DISTRIBUTION, ABUNDANCE, COMMUNITY STRUCTURE. AND TROPHIC RELATIONSHIPS OF THE BENTHOS OF THE NORTHEASTERN GULF OF ALASKA FROM YAKUTAT BAY TO CROSS SOUND

by

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TABLE OF CONTENTS

TABLE OF CONTENTS

(Continued)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES

(Continued)

I. SUMMARY OF OBJECTIVES AND CONCLUSIONS

The specific objectives of this investigation were to present: (1) a quantitative inventory of dominant epifaunal invertebrates; (2) a description of spatial distribution patterns of selected epifaunal invertebrates; (3) assess spatial distribution and relative abundance of selected infaunal invertebrate species; and (4) observations of biological interrelationships, emphasizing trophic interactions, between selected segments of the benthic biota.

During 6-25 November, 1979, trawls were made at 42 offshore stations, 33 of which were within an identified high priority area (designated Area 1). Twenty-seven additional offshore stations were surveyed and considered to be untrawlable. A total of 34 van Veen grab stations were sampled; 27 stations in Priority Area 1. Pipe dredge samples were taken from 34 stations, most of which were in Priority Area 1. Dredge samples were mainly used as an aid in identification of stomach contents from various species.

Trawls were made at three stations in Yakutat Bay; eleven additional stations were surveyed and considered to be untrawlable. Grab samples were analyzed from seven stations.

Analysis of the trawl material from offshore stations resulted in a delineation of benthic invertebrates belonging to 10 phyla, 19 classes, 72 families, 100 genera, and 134 species. Yakutat Bay trawl material delineated 4 phyla, 6 classes, 16 families, 19 genera, and 23 species. It is probable that all species with numerical and biomass importance have been collected in the area of investigation and only rare species will be added in future sampling.

Information derived from the grab sampling program indicates that the infauna at most stations was similar to that found in other areas of the northeastern Gulf of Alaska (NEGOA) where there is a soft substrate (Feder and Matheke, 1980). The infauna was dominated by motile deposit-feeding organisms, and the diversity of the fauna was relatively low compared to areas with a more heterogeneous substrate (Feder and Matheke, 1980) .

Information on the feeding biology of 20 species from NEGOA (Cross Sound to Yakutat Bay), in conjunction with data collected on other Outer Continental Shelf Environmental Assessment Program (OCSEAP) cruises, should enhance the understanding of benthic trophic relationships for the Gulf of Alaska.

II. INTRODUCTION

GENERAL NATURE AND SCOPE OF STUDY

Operations associated with oil exploration, production, and transportation in the northeast Gulf of Alaska (NEGOA) present a broad spectrum of potential dangers to the marine environment (see Olson and Burgess, 1967; Malins, 1977 for general discussions of marine pollution problems). Adverse effects on the marine environment of this area cannot be assessed nor predicted, unless background data are recorded prior to industrial development.

Insufficient long-term information about an environment, and the basic biology and recruitment of species in that environment, can lead to erroneous interpretations of changes in species which might occur if the area becomes altered (see Nelson-Smith, 1973; Pearson, 1971, 1972, 1975, 1980; Rosenberg, 1973 for general discussions on benthic biological investigations in industrialized marine areas). Populations of marine species may fluctuate over a time span of from a few to 30 years, but such fluctuations are typically unexplainable because of the absence of long-term ecological data (Lewis, 1970) .

Benthic organisms (primarily the infauna but also sessile and slow-moving epifauna) are useful as indicator species for a disturbed area because they tend to remain in place, typically react to long-range environmental changes, and, by their presence, generally reflect the nature of the substratum. Consequently, organisms of the infaunal benthos are frequently chosen to monitor long-term pollution effects, and are believed to reflect the biological health of a marine area (see Pearson, 1971, 1972, 1975, 1980; Pearson and Rosenberg, 1978; Rosenberg, 1973 for discussions on long-term usage of benthic organisms for monitoring pollution; and Feder and Matheke~ 1980, for data and discussion on the infauna of NEGOA).

The presence of large numbers of epifaunal invertebrates (crabs, shrimps, snails) and finfishes of actual or potential commercial importance in NEGOA further necessitates the understanding of benthic communities since many commercial species feed on infaunal and small epifaunal residents of the benthos (see Zenkevitch, 1963 for a discussion of the interaction of commercial species and the benthos; also see appropriate discussions in Feder and Jewett, 1980a, b; Feder et al., 1980a, b). Changes in density of benthic organisms utilized as food could affect the health and numbers of these commercially-important species.

Experience in pollution-prone areas of England (Smith, 1968); Scotland (Pearson, 1972, 1975, 1980); and California (Straughan, 1971) suggests that at the completion of an initial study, selected stations should be examined regularly on a long-term basis to determine changes in species content, abundance, diversity and biomass. Such long-term data acquisition should make it possible to differentiate between normal ecosystem variation and pollutant-induced biological alteration. Intensive investigations of the benthos of the NEGOA are essential to understand the changes that might take place if oil-related activities are initiated.

The benthic biological program in NEGOA (Jewett and Feder, 1975, unpublished OCSEAP data on file, National Oceanographic Data Center; Feder et al., 1980b) has emphasized the development of an inventory of epifaunal and infaunal species as part of the examination by OCSEAP of the physical, chemical, and biological components of areas slated for oil exploration and drilling activity. In addition, a program designed to quantitatively assess assemblages of infaunal species on the NEGOA shelf has expanded the understanding of patterns of distributions of species there (Feder and Jewett, 1980b; Feder and Matheke, 1980; Matheke et al., 1976). Investigations connected with distribution, abundance, community structure, and trophic relationships of benthic species in Cook Inlet (an embayment of NEGOA) and Kodiak Island waters, have recently been completed (Feder et al., 1980a; Feder and Jewett, 1977, 1980a). Detailed information on the temporal variability of the benthic fauna in NEGOA is sparse.

