 23). Often the area of fishing product was misreported as the area of landing, when shrimp were landed at Ucluelet or Tofino or other locations. Logbook data were not always completed and submitted.

There was much discussion between managers, stock assessment biologists and stakeholders on the management of the WCVI shrimp areas and shrimp stocks. Evidence from parasite studies (Thompson and Margolis 1987) and biological sampling (size and age characteristics) suggest that the shrimp are different in the inshore and offshore regions of Barkley Sound.

After much discussion, including advice from fishers, the WCVI area was divided into the following SMA's :

- Area 21-offshore: Areas 21 and 121
- Area 23-inshore: Subareas 23-1 to 23-6
- Area 23-offshore: Subareas 23-7 to 23-11 and 123.
- Area 124
- Area 125

*Area 24 and Area 25 had a catch ceiling of 10 t set for the 97/98 season.

Area 23 inshore: Arbitrary catch ceilings were developed based on a limited catch history for this area, from logbook records. The sales slip data base had limited value in this exercise, as it does not separate offshore 123 landings from Area 23 landings and Subarea information is not included.

The 10 year average of reported landings for subareas 23-1 to 23-6 was 138,066 lb. (62 t) with reported peak landings of 723,000 lb. in 1995 (328 t). Fishers recommended an arbitrary catch ceiling at 500 to 700 t, but DFO set a more conservative level of 175 t for 1997/98.

The 1998/99 season was opened April 1, 1998 at the precautionary level of 175 t. As outlined above, this was the first detailed survey of Barkley Sound. The survey was undertaken by three industry vessels making approximately 50 tows, May 8-9, 1998 in Area 23 as detailed in this report. The survey found a marked decline in shrimp stocks and the biomass for 23-in was estimated to be 223 t., combining the survey data and the commercial catches (Table 2). This resulted in a calculated quota of 73.5 t as shown in Table 2, considerably less than the initial catch ceiling announced at the start of the season. The 1998/99 management plan outlines that adjustments to the catch ceilings may occur as stock assessment information is collected and analyzed and industry will be notified of changes by "Notice to Industry".

By May 26, 1998, the estimated landings (66.9 t) from Area 23-In had reached the recommended TAC from the survey at the time (67.4 t); this estimate was lower due to lower

estimates of landings in May (44.2 t) that were later revised to 62.8 t when additional landing records were submitted. *A closure was implemented on short notice, on May 29, 1998*, due to a number of vessels active in the area. Efforts were made to notify fishers on the grounds.

Offshore Areas 21 -off (21, 121) 23-off (23-7 to 23-11 and 123), 124 and 125: A precautionary approach of a reduced season was suggested by managers as an option. A six-month season for the offshore areas was accepted by industry as an alternative to catch ceilings or a quota, until further surveys and assessments could be carried out in co-operation with industry and other stakeholders. The information available in the stock assessments suggested that the Tofino and Nootka grounds have stock-recruitment relationships, but environmental factors also play a strong role in the levels of recruitment (Boutillier et al. 1997).

The WCVI fishery had been open for many years on a year round basis, with a target catch of 5 million lb. (2268 t). The first seasonal closures (in recent times) were for the three month period January 1 to April 1, effective in 1996, 1997 and 1998. Given that the recommended reduction in the season was six months, industry supported delaying the opening from April 1, and have a six month season, May 1-October 31, 1998.

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Table 1. Total area surveyed, by Shrimp Management Area.

Shrimp Management Area	Area Surveyed (km ²)
23-IN	89.28
23-OFF & 21-OFF	1485.63
124-OFF	2567.79
125-OFF	2029.86

Table 2. Size and proportion of shrimp by age class. Carapace lengths are expressed in mm.

Species	PFMA	Mean Length 1+	Mean Length 2+	Mean Length 3+	Prop. 1+	Prop. 2+	Prop. 3+
Smooth Pink	23	13.4	17.9	21.4	0.206	0.496	0.298
Smooth Pink	121	12.5	17.1	19.9	0.020	0.583	0.397
Smooth Pink	123	13.7	17.8	21.3	0.092	0.659	0.249
Smooth Pink	124	14.0	17.0	19.7	0.011	0.686	0.303
Smooth Pink	125	12.4	16.5	20.3	0.131	0.841	0.028
Sidestripe	23	19.7	28.2	29.0	0.699	0.192	0.109
Sidestripe	123	18.8	26.0	30.4	0.596	0.208	0.196

Table 3. Survey biomass of shrimp, AMR validated and missing landings to May 27, 1998, quota estimates and remaining quotas, by Shrimp Management Area.

Shrimp Management Area	Survey Biomass (t)	Total Commercial Catch (t)	Combined Biomass (t)	Calculated Quota (t)	Remaining Quota (t)
23-IN	148.282 Pinks + 11.546 Sidestripes	62.840	222.668	73.480	10.640
23-OFF & 21-OFF	919.220 Pinks + 58.739 Sidestripes	103.988	1081.947	N/A	N/A
124-OFF	236.584	13.358	249.942	N/A	N/A
125-OFF	27.628	26.762	54.390	N/A	N/A

Table 4. Survey Biomass of eulachon, by Shrimp Management Area.

Shrimp Management Area	Survey Biomass (t)
23-IN	1.047
23-OFF & 21-OFF	179.360
124-OFF	19.031
125-OFF	125.069

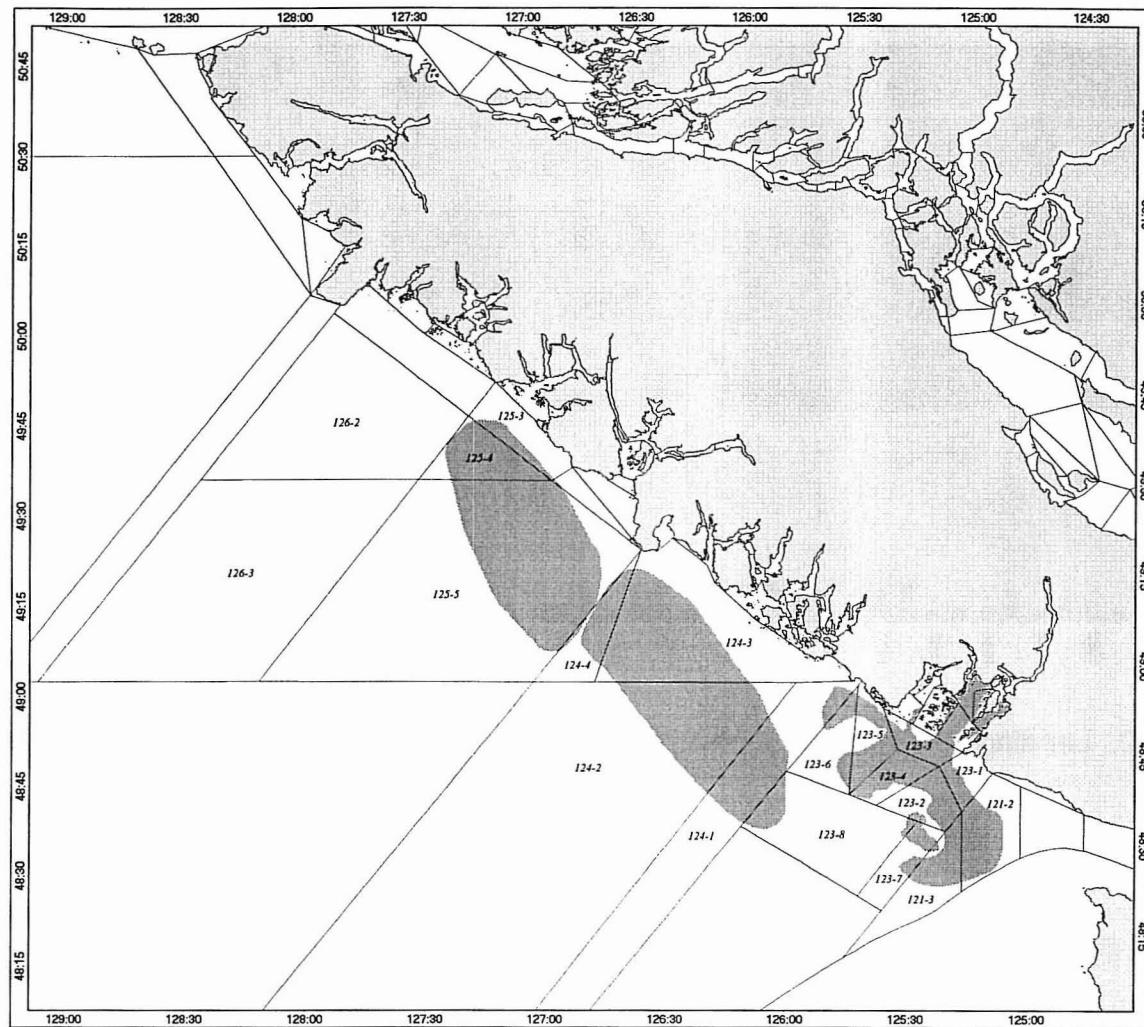


Figure 1. Survey areas off the WCVI in Pacific Fishery Management Areas 121, 123, 124, and 125.

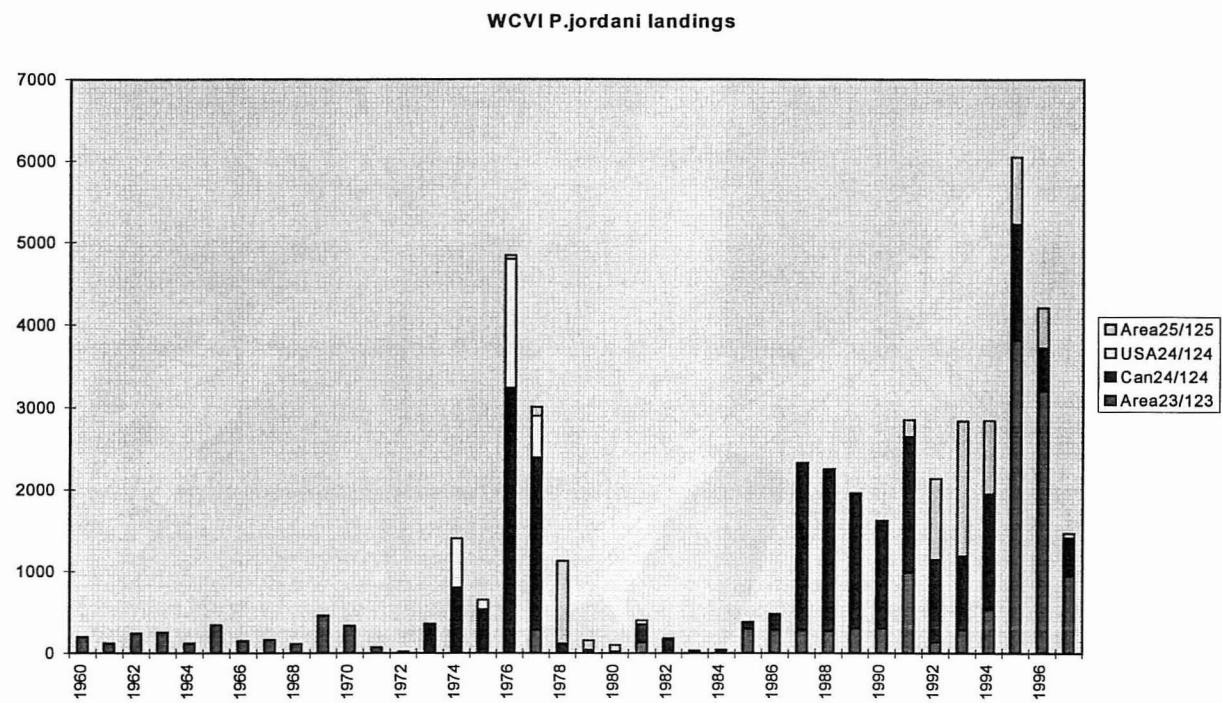


Figure 2. Landings of *P. jordani* (tonnes) off WCVI.

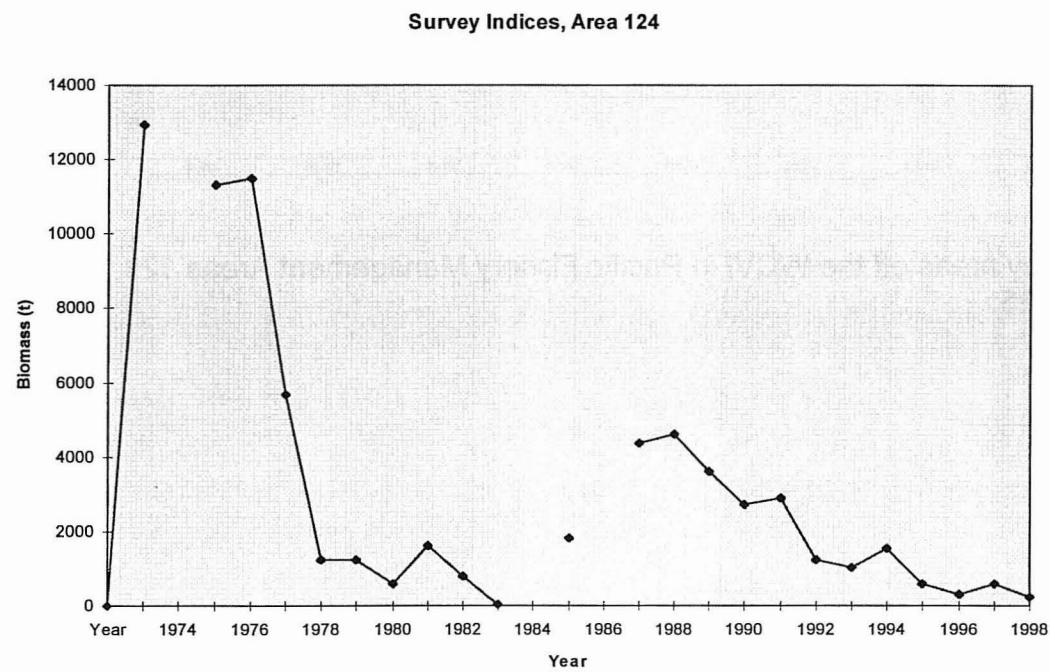


Figure 3. Survey Indices, Area 124

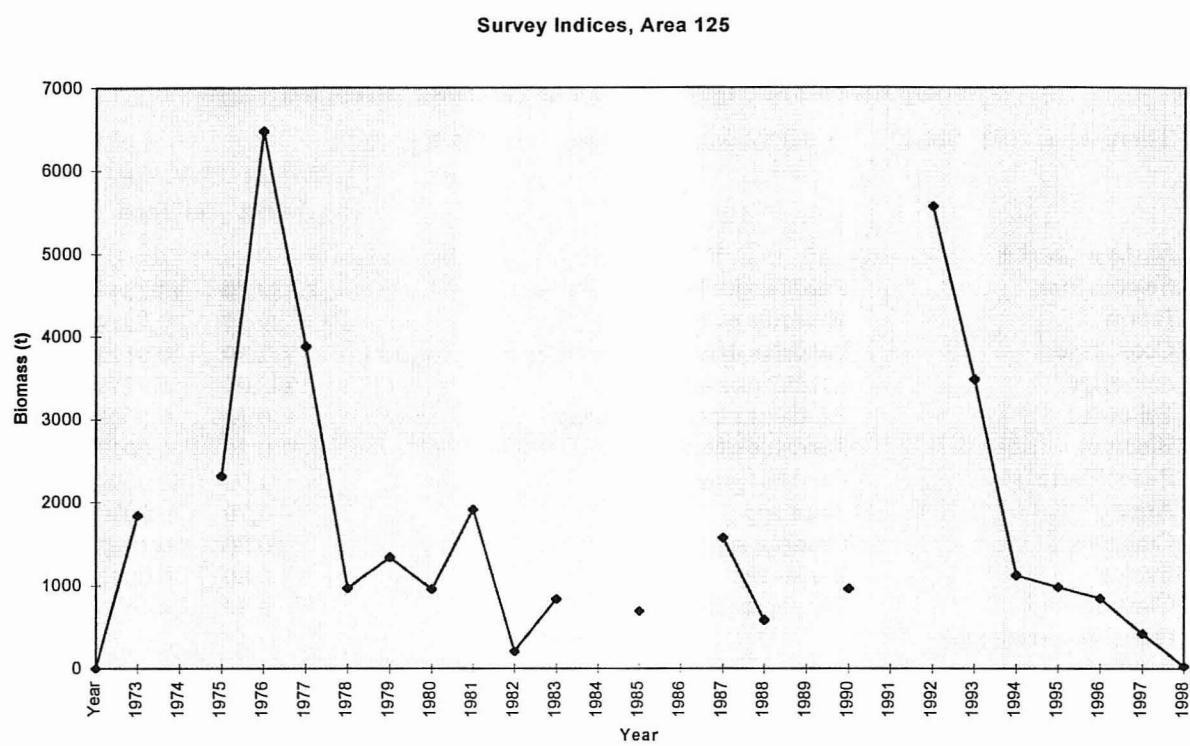


Figure 4. Survey Indices, Area 125

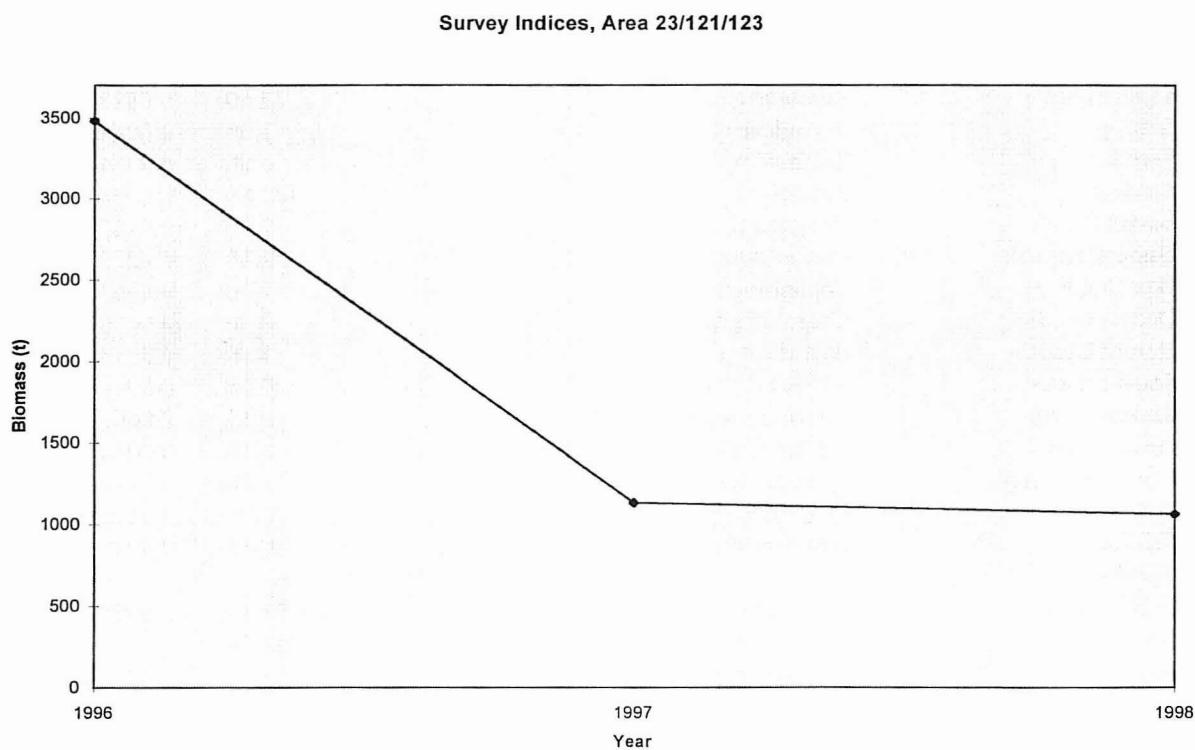


Figure 5. Survey indices, Area 23/121/123

Appendix 1

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

There were 162 Tows. Total Weight for all tows, 19,223 Kg.

		Weight in Kg	Percent of Total	Number of Tows
Shrimp Species				
Smooth Pink	<i>Pandalus jordani</i>	2,330.70	12.1247	127
Prawn	<i>Pandalus platyceros</i>	29.10	0.1514	52
Coonstripe	<i>Pandalus danae</i>	2.30	0.0120	17
Sidestripe	<i>Pandalopsis dispar</i>	138.00	0.7179	62
Yellowleg	<i>Pandalus montaqui tridens</i>	0.10	0.0005	1
Bluespot	<i>Pandalus stenolepsis</i>	0.20	0.0010	2
Pinks (Flexed)	<i>Pandalus goniurus</i>	1.90	0.0099	5
Argis	<i>Argis spp</i>	0.70	0.0036	7
Crangons	<i>Crangon spp</i>	20.80	0.1082	93
Eualus	<i>Eualus spp</i>	0.80	0.0042	8
Glass Shrimp	<i>Pasiphaea pacifica</i>	0.50	0.0026	4
Other Invertebrates				
Brittle Stars	Ophiurae (Order)	26.70	0.1389	39
Urchins	Echinacea (Superorder)	47.60	0.2476	35
Heart Urchin	Atelostomata (Superorder)	472.80	2.4596	41
Cucumbers	Holothuroidea (Class)	54.30	0.2825	37
Anemone	Actiniaria (Order)	27.50	0.1431	12
Sea Mouse	Aphroditidae spp	5.20	0.0271	17
Bivalves	Bivalvia (Class)	0.20	0.0010	2
Jellyfish	Scyphozoa (Class)	19.40	0.1009	75
Octopus	Octopoda (Order)	1.50	0.0078	8
Squat Squid	Rossia pacifica	15.60	0.0812	92
Scallop	Pectinidae (Family)	1.00	0.0052	8
Squid	Teuthoidea (Order)	6.80	0.0354	46
Starfish	Asteroidea (Class)	107.80	0.5608	72
Basket Stars	Euryalae (Order)	2.10	0.0109	11
Dungeness Crab	Cancer magister	4.40	0.0229	3
Box Crabs	Lopholithodes spp	7.40	0.0385	6
Decorator Crab	Oregonia gracilis	0.30	0.0016	3
Hermit Crabs	Paguridae (Family)	1.40	0.0073	14
Squat Lobster	Munida quadrispina	0.30	0.0016	3
Redclaw Crab	Chorilia longipes	0.10	0.0005	1
Peanutworms	Phylum Sipuncula	0.30	0.0016	3
Lewis moon Snail	Polinices lewisi	2.60	0.0135	8
Sea Whip	Osteocella septentrionalis	3.00	0.0156	7
Seaslugs	Nudibranchiata (Suborder)	0.30	0.0016	3
Flatfish				
Dab (Pacific)	<i>Citharichthys sordidus</i>	1,058.40	5.5060	109
Dover Sole	<i>Microstomus pacificus</i>	1,452.70	7.5572	109
English Sole	<i>Pleuronectes vetulus</i>	254.60	1.3245	45
Flathead Sole	<i>Hippoglossoides elassodon</i>	455.40	2.3691	114
Petrale Sole	<i>Eopsetta jordani</i>	39.50	0.2055	41
Rex Sole	<i>Errex zachirus</i>	1,248.50	6.4949	132

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

There were 162 Tows. Total Weight for all tows, 19,223 Kg.

		Weight in Kg	Percent of Total	Number of Tows
Turbot	<i>Atheresthes stomias</i>	770.20	4.0067	101
Dab (Speckled)	<i>Citharichthys stigmaeus</i>	1.50	0.0078	6
Pacific Halibut	<i>Hippoglossus stenolepis</i>	170.40	0.8864	22
Rock Sole	<i>Pleuronectes bilineatus</i>	4.20	0.0218	10
Slender Sole	<i>Eopsetta exilis</i>	950.80	4.9462	142
Sand Sole	<i>Psettichthys melanostictus</i>	0.10	0.0005	1
Rockfish				
Yellowtail	<i>Sebastes flavidus</i>	1,285.90	6.6895	49
Canary	<i>Sebastes pinniger</i>	380.90	1.9815	15
Rougheye	<i>Sebastes aleutianus</i>	5.80	0.0302	13
Pacific Ocean Perch	<i>Sebastes alutus</i>	5.20	0.0271	2
Redbanded	<i>Sebastes babcocki</i>	3.60	0.0187	4
Silvergray	<i>Sebastes brevispinis</i>	113.10	0.5884	3
Darkblotched	<i>Sebastes crameri</i>	112.60	0.5858	38
Greenstriped	<i>Sebastes elongatus</i>	12.90	0.0671	10
Bocaccio	<i>Sebastes paucispinis</i>	91.90	0.4781	5
Redstripe	<i>Sebastes proriger</i>	6.70	0.0349	9
Yelloweye	<i>Sebastes ruberrimus</i>	11.90	0.0619	2
Sharpchin	<i>Sebastes zacentrus</i>	3.60	0.0187	5
Shortspine Thornyhead	<i>Sebastolobus alascanus</i>	0.20	0.0010	1
Widow	<i>Sebastes entomelas</i>	1.90	0.0099	1
Roundfish				
Eulachon	<i>Thaleichthys pacificus</i>	333.10	1.7328	138
Pacific Herring	<i>Clupea pallasi</i>	179.80	0.9353	92
Lingcod	<i>Ophiodon elongatus</i>	308.30	1.6038	45
Pacific Cod	<i>Gadus macrocephalus</i>	60.90	0.3168	31
Walleye Pollock	<i>Theragra chalcogramma</i>	161.70	0.8412	117
Pacific Tomcod	<i>Microgadus proximus</i>	78.30	0.4073	39
Sablefish	<i>Anoplopoma fimbria</i>	39.50	0.2055	26
Eelpouts	<i>Zoarcidae (Family)</i>	105.60	0.5493	112
Pacific Hake	<i>Merluccius productus</i>	3,377.60	17.5708	133
Midshipman	<i>Porichthys notatus</i>	37.10	0.1930	57
Poachers	<i>Agonidae (Family)</i>	7.50	0.0390	33
Sculpins	<i>Cottidae (Family)</i>	1.60	0.0083	10
American Shad	<i>Alosa sapidissima</i>	1.70	0.0088	4
Shiner Perch	<i>Cymatogaster aggregata</i>	2.90	0.0151	17
Pacific Hagfish	<i>Eptatretus stouti</i>	0.40	0.0021	3
Pacific Sardine	<i>Sardinops sagax</i>	0.90	0.0047	9
Northern Anchovy	<i>Engraulis mordax mordax</i>	2.10	0.0109	4
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	5.00	0.0260	3
Whitebait Smelt	<i>Allosmerus elongatus</i>	1.70	0.0088	8
Lanternfishes	<i>Myctophidae (Family)</i>	0.10	0.0005	1
Pile Perch	<i>Rhacochilus vacca</i>	0.10	0.0005	1
Pricklebacks	<i>Stichaeidae (Family)</i>	0.60	0.0031	6
Dwarf Wrymouths	<i>Cryptacanthodes aleutensis</i>	0.80	0.0042	3
Chub Mackerel	<i>Scomber japonicus</i>	0.50	0.0026	1

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

There were 162 Tows. Total Weight for all tows, 19,223 Kg.

		Weight in Kg	Percent of Total	Number of Tows
Selachii				
Spiny Dogfish	<i>Squalus acanthias</i>	1,714.90	8.9212	77
Skates	Rajidae (Family)	574.50	2.9886	77
Spotted Ratfish	<i>Hydrolagus colliei</i>	372.70	1.9388	83

Appendix 2

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 5 1998	Time	12 : 31	Duration (min)	30	Area	121 - 0	Haul No.	1		
Depth M	148	144		Start Position	48	27.6	125	8.8	Direction	289	
Water Temp:	Surface	11.9	Bottom	7.2	Finish Position	48	28.1	125	11.3	Distance	1.7 Naut. Mi.
Type of Gear	2H		Total Catch		Remark	Usable		Vessel		16	
Net Effective Opening (feet) 34.9											

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	3.00	292	Heart Urchin	0.40 Dab (Pacific)
Crangons	0.10		Jellyfish	0.10 Dover Sole
				Flathead Sole 1.40
				Rex Sole 5.30
				Turbot 6.70
				Slender Sole 3.90
Rockfish			Roundfish	Selachii
Yellowtail	7.20		Eulachon	0.10 Spiny Dogfish
Canary	1.00		Pacific Herring	0.50 Spotted Ratfish
			Pacific Cod	1.70
			Eelpouts	0.60
			Pacific Hake	13.30

Date	May 5 1998	Time	13 : 38	Duration (min)	30	Area	121 - 0	Haul No.	2		
Depth M	150	152		Start Position	48	27.0	125	12.2	Direction	125	
Water Temp:	Surface	11.3	Bottom	6.9	Finish Position	48	26.1	125	10.2	Distance	1.6 Naut. Mi.
Type of Gear	2H		Total Catch		Remark	Usable		Vessel		16	
Net Effective Opening (feet) 34.9											

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.70	274	Heart Urchin	0.30 Dover Sole
Prawn	0.10		Jellyfish	0.40 Flathead Sole
Glass Shrimp	0.10		Starfish	0.10 Rex Sole
				Turbot 2.10
				Slender Sole 4.20
				6.00
Rockfish			Roundfish	Selachii
Rougheye	0.40		Eulachon	0.10 Spiny Dogfish
			Pacific Cod	3.00 Spotted Ratfish
			Eelpouts	0.60
			Pacific Hake	6.00

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 5 1998	Time	15 :01	Duration (min)	30	Area	121 - 0	Haul No.	3
Depth M	155 156			Start Position	48 26.7	125	15.0	Direction	126
Water Temp: Surface		Bottom	7.3	Finish Position	48 25.8	125	13.2	Distance	1.5 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.90	212	Urchins	Dover Sole
Prawn	0.10		Heart Urchin	Flathead Sole
Crangons	0.10		Jellyfish	Rex Sole
Glass Shrimp	0.10		Squat Squid	Turbot
				Slender Sole
Rockfish			Roundfish	Selachii
Yellowtail	4.80		Eulachon	Spiny Dogfish
Shortspine	0.20		Pacific Herring	Spotted Ratfish
			Eelpouts	
			Pacific Hake	6.00

Date	May 5 1998	Time	16 :15	Duration (min)	30	Area	121 - 0	Haul No.	4
Depth M	141 142			Start Position	48 28.7	125	13.4	Direction	293
Water Temp: Surface	11.3	Bottom	7.5	Finish Position	48 29.3	125	15.5	Distance	1.5 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	1.20	258	Heart Urchin	Dover Sole
			Jellyfish	Flathead Sole
				Rex Sole
				Turbot
				Slender Sole
Rockfish			Roundfish	Selachii
Yellowtail	6.20		Eulachon	Spiny Dogfish
			Pacific Herring	Skates
			Walleye Pollock	
			Eelpouts	0.90
			Pacific Hake	48.40

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 5 1998	Time	17:22	Duration (min)	30	Area	121 - 0	Haul No.	5
Depth M	134 138	Start Position	48 29.7	125	12.9	Direction		119	
Water Temp:	Surface 11.2 Bottom 6.9	Finish Position	48 29.1	125	11.2	Distance		1.3 Naut. Mi.	
Type of Gear	2H	Remark	Usable			Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	3.10	291	Urchins 0.20	Dover Sole 9.40
			Heart Urchin 0.10	Flathead Sole 0.50
			Jellyfish 0.20	Rex Sole 11.00
			Starfish 0.30	Turbot 4.20
			Hermit Crabs 0.10	Slender Sole 11.10
Rockfish			Roundfish	Selachii
Yellowtail	9.10		Eulachon 0.30	Spiny Dogfish 3.40
Canary	1.40		Pacific Herring 1.90	Spotted Ratfish 2.10
Greenstriped	0.60		Walleye Pollock 0.40	
			Eelpouts 0.50	
			Pacific Hake 7.90	

Date	May 6 1998	Time	6:27	Duration (min)	30	Area	121 - 0	Haul No.	6
Depth M	127 135	Start Position	48 30.6	125	8.6	Direction		161	
Water Temp:	Surface Bottom 7.0	Finish Position	48 29.5	125	8.0	Distance		1.2 Naut. Mi.	
Type of Gear	2H	Remark	Usable			Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	6.70	252	Urchins 1.10	Dab (Pacific) 7.00
Sidestripe	0.10		Starfish 0.30	Dover Sole 15.60
Crangons	0.10			Flathead Sole 4.40
				Rex Sole 10.50
				Turbot 13.40
				Rock Sole 0.30
				Slender Sole 1.30
Rockfish			Roundfish	Selachii
Yellowtail	18.60		Eulachon 0.10	Spiny Dogfish 3.70
Canary	1.80		Pacific Herring 0.40	Skates 3.60
			Walleye Pollock 2.70	Spotted Ratfish 5.70
			Eelpouts 1.10	
			Pacific Hake 5.60	
			Poachers 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 6 1998	Time	7:23	Duration (min)	30	Area	121 - 0	Haul No.	7
Depth M	123 134			Start Position	48 29.2	125	9.6	Direction	282
Water Temp: Surface		Bottom	7.5	Finish Position	48 29.5	125	11.7	Distance	1.5 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	4.00	379	Starfish	Dab (Pacific) 0.10
Prawn	0.20			Dover Sole 13.20
				Flathead Sole 0.10
				Rex Sole 7.30
				Turbot 6.30
				Slender Sole 2.70
Rockfish			Roundfish	Selachii
Yellowtail	35.30		Eulachon 0.10	Spiny Dogfish 6.50
Canary	1.80		Pacific Herring 0.50	Skates 4.10
Greenstriped	0.10		Walleye Pollock 0.20	Spotted Ratfish 6.10
Bocaccio	5.50		Eelpouts 0.30	
			Pacific Hake 5.30	

Date	May 6 1998	Time	8:29	Duration (min)	30	Area	121 - 0	Haul No.	8
Depth M	124 124			Start Position	48 31.7	125	11.8	Direction	309
Water Temp: Surface		Bottom	7.2	Finish Position	48 32.6	125	13.4	Distance	1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	79.20	319	Heart Urchin 0.10	Dover Sole 13.50
Crangons	0.10		Jellyfish 0.10	English Sole 0.30
Eualus	0.10			Flathead Sole 6.60
				Petrale Sole 1.00
				Rex Sole 8.80
				Turbot 5.30
				Slender Sole 13.90
Rockfish			Roundfish	Selachii
Yellowtail	26.70		Eulachon 0.10	Spiny Dogfish 5.80
Canary	0.80		Pacific Herring 2.60	Skates 3.50
			Pacific Cod 0.80	Spotted Ratfish 16.20
			Eelpouts 2.60	
			Pacific Hake 9.90	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 6 1998	Time	9 :27	Duration (min)	30	Area	121 - 0	Haul No.	9
Depth	M 129 136			Start Position	48 31.1	125 15.1	Direction	148	
Water Temp:	Surface 9.1	Bottom 7.0		Finish Position	48 30.1	125 14.1	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	4.30	298	Jellyfish 0.20	Dover Sole 11.00
			Octopus 0.10	Flathead Sole 9.10
			Squat Squid 0.10	Petrale Sole 1.00
				Rex Sole 13.50
				Turbot 3.70
				Slender Sole 15.80
Rockfish			Roundfish	Selachii
Yellowtail	168.00		Eulachon 0.20	Spiny Dogfish 6.50
Rougheye	0.10		Pacific Cod 1.30	Spotted Ratfish 10.70
Redstripe	0.70		Walleye Pollock 0.30	
			Eelpouts 3.60	
			Pacific Hake 23.00	
			Poachers 0.10	
			American Shad 0.80	

Date	May 6 1998	Time	10 :32	Duration (min)	30	Area	121 - 0	Haul No.	10
Depth	M 140 143			Start Position	48 30.8	125 17.2	Direction	203	
Water Temp:	Surface	Bottom 7.2		Finish Position	48 29.6	125 18.0	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	2.00	253	Heart Urchin 0.20	Dab (Pacific) 0.10
			Jellyfish 0.10	Dover Sole 10.90
			Squat Squid 0.10	Flathead Sole 15.10
			Starfish 0.10	Rex Sole 4.80
				Turbot 4.10
				Slender Sole 14.80
Rockfish			Roundfish	Selachii
Yellowtail	7.00		Eulachon 0.20	Spiny Dogfish 16.80
Darkblotched	0.10		Pacific Herring 0.80	Skates 2.70
			Eelpouts 3.80	Spotted Ratfish 2.40
			Pacific Hake 10.00	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 6 1998	Time	11 :33	Duration (min)	30	Area	121 - 0	Haul No.	11
Depth M	132 140			Start Position	48 29.8	125 20.0	Direction		30
Water Temp:	Surface	Bottom		Finish Position	48 31.0	125 19.0	Distance		1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.60	262	Heart Urchin	Dover Sole
Prawn	0.10		Jellyfish	Flathead Sole
				Rex Sole
				Turbot
				Pacific Halibut
				Slender Sole
				8.90
				10.50
				6.50
				6.30
				6.90
				9.70
Rockfish			Roundfish	Selachii
Yellowtail	17.80		Eulachon	Spiny Dogfish
Canary	1.30		Pacific Herring	Skates
Darkblotched	0.40		Eelpouts	Spotted Ratfish
			Pacific Hake	13.30
				3.30
				3.20

Date	May 6 1998	Time	12 :45	Duration (min)	30	Area	121 - 0	Haul No.	12
Depth M	139 145			Start Position	48 30.3	125 21.4	Direction		216
Water Temp:	Surface 11.6	Bottom 7.1		Finish Position	48 29.2	125 22.6	Distance		1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	1.60	258	Urchins	Dover Sole
Prawn	0.10		Heart Urchin	English Sole
Crangons	0.10		Jellyfish	Flathead Sole
			Squat Squid	Rex Sole
				Turbot
				20.50
				31.80
				23.00
Rockfish			Roundfish	Selachii
Yellowtail	9.50		Eulachon	Spiny Dogfish
Canary	3.80		Pacific Herring	Skates
Rougheye	0.50		Pacific Cod	Spotted Ratfish
Darkblotched	0.50		Walleye Pollock	6.00
Redstripe	1.50		Eelpouts	
			Pacific Hake	27.40
				8.40
				0.40
				16.50
				20.50
				31.80
				23.00

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 6 1998 Time 13:44 Duration (min) 30 Area 121 - 0 Haul No. 13
 Depth M 148 149 Start Position 48 27.6 125 25.1 Direction 212
 Water Temp: Surface 11.1 Bottom 7.1 Finish Position 48 26.5 125 26.2 Distance 1.4 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	0.30	230	Heart Urchin	Dover Sole	17.40
Prawn	0.10		Jellyfish	Flathead Sole	4.40
			Squat Squid	Rex Sole	19.00
			Starfish	Turbot	24.80
				Pacific Halibut	9.90
				Slender Sole	16.30
Rockfish			Roundfish	Selachii	
Yellowtail	12.70		Eulachon	Spiny Dogfish	58.20
Rougheye	0.50		Pacific Herring	Skates	7.70
Darkblotched	0.10		Pacific Cod	Spotted Ratfish	1.00
Bocaccio	5.00		Eelpouts		
			Pacific Hake		

Date May 6 1998 Time 14:54 Duration (min) 30 Area 121 - 0 Haul No. 14
 Depth M 158 161 Start Position 48 24.9 125 23.6 Direction 46
 Water Temp: Surface 11.1 Bottom 6.8 Finish Position 48 25.7 125 22.2 Distance 1.2 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	2.00	234	Urchins	Dover Sole	19.30
Prawn	0.10		Heart Urchin	Flathead Sole	18.10
			Jellyfish	Rex Sole	21.00
			Starfish	Turbot	13.40
			Sea Whip	Slender Sole	12.90
Rockfish			Roundfish	Selachii	
Yellowtail	5.80		Eulachon	Spiny Dogfish	16.80
Rougheye	0.40		Pacific Cod	Skates	1.00
Redbanded	0.20		Walleye Pollock	Spotted Ratfish	1.60
Darkblotched	0.70		Eelpouts		
			Pacific Hake		
			Sculpins		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 6 1998	Time	15 : 58	Duration (min)	30	Area	121 - 0	Haul No.	15
Depth M	148 154			Start Position	48 27.9	125 20.1	Direction		122
Water Temp:	Surface	Bottom	6.8	Finish Position	48 28.8	125 18.8	Distance		1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
Smooth Pink	2.90	234	Heart Urchin	0.20	Dover Sole	13.30
Prawn	0.10		Jellyfish	0.40	Flathead Sole	11.90
Eualus	0.10		Squat Squid	0.10	Rex Sole	9.60
			Starfish	0.20	Turbot	18.00
					Pacific Halibut	4.20
					Slender Sole	11.90
Rockfish			Roundfish	Selachii		
Yellowtail	8.70		Eulachon	0.40	Spiny Dogfish	25.50
Rougheye	0.40		Pacific Herring	0.60	Skates	16.40
Redbanded	3.10		Pacific Cod	7.00	Spotted Ratfish	3.60
Darkblotched	1.10		Walleye Pollock	0.10		
			Eelpouts	2.30		
			Pacific Hake	0.30		
			Poachers	0.10		
			American Shad	0.10		
			Lanternfishes	0.10		