The project considered in this Final Report was designed to survey the benthic fauna, including feeding interactions, on the shelf of NEGOA

(Yakutat Bay to Cross Sound) in regions of potential oil and gas concentrations. Data were obtained on faunal composition, abundance and biomass to develop baselines to which changes can be compared. Future long-term studies on life histories and trophic interactions of important species should define aspects of communities potentially vulnerable to environmental damage, and should help to assess rates at which damaged environments can recover.

RELEVANCE TO PROBLEMS OF PETROLEUM DEVELOPMENT

Lack of an adequate data base on responses of NEGOA species to oil makes it difficult to predict the effects of oil-related activity on the subtidal benthos of NEGOA. However, OCSEAP-sponsored research activities on the shelf should ultimately point to species or areas that might bear closer scrutiny once industrial activity is initiated. It must be emphasized that an extended time frame is needed to comprehend long-term fluctuations of benthic species; short-term research programs cannot be expected to provide predictive capabilities. Assessment of the environment must be conducted on a continuing basis.

As indicated previously, infaunal organisms tend to remain in place and, consequently, have been useful as indicator species for disturbed areas. Thus, critical examination of stations with substantial complements of infaunal species is warranted (see Feder and Mueller, 1975; Feder and Matheke, 1980; Matheke et al., 1976; NODC data on file for examples of such stations) . Changes in the environment at stations with relatively large numbers of species might be reflected by a decrease in diversity with increased dominance of a few species (see Nelson-Smith, 1973 for further discussion of oil-related changes in diversity). The potential effect of the loss of species from the trophic structure on the NEGOA shelf can be better addressed through the benthic feeding studies from recent OCSEAP projects (Feder and Jewett, 1977, 1978, 1980a, b; Smith et al, 1978).

Data indicating the effect of oil on subtidal benthic invertebrates are accumulating (see Boesch et al. , 1974; Malins, 1977; Nelson-Smith, 1973; Kineman et al., 1980 for reviews; Baker, 1976 for a general review of marine ecology and oil pollution), but virtually no data are available for the

NEGOA shelf. Snow (Tanner) crab (Chionoecetes *bairdi)* are conspicuous members of the shallow shelf of the Gulf of Alaska, and this species supports a commercial fishery of considerable importance. Laboratory experiments with this species have shown that postmolt individuals lose most of their legs after exposure to Prudhoe Bay crude oil (Karinen and Rice, 1974). This aspect of the biology of the snow crab must be considered in the continuing study of this species. Mecklenburg et al. (1976) examined the effects of Cook Inlet crude oil water soluble fractions on survival and molting of king crab (Paralicthodes camtschatica) and coonstripe shrimp *(Pandalus hypsinotus)* larvae. Molting was permanently inhibited by exposing larvae of both species for 72 hours to a concentration of 0.8 to 0.9 ppm of crude oil. Larvae that failed to molt died in seven days, although the contaminated water had been replaced with clean water. Although high concentrations of oil killed larvae in 96 hours, lower concentrations disrupted swimming and molting in the same period and ultimately resulted in death. Little other direct data based on laboratory experiments are available for subtidal benthic species from NEGOA. Experimentation on toxic effects of oil on other common members of the subtidal benthos should be encouraged in future OCSEAP programs.

A direct relationship between trophic structure (feeding type) and bottom stability has been demonstrated by Rhoads (see Rhoads, 1974 for review). A diesel fuel spill resulted in oil becoming absorbed on sediment particles with resultant mortality of many deposit feeders on sublittoral muds. Bottom stability was altered with the death of these organisms, and a new complex of species became established in the altered substratum. The most common members of the infauna of the Gulf of Alaska and the Bering Sea are deposit feeders; thus, oil-related mortality of these species could result in a changed near-bottom sedimentary regime with subsequent alteration of species composition.

As suggested above, upon completion of initial baseline studies in pollution prone areas, selected stations should be examined regularly on a long-term basis. Also, intensive examination of the biology (e.g., age, growth, condition, reproduction, recruitment, feeding habits and altered

physiological and biochemical activity) of selected species should provide indications of environmental alteration, should it occur.

III. CURRENT STATE OF KNOWLEDGE

Little was known about the biology of the invertebrate benthos of the northeast Gulf of Alaska (NEGOA) at the time OCS (Outer Continental Shelf) studies were initiated there. A compilation of some relevant data on the area was presented by Rosenberg (1972). Bakus and Chamberlain (1975) added some benthic biological data for a specific area of NEGOA south of the Bering Glacier; similar data were reported by Feder and Mueller (1975) and Feder and Matheke (1980) in their OCS investigations.

In late 1961 and early 1962 otter trawls were used by the Bureau of Commercial Fisheries (now National Marine Fisheries Service) in conjunction with the International Pacific Halibut Commission to survey the shellfishes and bottomfishes on the continental shelf and upper continental slope, in the Gulf of Alaska (Hitz and Rathjen, 1965). Invertebrates taken in these trawls were of secondary importance and only major groups and/or species were recorded, although they comprised 27 percent of the total catch. These invertebrates were grouped into the following categories: heart urchins (Echinoidea); snow crab *(Chionoecetes bairdi);* sea stars (Asteroidea); Dungeness crab *(Cancer magister);* scallop *(Pecten caurinus);* shrimps *(Pandalus borealis, P. platyceros, Pandalopsis dispar);* king crab *(Paralithodes camtschatica);* and miscellaneous invertebrates (shells, sponges, etc.). Heart urchins accounted for about 50 percent of the invertebrate catch and snow crab ranked second, representing about 22 percent. Approximately 20 percent of the total catch of invertebrates was composed of sea stars. Additional data on commercially important shellfish are available in Ronholt et al. (1976).