Date	May 6 1998	Time	17 : 05	Duration (min)	29	Area	121 - 0	Haul No.	16
Depth M	104 111			Start Position	48 31.8	125 18.5	Direction		13
Water Temp:	Surface	12.1	Bottom	7.6	Finish Position	48 33.4	125 17.9	Distance	1.7 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
Smooth Pink	1.30	288	Cucumbers	0.70	Dab (Pacific)	0.10
Prawn	0.10		Anemone	0.30	Dover Sole	0.50
Bluespot	0.10		Squat Squid	0.10	English Sole	0.10
			Starfish	0.10	Rex Sole	1.40
			Decorator Crab	0.10	Slender Sole	0.40
Rockfish			Roundfish	Selachii		
Yellowtail	6.70		Eulachon	0.40	Spiny Dogfish	4.10
Redstripe	2.10		Pacific Herring	0.80	Spotted Ratfish	1.00
Sharpchin	0.10		Eelpouts	0.80		
			Pacific Hake	76.50		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	6:09	Duration (min)	30	Area	121 - 0	Haul No.	17
Depth M	97 101			Start Position	48 35.3	125	4.3	Direction	284
Water Temp:	Surface 11.5	Bottom	7.8	Finish Position	48 35.7	125	6.6	Distance	1.6 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	2.50	250	Sea Whip	Dab (Pacific) 24.50
				Dover Sole 12.90
				English Sole 12.40
				Flathead Sole 1.50
				Petrale Sole 0.30
				Rex Sole 4.80
				Turbot 4.60
				Rock Sole 0.50
				Slender Sole 2.40
Rockfish			Roundfish	Selachii
Yellowtail	5.70		Eulachon 0.20	Spotted Ratfish 5.50
			Pacific Herring 0.90	
			Walleye Pollock 0.10	
			Eelpouts 0.10	
			Pacific Hake 7.80	

All Weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	7:02	Duration (min)	30	Area	121 - 0	Haul No.	18	
Depth M	100	102		Start Position	48 36.2	125	8.6	Direction	277	
Water Temp:	Surface		Bottom	8.0	Finish Position	48 36.4	125	10.8	Distance	1.5 Naut. Mi.
Type of Gear	2H		Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9										
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish			
Smooth Pink		8.10	244				Dab (Pacific)		8.00	
Rockfish							Dover Sole		41.40	
Yellowtail		9.00					English Sole		17.40	
							Flathead Sole		3.80	
							Rex Sole		6.30	
							Turbot		9.80	
							Pacific Halibut		22.10	
							Slender Sole		9.30	
Roundfish							Selachii			
Eulachon							Spotted Ratfish		42.50	
Pacific Herring										
Lingcod										
Pacific Cod										
Walleye Pollock										
Eelpouts										
Pacific Hake										
0.10										
1.00										
5.60										
3.20										
1.30										
0.60										
15.80										

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	7:54	Duration (min)	29	Area	121 - 0	Haul No.	19
Depth M	98 100			Start Position	48 37.2	125	12.0	Direction	335
Water Temp:	Surface	Bottom	8.6	Finish Position	48 38.5	125	12.9	Distance	1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg
Smooth Pink	3.40	262
Crangons	0.10	

Invertebrates**Flatfish**

Dab (Pacific)	6.70
English Sole	3.80
Flathead Sole	11.30
Petrale Sole	2.60
Rex Sole	14.40
Turbot	10.70
Slender Sole	10.90

Rockfish

Yellowtail	2.00
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Roundfish

Eulachon	0.10
Pacific Herring	0.40
Pacific Cod	1.60
Walleye Pollock	2.90
Eelpouts	4.10
Pacific Hake	24.40
Midshipman	0.10

Selachii

Skates	0.50
Spotted Ratfish	13.30

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	8:48	Duration (min)	30	Area	121 - 0	Haul No.	20
Depth M	102 108			Start Position	48 38.2	125	14.8	Direction	192
Water Temp: Surface		Bottom	8.1	Finish Position	48 36.8	125	15.3	Distance	1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	2.80	220	Jellyfish	0.10 Dab (Pacific) 0.10
Sidestripe	0.10		Starfish	0.10 Dover Sole 20.50
Crangons	0.10			English Sole 0.40
				Flathead Sole 17.80
				Petrale Sole 0.50
				Rex Sole 9.50
				Turbot 3.00
				Slender Sole 10.50

Rockfish	Roundfish	Selachii
Yellowtail	Eulachon 0.10	Skates 0.30
	Pacific Herring 0.10	Spotted Ratfish 10.70
	Walleye Pollock 0.70	
	Sablefish 0.60	
	Eelpouts 9.90	
	Pacific Hake 52.90	
	Midshipman 0.30	

Date	May 7 1998	Time	9:48	Duration (min)	29	Area	121 - 0	Haul No.	21
Depth M	105 113			Start Position	48 34.9	125	15.4	Direction	194
Water Temp: Surface		Bottom	7.8	Finish Position	48 33.3	125	16.0	Distance	1.6 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	2.00	293	Brittle Stars 0.10	Dover Sole 3.20
Prawn	0.20	15	Squat Squid 0.10	Flathead Sole 1.90
Crangons	0.10	10	Starfish 0.10	Rex Sole 0.60
Eualus	0.10	40		Turbot 1.10
				Slender Sole 1.50

Rockfish	Roundfish	Selachii
Yellowtail	Eulachon 0.10	Spotted Ratfish 3.80
Canary	Pacific Herring 0.60	
Greenstriped	Pacific Cod 0.70	
Redstripe	Walleye Pollock 0.10	
	Eelpouts 1.30	
	Pacific Hake 17.60	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	10 :53	Duration (min)	30	Area	121 - 0	Haul No.	22
Depth M	108 114	Start Position	48 36.1	125 17.2	Direction			8	
Water Temp:	Surface Bottom	Finish Position	48 37.4	125 17.0	Distance		1.3 Naut. Mi.		
Type of Gear	2H	Remark	Usable	Vessel			16		
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	2.60	237	Jellyfish	Dab (Pacific) 0.10
Sidestripe	0.20		Squat Squid 0.10	Dover Sole 10.50
			Starfish 0.10	English Sole 0.10
				Flathead Sole 9.00
				Rex Sole 12.40
				Turbot 2.00
				Slender Sole 8.00

Rockfish	Yellowtail	9.20	Roundfish	Selachii
			Eulachon 0.30	Spiny Dogfish 1.50
			Pacific Herring 0.20	Skates 9.50
			Walleye Pollock 0.60	Spotted Ratfish 3.40
			Eelpouts 3.80	
			Pacific Hake 64.70	
			Midshipman 0.50	
			Poachers 0.10	

Date	May 7 1998	Time	12 :17	Duration (min)	30	Area	121 - 0	Haul No.	23
Depth M	114 124	Start Position	48 35.6	125 19.5	Direction			41	
Water Temp:	Surface 11.6 Bottom 7.6	Finish Position	48 36.5	125 18.4	Distance		1.2 Naut. Mi.		
Type of Gear	2H	Remark	Usable	Vessel			16		
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.30		Jellyfish 0.40	Dover Sole 29.20
Sidestripe	0.20	45	Starfish 0.10	Flathead Sole 19.20
			Squat Lobster 0.10	Rex Sole 12.20
				Turbot 3.60
				Slender Sole 12.70

Rockfish	Yellowtail	31.40	Roundfish	Selachii
			Eulachon 0.10	Spiny Dogfish 9.10
			Pacific Cod 0.70	Skates 11.70
			Eelpouts 1.60	Spotted Ratfish 20.90
			Pacific Hake 209.70	
			Midshipman 0.40	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	13:39	Duration (min)	30	Area	121 - 0	Haul No.	24
Depth M	95 101			Start Position	48 40.5	125	16.9	Direction	192
Water Temp:	Surface 11.6	Bottom 8.0		Finish Position	48 39.2	125	17.3	Distance	1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)	34.9								
Shrimp		Weight	Num/Kg						
Smooth Pink		2.60	226						
Sidestripe		0.10							
Crangons		0.10							
				Invertebrates				Flatfish	
				Squat Squid	0.10		Dab (Pacific)		20.40
				Starfish	0.10		Dover Sole		34.20
				Basket Stars	0.10		English Sole		36.50
							Flathead Sole		23.60
							Petrale Sole		4.70
							Rex Sole		8.90
							Turbot		6.70
							Slender Sole		6.70
Rockfish				Roundfish			Selachii		
Rougheye		0.20		Eulachon	0.60		Spiny Dogfish		5.20
				Walleye Pollock	1.00		Skates		6.90
				Eelpouts	2.30		Spotted Ratfish		7.20
				Pacific Hake	387.50				
				Midshipman	0.10				
Date	May 7 1998	Time	14:55	Duration (min)	30	Area	121 - 0	Haul No.	25
Depth M	82 88			Start Position	48 41.5	125	13.5	Direction	163
Water Temp:	Surface	Bottom 8.2		Finish Position	48 40.2	125	12.9	Distance	1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)	34.9								
Shrimp		Weight	Num/Kg					Flatfish	
Smooth Pink		0.70	256				Dab (Pacific)		22.80
Argis		0.10					English Sole		16.60
Crangons		0.10					Flathead Sole		10.50
							Rex Sole		5.90
							Turbot		0.70
							Slender Sole		4.00
Rockfish				Roundfish			Selachii		
Yellowtail		0.40		Eulachon	2.70		Skates		9.90
				Pacific Herring	0.20		Spotted Ratfish		1.00
				Walleye Pollock	9.80				
				Pacific Tomcod	1.80				
				Eelpouts	0.20				
				Pacific Hake	233.60				
				Midshipman	0.10				
				Poachers	0.10				
				Shiner Perch	0.10				

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 7 1998	Time	16 :44	Duration (min)	30	Area	121 - 0	Haul No.	26
Depth	M 82	82		Start Position	48 45.4	125 17.6	Direction	2	
Water Temp:	Surface 12.4	Bottom 9.0		Finish Position	48 46.5	125 17.5	Distance	1.1 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
Smooth Pink	78.10	297	Octopus	0.10	Dab (Pacific)	16.00
			Squat Squid	0.40	Dover Sole	14.90
			Squid	0.10	English Sole	13.10
			Starfish	5.00	Flathead Sole	2.20
			Lewis Moon Snail	0.10	Rex Sole	11.00
					Turbot	1.40
					Slender Sole	3.80
Rockfish			Roundfish	Selachii		
			Eulachon	7.60	Spiny Dogfish	0.70
			Pacific Herring	0.80	Skates	5.40
			Walleye Pollock	8.90	Spotted Ratfish	0.70
			Eelpouts	0.40		
			Pacific Hake	0.60		
			Midshipman	0.90		
			Dwarf Wrymouths	0.40		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 8 1998	Time	10 : 16	Duration (min)	30	Area	123 - 0	Haul No.	30
Depth M	83 85			Start Position	48 47.4	125 20.1	Direction	299	
Water Temp:	Surface	Bottom	8.9	Finish Position	48 47.9	125 21.6	Distance	1.1 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	43.00	355	Squat Squid	Dab (Pacific) 2.00
Sidestripe	0.10		Hermit Crabs	Dover Sole 2.40
				English Sole 7.30
				Flathead Sole 1.00
				Rex Sole 6.40
				Turbot 0.50
				Rock Sole 0.40
				Slender Sole 2.20
Rockfish			Roundfish	Selachii
			Eulachon 12.10	Skates 16.90
			Pacific Herring 0.40	Spotted Ratfish 5.20
			Walleye Pollock 2.80	
			Pacific Tomcod 3.50	
			Eelpouts 0.10	
			Pacific Hake 1.70	
			Midshipman 0.80	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 8 1998	Time	11:23	Duration (min)	30	Area	123 - 0	Haul No.	31
Depth M	95 97			Start Position	48 45.1	125 22.2	Direction		291
Water Temp:	Surface 12.2	Bottom		Finish Position	48 45.5	125 23.8	Distance	1.1 Naut. Mi.	
Type of Gear	2H	Total Catch	136	Remark	Usable		Vessel		16
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	61.10	282	Squat Squid	Dab (Pacific) 17.50
Sidestripe	1.40	174	Squid	Dover Sole 2.10
			Starfish	English Sole 0.30
				Flathead Sole 5.40
				Rex Sole 3.90
				Turbot 1.60
				Pacific Halibut 6.00
				Rock Sole 0.50
				Slender Sole 2.40
Rockfish	Roundfish		Selachii	
	Eulachon	11.60	Skates	6.70
	Pacific Herring	0.30	Spotted Ratfish	3.20
	Walleye Pollock	9.00		
	Midshipman	0.90		
	American Shad	0.40		
	Northern Anchovy	0.10		
	Whitebait Smelt	0.10		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 8 1998	Time	12 : 36	Duration (min)	30	Area	123 - 0	Haul No.	32
Depth M	85 89			Start Position	48 46.8	125 19.6	Direction	213	
Water Temp:	Surface 12.0	Bottom 9.0		Finish Position	48 45.7	125 20.6	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch	134	Remark	Usable	Vessel		16	
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	33.30	327	Heart Urchin	0.40 Dab (Pacific) 25.40
Coonstripe	0.10		Sea Mouse	0.10 Dover Sole 9.70
Sidestripe	0.20		Squat Squid	0.40 English Sole 11.10
Crangons	0.10		Starfish	1.80 Flathead Sole 2.80
				Petrale Sole 1.10
				Rex Sole 8.30
				Turbot 1.20
				Slender Sole 4.90
Rockfish			Roundfish	Selachii
			Eulachon 9.30 Skates 6.70	
			Pacific Herring 1.20 Spotted Ratfish 2.20	
			Lingcod 3.80	
			Walleye Pollock 4.00	
			Pacific Tomcod 3.00	
			Eelpouts 0.20	
			Pacific Hake 1.20	
			Midshipman 1.00	
			Shiner Perch 0.20	
			Chinook Salmon 0.30	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 8 1998 **Time** 13 :38 **Duration (min)** 30 **Area** 123 - 0 **Haul No.** 33
Depth M 101 101 Start Position 48 44.5 125 24.2 Direction 304
Water Temp: Surface 12.0 Bottom 8.6 Finish Position 48 45.1 125 25.4 Distance 1.1 Naut. Mi.
Type of Gear 2H Total Catch 142 Remark Usable Vessel 16
Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	65.30	272	Heart Urchin	Dab (Pacific)	9.00
Coonstripe	0.10		Jellyfish	Dover Sole	0.80
Sidestripe	1.50		Squat Squid	English Sole	0.10
Crangons	0.10		Squid	Flathead Sole	3.00
			Starfish	Rex Sole	5.50
				Turbot	0.40
				Slender Sole	3.30

Rockfish	Roundfish	Selachii
	Eulachon	Skates
	Walleye Pollock	Spotted Ratfish
	Eelpouts	
	Pacific Hake	
	Pacific Hagfish	

Date May 8 1998 **Time** 14 :31 **Duration (min)** 30 **Area** 123 - 0 **Haul No.** 34
Depth M 96 99 Start Position 48 46.2 125 25.6 Direction 302
Water Temp: Surface 12.0 Bottom 8.6 Finish Position 48 46.8 125 27.1 Distance 1.1 Naut. Mi.
Type of Gear 2H Total Catch 126 Remark Usable Vessel 16
Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	47.40	264	Squat Squid	Dab (Pacific)	9.60
Sidestripe	1.00		Squid	Dover Sole	2.60
Crangons	0.10		Starfish	Flathead Sole	5.50
				Rex Sole	8.70
				Turbot	0.10
				Slender Sole	2.90

Rockfish	Roundfish	Selachii
	Eulachon	Spiny Dogfish
	Walleye Pollock	Skates
	Eelpouts	Spotted Ratfish
	Pacific Hake	
	Midshipman	
	Whitebait Smelt	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 8 1998	Time	15 :26	Duration (min)	30	Area	123 - 0	Haul No.	35
Depth M	92 93			Start Position	48 47.4	125 25.7	Direction	123	
Water Temp:	Surface	Bottom	9.4	Finish Position	48 46.7	125 24.1	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch	131	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
Smooth Pink	67.20	315	Urchins	0.60	Dab (Pacific)	6.90
Coonstripe	0.10		Heart Urchin	1.80	Dover Sole	4.00
Sidestripe	2.40	214	Starfish	1.40	English Sole	0.30
Crangons	0.10		LewisMoon Snail	1.00	Flathead Sole	1.70
					Rex Sole	9.20
					Turbot	1.00
					Slender Sole	3.50
Rockfish			Roundfish	Selachii		
Yellowtail	1.00		Eulachon	7.90	Skates	11.50
			Walleye Pollock	4.20	Spotted Ratfish	1.40
			Eelpouts	1.20		
			Midshipman	2.10		
			Pacific Hagfish	0.10		
			Whitebait Smelt	0.10		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	6 :06	Duration (min)	30	Area	123 - 3	Haul No.	45
Depth M	92 94			Start Position	48 50.0	125 28.3	Direction	166	
Water Temp:	Surface	Bottom	9.3	Finish Position	48 48.8	125 27.9	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	96.60	258	Squat Squid	Dab (Pacific) 6.40
Prawn	0.10			Dover Sole 2.20
Coonstripe	0.10			English Sole 0.30
Sidestripe	1.20			Flathead Sole 0.70
Crangons	0.10			Petrale Sole 0.30
				Rex Sole 3.60
				Turbot 0.30
				Rock Sole 0.30
				Slender Sole 0.70
Rockfish			Roundfish	Selachii
			Eulachon 15.00	Skates 4.00
			Pacific Herring 4.00	
			Walleye Pollock 5.80	
			Eelpouts 0.60	
			Midshipman 0.10	
			Pacific Sardine 0.10	
			Whitebait Smelt 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 9 1998	Time	8:55	Duration (min)	30	Area	123 - 4	Haul No.	39
Depth	M 121 127			Start Position	48 43.1	125 28.9	Direction		308
Water Temp:	Surface 12.6	Bottom	9.6	Finish Position	48 43.9	125 30.5	Distance		1.3 Naut. Mi.
Type of Gear	2H	Total Catch	168	Remark	Usable	Vessel			16
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	57.60	206	Heart Urchin	Dab (Pacific) 0.40
Prawn	1.10		Sea Mouse	Dover Sole 13.40
Sidestripe	5.70	91	Squat Squid	Flathead Sole 9.00
			Squid	Rex Sole 12.90
			Peanutworms	Turbot 4.10
				Slender Sole 17.80
Rockfish			Roundfish	Selachii
Rougheye	0.20		Eulachon 9.10	Skates 2.90
			Pacific Herring 0.30	Spotted Ratfish 7.10
			Lingcod 3.90	
			Walleye Pollock 0.30	
			Sablefish 0.30	
			Eelpouts 4.00	
			Pacific Hake 15.30	
			Midshipman 1.10	

Date	May 9 1998	Time	9:50	Duration (min)	30	Area	123 - 4	Haul No.	40
Depth	M 136 138			Start Position	48 44.7	125 32.5	Direction		307
Water Temp:	Surface 12.1	Bottom	8.6	Finish Position	48 45.5	125 34.2	Distance		1.4 Naut. Mi.
Type of Gear	2H	Total Catch	197	Remark	Usable	Vessel			16
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	13.30	164	Brittle Stars 0.10	Dover Sole 16.20
Prawn	0.60		Heart Urchin 10.10	Flathead Sole 26.00
Sidestripe	12.80	94	Cucumbers 1.40	Rex Sole 18.80
			Squat Squid 0.30	Turbot 3.90
			Squid 0.30	Pacific Halibut 12.20
			Peanutworms 0.10	Slender Sole 13.60
Rockfish			Roundfish	Selachii
Rougheye	1.70		Eulachon 6.80	Skates 30.70
Darkblotched	0.20		Walleye Pollock 3.00	Spotted Ratfish 18.20
			Eelpouts 3.40	
			Pacific Hake 3.40	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 9 1998	Time	10 :57	Duration (min)	30	Area	123 - 4	Haul No.	41
Depth	M 150 165			Start Position	48 44.6	125 35.9	Direction		305
Water Temp:	Surface 12.9	Bottom	8.4	Finish Position	48 45.4	125 37.7	Distance		1.5 Naut. Mi.
Type of Gear	2H	Total Catch	38	Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	1.20	185	Brittle Stars	Dover Sole 1.00
Prawn	0.10		Heart Urchin	Flathead Sole 3.60
Sidestripe	3.30	108	Cucumbers	Rex Sole 2.90
			Squid	Slender Sole 3.10
			Starfish	
Rockfish			Roundfish	Selachii
Rougheye	0.70		Eulachon 2.20	Spotted Ratfish 0.10
			Pacific Herring 0.60	
			Walleye Pollock 2.40	
			Eelpouts 0.60	
			Pacific Hake 15.30	
			Midshipman 0.30	

Date	May 9 1998	Time	12 :25	Duration (min)	30	Area	123 - 4	Haul No.	42
Depth	M 158 167			Start Position	48 44.0	125 39.7	Direction		196
Water Temp:	Surface 12.6	Bottom	8.8	Finish Position	48 42.6	125 40.3	Distance		1.4 Naut. Mi.
Type of Gear	2H	Total Catch	68	Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.40	200	Brittle Stars	Dover Sole 4.90
Sidestripe	1.20	105	Heart Urchin	Flathead Sole 22.40
			Sea Mouse	Rex Sole 9.90
			Starfish	Rock Sole 0.70
			Peanutworms	Slender Sole 3.40
Rockfish			Roundfish	Selachii
Yellowtail	3.10		Eulachon 1.30	Spiny Dogfish 0.10
			Pacific Herring 0.70	Skates 5.20
			Walleye Pollock 1.70	Spotted Ratfish 0.90
			Eelpouts 0.10	
			Pacific Hake 6.00	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 9 1998 **Time** 14 :01 **Duration (min)** 30 **Area** 123 - 4 **Haul No.** 43
Depth M 120 126 Start Position 48 45.0 125 30.8 Direction 339
Water Temp: Surface 13.5 Bottom 8.8 Finish Position 48 46.2 125 31.6 Distance 1.3 Naut. Mi.
Type of Gear 2H Total Catch 64 Remark Usable
Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	27.50	185	Brittle Stars	Dab (Pacific)	0.60
Prawn	0.10		Squat Squid	Dover Sole	1.60
Sidestripe	4.60	127	Squid	Flathead Sole	3.70
				Rex Sole	6.20
				Turbot	1.10
				Rock Sole	0.70
				Slender Sole	1.90
Rockfish			Roundfish	Selachii	
Rougheye	0.40		Pacific Herring	Skates	2.20
			Walleye Pollock	Spotted Ratfish	1.80
			Eelpouts		
			Pacific Hake		

Date May 9 1998 **Time** 14 :54 **Duration (min)** 31 **Area** 123 - 4 **Haul No.** 44
Depth M 109 110 Start Position 48 46.4 125 29.9 Direction 140
Water Temp: Surface Bottom 9.0 Finish Position 48 45.3 125 28.5 Distance 1.5 Naut. Mi.
Type of Gear 2H Total Catch 130 Remark Usable
Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	85.30	251	Squat Squid	Dab (Pacific)	6.90
Sidestripe	3.30	130	Squid	Dover Sole	1.30
Crangons	0.10			Flathead Sole	3.10
				Petrale Sole	0.40
				Rex Sole	4.10
				Turbot	0.30
				Slender Sole	2.80
Rockfish			Roundfish	Selachii	
			Pacific Herring	Skates	10.60
			Pacific Cod		
			Walleye Pollock		
			Eelpouts		
			Pacific Hake		
			Midshipman		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	7:06	Duration (min)	30	Area	123 - 5	Haul No.	46
Depth	M 101 106			Start Position	48 48.3	125 30.3	Direction	176	
Water Temp:	Surface	Bottom	9.5	Finish Position	48 47.0	125 30.2	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	7.10	208	Jellyfish	Dab (Pacific) 10.80
Sidestripe	0.90	130	Squid	Dover Sole 1.30
Crangons	0.10		Starfish	Flathead Sole 2.90
				Rex Sole 1.80
				Slender Sole 0.10

Rockfish	Roundfish	Selachii
	Eulachon 24.10	Skates 0.70
	Pacific Herring 1.00	Spotted Ratfish 0.60
	Walleye Pollock 5.20	
	Eelpouts 1.20	
	Pacific Hake 9.00	

Date	May 10 1998	Time	8:07	Duration (min)	30	Area	123 - 5	Haul No.	47
Depth	M 102 109			Start Position	48 47.7	125 31.9	Direction	34	
Water Temp:	Surface	Bottom	9.5	Finish Position	48 48.8	125 30.8	Distance	1.4 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	15.10	235	Squat Squid 0.10	Dab (Pacific) 8.80
Sidestripe	2.60	85	Squid 0.20	Dover Sole 0.20
Crangons	0.10			Flathead Sole 2.60
				Rex Sole 2.50
				Slender Sole 0.40

Rockfish	Roundfish	Selachii
	Eulachon 32.90	
	Pacific Herring 1.90	
	Walleye Pollock 5.90	
	Pacific Tomcod 0.20	
	Eelpouts 4.30	
	Pacific Hake 9.60	
	Midshipman 0.90	
	Pacific Sardine 0.10	
	Whitebait Smelt 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	9:09	Duration (min)	30	Area	123 - 5	Haul No.	48
Depth	M	94	105	Start Position	48 50.4	125 28.5	Direction	313	
Water Temp:	Surface	10.8	Bottom	Finish Position	48 51.3	125 29.9	Distance	1.3	Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet)					34.9				

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	55.40	252	Sea Mouse	Dab (Pacific) 1.50
Coonstripe	0.10		Squat Squid	Dover Sole 1.70
Sidestripe	6.10	179		English Sole 0.40
Crangons	0.10			Flathead Sole 2.60
				Petrale Sole 0.10
				Rex Sole 3.20
				Turbot 0.80
				Slender Sole 0.80
Rockfish			Roundfish	Selachii
			Eulachon 22.40	Spotted Ratfish 0.60
			Pacific Herring 1.60	
			Walleye Pollock 3.40	
			Pacific Tomcod 0.10	
			Eelpouts 0.40	
			Pacific Hake 0.20	
			Pacific Sardine 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	10 :19	Duration (min)	30	Area	123 - 5	Haul No.	49
Depth	M 98			Start Position	48 53.6	125 32.9	Direction	132	
Water Temp:	Surface	Bottom	9.3	Finish Position	48 52.7	125 31.4	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet)	34.9								
Shrimp		Weight	Num/Kg	Invertebrates		Flatfish			
Smooth Pink	97.90	214		Squat Squid	0.10	Dab (Pacific)	0.10		
Coonstripe	0.10					Dover Sole	3.30		
Sidestripe	19.60		187			Flathead Sole	7.40		
Crangons	0.10					Rex Sole	2.10		
						Turbot	0.10		
						Slender Sole	1.30		
						Sand Sole	0.10		
Rockfish		Roundfish			Selachii				
		Eulachon	24.50		Skates	2.60			
		Pacific Herring	1.20		Spotted Ratfish	5.30			
		Walleye Pollock	8.00						
		Eelpouts	1.80						
		Pacific Hake	0.60						
		Midshipman	1.80						
		Shiner Perch	0.10						

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	11 :28	Duration (min)	30	Area	123 - 5	Haul No.	50
Depth M	93 94			Start Position	48 54.7	125 35.8	Direction		306
Water Temp:	Surface 11.8	Bottom 9.3		Finish Position	48 55.6	125 37.4	Distance	1.5 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	6.70	204	Squat Squid	Dab (Pacific) 6.10
Prawn	0.10		Starfish	Dover Sole 2.60
Sidestripe	4.50	178		English Sole 0.50
				Flathead Sole 2.80
				Petrale Sole 0.40
				Rex Sole 5.70
				Slender Sole 1.30

Rockfish	Yellowtail	3.90	Roundfish	Selachii
			Eulachon 2.70	Skates 3.30
			Pacific Herring 0.40	Spotted Ratfish 12.30
			Walleye Pollock 4.80	
			Pacific Tomcod 0.10	
			Eelpouts 0.30	
			Pacific Hake 1.20	
			Midshipman 2.00	
			Shiner Perch 0.10	
			Pacific Hagfish 0.10	

Date	May 10 1998	Time	12 :33	Duration (min)	30	Area	123 - 5	Haul No.	51
Depth M	83 84			Start Position	48 57.4	125 41.9	Direction		258
Water Temp:	Surface 11.2	Bottom 9.7		Finish Position	48 57.1	125 43.8	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	11.70	224	Anemone 7.00	Dab (Pacific) 21.70
Coonstripe	0.10		Octopus 0.10	Dover Sole 0.80
Sidestripe	0.10		Squat Squid 0.10	English Sole 4.50
Crangons	0.10		Starfish 2.80	Petrale Sole 0.50
			Dungeness Crab 0.70	Rex Sole 6.40
			Seaslugs 0.10	Slender Sole 0.40

Rockfish	Roundfish	Selachii
	Eulachon 2.10	Skates 9.80
	Walleye Pollock 0.80	Spotted Ratfish 3.60
	Pacific Tomcod 23.00	
	Eelpouts 0.30	
	Midshipman 0.80	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	13 :32	Duration (min)	30	Area	123 - 5	Haul No.	52
Depth M	98 100			Start Position	48 55.3	125 42.2	Direction	257	
Water Temp:	Surface 12.3	Bottom 9.3		Finish Position	48 55.0	125 44.3	Distance	1.4 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	17.70	148	Anemone	Dab (Pacific) 6.70
Sidestripe	0.10		Squat Squid 0.20	Dover Sole 2.50
			Squid 0.10	English Sole 10.50
			Lewismoon Snail 0.60	Flathead Sole 0.30
				Petrale Sole 0.40
				Rex Sole 5.00
				Rock Sole 0.50
				Slender Sole 0.70
Rockfish			Roundfish	Selachii
			Eulachon 5.30	Skates 13.90
			Pacific Herring 0.40	Spotted Ratfish 3.20
			Pacific Cod 1.00	
			Walleye Pollock 1.30	
			Pacific Tomcod 1.50	
			Pacific Hake 10.70	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	14 :21	Duration (min)	30	Area	123 - 5	Haul No.	53
Depth M	95 101			Start Position	48 54.1	125 45.0	Direction	206	
Water Temp:	Surface 12.6	Bottom 9.4		Finish Position	48 53.0	125 45.8	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Anemone 14.10	Dab (Pacific) 17.70
Sidestripe	0.10		Squat Squid 0.20	Dover Sole 9.50
Crangons	0.10		Starfish 0.60	English Sole 6.50
			Dungeness Crab 2.80	Rex Sole 25.10
			Decorator Crab 0.10	Slender Sole 0.10
			Hermit Crabs 0.10	
			Seaslugs 0.10	
Rockfish			Roundfish	Selachii
			Eulachon 1.90	Spotted Ratfish 0.20
			Pacific Herring 0.60	
			Lingcod 0.50	
			Walleye Pollock 1.20	
			Pacific Tomcod 5.80	
			Eelpouts 0.10	
			Pacific Hake 0.20	
			Midshipman 0.10	
			Poachers 0.10	
			Shiner Perch 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 11 1998	Time	9 :30	Duration (min)	30	Area	124 -	Haul No.	59
Depth	M 129 132			Start Position	48 47.7	126	11.2	Direction	325
Water Temp:	Surface	Bottom	7.1	Finish Position	48 48.7	126	12.3	Distance	1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars	0.10 Dab (Pacific) 16.50
Crangons	0.10		Urchins	2.90 Dover Sole 11.10
			Jellyfish	0.10 Flathead Sole 0.80
			Squat Squid	0.10 Petrale Sole 1.40
			Squid	0.10 Rex Sole 38.70
			Starfish	0.20 Turbot 9.70
			Hermit Crabs	0.10 Slender Sole 13.60
Rockfish			Roundfish	Selachii
Darkblotched	1.70		Eulachon	0.60 Spiny Dogfish 0.10
			Pacific Herring	1.60 Skates 11.90
			Lingcod	1.80
			Walleye Pollock	0.30
			Sablefish	0.70
			Eelpouts	0.10
			Pacific Hake	3.00

Date	May 11 1998	Time	12 :55	Duration (min)	23	Area	124 -	Haul No.	62	
Depth	M 161 161			Start Position	48 46.6	126	16.1	Direction	272	
Water Temp:	Surface	12.3	Bottom	6.8	Finish Position	48 47.7	126	16.9	Distance	0.5 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16	
Net Effective Opening (feet) 34.9										

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Cucumbers	0.10 Rex Sole 0.10
			Jellyfish	0.10 Turbot 5.90
			Squat Squid	0.10 Slender Sole 3.80
			Starfish	0.10
Rockfish			Roundfish	Selachii
Yellowtail	310.10		Eulachon	0.10 Spiny Dogfish 34.60
Darkblotched	51.70		Pacific Herring	23.00 Spotted Ratfish 0.50
Greenstriped	1.30		Lingcod	1.10
Redstripe	0.80		Eelpouts	0.10
Sharpchin	2.80		Pacific Hake	0.90

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 11 1998 **Time** 14:02 **Duration (min)** 17 **Area** 124 - **Haul No.** 63
Depth M 159 161 Start Position 48 49.8 126 18.7 Direction 319
Water Temp: Surface 12.4 Bottom 6.9 Finish Position 48 50.3 126 19.4 Distance 0.6 Naut. Mi.
Type of Gear 2H Total Catch
Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Urchins 4.70	Dover Sole 14.70
				Flathead Sole 0.10
				Rex Sole 18.60
				Turbot 22.90
				Slender Sole 4.00
Rockfish				
Yellowtail	10.00		Roundfish	Selachii
Darkblotched	1.70		Pacific Herring 3.50	Spiny Dogfish 86.40
Greenstriped	0.80		Sablefish 2.30	
Sharpchin	0.50		Pacific Hake 814.50	

Date May 11 1998 **Time** 17:03 **Duration (min)** 30 **Area** 124 - **Haul No.** 66
Depth M 119 120 Start Position 48 53.9 126 14.8 Direction 151
Water Temp: Surface Bottom 7.3 Finish Position 48 52.8 126 13.8 Distance 1.2 Naut. Mi.
Type of Gear 2H Total Catch
Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Brittle Stars 0.10	Dab (Pacific) 11.70
			Urchins 1.80	Dover Sole 16.10
			Heart Urchin 0.30	Flathead Sole 0.70
			Squat Squid 0.10	Petrle Sole 1.00
			Squid 0.10	Turbot 0.70
			Starfish 0.10	Slender Sole 5.20
Rockfish			Roundfish	Selachii
Darkblotched	0.10		Eulachon 0.10	Spiny Dogfish 3.60
			Pacific Herring 10.80	Skates 19.30
			Pacific Cod 0.90	
			Walleye Pollock 0.20	
			Pacific Hake 1.20	
			Poachers 0.10	
			Shiner Perch 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	12:44	Duration (min)	30	Area	124 - 0	Haul No.	73
Depth M	130 134			Start Position	48 58.3	126 21.4	Direction	114	
Water Temp:	Surface 12.2	Bottom	7.1	Finish Position	48 57.8	126 19.8	Distance	1.1 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	33.00	243	Brittle Stars	0.10 Dab (Pacific) 1.90
Prawn	0.20		Heart Urchin	1.90 Dover Sole 1.50
Crangons	0.10		Squat Squid	0.10 Flathead Sole 3.70
			Squid	0.10 Petrale Sole 1.20
				Rex Sole 5.10
				Turbot 4.50
				Pacific Halibut 7.30
				Slender Sole 7.30
Rockfish			Roundfish	Selachii
Rougheye	0.20		Eulachon	0.90 Spiny Dogfish 187.40
Darkblotched	4.80		Pacific Herring	11.70 Skates 0.80
			Lingcod	8.70 Spotted Ratfish 2.50
			Walleye Pollock	0.40
			Pacific Hake	5.70
			Poachers	0.10

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	13 :46	Duration (min)	25	Area	124 - 0	Haul No.	74
Depth	M 119 119			Start Position	48 57.9	126 16.7	Direction	327	
Water Temp:	Surface	Bottom	7.5	Finish Position	48 58.7	126 17.5	Distance	1 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
			Heart Urchin	423.70	Dab (Pacific)	9.50
			Scallop	0.10	Dover Sole	5.50
			Squid	0.10	English Sole	1.00
			Starfish	32.80	Flathead Sole	4.60
			Hermit Crabs	0.10	Petrale Sole	3.70
					Rex Sole	16.60
					Turbot	2.10
					Slender Sole	37.10
Rockfish			Roundfish		Selachii	
Darkblotched	2.20		Eulachon	0.10	Spiny Dogfish	3.40
			Pacific Herring	25.50	Skates	18.00
			Walleye Pollock	6.00	Spotted Ratfish	3.00
			Sablefish	1.20		
			Pacific Hake	27.50		
			Poachers	3.00		
			Pricklebacks	0.10		

Date	May 12 1998	Time	14 :50	Duration (min)	15	Area	124 - 0	Haul No.	75
Depth	M 129 129			Start Position	49 0.0	126 21.3	Direction	310	
Water Temp:	Surface	Bottom	7.3	Finish Position	49 0.6	126 22.0	Distance	0.7 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
Smooth Pink	0.10		Brittle Stars	0.10	Dover Sole	0.60
			Squat Squid	0.10	English Sole	0.20
			Squid	0.10	Flathead Sole	0.20
					Rex Sole	1.10
					Turbot	3.10
					Pacific Halibut	10.60
					Slender Sole	1.70
Rockfish			Roundfish		Selachii	
Darkblotched	2.00		Eulachon	0.10	Spiny Dogfish	1.80
			Pacific Cod	0.30		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 13 1998	Time	9 :00	Duration (min)	30	Area	124 - 0	Haul No.	80
Depth	M 143 130			Start Position	49 3.3	126 32.9	Direction	309	
Water Temp:	Surface	Bottom	7.3	Finish Position	49 4.1	126 34.4	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Squat Squid	Dab (Pacific)
				1.30
				Dover Sole
				1.10
				Flathead Sole
				3.10
				Turbot
				2.90
				Slender Sole
				0.70
Rockfish			Roundfish	Selachii
Yellowtail	3.60		Eulachon	Spiny Dogfish
Widow	1.90		Pacific Herring	16.50
			Lingcod	
			Walleye Pollock	
			Sablefish	
			Eelpouts	

Date	May 13 1998	Time	11 :06	Duration (min)	30	Area	124 - 0	Haul No.	82
Depth	M 122 124			Start Position	49 5.6	126 28.2	Direction	133	
Water Temp:	Surface	Bottom	7.5	Finish Position	49 4.8	126 26.8	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Cucumbers	Dab (Pacific)
			Squat Squid	0.10
			Squid	0.10
				Flathead Sole
				Petrale Sole
				Rex Sole
				Turbot
				Slender Sole
Rockfish			Roundfish	Selachii
			Eulachon	Spiny Dogfish
			Lingcod	13.50
			Walleye Pollock	
			Pacific Hake	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 13 1998	Time	12 :41	Duration (min)	30	Area	124 - 0	Haul No.	83
Depth	M 114 118			Start Position	49 5.8	126 25.7	Direction	245	
Water Temp:	Surface	Bottom	7.6	Finish Position	49 5.2	126 23.9	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Heart Urchin 1.40	Dab (Pacific) 12.10
			Jellyfish 0.20	Flathead Sole 4.90
			Squat Squid 0.10	Rex Sole 9.50
			Squid 0.10	Turbot 4.60
			Starfish 0.30	Slender Sole 4.40
			Sea Whip 0.10	
Rockfish			Roundfish	Selachii
Yellowtail	32.10		Eulachon 0.90	Spiny Dogfish 10.50
			Pacific Herring 2.40	Skates 3.50
			Lingcod 2.60	
			Pacific Cod 2.40	
			Walleye Pollock 1.20	
			Pacific Tomcod 0.20	
			Eelpouts 0.10	
			Pacific Hake 7.20	

Date	May 13 1998	Time	13 :44	Duration (min)	30	Area	124 - 0	Haul No.	84
Depth	M 97 98			Start Position	49 7.8	126 24.0	Direction	328	
Water Temp:	Surface 12.0	Bottom 7.9		Finish Position	49 8.9	126 25.0	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch	596	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Brittle Stars 0.40	Dab (Pacific) 25.50
			Urchins 0.20	Dover Sole 3.90
			Anemone 0.30	English Sole 5.40
			Scallop 0.10	Petrale Sole 0.90
			Squid 0.10	Rex Sole 16.20
			Starfish 0.30	Turbot 0.30
				Slender Sole 4.20

Rockfish			Roundfish	Selachii
			Eulachon 0.10	
			Pacific Herring 1.80	
			Lingcod 14.70	
			Pacific Tomcod 6.50	
			Pacific Hake 0.30	
			Whitebait Smelt 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 13 1998	Time	14 :45	Duration (min)	30	Area	124 - 0	Haul No.	85
Depth	M 110 112			Start Position	49 7.4	126 26.8	Direction		321
Water Temp:	Surface	Bottom	7.7	Finish Position	49 8.5	126 28.1	Distance		1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Brittle Stars 0.10	Dab (Pacific) 7.50
			Heart Urchin 0.10	Dover Sole 3.60
			Squid 0.10	Flathead Sole 0.90
			Starfish 0.10	Petrale Sole 0.30
				Rex Sole 7.60
				Turbot 2.30
				Slender Sole 4.30
Rockfish			Roundfish	Selachii
Darkblotched	0.10		Eulachon 0.10	Spiny Dogfish 14.50
			Pacific Herring 0.10	Skates 2.70
			Lingcod 8.10	
			Walleye Pollock 0.30	
			Pacific Tomcod 1.40	
			Pacific Hake 6.80	