Ronholt et al. (1978) presented a historical review of the demersal fish and shellfish resources of the Gulf of Alaska from Cape Spencer to Unimak Pass (1948-1976). The International Pacific Halibut Commission conducts surveys in the Gulf of Alaska annually and records selected commercially-important invertebrates; noncommercial species are not considered.

The benthic investigations of Feder and Matheke (1980), Feder and Mueller (1975), Jewett and Feder (1976) and Matheke et al. (1976) were the first intensive qualitative and quantitative examinations of the benthic infauna and epifauna of the Gulf of Alaska. These studies also represented the first examinations of trophic relationships involving some of the species in the area.

The present report represents an extension of the above NEGOA investigations eastward to a region where invertebrates have not been properly assessed. A determination of the distribution, relative abundance, and biomass of benthic infauna and epifauna, as well as observations on food habits of selected species, is presented.

Iv. STUDY AREA

Sampling was conducted in the region of the northeastern Gulf of Alaska from Icy Bay to Cross Sound, extending outward to approximately the 300 m isobath. Stations were established on a grid (Fig. 1), which was an eastward extension of the stations used by Jewett and Feder (1975, unpublished OCSEAP data on file, National Oceanographic Data Center). The area surrounding each station, usually a rectangle 11 x 14 km, was designated as the station block. If bottom conditions prevented trawling at the predesignated station location, a trawl was attempted from any suitable location within the block. Special attention was given to stations within the proposed sale lease area No. 55 (Priority Area 1) (Fig. 2) and to a limited number of stations in Yakutat Bay (Fig. 3). Those stations peripheral to northwest and southwest of the lease area (Priority Area 2) were of secondary importance (Fig. 2). The stations of least importance were located in the region toward Cross Sound (Priority Area 3) (Fig. 2).

A second grid system was constructed for Yakutat Bay (Fig. 3). North-south lines at every five minutes of longitude were established. Stations were located along each of these lines at every 2.5 minutes of latitude. On alternate longitudinal lines, stations were shifted by 1.25 minutes of latitude from those of adjacent lines. For example, the mid-point of Station IA was located at 59°41.0'N and 140°12.5'W. The surrounding station blocks were approximately 4.7 x 4.6 km.

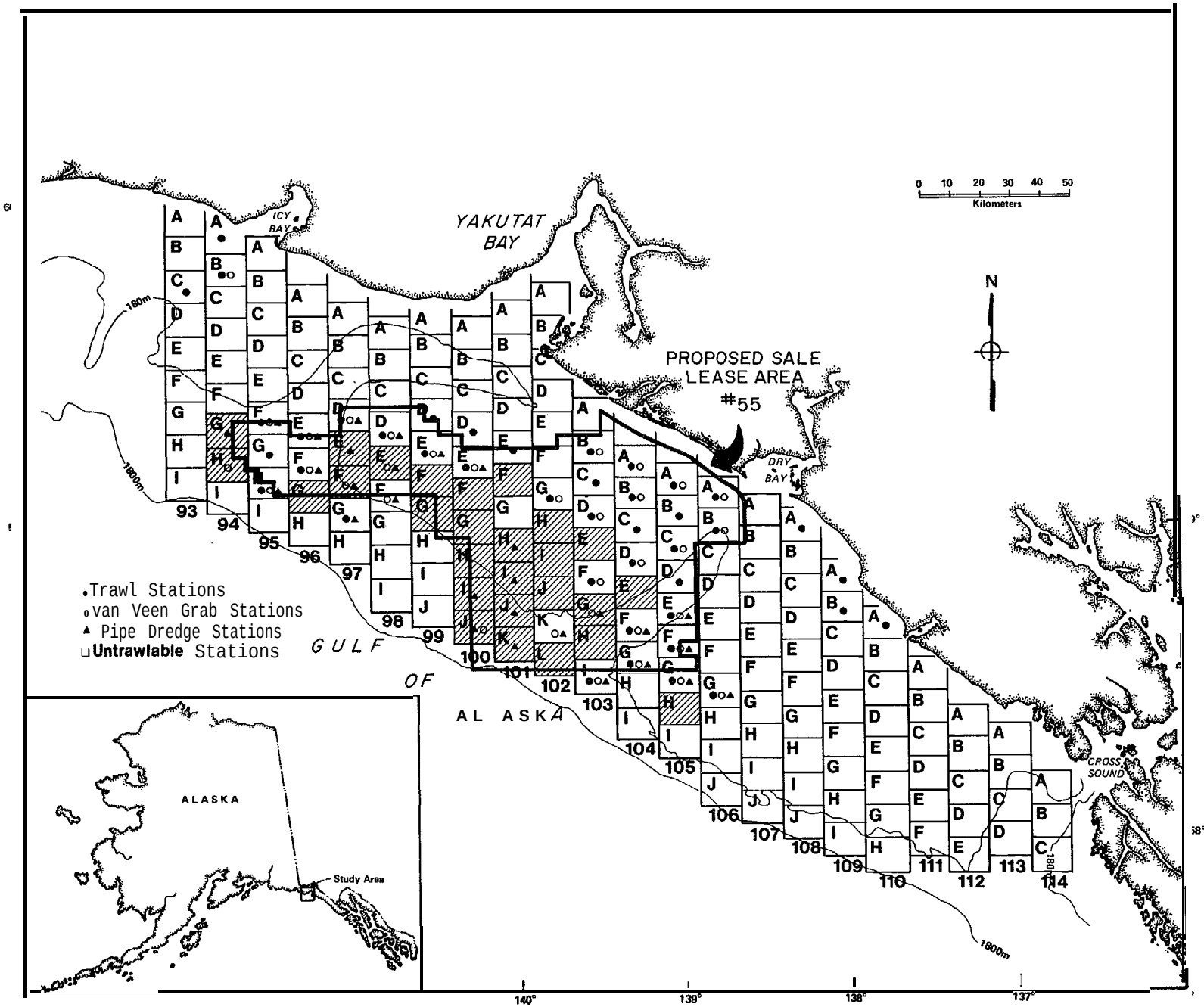

Figure 1. Northeastern Gulf of Alaska station grid occupied by the NOAA ship *Miller Freeman*, November 1979.