Date	May 13 1998	Time	15 :48	Duration (min)	30	Area	124 - 0	Haul No.	86
Depth	M 117 119			Start Position	49 7.1	126 29.2	Direction		323
Water Temp:	Surface	12.0	Bottom	7.7	Finish Position	49 8.1	126 30.4	Distance	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		1.3 Naut. Mi.
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars 0.10	Dab (Pacific) 6.90
Crangons	0.10		Urchins 0.40	Dover Sole 2.00
			Heart Urchin 0.10	Flathead Sole 1.40
			Cucumbers 0.40	Rex Sole 7.80
			Anemone 0.10	Slender Sole 4.10
			Sea Mouse 0.20	
			Jellyfish 0.10	
			Starfish 0.10	
			Seaslugs 0.10	
Rockfish			Roundfish	Selachii
			Eulachon 0.30	Spiny Dogfish 9.40
			Lingcod 6.20	Skates 5.20
			Walleye Pollock 0.60	
			Pacific Tomcod 0.50	
			Pacific Hake 3.50	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 13 1998	Time	16 :50	Duration (min)	30	Area	124 - 0	Haul No.	87
Depth M	121 125			Start Position	49	6.7	126 31.9	Direction	334
Water Temp:	Surface	Bottom	7.6	Finish Position	49	8.0	126 32.8	Distance	1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars	0.10 Dab (Pacific) 15.10
Crangons	0.10		Urchins	0.10 Dover Sole 1.40
			Jellyfish	0.10 Flathead Sole 1.10
			Squat Squid	0.10 Petrale Sole 0.60
			Squid	0.10 Rex Sole 8.70
			Starfish	0.30 Turbot 1.70
				Slender Sole 7.00
Rockfish			Roundfish	Selachii
			Eulachon	0.20 Spiny Dogfish 5.00
			Pacific Herring	0.10 Skates 0.60
			Walleye Pollock	0.10

Date	May 14 1998	Time	6 :08	Duration (min)	30	Area	124 - 0	Haul No.	88
Depth M	128 135			Start Position	48	6.2	126 37.7	Direction	129
Water Temp:	Surface	Bottom	7.2	Finish Position	48	5.4	126 36.2	Distance	1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Argis	0.10		Brittle Stars	21.30 Dab (Pacific) 14.00
Crangons	0.10		Cucumbers	0.10 Dover Sole 8.60
			Squat Squid	0.10 Flathead Sole 0.70
			Starfish	1.70 Rex Sole 6.10
				Turbot 1.10
				Slender Sole 14.20
Rockfish			Roundfish	Selachii
			Eulachon	0.90 Spiny Dogfish 9.30
			Pacific Herring	0.50 Skates 0.70
			Lingcod	7.10
			Walleye Pollock	0.10
			Pacific Tomcod	0.50
			Pacific Hake	0.10

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	9 :44	Duration (min)	30	Area	124 - 0	Haul No.	91																																																																	
Depth M	110	125		Start Position	49 10.6	126 32.7	Direction	126																																																																		
Water Temp: Surface		Bottom	7.9	Finish Position	49 9.8	126 31.1	Distance	1.3 Naut. Mi.																																																																		
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16																																																																		
Net Effective Opening (feet)	34.9																																																																									
Shrimp		Weight	Num/Kg																																																																							
Smooth Pink		0.90	236																																																																							
<table border="0"> <tr> <td colspan="4"></td> <td>Invertebrates</td> <td colspan="4">Flatfish</td> </tr> <tr> <td colspan="4"></td> <td>Brittle Stars</td> <td>0.10</td> <td>Dab (Pacific)</td> <td>4.60</td> </tr> <tr> <td colspan="4"></td> <td>Heart Urchin</td> <td>0.10</td> <td>Dover Sole</td> <td>0.10</td> </tr> <tr> <td colspan="4"></td> <td>Cucumbers</td> <td>0.30</td> <td>Flathead Sole</td> <td>0.70</td> </tr> <tr> <td colspan="4"></td> <td>Jellyfish</td> <td>0.10</td> <td>Rex Sole</td> <td>3.70</td> </tr> <tr> <td colspan="4"></td> <td>Squat Squid</td> <td>0.10</td> <td>Turbot</td> <td>0.10</td> </tr> <tr> <td colspan="4"></td> <td>Squid</td> <td>0.10</td> <td>Slender Sole</td> <td>2.20</td> </tr> <tr> <td colspan="4"></td> <td>Decorator Crab</td> <td>0.10</td> <td></td> <td></td> </tr> </table>														Invertebrates	Flatfish								Brittle Stars	0.10	Dab (Pacific)	4.60					Heart Urchin	0.10	Dover Sole	0.10					Cucumbers	0.30	Flathead Sole	0.70					Jellyfish	0.10	Rex Sole	3.70					Squat Squid	0.10	Turbot	0.10					Squid	0.10	Slender Sole	2.20					Decorator Crab	0.10		
				Invertebrates	Flatfish																																																																					
				Brittle Stars	0.10	Dab (Pacific)	4.60																																																																			
				Heart Urchin	0.10	Dover Sole	0.10																																																																			
				Cucumbers	0.30	Flathead Sole	0.70																																																																			
				Jellyfish	0.10	Rex Sole	3.70																																																																			
				Squat Squid	0.10	Turbot	0.10																																																																			
				Squid	0.10	Slender Sole	2.20																																																																			
				Decorator Crab	0.10																																																																					
Rockfish				Roundfish		Selachii																																																																				
				Lingcod	1.30	Spiny Dogfish	6.40																																																																			
				Walleye Pollock	0.10																																																																					
				Pacific Tomcod	2.30																																																																					
				Pacific Hake	0.20																																																																					

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	16 :21	Duration (min)	30	Area	124 - 0	Haul No.	97
Depth M	113 109			Start Position	49 15.1	126 40.8	Direction		79
Water Temp: Surface		Bottom		Finish Position	49 15.3	126 39.1	Distance		1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)	34.9								
Shrimp		Weight	Num/Kg	Invertebrates		Flatfish			
Argis		0.10		Brittle Stars	0.10	Dab (Pacific)			32.90
Crangons		0.10		Urchins	0.20	Dover Sole			13.60
				Heart Urchin	0.10	English Sole			9.40
				Cucumbers	2.30	Flathead Sole			0.50
				Anemone	0.90	Rex Sole			28.60
				Sea Mouse	0.30	Turbot			0.20
				Squat Squid	0.10	Slender Sole			15.30
				Scallop	0.20				
				Starfish	4.80				
				Hermit Crabs	0.10				
				Lewis Moon Snail	0.10				
Rockfish				Roundfish		Selachii			
				Eulachon	0.10	Spiny Dogfish			13.10
				Pacific Herring	0.40	Skates			3.80
				Pacific Cod	0.10	Spotted Ratfish			0.40
				Pacific Tomcod	3.50				
				Eelpouts	0.70				
				Poachers	0.10				
				Shiner Perch	0.10				
Date	May 16 1998	Time	15 :57	Duration (min)	24	Area	124 - 0	Haul No.	119
Depth M	217 221			Start Position	49 12.5	126 59.9	Direction		139
Water Temp: Surface		Bottom	6.3	Finish Position	49 11.7	126 58.9	Distance		1.1 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)	34.9								
Shrimp		Weight	Num/Kg	Invertebrates		Flatfish			
						Dover Sole			1.10
						Rex Sole			1.10
						Turbot			78.10
						Slender Sole			0.50
Rockfish				Roundfish		Selachii			
Yellowtail	3.70			Walleye Pollock	2.50	Spiny Dogfish			18.70
Canary	2.10			Sablefish	2.70	Spotted Ratfish			0.10
Pacific Ocean	4.80								
Silvergray	4.80								
Darkblotched	3.00								
Redstripe	0.60								

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 16 1998	Time	18 :04	Duration (min)	30	Area	124 - 0	Haul No.	120
Depth M	132			Start Position	49 15.4	126 50.0	Direction	156	
Water Temp: Surface		Bottom	7.1	Finish Position	49 14.5	126 49.4	Distance	1.1 Naut. Mi.	
Type of Gear	2H		Total Catch	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars	0.10 Dab (Pacific) 7.00
Crangons	0.10		Urchins	0.30 Dover Sole 3.70
			Cucumbers	0.10 English Sole 2.70
			Jellyfish	0.10 Flathead Sole 0.10
			Squat Squid	0.10 Rex Sole 22.00
			Starfish	0.20 Turbot 3.60
			Box Crabs	0.50 Slender Sole 13.10

Rockfish	Roundfish	Selachii
Pacific Ocean	Eulachon	
Darkblotched	Pacific Herring	
Redstripe	Lingcod	
	Walleye Pollock	
	Eelpouts	
	Pacific Hake	
	Poachers	

Date	May 10 1998	Time	16 :42	Duration (min)	31	Area	124 - 1	Haul No.	54
Depth M	89 93			Start Position	48 43.8	126 0.8	Direction	303	
Water Temp: Surface		Bottom	8.3	Finish Position	48 44.4	126 2.3	Distance	1.2 Naut. Mi.	
Type of Gear	2H		Total Catch	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Brittle Stars	0.10 Dab (Pacific) 87.80
			Squat Squid	0.10 Dover Sole 626.00
			Starfish	1.40 English Sole 21.80
				Petrale Sole 0.30
				Rex Sole 45.30
				Slender Sole 0.50

Rockfish	Roundfish	Selachii
	Pacific Herring	
	Pacific Tomcod	
		Skates
		12.30

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 10 1998	Time	18 : 06	Duration (min)	30	Area	124 - 1	Haul No.	55
Depth M	106 110			Start Position	48 43.2	126	4.4 Direction	314	
Water Temp: Surface		Bottom	8.8	Finish Position	48 44.0	126	5.6 Distance	1.1 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Sea Mouse	0.10 Dab (Pacific) 62.90
			Starfish	1.70 Dover Sole 14.10
			Lewis Moon Snail	0.20 English Sole 20.40
				Petrale Sole 0.30
				Rex Sole 17.00
				Turbot 0.10
				Pacific Halibut 14.70
				Slender Sole 0.80
Rockfish			Roundfish	Selachii
Yellowtail	9.10		Pacific Herring	0.70 Spiny Dogfish 16.80
			Lingcod	4.10 Skates 5.10
			Pacific Cod	7.60
			Pacific Tomcod	0.20

Date	May 11 1998	Time	6 : 10	Duration (min)	30	Area	124 - 2	Haul No.	56
Depth M	144 146			Start Position	48 47.8	126	14.8 Direction	142	
Water Temp: Surface		Bottom	6.9	Finish Position	48 46.9	126	13.8 Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	155.4	323	Brittle Stars	0.10 Dab (Pacific) 0.90
			Urchins	9.30 Dover Sole 44.20
			Cucumbers	0.40 English Sole 0.40
			Octopus	0.70 Flathead Sole 2.20
			Squat Squid	0.70 Petrale Sole 0.50
			Starfish	0.10 Rex Sole 27.80
				Turbot 33.40
				Slender Sole 15.40
Rockfish			Roundfish	Selachii
Yellowtail	59.00		Eulachon	2.10 Spiny Dogfish 24.80
Redbanded	0.10		Lingcod	9.00 Skates 8.90
Darkblotched	22.60		Sablefish	2.00 Spotted Ratfish 0.50
Greenstriped	6.30		Pacific Hake	17.30
			Poachers	0.10

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 11 1998	Time	7 :10	Duration (min)	30	Area	124 - 2	Haul No.	57
Depth M	130 136	Start Position	48	46.1	126	11.6	Direction	124	
Water Temp:	Surface 12.1 Bottom 7.0	Finish Position	48	45.4	126	10.0	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Remark	Usable		Vessel			16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.30	340	Brittle Stars Urchins Heart Urchin Squat Squid Squid	Dab (Pacific) Dover Sole Flathead Sole Petrale Sole Rex Sole Turbot Slender Sole
Rockfish			Roundfish	Selachii
Yellowtail	2.70		Eulachon Pacific Herring Sablefish Eelpouts Pacific Hake Poachers	Spiny Dogfish Skates
Darkblotched	0.40			

Date	May 11 1998	Time	8 :15	Duration (min)	30	Area	124 - 2	Haul No.	58
Depth M	142 149	Start Position	48	44.7	126	11.8	Direction	306	
Water Temp:	Surface 12.1 Bottom 6.8	Finish Position	48	45.5	126	13.5	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Remark	Usable		Vessel			16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars Urchins Cucumbers Squid Box Crabs	Dover Sole Flathead Sole Rex Sole Turbot Dab (Speckled) Pacific Halibut Slender Sole
Rockfish			Roundfish	Selachii
Yellowtail	190.20		Eulachon Lingcod Pacific Cod Walleye Pollock Sablefish Pacific Hake	Spiny Dogfish Skates Spotted Ratfish
Darkblotched	0.10			

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 11 1998	Time	10 :26	Duration (min)	31	Area	124 - 2	Haul No.	60
Depth M	133 134			Start Position	48 49.8	126	13.6	Direction	319
Water Temp:	Surface	Bottom	7.1	Finish Position	48 50.7	126	14.8	Distance	1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Urchins	2.70 Dab (Pacific) 9.90
Crangons	0.10		Heart Urchin	2.30 Dover Sole 15.30
			Cucumbers	0.60 Flathead Sole 0.30
			Jellyfish	0.20 Petrale Sole 0.90
			Squat Squid	0.10 Rex Sole 23.00
			Starfish	0.70 Turbot 23.10
				Slender Sole 9.40

Rockfish	Roundfish	Selachii
Darkblotched	0.30	Eulachon 0.60 Spiny Dogfish 4.00
		Pacific Herring 1.10 Skates 31.80
	Walleye Pollock 0.10	
	Pacific Hake 1.50	
	Sculpins 0.20	
	Pacific Sardine 0.10	

Date	May 11 1998	Time	11 :32	Duration (min)	30	Area	124 - 2	Haul No.	61
Depth M	147 147			Start Position	48 49.9	126	16.9	Direction	141
Water Temp:	Surface	Bottom	6.9	Finish Position	48 49.0	126	15.8	Distance	1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Urchins 1.20 Dab (Pacific) 0.20	
			Squat Squid 0.10 Dover Sole 28.10	
			Squid 0.10 Flathead Sole 0.70	
				Rex Sole 18.10
				Turbot 6.40
				Slender Sole 9.80

Rockfish	Roundfish	Selachii
Darkblotched	1.50	Eulachon 0.40 Spiny Dogfish 8.60
		Pacific Herring 10.50 Skates 1.00
	Sablefish 5.70	Spotted Ratfish 2.80
	Eelpouts 0.10	
	Pacific Hake 11.40	
	Poachers 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 11 1998	Time	14 :57	Duration (min)	30	Area	124 - 2	Haul No.	64
Depth M	143 143			Start Position	48 51.5	126	17.4	Direction	320
Water Temp:	Surface 12.4	Bottom		Finish Position	48 52.3	126	18.5	Distance	1.1 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Heart Urchin	4.00 Dab (Pacific) 3.50
Crangons	0.10		Cucumbers	0.90 Dover Sole 3.80
			Squat Squid	0.10 Flathead Sole 0.90
			Squid	0.10 Petrale Sole 0.60
			Starfish	0.90 Rex Sole 14.40
				Turbot 15.00
				Pacific Halibut 3.90
				Slender Sole 6.10
Rockfish			Roundfish	Selachii
Darkblotched	0.30		Eulachon	0.50 Spiny Dogfish 3.30
Sharpchin	0.10		Pacific Herring	2.40 Skates 1.60
			Lingcod	7.70 Spotted Ratfish 0.50
			Walleye Pollock	0.20
			Sablefish	2.00
			Pacific Hake	52.00
			Poachers	0.10
			Sculpins	0.20

Date	May 11 1998	Time	16 :02	Duration (min)	30	Area	124 - 2	Haul No.	65
Depth M	131 133			Start Position	48 52.5	126	15.9	Direction	310
Water Temp:	Surface	Bottom	6.9	Finish Position	48 53.2	126	17.2	Distance	1.1 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars	0.10 Dab (Pacific) 10.20
Crangons	0.10		Urchins	0.40 Dover Sole 6.10
			Heart Urchin	0.40 Flathead Sole 1.40
			Squat Squid	0.10 Rex Sole 11.60
			Squid	0.10 Turbot 2.70
			Starfish	0.30 Slender Sole 6.40
			Box Crabs	0.40
Rockfish			Roundfish	Selachii
Darkblotched	0.10		Eulachon	0.80 Spiny Dogfish 14.50
			Walleye Pollock	0.90 Skates 0.10
			Sablefish	0.30
			Eelpouts	0.10
			Pacific Hake	1.50

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	6:08	Duration (min)	30	Area	124 - 2	Haul No.	67
Depth	M 101 105			Start Position	48 53.4	126 10.4	Direction	316	
Water Temp:	Surface	Bottom	8.8	Finish Position	48 54.2	126 11.7	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Urchins 1.20	Dab (Pacific) 18.60
			Cucumbers 0.50	Dover Sole 5.90
			Sea Mouse 0.10	English Sole 23.70
			Jellyfish 0.10	Petrale Sole 0.90
			Squat Squid 0.10	Rex Sole 25.20
			Squid 0.10	Slender Sole 3.90
			Starfish 1.10	
			Lewis Moon Snail 0.20	
Rockfish			Roundfish	Selachii
Yellowtail	2.10		Pacific Herring 3.60	Skates 1.00
			Pacific Cod 0.10	
			Walleye Pollock 0.10	
			Pacific Tomcod 2.50	
			Shiner Perch 0.50	
			Pacific Sardine 0.10	
			Whitebait Smelt 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	7 :13	Duration (min)	30	Area	124 - 2	Haul No.	68
Depth	M 115 118			Start Position	48 55.2	126 14.7	Direction	297	
Water Temp:	Surface	Bottom	7.8	Finish Position	48 55.7	126 16.3	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet)	34.9								

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Prawn	0.10		Urchins	2.20 Dab (Pacific) 16.80
Crangons	0.10		Heart Urchin	0.40 Dover Sole 5.40
			Squat Squid	0.10 English Sole 0.80
			Squid	0.10 Flathead Sole 1.20
			Starfish	0.40 Petrale Sole 0.60
			Hermit Crabs	0.10 Rex Sole 11.90
				Turbot 1.70
				Pacific Halibut 3.90
				Slender Sole 8.90
Rockfish			Roundfish	Selachii
Darkblotched	0.10		Eulachon 0.10 Spiny Dogfish 7.00	
			Pacific Herring 0.40 Skates 1.50	
			Walleye Pollock 0.50 Spotted Ratfish 0.10	
			Pacific Tomcod 0.10	
			Eelpouts 0.10	
			Pacific Hake 2.20	
			Poachers 0.10	
			Sculpins 0.10	
			Shiner Perch 0.10	
			Chinook Salmon 2.80	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	8 :10	Duration (min)	30	Area	124 - 2	Haul No.	69
Depth	M 127 131			Start Position	48 54.9	126	17.6	Direction	317
Water Temp:	Surface	Bottom	8.1	Finish Position	48 55.8	126	18.8	Distance	1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Urchins	0.10 Dab (Pacific) 9.70
Prawn	0.10		Heart Urchin	3.70 Dover Sole 0.90
Crangons	0.10		Cucumbers	1.30 Flathead Sole 1.60
			Sea Mouse	0.10 Rex Sole 7.60
			Jellyfish	0.10 Turbot 3.10
			Squat Squid	0.30 Slender Sole 9.60
			Squid	0.10
			Starfish	0.50
Rockfish			Roundfish	Selachii
Yellowtail	0.10		Eulachon	0.70 Skates 3.30
Darkblotched	0.20		Pacific Herring	0.10 Spotted Ratfish 0.20
			Lingcod	14.90
			Walleye Pollock	1.00
			Sablefish	0.30
			Eelpouts	0.10
			Pacific Hake	2.20
			Poachers	0.10

Date	May 12 1998	Time	9 :12	Duration (min)	30	Area	124 - 2	Haul No.	70
Depth	M 140 142			Start Position	48 56.7	126	22.6	Direction	312
Water Temp:	Surface	Bottom	6.8	Finish Position	48 57.5	126	24.0	Distance	1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.60		Urchins	1.20 Dover Sole 25.20
			Cucumbers	2.70 Flathead Sole 6.00
			Jellyfish	0.10 Rex Sole 17.00
			Starfish	6.20 Turbot 15.80
			Hermit Crabs	0.10 Slender Sole 18.40
Rockfish			Roundfish	Selachii
Yellowtail	27.40		Eulachon	1.80 Spiny Dogfish 610.60
Darkblotched	1.90		Pacific Herring	0.60 Skates 10.90
			Eelpouts	0.10
			Pacific Hake	168.00