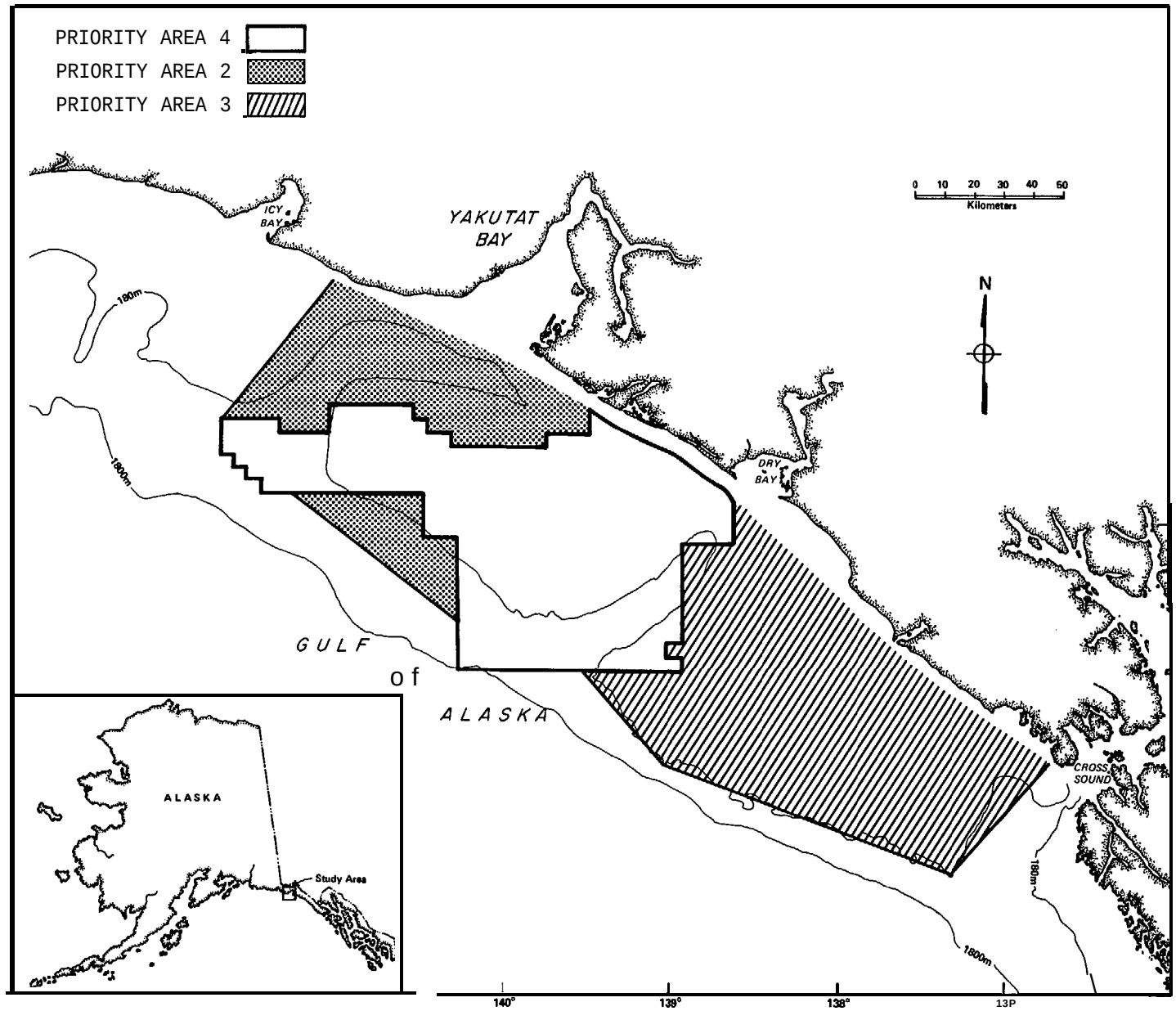

Figure 2. Priority sampling areas established in the northeastern Gulf of Alaska. Priority Area 1 represents the proposed lease area.