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	10 : 15	Duration (min)	30	Area	124 - 2	Haul No.	71
Depth M	146 149			Start Position	48 59.0	126 26.8	Direction		308
Water Temp: Surface		Bottom	6.7	Finish Position	48 59.7	126 28.3	Distance		1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Prawn	0.40	32	Urchins	Dover Sole
			Cucumbers	Flathead Sole
			Starfish	Rex Sole
				Turbot
				Slender Sole
Rockfish				
Yellowtail	4.80		Roundfish	Selachii
Greenstriped	1.30		Eulachon	Spiny Dogfish
			Pacific Cod	Skates
			Sablefish	Spotted Ratfish
			Pacific Hake	
			Poachers	

Date	May 12 1998	Time	11 : 20	Duration (min)	30	Area	124 - 2	Haul No.	72
Depth M	138 140			Start Position	49 0.3	126 25.6	Direction		
Water Temp: Surface		Bottom	6.8	Finish Position	48 59.7	126 24.2	Distance		1.1 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	2.40	225	Urchins	Dab (Pacific)
			Heart Urchin	Dover Sole
			Cucumbers	Flathead Sole
			Squat Squid	Rex Sole
			Starfish	Turbot
Rockfish				Slender Sole
Yellowtail	3.30		Roundfish	Selachii
Redbanded	0.20		Eulachon	Spiny Dogfish
Darkblotched	0.60		Pacific Herring	Skates
			Sablefish	Spotted Ratfish
			Pacific Hake	
			Poachers	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 12 1998	Time	15 :40	Duration (min)	30	Area	124 - 3	Haul No.	76
Depth M	115 119			Start Position	49 3.3	126 22.5	Direction	118	
Water Temp: Surface		Bottom	7.6	Finish Position	49 2.7	126 20.9	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Heart Urchin	0.40 Dab (Pacific) 6.00
			Squat Squid	0.20 Dover Sole 2.80
			Scallop	0.10 Flathead Sole 0.80
			Squid	0.10 Petrale Sole 1.20
			Starfish	0.10 Rex Sole 5.30
				Pacific Halibut 6.00
				Slender Sole 5.00
Rockfish			Roundfish	Selachii
Darkblotched	0.80		Eulachon	0.10 Spiny Dogfish 9.10
			Pacific Herring	4.90 Skates 2.20
			Pacific Cod	14.00 Spotted Ratfish 0.10
			Walleye Pollock	0.60
			Pacific Tomcod	0.20
			Pacific Hake	3.70
			Pacific Sardine	0.10
			Dwarf Wrymouths	0.10

Date	May 12 1998	Time	16 :56	Duration (min)	30	Area	124 - 3	Haul No.	77
Depth M	126 127			Start Position	49 3.0	126 24.5	Direction	137	
Water Temp: Surface		Bottom	7.2	Finish Position	49 2.0	126 23.2	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Heart Urchin	3.40 Dab (Pacific) 8.90
			Squat Squid	0.20 Dover Sole 5.30
			Starfish	0.10 Flathead Sole 8.90
			Hermit Crabs	0.10 Petrale Sole 0.20
				Rex Sole 8.00
				Turbot 16.20
				Slender Sole 17.60
Rockfish			Roundfish	Selachii
Yellowtail	25.20		Eulachon	0.40 Spiny Dogfish 10.80
Rougheye	0.10		Pacific Herring	2.60 Skates 4.50
			Lingcod	14.70 Spotted Ratfish 2.60
			Walleye Pollock	1.00
			Pacific Hake	5.00
			Chub Mackerel	0.50

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 13 1998	Time	6 :09	Duration (min)	30	Area	124 - 3	Haul No.	78
Depth	M 135 135			Start Position	49 2.7	126 27.2	Direction	145	
Water Temp:	Surface	Bottom	7.1	Finish Position	49 1.7	126 26.1	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	3.80	235	Urchins 0.20	Dover Sole 5.60
Crangons	0.10		Heart Urchin 7.00	Flathead Sole 5.40
			Cucumbers 0.20	Rex Sole 11.70
			Sea Mouse 0.10	Turbot 31.40
			Jellyfish 0.10	Slender Sole 44.30
			Squat Squid 0.10	
			Starfish 0.50	
			Hermit Crabs 0.10	
Rockfish			Roundfish	Selachii
Yellowtail	15.30		Eulachon 4.70	Spiny Dogfish 20.90
			Pacific Herring 0.40	Skates 27.50
			Lingcod 19.40	Spotted Ratfish 0.10
			Walleye Pollock 0.40	
			Sablefish 0.40	
			Poachers 0.10	
			Chinook Salmon 1.90	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 13 1998	Time	7 :27	Duration (min)	30	Area	124 - 3	Haul No.	79
Depth M	142 143			Start Position	49 1.8	126 29.6	Direction	142	
Water Temp: Surface		Bottom	7.0	Finish Position	49 0.7	126 28.3	Distance	1.4 Naut. Mi.	
Type of Gear	2H		Total Catch	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	9.50	243	Urchins	Dover Sole	2.40
			Cucumbers	Flathead Sole	5.40
			Squid	Rex Sole	8.30
				Turbot	19.40
				Pacific Halibut	6.00
				Slender Sole	7.10
Rockfish			Roundfish	Selachii	
Yellowtail	10.70		Eulachon	Spiny Dogfish	13.50
			Pacific Herring	Skates	11.30
			Lingcod	Spotted Ratfish	0.10
			Sablefish		
			Eelpouts		
			Pacific Hake		
			Poachers		
			Pacific Sardine		

Date	May 13 1998	Time	9 :58	Duration (min)	30	Area	124 - 3	Haul No.	81
Depth M	130 134			Start Position	49 4.7	126 32.4	Direction	133	
Water Temp: Surface		Bottom	7.4	Finish Position	49 3.9	126 31.1	Distance	1.2 Naut. Mi.	
Type of Gear	2H		Total Catch	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	7.10	302	Brittle Stars	Dab (Pacific)	3.00
			Squid	Dover Sole	3.60
			Starfish	English Sole	0.30
				Flathead Sole	4.20
				Rex Sole	5.50
				Slender Sole	4.30
Rockfish			Roundfish	Selachii	
			Eulachon	Spiny Dogfish	10.70
			Pacific Herring		
			Walleye Pollock		
			Sablefish		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	7:24	Duration (min)	30	Area	124 - 3	Haul No.	89	
Depth	M	121	121	Start Position	49	8.8	126 37.7	Direction	292	
Water Temp:	Surface	11.5	Bottom	7.3	Finish Position	49	9.3	126 39.6	Distance	1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16	
Net Effective Opening (feet) 34.9										

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Brittle Stars	Dab (Pacific) 8.00
			Jellyfish	Dover Sole 2.90
			Squat Squid	Rex Sole 10.20
			Squid	Turbot 0.20
			Starfish	Slender Sole 7.40
Rockfish			Roundfish	Selachii
			Eulachon	Spiny Dogfish 15.30
			Lingcod	
			Walleye Pollock	
			Eelpouts	
			Pacific Hake	

Date	May 14 1998	Time	8:45	Duration (min)	30	Area	124 - 3	Haul No.	90	
Depth	M	116	115	Start Position	49	9.5	126 33.4	Direction	308	
Water Temp:	Surface	11.5	Bottom	7.5	Finish Position	49	10.3	126 35.0	Distance	1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable	Vessel			16	
Net Effective Opening (feet) 34.9										

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	88.10	300	Brittle Stars	Dab (Pacific) 17.90
Crangons	0.10		Urchins	Dover Sole 4.30
			Heart Urchin	Flathead Sole 3.60
			Cucumbers	Petrale Sole 0.30
			Sea Mouse	Rex Sole 12.80
			Squat Squid	Turbot 0.60
			Starfish	Slender Sole 18.20
Rockfish			Roundfish	Selachii
			Eulachon	Spiny Dogfish 4.90
			Lingcod	Skates 5.60
			Eelpouts	Spotted Ratfish 0.10
			Pacific Hake	
			Poachers	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 14 1998 **Time** 10:51 **Duration (min)** 30 **Area** 124 - 3 **Haul No.** 92
 Depth M 101 103 Start Position 49 10.5 126 29.0 Direction 311
 Water Temp: Surface Bottom Finish Position 49 11.3 126 30.5 Distance 1.3 Naut. Mi.
 Type of Gear 2H Total Catch Remark Usable Vessel 16
 Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates		Flatfish	
Prawn	0.10		Anemone	0.20	Dab (Pacific)	16.90
			Jellyfish	0.20	Dover Sole	0.10
			Squid	0.20	English Sole	5.20
			Starfish	0.10	Petrale Sole	0.90
			Basket Stars	0.20	Rex Sole	16.10
			Redclaw Crab	0.10	Turbot	2.20
			Lewis Moon Snail	0.30	Pacific Halibut	5.10
			Sea Whip	0.10	Slender Sole	6.80
Rockfish			Roundfish		Selachii	
Yellowtail	4.10		Eulachon	0.10	Spotted Ratfish	
			Pacific Herring	0.10		0.50
			Lingcod	13.80		
			Pacific Tomcod	4.70		
			Eelpouts	0.10		
			Pacific Hake	2.00		
			Poachers	0.10		
			Shiner Perch	0.10		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	12 :12	Duration (min)	30	Area	124 - 3	Haul No.	93
Depth M	106 108			Start Position	49 12.7	126 33.5	Direction		309
Water Temp:	Surface	Bottom		Finish Position	49 13.5	126 35.1	Distance		1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Argis	0.10		Urchins	Dab (Pacific)	39.30
Crangons	0.10		Cucumbers	Dover Sole	15.50
			Anemone	English Sole	9.80
			Sea Mouse	Flathead Sole	1.00
			Squat Squid	Petrale Sole	0.90
			Scallop	Rex Sole	31.60
			Squid	Turbot	2.70
			Starfish	Slender Sole	21.60
			Basket Stars		
			Hermit Crabs		
Rockfish			Roundfish	Selachii	
			Eulachon	Skates	11.70
			Pacific Herring	Spotted Ratfish	1.90
			Lingcod		
			Walleye Pollock		
			Pacific Tomcod		
			Sablefish		
			Eelpouts		
			Pacific Hake		
			Shiner Perch		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	13 :06	Duration (min)	30	Area	124 - 3	Haul No.	94
Depth M	112 113			Start Position	49 12.9	126 36.7	Direction	133	
Water Temp:	Surface	Bottom		Finish Position	49 12.1	126 35.5	Distance	1.1 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Brittle Stars 0.10	Dab (Pacific) 32.20
			Urchins 0.30	Dover Sole 4.70
			Cucumbers 11.30	English Sole 0.20
			Anemone 2.00	Flathead Sole 1.60
			Sea Mouse 1.40	Rex Sole 22.30
			Squat Squid 0.10	Turbot 0.20
			Scallop 0.10	Slender Sole 24.90
			Squid 0.10	
			Starfish 1.40	
			Basket Stars 0.20	
			Hermit Crabs 0.10	
			Sea Whip 0.10	
Rockfish			Roundfish	Selachii
			Eulachon 0.40	Spiny Dogfish 4.90
			Pacific Herring 0.20	Spotted Ratfish 0.20
			Lingcod 12.10	
			Pacific Cod 0.10	
			Pacific Tomcod 0.40	
			Eelpouts 0.30	
			Pacific Hake 0.10	
			Poachers 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	14 :08	Duration (min)	31	Area	124 - 3	Haul No.	95
Depth	M	117	117	Start Position	49 11.7	126 38.1	Direction	325	
Water Temp:	Surface		Bottom	Finish Position	49 12.9	126 39.4	Distance	1.5 Naut. Mi.	
Type of Gear	2H		Total Catch	Remark	Usable		Vessel	16	
Net Effective Opening (feet)		34.9							

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Argis	0.10		Brittle Stars	0.10	Dab (Pacific) 26.50
Crangons	0.10		Heart Urchin	0.10	Dover Sole 8.60
			Cucumbers	1.20	English Sole 1.00
			Sea Mouse	0.20	Flathead Sole 27.60
			Bivalves	0.10	Rex Sole 20.40
			Jellyfish	0.10	Slender Sole 0.90
			Squat Squid	0.10	
			Starfish	1.00	
			Basket Stars	0.10	
Rockfish			Roundfish		Selachii
			Eulachon	0.10	Spiny Dogfish 3.40
			Lingcod	4.50	Skates 1.30
			Walleye Pollock	1.60	Spotted Ratfish 0.10
			Pacific Tomcod	0.20	
			Sablefish	0.10	
			Eelpouts	0.30	
			Pacific Hake	1.90	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	15 :13	Duration (min)	30	Area	124 - 3	Haul No.	96
Depth	M	115		Start Position	49 12.2	126 41.5	Direction		96
Water Temp:	Surface		Bottom	Finish Position	49 12.1	126 39.8	Distance	1.1 Naut. Mi.	
Type of Gear	2H		Total Catch	Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish		
Argis		0.10	Brittle Stars Heart Urchin Cucumbers Sea Mouse Jellyfish Squat Squid Scallop Starfish Basket Stars Box Crabs Lewismoon Snail	0.10 0.10 0.10 0.40 0.10 0.10 0.10 13.80 0.10 0.40 0.10	Dab (Pacific) Dover Sole English Sole Rex Sole Slender Sole	31.50 0.60 5.40 52.30 13.40
Rockfish			Roundfish		Selachii	
Canary		2.10	Eulachon	0.70	Spiny Dogfish	
Greenstriped		0.20	Pacific Herring	0.20	Skates	
			Walleye Pollock	0.60	Spotted Ratfish	
			Pacific Tomcod	0.10		
			Eelpouts	0.10		
			Pacific Hake	0.10		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 14 1998	Time	18 :06	Duration (min)	15	Area	124 - 4	Haul No.	98
Depth M	110 112			Start Position	49 14.7	126 41.9	Direction	106	
Water Temp: Surface		Bottom	7.2	Finish Position	49 14.5	126 41.0	Distance	0.6 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Brittle Stars Cucumbers Anemone Jellyfish Squat Squid Squid Starfish Basket Stars Hermit Crabs	Dab (Pacific) Dover Sole Flathead Sole Rex Sole Slender Sole
Rockfish				
Greenstriped	0.10		Eulachon	Spiny Dogfish
Yelloweye	6.60		Pacific Herring Walleye Pollock Pacific Tomcod Eelpouts Pacific Hake Sculpins	Spotted Ratfish
			Roundfish	Selachii

Date	May 15 1998	Time	6 :09	Duration (min)	30	Area	125 - 0	Haul No.	99
Depth M	118 121			Start Position	49 17.6	126 47.5	Direction	298	
Water Temp: Surface		Bottom	7.4	Finish Position	49 18.2	126 49.2	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable	Vessel		16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Cucumbers Anemone Squat Squid Starfish Basket Stars	Dab (Pacific) Dover Sole Flathead Sole Rex Sole Slender Sole
Rockfish				
Yellowtail	11.30		Eulachon	Spiny Dogfish
Canary	352.20		Pacific Herring	
Silvergray	107.00		Lingcod	
Bocaccio	73.80		Walleye Pollock	
Yelloweye	5.30			
			Roundfish	Selachii

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 15 1998 **Time** 7:13 **Duration (min)** 30 **Area** 125 - 0 **Haul No.** 100
 Depth M 128 132 Start Position 49 17.3 126 50.6 Direction 309
 Water Temp: Surface 11.7 Bottom 7.2 Finish Position 49 18.1 126 52.1 Distance 1.3 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Crangons	0.10		Jellyfish 0.10	Dab (Pacific) 4.40
			Squat Squid 0.10	Dover Sole 1.30
			Basket Stars 0.10	Flathead Sole 0.30
				Rex Sole 2.60
				Turbot 1.60
				Pacific Halibut 5.00
				Slender Sole 3.60

Rockfish	Roundfish	Selachii
	Eulachon 0.30	
	Pacific Herring 2.90	
	Lingcod 7.10	
	Walleye Pollock 1.30	
	Pacific Hake 0.40	

Date May 15 1998 **Time** 8:13 **Duration (min)** 30 **Area** 125 - 0 **Haul No.** 101
 Depth M 142 144 Start Position 49 17.7 126 54.8 Direction 294
 Water Temp: Surface Bottom 7.1 Finish Position 49 18.3 126 56.8 Distance 1.4 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Jellyfish 0.10	Dab (Pacific) 1.90
			Squat Squid 0.10	Flathead Sole 2.40
			Squid 0.10	Rex Sole 3.50
			Starfish 0.10	Turbot 5.60
			Basket Stars 0.10	Slender Sole 4.90

Rockfish	Roundfish	Selachii
Yellowtail 0.80	Eulachon 2.60	
Canary 1.60	Walleye Pollock 0.40	
Darkblotched 0.10	Sablefish 0.30	
	Pacific Hake 31.90	
	Scorpions 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 15 1998	Time	9 :25	Duration (min)	30	Area	125 - 0	Haul No.	102
Depth M	153 152			Start Position	49 16.5	126 56.6	Direction		296
Water Temp: Surface		Bottom	7.0	Finish Position	49 17.0	126 58.3	Distance		1.3 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	13.30	323	Jellyfish	Dover Sole
			Squat Squid	Flathead Sole
				Rex Sole
				Turbot
				Slender Sole
Rockfish			Roundfish	Selachii
			Eulachon	Spiny Dogfish
			Pacific Herring	
			Lingcod	6.10
			Walleye Pollock	
			Eelpouts	
			Pacific Hake	
			Sculpins	
			American Shad	

Date	May 15 1998	Time	10 :26	Duration (min)	30	Area	125 - 5	Haul No.	103
Depth M	138 144			Start Position	49 18.9	127 0.2	Direction		293
Water Temp: Surface		Bottom	7.5	Finish Position	49 19.4	127 2.2	Distance		1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable		Vessel		16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	1.30	352	Jellyfish	Dab (Pacific)
Crangons	0.10		Squat Squid	Dover Sole
			Starfish	Petrale Sole
			Basket Stars	Rex Sole
				Turbot
Rockfish			Roundfish	Selachii
			Eulachon	Spiny Dogfish
			Pacific Herring	
			Walleye Pollock	5.30
			Pacific Hake	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 15 1998	Time	12 :07	Duration (min)	30	Area	125 - 5	Haul No.	104
Depth	M 143 145			Start Position	49 19.5	126 55.3	Direction	300	
Water Temp:	Surface 11.0	Bottom	7.1	Finish Position	49 20.2	126 57.0	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Cucumbers	Dab (Pacific)
				Dover Sole
				Flathead Sole
				Turbot
				Slender Sole
Rockfish				
Darkblotched	10.40		Roundfish	Selachii
			Eulachon	Spiny Dogfish
			Sablefish	
			Pacific Hake	4.60

Date	May 15 1998	Time	13 :21	Duration (min)	30	Area	125 - 5	Haul No.	105
Depth	M 137 139			Start Position	49 20.1	126 53.6	Direction	305	
Water Temp:	Surface	Bottom	7.1	Finish Position	49 20.8	126 55.2	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars	Dab (Pacific)
Crangons	0.10		Heart Urchin	Dover Sole
			Cucumbers	Flathead Sole
			Squat Squid	Rex Sole
				Turbot
				Pacific Halibut
				Slender Sole
Rockfish				
Darkblotched	0.20		Roundfish	Selachii
			Eulachon	Spiny Dogfish
			Pacific Herring	Skates
			Lingcod	
			Walleye Pollock	0.30
			Eelpouts	
			Pacific Hake	
			Pacific Sardine	

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars	Dab (Pacific)
Crangons	0.10		Heart Urchin	Dover Sole
			Cucumbers	Flathead Sole
			Squat Squid	Rex Sole
				Turbot
				Pacific Halibut
				Slender Sole
Rockfish				
Darkblotched	0.20		Roundfish	Selachii
			Eulachon	Spiny Dogfish
			Pacific Herring	Skates
			Lingcod	
			Walleye Pollock	0.30
			Eelpouts	
			Pacific Hake	
			Pacific Sardine	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 15 1998 **Time** 14 :34 **Duration (min)** 30 **Area** 125 - 5 **Haul No.** 106
 Depth M 126 139 Start Position 49 20.1 126 51.4 Direction 317
 Water Temp: Surface Bottom 7.3 Finish Position 49 21.1 126 52.8 Distance 1.3 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Crangons		0.10	Brittle Stars 0.10	Dab (Pacific) 8.30	
			Cucumbers 1.10	Dover Sole 3.30	
			Jellyfish 0.10	Flathead Sole 0.70	
			Squat Squid 0.20	Rex Sole 16.10	
			Starfish 1.50	Turbot 1.50	
				Slender Sole 20.40	
Rockfish			Roundfish	Selachii	
			Eulachon 0.10	Skates 11.80	
			Lingcod 6.30		
			Walleye Pollock 0.10		
			Eelpouts 0.10		
			Pacific Hake 0.20		
			Poachers 0.10		