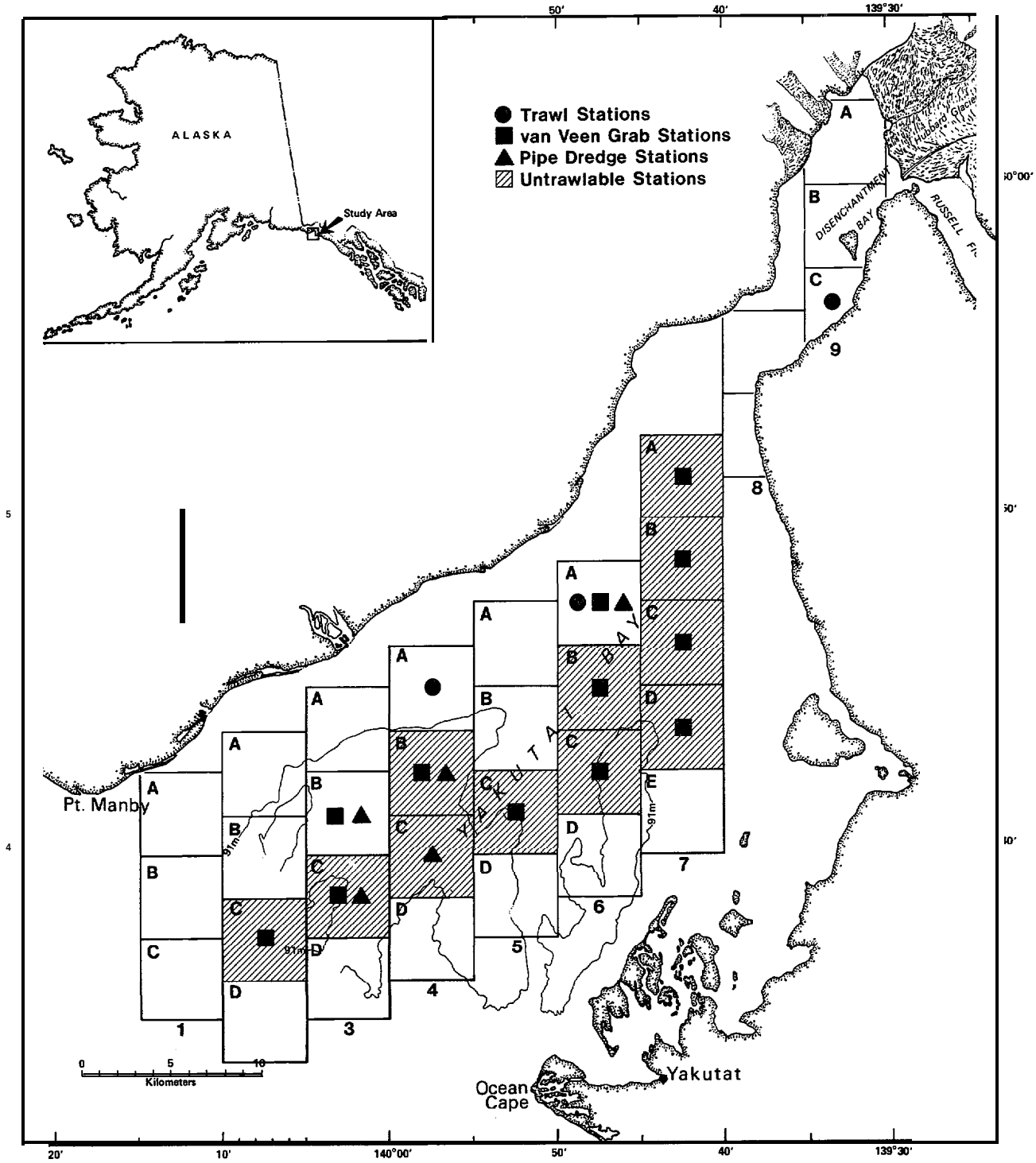

Figure 3. Yakutat station grid occupied by the NOAA ship *Miller Freeman*, November 1979.

V. SOURCES, METHODS AND RATIONALE OF DATA COLLECTION

Specimens were collected onboard the NOAA Ship *Miller Freeman* from 6-25 November 1979.

Usually, one-half-hour tows were made at predetermined stations using a commercial-size 400-mesh Eastern otter trawl with a 12.2 m horizontal opening. The lengths of some tows were shortened to no less than 15 minutes due to marginal bottom conditions. All catches were sorted, weighed, counted, and given tentative identifications onboard ship, according to methodology developed in previous OCS investigations (Feder, et al , 1980b) . Aliquot samples of species of invertebrates were preserved in 10 percent neutral buffered formalin and labeled for verification at the Institute of Marine Science, University of Alaska. Tabulations of stomach contents from selected species of invertebrates and fishes were also carried out onboard. Contents of stomachs , or entire stomachs from some species, were preserved in 10 percent neutral buffered formalin, and returned to the University of Alaska for more detailed analysis. Feeding data were examined in the laboratory using the frequency of occurrence method. In the discussion on food habits , species used as food are summarized based on the literature and data of this study; all food species are listed in decreasing order of importance, except where noted otherwise.

Samples of infaunal and small epifaunal invertebrates were taken from selected stations by van Veen grab and pipe dredge according to methodology developed by Feder and Matheke (1980) and Feder et aZ. (1980a, b). Infaunal samples were usually collected by pipe dredge at successfully trawled stations as an aid in stomach analysis of various species and to provide additional information on small epifaunal species not obtained by trawl. Pipe dredge and van Veen grab samples were also taken from some untrawlable stations in Priority Area 1 to permit characterization of three stations. Five replicate grabs were usually taken at all stations. Pipe dredge and grab samples were washed over a l-mm mesh screen to remove fine sediment, and preserved in 10 percent neutral buffered formalin for later examination in the laboratory in Fairbanks.

At Fairbanks, samples were washed through a l-mm mesh screen to remove the formalin and any remaining sediment, and rough sorted using a magnifying

sorting lamp. Specimens were identified using a *Wild* dissection microscope at 60x to 500x magnifications. A compound microscope of 100x to 1000x magnifications was used, as needed, to assist in identifications. A wet weight was taken of all specimens using *a* Mettler balance. Samples were recombined, cataloged, and stored. A voucher collection containing representatives of each species *was* deposited at the California Academy of Science.

Pipe dredge samples were examined qualitatively in the laboratory.

NUMERICAL ANALYSIS OF VAN VEEN GRABS

Station groups and species assemblages were identified using cluster analysis. Cluster analysis can be divided into three basic steps.

1. Calculation of a measure of similarity or dissimilarity between entities to be classified.
2. Sorting through a matrix of similarity coefficients to arrange the entities in a hierarchy or dendrogram.
3. Recognition of classes within the hierarchy.

Data reduction prior to calculation of similarity coefficients consisted of elimination of taxa that could not be identified to genus.

The coefficient used to calculate similarity matrices for cluster analysis routines was the Czekanowski coefficient

Czekanowski Coefficient

$$Cs_{1,2} = \frac{2W}{A + B}$$ where A = the sum of the measures of attributes of entity one

B = the sum of the measures of attributes of entity two

W = the sum of the lesser measures of attributes shared by entities one and two.