Date May 15 1998 **Time** 15 :34 **Duration (min)** 30 **Area** 125 - 5 **Haul No.** 107
 Depth M 121 122 Start Position 49 23.5 126 53.4 Direction 322
 Water Temp: Surface Bottom 7.5 Finish Position 49 24.6 126 54.8 Distance 1.5 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
			Cucumbers 0.20	Dab (Pacific) 11.40	
			Jellyfish 0.20	Dover Sole 0.70	
			Squat Squid 0.10	Flathead Sole 1.30	
			Starfish 0.10	Petrale Sole 1.10	
				Rex Sole 8.00	
				Slender Sole 11.40	
Rockfish			Roundfish	Selachii	
			Eulachon 0.10	Spiny Dogfish 9.80	
			Pacific Herring 0.20	Spotted Ratfish 0.90	
			Lingcod 3.50		
			Pacific Cod 0.10		
			Walleye Pollock 0.70		
			Pacific Tomcod 0.20		
			Eelpouts 0.10		
			Pacific Hake 0.50		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 15 1998 **Time** 16 :33 **Duration (min)** 30 **Area** 125 - 5 **Haul No.** 108
Depth M 132 135 Start Position 49 23.6 126 56.4 Direction 150
Water Temp: Surface 11.0 Bottom 7.6 Finish Position 49 22.6 126 56.4 Distance 1.2 Naut. Mi.
Type of Gear 2H Total Catch
Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	0.10		Brittle Stars 0.10	Dab (Pacific) 7.10	
Crangons	0.10		Urchins 0.10	Dover Sole 1.10	
			Squat Squid 0.10	Flathead Sole 2.10	
			Starfish 0.10	Rex Sole 7.50	
				Turbot 5.80	
				Slender Sole 6.80	
Rockfish			Roundfish	Selachii	
Yellowtail	1.50		Eulachon 0.10	Spiny Dogfish 5.30	
			Pacific Herring 0.50		
			Lingcod 1.80		
			Walleye Pollock 0.20		
			Eelpouts 0.10		
			Pacific Hake 6.70		

Date May 15 1998 **Time** 18 :05 **Duration (min)** 30 **Area** 125 - 5 **Haul No.** 109
Depth M 134 139 Start Position 49 22.2 126 57.4 Direction 338
Water Temp: Surface 11.0 Bottom 7.1 Finish Position 49 23.6 126 58.3 Distance 1.5 Naut. Mi.
Type of Gear 2H Total Catch
Net Effective Opening (feet) 34.9 Remark Usable Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	0.40		Urchins 0.40	Dab (Pacific) 1.80	
			Cucumbers 1.90	Dover Sole 0.40	
			Box Crabs 1.60	Flathead Sole 3.40	
				Rex Sole 7.30	
				Turbot 10.70	
				Pacific Halibut 5.20	
				Slender Sole 6.40	
Rockfish			Roundfish	Selachii	
Darkblotched	0.40		Eulachon 1.00	Spiny Dogfish 9.50	
			Pacific Herring 0.60	Spotted Ratfish 1.50	
			Walleye Pollock 0.20		
			Pacific Hake 51.00		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 16 1998	Time	6 :05	Duration (min)	30	Area	125 - 5	Haul No.	110
Depth	M 137 135			Start Position	49 28.5	127	5.7	Direction	136
Water Temp:	Surface	Bottom	7.1	Finish Position	49 27.5	127	4.2	Distance	1.4 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Sea Mouse	0.10 Dab (Pacific) 8.90
			Squat Squid	0.10 Dover Sole 2.90
			Box Crabs	0.30 Rex Sole 7.70
				Turbot 3.70
				Slender Sole 10.30
Rockfish			Roundfish	Selachii
Darkblotched	0.10		Eulachon 2.80 Spiny Dogfish 7.70	
			Pacific Herring 1.80	
			Walleye Pollock 0.40	
			Pacific Hake 0.50	

Date	May 16 1998	Time	7 :05	Duration (min)	30	Area	125 - 5	Haul No.	111
Depth	M 126 125			Start Position	49 27.5	127	1.5	Direction	323
Water Temp:	Surface	Bottom	11.3	Finish Position	49 28.4	127	2.5	Distance	1.1 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Prawn	0.10		Brittle Stars 0.10 Dab (Pacific) 18.40	
			Jellyfish 0.10 Dover Sole 6.40	
			Squat Squid 0.20 Flathead Sole 0.10	
				Petrale Sole 2.10
				Rex Sole 21.80
				Turbot 1.60
				Pacific Halibut 15.10
				Slender Sole 6.60
Rockfish			Roundfish	Selachii
Darkblotched	0.20		Eulachon 0.60 Spiny Dogfish 3.30	
Bocaccio	3.90		Pacific Herring 11.40 Skates 6.40	
			Lingcod 10.50	
			Pacific Cod 0.60	
			Walleye Pollock 0.10	
			Pacific Tomcod 0.10	
			Eelpouts 0.10	
			Pacific Hake 1.60	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 16 1998	Time	8:00	Duration (min)	30	Area	125 - 5	Haul No.	112
Depth M	114 112			Start Position	49 29.3	127	0.2	Direction	130
Water Temp:	Surface	Bottom	7.5	Finish Position	49 28.5	126	58.8	Distance	1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Brittle Stars	Dab (Pacific)
			Jellyfish	Dover Sole
			Squat Squid	Flathead Sole
			Starfish	Petrale Sole
				Rex Sole
				Turbot
				Slender Sole
Rockfish			Roundfish	Selachii
			Pacific Herring	Skates
			Lingcod	Spotted Ratfish
			Walleye Pollock	
			Pacific Tomcod	
			Eelpouts	
			Pacific Hake	

Date	May 16 1998	Time	8:55	Duration (min)	30	Area	125 - 5	Haul No.	113
Depth M	115 114			Start Position	49 26.3	126	56.8	Direction	129
Water Temp:	Surface	Bottom	7.6	Finish Position	49 25.5	126	55.3	Distance	1.2 Naut. Mi.
Type of Gear	2H	Total Catch		Remark	Usable			Vessel	16
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Argis	0.10		Brittle Stars	Dab (Pacific)
			Cucumbers	Dover Sole
			Sea Mouse	English Sole
			Jellyfish	Flathead Sole
			Squat Squid	Petrale Sole
			Squid	Rex Sole
			Starfish	Turbot
Rockfish			Roundfish	Selachii
			Eulachon	Skates
			Pacific Herring	Spotted Ratfish
			Walleye Pollock	
			Pacific Tomcod	
			Eelpouts	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 16 1998	Time	9 :56	Duration (min)	30	Area	125 - 5	Haul No.	114
Depth	M 124 126			Start Position	49 25.1	126 58.0	Direction	291	
Water Temp:	Surface	Bottom	7.3	Finish Position	49 25.5	126 59.8	Distance	1.3 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
			Brittle Stars	0.10 Dab (Pacific) 7.20
			Cucumbers	0.10 Dover Sole 0.30
			Jellyfish	0.10 Flathead Sole 0.30
			Squat Squid	0.10 Petrale Sole 0.70
				Rex Sole 7.30
				Turbot 2.50
				Slender Sole 3.30
Rockfish			Roundfish	Selachii
Darkblotched	0.10		Eulachon 0.60 Spiny Dogfish 10.20	
			Pacific Herring 1.10	
			Lingcod 10.20	
			Walleye Pollock 0.10	
			Eelpouts 0.10	
			Pacific Hake 5.60	

Date	May 16 1998	Time	10 :58	Duration (min)	30	Area	125 - 5	Haul No.	115
Depth	M 131 133			Start Position	49 25.4	127 1.9	Direction	158	
Water Temp:	Surface	Bottom	7.8	Finish Position	49 24.3	127 1.2	Distance	1.2 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish
Smooth Pink	0.10		Brittle Stars 0.30 Dab (Pacific) 17.10	
			Squat Squid 0.20 Dover Sole 4.00	
				Rex Sole 20.80
				Turbot 3.20
				Slender Sole 6.40

Rockfish			Roundfish	Selachii
Sharpchin	0.10		Eulachon 1.30 Skates 6.80	
			Pacific Herring 4.80	
			Lingcod 7.40	
			Walleye Pollock 0.90	
			Eelpouts 0.10	
			Pacific Hake 1.90	
			Pacific Sardine 0.10	

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date May 16 1998 **Time** 12 :40 **Duration (min)** 30 **Area** 125 - 5 **Haul No.** 116
 Depth M 152 153 Start Position 49 20.1 127 4.5 Direction 7
 Water Temp: Surface 11.3 Bottom 7.0 Finish Position 49 21.2 127 4.3 Distance 1.1 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9 Remark Usable
 Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	0.50	416	Brittle Stars	Dab (Pacific)	0.10
Crangons	0.10		Urchins	English Sole	1.60
			Squat Squid	Rex Sole	0.60
				Turbot	2.30
				Pacific Halibut	4.30
				Slender Sole	8.00
Rockfish			Roundfish	Selachii	
			Eulachon	Spiny Dogfish	7.00
			Pacific Herring		
			Lingcod		
			Eelpouts		
			Pacific Hake		
			Poachers		

Date May 16 1998 **Time** 13 :43 **Duration (min)** 29 **Area** 125 - 5 **Haul No.** 117
 Depth M 153 156 Start Position 49 18.6 127 2.9 Direction 151
 Water Temp: Surface 11.1 Bottom 6.8 Finish Position 49 17.4 127 1.9 Distance 1.3 Naut. Mi.
 Type of Gear 2H Total Catch
 Net Effective Opening (feet) 34.9 Remark Usable
 Vessel 16

Shrimp	Weight	Num/Kg	Invertebrates	Flatfish	
Smooth Pink	0.20		Brittle Stars	Dab (Pacific)	0.10
			Urchins	Pacific Halibut	5.90
			Squat Squid	Slender Sole	1.00
			Starfish		
			Sea Whip		
Rockfish			Roundfish	Selachii	
Canary	2.20		Eulachon	Spiny Dogfish	27.60
Greenstriped	1.50		Pacific Herring		
			Lingcod		
			Pacific Cod		
			Sablefish		

All weights are in Kilograms

Shrimp Biomass Survey, West Coast of Vancouver Island, May, 1998

Date	May 16 1998	Time	14 :42	Duration (min)	30	Area	125 - 5	Haul No.	118
Depth M	160 163			Start Position	49 15.8	126 58.6	Direction	131	
Water Temp:	Surface	Bottom	7.0	Finish Position	49 14.9	126 57.0	Distance	1.4 Naut. Mi.	
Type of Gear	2H	Total Catch		Remark	Usable		Vessel	16	
Net Effective Opening (feet) 34.9									
Shrimp		Weight	Num/Kg	Invertebrates		Flatfish			
Smooth Pink		0.10		Squid	0.10	Dover Sole	0.40		
Eualus		0.10		Sea Whip	0.10	Rex Sole	2.90		
						Turbot	0.90		
						Pacific Halibut	3.70		
						Slender Sole	9.00		
Rockfish				Roundfish		Selachii			
Canary		2.40		Eulachon	5.10	Spiny Dogfish	78.80		
Silvergray		1.30		Pacific Herring	0.90	Skates	4.70		
Darkblotched		0.10		Lingcod	17.80				
Bocaccio		3.70		Pacific Cod	0.70				
				Walleye Pollock	0.10				
				Sablefish	1.00				

All weights are in Kilograms

Appendix 3

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	6 :25	Duration (min)	30	Area	23 - 4	Haul No.	211
Depth M	90 101						Direction	15	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		16.80	304			Jellyfish		Slender Sole	
Prawn		0.90							0.50
Sidestripe		2.10							
Crangons		2.10							
Rockfish						Roundfish		Selachii	
						Eulachon	0.10	Spotted Ratfish	
						Eelpouts	0.50		
						Pacific Hake	2.90		
						Midshipman	0.70		
						Poachers	0.40		
Date	May 9 1998	Time	7 :30	Duration (min)	30	Area	23 - 4	Haul No.	212
Depth M	128 143						Direction	52	
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch	28	Remark	Usable		Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		11.90	212			Jellyfish	0.10	Slender Sole	
Prawn		1.00				Octopus	0.10		
Sidestripe		1.90				Squid	0.10		
Crangons		0.60							
Rockfish						Roundfish		Selachii	
Redstripe		0.40				Eelpouts	1.50	Skates	
						Pacific Hake	1.30	Spotted Ratfish	
						Midshipman	2.40		
						Poachers	0.10		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	8 :45	Duration (min)	30	Area	23 - 4	Haul No.	213
Depth	M 95 124						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch	49	Remark	Usable		Vessel	20092	
Net Effective Opening (feet) 46.0									
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Smooth Pink	34.30	275		Jellyfish		0.60	English Sole		0.70
Prawn	3.00			Squat Squid		0.20	Turbot		1.00
Sidestripe	0.90	156					Slender Sole		2.00
Crangons	1.00								
Rockfish				Roundfish			Selachii		
				Walleye Pollock		0.70	Spotted Ratfish		3.50
				Eelpouts		0.70			
				Pacific Hake		1.60			
				Midshipman		0.80			
				Poachers		0.50			
				Sculpins		0.20			
Date	May 9 1998	Time	9 :50	Duration (min)	3	Area	23 - 4	Haul No.	214
Depth	M 128 128						Direction		
Water Temp:	Surface	Bottom					Distance	Naut. Mi.	
Type of Gear	PH	Total Catch	0	Remark	Snagged - Usable		Vessel	20092	
Net Effective Opening (feet) 46.0									
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Rockfish				Roundfish			Selachii		

Date	May 9 1998	Time	10 :35	Duration (min)	30	Area	23 - 4	Haul No.	215
Depth	M 115 144						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch	43	Remark	Usable		Vessel	20092	
Net Effective Opening (feet) 46.0									
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Smooth Pink	11.70	228		Jellyfish		0.10	Turbot		4.20
Prawn	1.20			Squat Squid		0.20			
Sidestripe	15.30	117							
Rockfish				Roundfish			Selachii		
				Eelpouts		0.40	Spotted Ratfish		5.90
				Pacific Hake		2.70			
				Midshipman		1.00			
				Poachers		0.30			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	14 :20	Duration (min)	30	Area	23 - 5	Haul No.	207
Depth M	86 90						Direction		
Water Temp:	Surface	Bottom					Distance	0.7 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet) 46.0									
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Smooth Pink	9.20	382		Cucumbers	1.90		Rex Sole		0.20
Prawn	0.50			Bivalves	0.10				
Sidestripe	0.20			Squat Lobster	0.10				
Rockfish				Roundfish			Selachii		
				Eulachon	0.20				
				Walleye Pollock	0.30				
				Eelpouts	0.10				
				Pacific Hake	0.10				
				Midshipman	0.20				

Date	May 9 1998	Time	12 :25	Duration (min)	30	Area	23 - 5	Haul No.	216
Depth M	86 90						Direction		
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch	38	Remark	Usable		Vessel	20092	
Net Effective Opening (feet) 46.0									
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Smooth Pink	25.90	173		Jellyfish	0.40		Flathead Sole		3.00
Prawn	0.30						Turbot		0.70
Sidestripe	0.30								
Crangons	0.10								
Rockfish				Roundfish			Selachii		
Redstripe	0.20			Eulachon	1.00				
				Pacific Herring	0.10				
				Sablefish	0.50				
				Eelpouts	2.00				
				Pacific Hake	2.90				
				Midshipman	0.50				
				Sculpins	0.20				
				Northern Anchovy	0.40				
				Dwarf Wrymouths	0.30				

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	13 : 40	Duration (min)	30	Area	23 - 5	Haul No.	217
Depth M	84 93						Direction		
Water Temp:	Surface	Bottom					Distance	0.7 Naut. Mi.	
Type of Gear	PH	Total Catch	40	Remark	Usable	Vessel	20092		
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish		
Smooth Pink	33.40	262		Jellyfish	0.30		Rex Sole	0.20	
Prawn	0.20						Turbot	0.50	
Sidestripe	0.10						Slender Sole	0.30	
Crangons	3.70								
Rockfish				Roundfish			Selachii		
				Eulachon	0.50				
				Eelpouts	0.40				
				Pacific Hake	0.80				
				Whitebait Smelt	0.10				
Date	May 8 1998	Time	18 : 22	Duration (min)	33	Area	23 - 5	Haul No.	310
Depth M	75 79						Direction	206	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable	Vessel	22101		
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish		
Smooth Pink	33.10	210		Squat Squid	0.40		Dab (Pacific)	0.10	
Pinks (Flexed)	0.10			Squid	0.90		Flathead Sole	0.20	
Crangons	0.40						Rex Sole	0.10	
							Slender Sole	0.50	
Rockfish				Roundfish			Selachii		
				Eulachon	0.40				
				Walleye Pollock	0.30				
				Eelpouts	0.40				
				Pacific Hake	0.10				
				Midshipman	0.50				
				Shiner Perch	0.10				

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	8:47	Duration (min)	31	Area	23 - 5	Haul No.	313
Depth M	110 119						Direction	42	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch			Remark	Usable	Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp	Weight	Num/Kg			Invertebrates		Flatfish		
Smooth Pink	19.70	104			Jellyfish		Slender Sole		0.10
Prawn	2.50				Octopus				
Sidestripe	1.20	83							
Crangons	0.50								
Glass Shrimp	0.20								
Rockfish					Roundfish		Selachii		
					Walleye Pollock		0.20		
					Eelpouts		0.70		
					Pacific Hake		1.30		
					Midshipman		0.90		
					Poachers		0.20		
Date	May 9 1998	Time	10:00	Duration (min)	30	Area	23 - 5	Haul No.	314
Depth M	128 137						Direction	326	
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch			Remark	Usable	Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp	Weight	Num/Kg			Invertebrates		Flatfish		
Smooth Pink	9.60	112			Jellyfish		Dab (Pacific)		0.10
Prawn	2.90						Slender Sole		1.00
Sidestripe	7.50	85							
Crangons	0.10								
Glass Shrimp	0.10								
Rockfish					Roundfish		Selachii		
					Eelpouts		0.40		
					Pacific Hake		2.30		
					Midshipman		1.00		
					Poachers		0.40		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	12 : 21	Duration (min)	32	Area	23 - 5	Haul No.	315
Depth M	88 91						Direction	332	
Water Temp:	Surface	Bottom					Distance	0.4 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg				Invertebrates		Flatfish
Smooth Pink		34.50	137				Jellyfish		Dab (Pacific) 0.10
Prawn		0.40							Flathead Sole 0.20
Sidestripe		0.40							Slender Sole 0.20
Crangons		0.10							
Rockfish							Roundfish		Selachii
							Eulachon 0.10		
							Walleye Pollock 0.50		
							Eelpouts 0.40		
							Pacific Hake 0.10		
							Midshipman 0.20		
Date	May 8 1998	Time	17 : 03	Duration (min)	30	Area	23 - 5	Haul No.	409
Depth M	95 95						Direction	225	
Water Temp:	Surface	Bottom					Distance	0.4 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg				Invertebrates		Flatfish
Smooth Pink		11.90	206				Jellyfish		Dab (Pacific) 0.10
Sidestripe		1.10	136						Flathead Sole 0.10
Crangons		0.10							Slender Sole 0.10
Eualus		0.10							
Rockfish							Roundfish		Selachii
							Eulachon 0.30		
							Walleye Pollock 0.30		
							Eelpouts 0.30		
							Pacific Hake 1.10		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	18 :04	Duration (min)	30	Area	23 - 5	Haul No.	410
Depth M	80 82						Direction	205	
Water Temp:	Surface	Bottom					Distance	0.4 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		13.00	282		Jellyfish	0.20	Flathead Sole		0.10
Crangons		0.10							
Rockfish					Roundfish		Selachii		
					Eulachon	0.10			
					Walleye Pollock	0.10			
					Pacific Tomcod	0.10			
					Eelpouts	0.10			
					Pacific Hake	0.50			
					Midshipman	0.20			
Date	May 8 1998	Time	16 :30	Duration (min)	30	Area	23 - 6	Haul No.	209
Depth M	95 93						Direction		
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		19.10	210						
Sidestripe		3.90	148						
Rockfish					Roundfish		Selachii		
Date	May 8 1998	Time	14 :00	Duration (min)	31	Area	23 - 6	Haul No.	307
Depth M	99 101						Direction	18	
Water Temp:	Surface	Bottom					Distance	0.7 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		14.70	143		Jellyfish	0.20	Dab (Pacific)		0.10
Prawn		0.40			Squat Squid	0.10	Flathead Sole		0.10
Sidestripe		2.60	104				Rex Sole		0.10
Crangons		0.50					Slender Sole		0.30
Rockfish					Roundfish		Selachii		
					Eulachon	0.10			
					Walleye Pollock	1.00			
					Eelpouts	1.20			
					Pacific Hake	2.80			
					Midshipman	0.40			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	15 :12	Duration (min)	31	Area	23 - 6	Haul No.	308
Depth M	84 97						Direction	3	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish		
Smooth Pink	103.3	200		Jellyfish	1.50		Dab (Pacific)	1.90	
Prawn	1.50						English Sole	0.20	
Sidestripe	4.40	133					Flathead Sole	0.30	
Pinks (Flexed)	1.50						Rex Sole	0.20	
Crangons	1.50						Slender Sole	1.80	
Rockfish				Roundfish			Selachii		
				Eulachon	1.50		Spotted Ratfish	0.10	
				Walleye Pollock	0.20				
				Eelpouts	3.00				
				Pacific Hake	0.20				
				Midshipman	2.30				
				Northern Anchovy	1.50				
Date	May 8 1998	Time	16 :46	Duration (min)	34	Area	23 - 6	Haul No.	309
Depth M	93 95						Direction	224	
Water Temp:	Surface	Bottom					Distance	1 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish		
Smooth Pink	28.30	182					Dab (Pacific)	0.40	
Prawn	0.80	30					Flathead Sole	0.20	
Sidestripe	5.40	118					Petrale Sole	0.10	
Crangons	0.40						Rex Sole	0.20	
							Slender Sole	0.80	
Rockfish				Roundfish			Selachii		
				Walleye Pollock	0.40				
				Eelpouts	0.80				
				Pacific Hake	0.70				
				Midshipman	0.60				