[1]The Czekanowski coefficient is synonymous with the Motyka (Mueller-Dombois and Ellenberg, 1974), and Bray-Curtis (Clifford and Stephenson, 1975) coefficients.

The Czekanowski coefficient has been used effectively in marine benthic studies by Field and MacFarlane (1968), Field (1969, 1970 and 1971), Day *et al.* (1971), Stephenson and Williams (1971), and Stephenson *et* aZ. (1972). This coefficient emphasizes the effect of dominant species on the classification, and is often used with some form of transformation. The Czekanowski coefficient was used to calculate similarity matrices for normal cluster analysis (with sites as the entities to be classified and species as their attributes) and inverse cluster analysis (with species as entities and sites as attributes) using both untransformed and natural logarithm transformed abundance data (individuals/m^2). The natural logarithm transformation, Y = ln(X+1), reduces the influence that dominant species have on the similarity determination.

Dendrogams were constructed from the similarity matrices using a group-average agglomerative hierarchical cluster analysis (Lance and Williams, 1966). Two-way coincidence tables comparing site groups formed by normal analysis and species groups formed by inverse analysis were constructed as an aid in the interpretation of dendrograms formed by cluster analyses (Stephenson *et* aZ., 1972). In each table the original species x stations data matrix was rearranged (based on the results of both normal and inverse analysis) so that the stations and species with the highest similarities were adjacent to each other.

Principal coordinate analysis (Gower, 1967, 1969) was used as an aid in interpreting the results of the cluster analyses (Stephenson and Williams, 1971; Boesch, 1973) and identifying misclassifications of stations by cluster analysis. Misclassifications in an agglomerative cluster analysis can occur by the early fusion of two stations and their subsequent incorporation into a group whose stations have *a* high similarity to only one member of the original pair (Boesch, 1973). In principal coordinate analysis an interstation similarity matrix is generated as in normal cluster analysis. The similarity matrix generated can be conceived of as a multidimensional space, in which, the stations are arranged in such a way that they are separated from one another according to their similarities. An ordination is then performed on the matrix to extract axes from this multidimensional

space. The first axis extracted coincides with the longest axis, and accounts for the largest amount of variation in the similarity matrix. Subsequent axes account for successively smaller amounts of variation in the data. The Czekanowksi similarity coefficient was used to calculate the similarity matrices used in principal coordinate analysis. Both the Czekanowski and the Canberra "metric" similarity coefficients were used to calculate the similarity matrices used in principal coordinate analysis. The Canberra "metric" coefficient defines the similarity of two entities as:

$$Cs_{1,2} = 1 - \frac{1}{n} \sum_{i}^{n} \frac{|X_{1i} - X_{2i}|}{(X_{1i} + X_{2i})}$$ where $'_{ii}$ = the measure of the ith attribute in entity one

$'_{2i}$ = the measure of the ith attribute in entity two

Because the Canberra "metric" coefficient is a series of fractions, it gives a more equal weighting to all species and reduces the effect of the dominant species on the analysis. It was used as a means of comparison with the results of analyses using the Czekanowski coefficient which emphasizes dominant species.

DIVERSITY OF VAN VEEN GRABS

Species diversity can be thought of as a measurable attribute of a collection or a natural assemblage of species, and consists of two components: the number of species or "species richness" and the relative abundance of each species or "evenness". The two most widely used measures of diversity which include species richness and evenness are the Brillouin (Brillouin, 1962) and Shannon (Shannon and Weaver, 1963) information measures of diversity (Nybakken, 1978). There is still disagreement on the applicability of these indices, and the results are often difficult to interpret (Sager and Hasler, 1969; Huribert, 1971; Fager 1972; Peet, 1974; Pielou, 1966a, b). Pielou (1966a, b, 1977) has outlined some of the conditions under which these indices are appropriate.

The Shannon function

$$H' = -\sum_i pi \log pi \text{ where } pi = \frac{n_i}{N}$$

where n_i = number of individuals in the i^{th} species

N = total number of individuals

assumes that a random sample has been taken from an infinitely large population whereas the Brillouin function

$$H = \frac{1}{N} \log \frac{N!}{n_1!n_2!\cdots n_s!}$$

is appropriate only if the entire population has been sampled. Thus, if we wish to estimate the diversity of the fauna at a sampling site the Shannon function is appropriate. The Brillouin function is merely a measure of the diversity of the five grab samples taken at each site, and makes no predictions about the diversity of the benthic community that the samples were drawn from. The evenness of samples taken at each site can be calculated using the Brillouin measure of evenness, $J = H/H_{maximum}$, where H = Brillouin diversity function. $H_{maximum}$, the maximum possible diversity for a given number of species, occurs if all species are equally common and is calculated as:

$$H_{maximum} = \frac{1}{N} \log \frac{N!}{[N/s]!^{s-r}([N/s]+1)!^{r}}$$

where [N/s] = the integer part of N/s

s = number of species in the censused community

r = N - s[N/s]

Theoretically, the evenness component of the Shannon function can be calculated from the following:

$$J' = \frac{H'}{\log s^*}$$ where H' = Shannon diversity function

s* = the total number of species in the randomly sampled community

However, s* is seldom known for benthic infaunal communities. Therefore, the Shannon indices of diversity and evenness were not calculated in the present study. Several investigators (Loya, 1972, Nybakken, 1978; Feder and Matheke, 1980) have demonstrated a close correlation between the Brillouin and Shannon diversity indices.

Species richness (Margalef, 1958) was calculated as:

$$SR = \frac{(S-1)}{\ln N}$$ where S = the number of species
N = the total number of individuals

VI. RESULTS

BENTHIC EPIFAUNAL PROGRAM

Offshore Stations

A total of 42 offshore stations were sampled by trawl; 33 stations in Priority Area 1; 1 station in Priority Area 2, in addition to 3 stations peripheral to Area 2; and 5 stations in Priority Area 3 (Figs. 1 and 2; Appendix A). Due to the limited number of stations occupied in Areas 2 and 3, data from all areas were combined in taxonomic density and biomass analyses.

Taxonomic analysis delineated 10 phyla, 19 classes, 72 families, 100 genera, and 134 species of epifaunal invertebrates (Table 1). Echinodermata, Arthropoda, and Mollusca were the dominant phyla represented with 51 (36%), 35 (25%) and 26 (19%) species, respectively (Table 1). These three phyla made up 27.4, 26.2, and 21.1 percent of the invertebrate biomass, respectively (Table 11).

The mean biomass for all epifaunal species collected was 1.7 g/m^2 (data base on file at the National Oceanographic Data Center, NODC). The biomasses of the major phyla were usually dominated by a few species (Table II). For example, the phylum Cnidaria was dominated by the anemone, *Metridium senile*, (80.5% of the phylum weight). Other species biomass dominants by phylum were: Mollusca-*Pecten caurinus* (scallop) (86.6%); Arthropoda-*Cancer magister* (Dungeness crab) (55.6%) and *Chionoecetes bairdi* (snow crab) (27.4%); and Echinodermata-*Strongylocentrotus* spp. (urchins) (56.6%).

TABLE I

SPECIES OF INVERTEBRATES TAKEN BY TRAWL FROM THE NORTHEASTERN GULF OF ALASKA EXCLUDING YAKUTAT BAY, NOVEMBER, 1979

Phylum Porifera
Unidentified species

Phylum Cnidaria
Class Scyphozoa
Unidentified species

Class Anthozoa
Unidentified species

Order Alcyonacea

Family Nephtheidae
Eunephthya rubiformis (Pallas)
Unidentified species

Family Primnoidae
Primnoa sp.

Family Pennatulidae
Stylatula gracile (Gabb)

Family Actinostolidae
Stomphia coccinea (O. F. Müeller)

Family Actiniidae
Unidentified species

Family Metridiidae
Metridium senile

Phylum Rhynchocoela
Class Anopla

Family Rineidae
Cerebratulus sp.

Phylum Annelida
Class Polychaeta

Family Polynoidae
Eunoë senta (Moore)

Family Euphrosinidae
Euphrosine hortensis Moore

Family Syllidae
Pionosyllis gigantea Moore

Family Nereidae
Cheilonereis cyclurus (Barrington)
Nereis sp.

TABLE I

CONTINUED

Family Ampharetidae
Unidentified species

Family Terebellidae
Pista spp.

Family Serpulidae
Crucigera irregulars Bush

Family Aphroditidae
Aphrodita spp.
Aphrodita japonica Marenzeller
Aphrodita negligens Moore

Class Hirudinea
Notostomobdella spp.

Phylum Mollusca
Class Bivalvia

Family Pectinidae
Chlamys rubida (Hinds)
Pee-ten caurinus Gould

Family Cardiidae
Clinocardium ciliatum (Fabricius)

Family Veneridae
Compsomyax subdiaphana Carpenter

Family Hiatellidae
Hiatella arctica (Linnaeus)

Family Teredinidae
Bankia setacea Tryon

Class Gastropoda

Family Bathybembix
Lischkeia cidaris (Carpenter)

Family Naticidae
Natica clausa Broderip and Sowerby

Family Cymatiidae
Fusitriton oregonensis (Redfield)

Family Buccinidae
Buccinum spp.
Buccinum polare Gray
Buccinum plectrum Stimpson

TABLE I

CONTINUED

Family Neptuneidae
Beringius kennicotti (Dan)
Colus Spp.
Neptunea lyrata (Gmelin)
Neptunea pribiloffensis (Dan)
Pyrulofusus harpa (Mörch)

Family Volutidae
Arctomelon sternsii (Dall)

Family Doridídae
Archidoris spp.

Family Tritoniidae
Tritonia exsulans Bergh

Family Arminidae
Armina californica (Cooper)

Class Cephalopoda

Family Sepiolidae
Rossia pacifica Berry

Family Gonatidae
Gonatus magister Berry

Family Octopodidae
octopus Sp.

Phylum Arthropoda
Class Crustacea

Order Thoracica

Family Balanidae
Balanus hesperius Pilsbry

Order Isopoda

Family Limnoridae
Limnoria lignorum Rathke

Family Aegidae
Rocinela belliceps Stimpson

Order Decapoda

Family Pandalidae
Pandalus borealis Kröyer
Pandalus goniurus Stimpson
Pandalus jordani Rathbun
Pandalus montagui tridens Rathbun
Pandalus platyceros Brandt
Pandalus danae Stimpson
Pandalopsis dispar Rathbun

TABLE I

CONTINUED

Family Hippolytidae
Eualus barbata (Rathbun)

Family Crangonidae
Unidentified species
Crangon dalli (Rathbun)
Crangon communis Rathbun
Crangon resima Rathbun
Argis lar (Owen)
Argis dentata (Rathbun)
Argis ovifer (Rathbun)

Family Paguridae
Pagurus spp.
Pagurus ochotensis (Benedict)
Pagurus aleuticus (Benedict)
Pagurus setosus (Benedict)
Pagurus confragosus (Benedict)
Pagurus cornutus (Benedict)
Elassochirus cavimanus (Dana)
Labidochirus splendescens (Owen)

Family Lithodidae
Acantholithodes hispidus (Stimpson)
Paralithodes platypus Brandt
Lopholithodes foraminatus (Stimpson)

Family Galatheidae
Munida quadrispina Benedict

Family Majidae
Hyas lyratus Dana
Chionoecetes bairdi Rathbun
Scyra acutifrons Dana