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	13 :27	Duration (min)	30	Area	23 - 6	Haul No.	316
Depth M	90 93						Direction	242	
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		26.90	148					Dab (Pacific)	0.30
Prawn		0.40						English Sole	0.30
Sidestripe		0.40						Flathead Sole	0.40
Crangons		0.40						Rex Sole	0.50
								Slender Sole	0.70
Rockfish						Roundfish		Selachii	
						Eulachon	0.40		
						Eelpouts	0.70		
						Pacific Hake	1.30		
						Midshipman	0.70		
Date	May 8 1998	Time	10 :38	Duration (min)	30	Area	23 - 6	Haul No.	404
Depth M	95 97						Direction	30	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		7.50	226			Jellyfish	0.10	Dab (Pacific)	0.30
Sidestripe		0.10						Dover Sole	0.10
Crangons		0.20						Flathead Sole	0.20
								Rex Sole	0.10
								Slender Sole	0.10
Rockfish						Roundfish		Selachii	
						Eulachon	0.30		
						Walleye Pollock	0.80		
						Eelpouts	0.90		
						Pacific Hake	2.20		
						Midshipman	1.00		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May	8	1998	Time	13 : 02	Duration (min)	30	Area	23 - 6	Haul No.	406
Depth	M	93	95					Direction	250		
Water Temp:	Surface		Bottom					Distance	0.6 Naut. Mi.		
Type of Gear	PH		Total Catch			Remark	Usable			Vessel	24254
Net Effective Opening (feet)		48.0									
Shrimp		Weight	Num/Kg			Invertebrates				Flatfish	
Smooth Pink		32.10	264			Jellyfish		0.10		Dab (Pacific)	0.20
Prawn		0.10								Flathead Sole	0.30
Sidestripe		0.10								Rex Sole	0.20
Crangons		0.10								Slender Sole	0.10
Eualus		0.10									
Rockfish						Roundfish				Selachii	
						Eulachon		0.40		Spotted Ratfish	0.20
						Pacific Cod		0.10			
						Walleye Pollock		0.10			
						Pacific Tomcod		0.10			
						Eelpouts		1.00			
						Pacific Hake		2.50			
						Midshipman		0.10			
Date	May	8	1998	Time	14 : 15	Duration (min)	30	Area	23 - 6	Haul No.	407
Depth	M	80	80					Direction	320		
Water Temp:	Surface		Bottom					Distance	0.4 Naut. Mi.		
Type of Gear	PH		Total Catch			Remark	Usable			Vessel	24254
Net Effective Opening (feet)		48.0									
Shrimp		Weight	Num/Kg			Invertebrates				Flatfish	
Smooth Pink		74.70	188							Dab (Pacific)	0.40
Prawn		1.00	39							Flathead Sole	0.30
Sidestripe		1.40	125							Slender Sole	0.20
Yellowleg		0.10									
Bluespot		0.10									
Crangons		0.10									
Eualus		0.10									
Rockfish						Roundfish				Selachii	
						Eulachon		0.20			
						Walleye Pollock		0.10			
						Eelpouts		1.70			
						Pacific Hake		1.50			
						Midshipman		0.20			
						Poachers		0.10			
						Sculpins		0.30			
						Northern Anchovy		0.10			
						Pricklebacks		0.10			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	16:00	Duration (min)	30	Area	23 - 6	Haul No.	408
Depth M	97 99						Direction		
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg				Invertebrates		Flatfish
Smooth Pink		4.80	170				Octopus		English Sole
Prawn		0.10							Turbot
Sidestripe		2.60	198						
Crangons		0.10							
Rockfish							Roundfish		Selachii
							Eulachon	0.10	
							Walleye Pollock	0.10	
							Eelpouts	1.10	
							Pacific Hake	0.70	
							Midshipman	0.40	
							Pricklebacks	0.10	
Date	May 8 1998	Time	7:00	Duration (min)	30	Area	23 - 7	Haul No.	201
Depth M	108 113						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg				Invertebrates		Flatfish
Smooth Pink		15.00	187						Rex Sole
Sidestripe		0.60							Turbot
Rockfish							Roundfish		Selachii
							Eulachon	0.60	Spotted Ratfish
							Pacific Hake	1.70	59.00

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	8:05	Duration (min)	30	Area	23 - 7	Haul No.	202
Depth M	84 82						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
						Jellyfish	0.10		
	Smooth Pink	0.10				Squat Squid	0.10		
	Crangons	0.10							
Rockfish						Roundfish		Selachii	
						Eulachon	0.30		
						Walleye Pollock	1.00		
						Eelpouts	0.10		
						Pacific Hake	0.30		
						Midshipman	0.40		
Date	May 8 1998	Time	9:50	Duration (min)	30	Area	23 - 7	Haul No.	203
Depth M	80 77						Direction		
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
						Squat Squid	0.10		
	Smooth Pink	23.90	417						
	Sidestripe	0.10							
	Crangons	0.10							
Rockfish						Roundfish		Selachii	
						Eulachon	0.10	Spotted Ratfish	0.40
						Walleye Pollock	0.10		
						Eelpouts	0.20		
						Pacific Hake	1.00		
						Midshipman	1.20		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	10 :55	Duration (min)	30	Area	23 - 7	Haul No.	204
Depth M	79 79						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		47.30	387			Squat Squid		Dover Sole	0.30
Prawn		1.90						Rex Sole	0.10
Coonstripe		0.10						Slender Sole	0.10
Crangons		0.10							
Rockfish						Roundfish		Selachii	
						Eulachon	0.10		
						Walleye Pollock	0.20		
						Midshipman	0.10		
Date	May 8 1998	Time	12 :10	Duration (min)	30	Area	23 - 7	Haul No.	205
Depth M	90 90						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		13.40	204			Octopus		Dover Sole	0.30
Prawn		0.10						Rex Sole	0.10
Coonstripe		0.10						Slender Sole	0.10
Sidestripe		0.10							
Crangons		0.10							
Rockfish						Roundfish		Selachii	
						Eulachon	0.10		
						Walleye Pollock	1.00		
						Eelpouts	0.20		
						Pacific Hake	0.50		
						Midshipman	0.40		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	13 : 20	Duration (min)	30	Area	23 - 7	Haul No.	206
Depth M	88 88						Direction		
Water Temp: Surface		Bottom					Distance	0.6 Naut. Mi.	
Type of Gear PH		Total Catch					Vessel	20092	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		15.80	230				Turbot		0.20
Prawn		0.10					Slender Sole		0.10
Coonstripe		0.10							
Sidestripe		0.20							
Crangons		0.10							
Rockfish					Roundfish		Selachii		
					Eulachon	0.40			
					Walleye Pollock	0.40			
					Eelpouts	0.20			
					Pacific Hake	1.90			
					Midshipman	0.50			
Date	May 8 1998	Time	7 : 05	Duration (min)	30	Area	23 - 7	Haul No.	301
Depth M	86 91						Direction	310	
Water Temp: Surface		Bottom					Distance	0.6 Naut. Mi.	
Type of Gear PH		Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		17.00	212		Jellyfish	0.20			
Prawn		0.30	20		Squat Squid	0.20			
Coonstripe		0.20			Squid	0.20			
Sidestripe		0.40							
Crangons		0.20							
Rockfish					Roundfish		Selachii		
					Eulachon	0.90			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	8 :08	Duration (min)	31	Area	23 - 7	Haul No.	302
Depth M	88 93						Direction	10	
Water Temp:	Surface	Bottom					Distance	0.9 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		18.30			Jellyfish	0.30			
Sidestripe		2.70	100		Squat Squid	0.30			
Crangons		0.30							
Rockfish					Roundfish		Selachii		
					Eulachon	0.30			
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		33.80			Squat Squid	0.40	Dab (Pacific)	0.40	
Crangons		0.40					Flathead Sole	0.20	
							Rex Sole	0.30	
							Slender Sole	0.10	
Rockfish					Roundfish		Selachii		
					Eulachon	0.40			
					Eelpouts	0.90			
					Pacific Hake	0.70			
					Midshipman	0.90			
Date	May 8 1998	Time	9 :20	Duration (min)	34	Area	23 - 7	Haul No.	303
Depth M	84 88						Direction	18	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		33.80			Squat Squid	0.40	Dab (Pacific)	0.40	
Crangons		0.40					Flathead Sole	0.20	
							Rex Sole	0.30	
							Slender Sole	0.10	
Rockfish					Roundfish		Selachii		
					Eulachon	0.40			
					Eelpouts	0.90			
					Pacific Hake	0.70			
					Midshipman	0.90			
Date	May 8 1998	Time	10 :35	Duration (min)	32	Area	23 - 7	Haul No.	304
Depth M	80 82						Direction	34	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg		Invertebrates		Flatfish		
Smooth Pink		8.20	205		Jellyfish	0.10	Dab (Pacific)	0.10	
Sidestripe		0.10					Rex Sole	0.10	
Crangons		0.10					Slender Sole	0.10	
Rockfish					Roundfish		Selachii		
					Eulachon	0.10			
					Walleye Pollock	0.20			
					Eelpouts	0.10			
					Pacific Hake	0.20			
					Midshipman	0.10			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	11:47	Duration (min)	34	Area	23 - 7	Haul No.	305
Depth M	95 108						Direction	352	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		13.90	206			Jellyfish		Dab (Pacific)	0.10
Sidestripe		2.20	100					Flathead Sole	0.40
Crangons		0.10						Rex Sole	0.30
								Slender Sole	0.10
Rockfish						Roundfish		Selachii	
						Eulachon	0.10		
						Walleye Pollock	1.20		
						Eelpouts	0.30		
						Pacific Hake	0.60		
						Midshipman	1.00		
Date	May 8 1998	Time	12:52	Duration (min)	32	Area	23 - 7	Haul No.	306
Depth M	90 99						Direction	36	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	22101	
Net Effective Opening (feet)	46.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		46.80	250			Jellyfish	0.50	Dab (Pacific)	0.10
Prawn		3.00	31			Squat Lobster	0.10	Flathead Sole	0.50
Sidestripe		0.10						Rex Sole	0.60
Crangons		0.50						Slender Sole	0.10
Rockfish						Roundfish		Selachii	
						Eulachon	0.80		
						Walleye Pollock	0.50		
						Eelpouts	0.50		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	6:30	Duration (min)	30	Area	23 - 7	Haul No.
Depth M	53 64						Direction	311
Water Temp:	Surface	Bottom					Distance	80
Type of Gear	PH	Total Catch		Remark	Usable	Vessel	0.6 Naut. Mi.	
Net Effective Opening (feet)	46.0					22101		
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish	
Smooth Pink	60.40	172		Jellyfish		0.60	Dab (Pacific)	3.30
Prawn	0.60						English Sole	0.10
Coonstripe	0.60						Flathead Sole	0.10
							Rex Sole	0.10
							Rock Sole	0.10
							Slender Sole	0.10
Rockfish				Roundfish			Selachii	
				Walleye Pollock		0.60	Spotted Ratfish	26.20
				Pacific Hake		0.60		
				Midshipman		0.70		
Date	May 9 1998	Time	7:35	Duration (min)	30	Area	23 - 7	Haul No.
Depth M	75 79						Direction	312
Water Temp:	Surface	Bottom					Distance	53
Type of Gear	PH	Total Catch		Remark	Usable	Vessel	0.5 Naut. Mi.	
Net Effective Opening (feet)	46.0					22101		
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish	
Smooth Pink	14.40	294		Jellyfish		1.00	Dab (Pacific)	0.10
Prawn	0.10						Rex Sole	0.10
Coonstripe	0.10						Slender Sole	0.40
Sidestripe	4.80	114						
Crangons	0.30							
Rockfish				Roundfish			Selachii	
				Eelpouts		0.60	Spiny Dogfish	0.40
				Pacific Hake		1.20	Spotted Ratfish	0.50
				Midshipman		0.40		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May	8	1998	Time	7 : 05	Duration (min)	30	Area	23 - 7	Haul No.	401
Depth	M	88	91					Direction	240		
Water Temp:	Surface		Bottom					Distance	0.7 Naut. Mi.		
Type of Gear	PH		Total Catch			Remark	Usable			Vessel	24254
Net Effective Opening (feet)	48.0										
Shrimp		Weight	Num/Kg			Invertebrates			Flatfish		
Smooth Pink		9.80	360			Squat Squid		0.10	Rex Sole		0.80
Sidestripe		0.40	163						Slender Sole		0.30
Crangons		0.10									
Rockfish						Roundfish			Selachii		
						Eulachon		0.60	Skates		0.10
						Walleye Pollock		0.10	Spotted Ratfish		3.00
						Pacific Tomcod		0.10			
						Eelpouts		0.10			
						Midshipman		0.10			
Date	May	8	1998	Time	8 : 25	Duration (min)	30	Area	23 - 7	Haul No.	402
Depth	M	86	90					Direction	26		
Water Temp:	Surface		Bottom					Distance	0.6 Naut. Mi.		
Type of Gear	PH		Total Catch			Remark	Usable			Vessel	24254
Net Effective Opening (feet)	48.0										
Shrimp		Weight	Num/Kg			Invertebrates			Flatfish		
Smooth Pink		16.40	398			Jellyfish		0.10	Flathead Sole		0.10
Coonstripe		0.10							Rex Sole		0.10
Sidestripe		0.10	160						Slender Sole		0.10
Crangons		0.10									
Rockfish						Roundfish			Selachii		
						Eulachon		0.80			
						Eelpouts		0.10			
						Pacific Hake		0.30			
						Midshipman		0.60			
						Pricklebacks		0.10			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	9 :28	Duration (min)	30	Area	23 - 7	Haul No.	403
Depth M	93 93						Direction	360	
Water Temp:	Surface	Bottom					Distance	0.7 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates	Flatfish		
Smooth Pink		7.80	286			Jellyfish	Flathead Sole		0.30
Sidestripe		0.60	163				Rex Sole		0.20
Crangons		0.10					Slender Sole		0.10
Rockfish						Roundfish	Selachii		
						Eulachon	0.30		
						Walleye Pollock	0.40		
						Eelpouts	0.50		
						Pacific Hake	0.60		
						Midshipman	0.20		
Date	May 8 1998	Time	11 :50	Duration (min)	30	Area	23 - 7	Haul No.	405
Depth M	97 99						Direction	5	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates	Flatfish		
Smooth Pink		12.50	314			Jellyfish	Dab (Pacific)		0.10
Prawn		0.10					Rex Sole		0.10
Sidestripe		0.10					Slender Sole		0.10
Crangons		0.20							
Eualus		0.10							
Rockfish						Roundfish	Selachii		
						Eulachon	0.30		
						Pacific Herring	0.10		
						Walleye Pollock	0.30		
						Eelpouts	0.30		
						Pacific Hake	0.50		
						Midshipman	0.40		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 8 1998	Time	15 : 20	Duration (min)	30	Area	23 - 8	Haul No.	208
Depth M	86 75						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	20092	
Net Effective Opening (feet)		46.0							
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Smooth Pink	29.40	306							
Prawn	0.80								
Sidestripe	0.10								
Crangons	0.10								
Rockfish				Roundfish			Selachii		
				Walleye Pollock	0.10				
				Pacific Hake	1.50				
Date	May 8 1998	Time	17 : 50	Duration (min)	30	Area	23 - 8	Haul No.	210
Depth M	66 59						Direction		
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	20092	
Net Effective Opening (feet)		46.0							
Shrimp	Weight	Num/Kg		Invertebrates			Flatfish		
Smooth Pink	1.10	195		Jellyfish	0.30				
Prawn	0.30								
Crangons	0.10								
Rockfish				Roundfish			Selachii		
				Eulachon	0.10				
				Pacific Herring	0.10				
				Walleye Pollock	0.10				
				Eelpouts	0.30				
				Pacific Hake	0.90				
				Midshipman	0.10				

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	7:25	Duration (min)	30	Area	23 - 11	Haul No.	411
Depth M	55 59						Direction	20	
Water Temp:	Surface	Bottom					Distance	0.8 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		0.10				Jellyfish	0.10	Rex Sole	0.10
Pinks (Flexed)		0.10						Dab (Speckled)	0.20
Crangons		0.10						Rock Sole	0.20
Rockfish						Roundfish		Selachii	
						Walleye Pollock	0.20		
						Pacific Tomcod	0.60		
						Pacific Hake	0.10		
						Midshipman	0.30		
						Shiner Perch	0.60		
Date	May 9 1998	Time	8:35	Duration (min)	30	Area	23 - 11	Haul No.	412
Depth M	57 66						Direction	210	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		1.50	266			Jellyfish	1.40	Dab (Pacific)	0.40
Prawn		0.10				Squat Squid	0.10	Dab (Speckled)	0.20
Coonstripe		0.10				Dungeness Crab	0.90		
Crangons		0.10							
Rockfish						Roundfish		Selachii	
						Pacific Tomcod	0.30		
						Shiner Perch	0.10		
						Pile Perch	0.10		
						Pricklebacks	0.10		

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	9 :30	Duration (min)	30	Area	23 - 11	Haul No.	413
Depth M	59 60						Direction	210	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	24254	
Net Effective Opening (feet) 48.0									
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish		
Smooth Pink		0.10		Jellyfish		0.40	Dab (Pacific)	0.50	
Prawn		0.10					Dab (Speckled)	0.20	
Coonstripe		0.10							
Pinks (Flexed)		0.10							
Crangons		0.10							
Rockfish				Roundfish			Selachii		
				Pacific Tomcod		0.80			
				Pricklebacks		0.10			
Date	May 9 1998	Time	10 :35	Duration (min)	30	Area	23 - 11	Haul No.	414
Depth M	62 69						Direction	103	
Water Temp:	Surface	Bottom					Distance	0.6 Naut. Mi.	
Type of Gear	PH	Total Catch		Remark	Usable		Vessel	24254	
Net Effective Opening (feet) 48.0									
Shrimp		Weight	Num/Kg	Invertebrates			Flatfish		
Coonstripe		0.10		Cucumbers		0.40	Dab (Pacific)	0.30	
Crangons		0.10		Scallop		0.10	Dab (Speckled)	0.20	
				Squid		0.10			
Rockfish				Roundfish			Selachii		
				Walleye Pollock		0.20			
				Pacific Tomcod		0.10			
				Shiner Perch		0.10			

All weights are in Kilograms

Shrimp Biomass Survey, Area 23, May 1998

Date	May 9 1998	Time	11 :35	Duration (min)	30	Area	23 - 11	Haul No.	415
Depth M	79 79						Direction	200	
Water Temp:	Surface	Bottom					Distance	0.5 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		0.80	382						
Sidestripe		0.10							
Crangons		0.10							
Rockfish						Roundfish		Selachii	
Yellowtail		0.20				Eulachon	0.10	Spotted Ratfish	0.80
						Lingcod	0.20		
						Pacific Cod	0.10		
						Walleye Pollock	0.20		
						Shiner Perch	0.10		
Date	May 9 1998	Time	12 :47	Duration (min)	55	Area	23 - 11	Haul No.	416
Depth M	49 75						Direction	20	
Water Temp:	Surface	Bottom					Distance	1 Naut. Mi.	
Type of Gear	PH	Total Catch					Vessel	24254	
Net Effective Opening (feet)	48.0								
Shrimp		Weight	Num/Kg			Invertebrates		Flatfish	
Smooth Pink		0.10						Dab (Pacific)	0.80
Prawn		0.10						Dab (Speckled)	0.20
Pinks (Flexed)		0.10							
Crangons		0.10							
Rockfish						Roundfish		Selachii	
						Pacific Cod	0.10		
						Walleye Pollock	0.10		
						Pacific Tomcod	0.30		
						Midshipman	0.20		
						Shiner Perch	0.30		

All weights are in Kilograms