Family Cancridae
Cancer *magister* Dana

Phylum Sipuncula
Unidentified species

Phylum Brachiopoda
Class Articulate

Family Cancellothyrididae
Terebratulina unguicula Carpenter

Family Dallinidae
Laqueus californianus Koch

TABLE I

CONTINUED

Phylum Echinodermata
Class Asteroidea

Family Astropectinidae
Dipsacaster spp.
Dipsacaster borealis Fisher

Family Benthopectinidae
Luidiaster dawsoni (Verrill)

Family Goniasteridae
Ceramaster spp.
Ceramaster patagonicus (Sladen)
Hippasterias spinosa Verrill
Mediaster aequalis Stimpson
Pseudarchaster parelii (Düben and Koren)

Family Luiidae
Luidia foliolata Grube

Family Porcellanasteridae
Ctenodiscus crispatus (Retzius)

Family Echinasteridae
Henricia spp.
Henricia aspera Fisher
Henricia beringiania Djakonov
Henricia derjugini Djakonov
Henricia leviuscula (Stimpson)
Henricia sanguinolenta (O. F. Müller)
Henricia clarki Fisher
Poraniopsis inflata Fisher

Family Pterasteridae
Diplopteraster multipes (Sars)
Pteraster militaris (O. F. Müller)
Pteraster tesselatus Ives

Family Solasteridae
Crossaster borealis (Fisher)
Crossaster papposus (Linnaeus)
Lophaster furcilliger Fisher
Solaster dawsoni Verrill
Solaster endeca (Linné)

Family Asteridae
Leptasterias hylodes Fisher
Leptasterias fisheri Djakonov
Lethasterias nanimemsis (Verrill)
Stylasterias forreri (de Loriol)
Pycnopodia he lianthoides (Brandt)

TABLE I

CONTINUED

Class Echinoidea

Family Schizasteridae
Brisaster townsendi (Agassiz)

Family Strongylocentrotidae
Allocentrotus fragilis (Jackson)
Strongylocentrotus spp.
Strongylocentrotus droebachiensis (O. F. Müller)

Class Ophiuroidea

Family Gorgonocephalidae
Gorgonocephalus caryi (Lyman)

Family Ophiacanthidae
Ophiacantha gratiosa Koehler

Family Ophiactidae
Ophiopholis aculeata (Linnaeus)
Ophiopholis baker-i McClendon

Family Ophiuridae
Amphiophiura ponderosa (Lyman)
Ophiura sarsi Lütkin

Class Holothuroidea
Unidentified species

Family Molpadiidae
Molpadia intermedia (Ludwig)

Family Stichopodidae
Parastichopus californicus

Family Synallactidae
Pseudostichopus mollis
Bathyplotes spp.

Class Crinoidea
Unidentified species

Phylum Chordata

Subphylum Urochordata
Unidentified species

Class Ascidiacea

Family Pyuridae
Halocynthia igaboja Oka

TABLE II

NUMBERS, WEIGHTS AND BIOMASS (g/m^2) OF THE MAJOR EPIFAUNAL TAXA OF CNIDARIA, MOLLUSCA, ARTHROPODA, AND ECHINODERMATA FROM THE NORTHEASTERN GULF OF ALASKA, EXCLUDING YAKUTAT BAY, NOVEMBER 1979

Phylum	Percent of total weight	Taxon[1]	Number of organisms	Wet weight (g)	Percent of[2] total weight	Percent of phylum weight	Mean biomass per square meter ($\bar{x}$ g/m^2)
Cnidaria	13.7	**Anthozoa**	86	37531	1.5	11.2	0.03
		Actiniidae	82	26006	1.0	7.8	0.02
		Metridium senile	*790*	268800	11.0	80.5	0.19
		Total	948	332337	13.6	*99.6*	0.23
Mollusca	21.1	*Pecten caurinus*	1960	447060	18.3	*86.6*	0.31
		Fusitriton oregonensis	*513*	39523	1.6	*7.7*	0.03
		Rossia pacifica	119	11056	0.4	*2.1*	<().01
		Total	2592	497639	*20.4*	*96.4*	0.35
Arthropoda (**Crustacea**)	26.2	*Pandalus jordani*	1533	13759	0.6	2.2	0.01
		Lopholithodes foraminatus	109	67717	2.8	10.6	0.05
		Chionoecetes bairdi	1377	175244	7.2	27.4	0.12
		Cancer magister	*842*	355837	14.6	55.6	0.25
		Total	3861	612557	25.1	95.7	0.43
Echinodermata	27.4	*Pycnopodia he lianthoides*	*88*	105722	4.3	15.8	0.07
		Allocentrotus fragilis	*1522*	75752	3.1	11.3	0.05
		Strongylocentrotus sp.	5019	214230	8.8	32.0	0.15
		Strongylocentrotus droebachiensis	*2393*	164916	6.7	24.6	0.11
		Total	9022	560620	22.9	83.7	0.39
Grand Total	88.4		16423	2003153	82.0		1.40

[1]Species or lowest level of identification.

[2]Total weight of all epifauna = 2444090 g.

Some species were widely distributed while others were relatively localized (Table III and Appendix A). *Chionoecetes bairdi* occurred in 25 widely distributed stations. Highest densities and biomasses of this crab occurred in Priority Area 1 at stations 101E, 103B and D, and 104B and C (Table III: Fig. 1). Cancer *magister* occurred at only five stations and was most important at Station 94A, a station northwest of Priority Area 2. At this station, 195 C. *magister* were caught per kilometer of fishing. *Pecten caurinus* was found at 10 stations which were distributed between Stations 93C and 11OA. Stations 93C and 108A, located outside of Priority Area 1, yielded the greatest scallop catches with 590 and 249 individuals/ km, respectively. Many scallops were infected by the spionid polychaetes, *Pygospio elegans* and *Polydora ciliata*. These polychaetes burrow into the dorsal valve, weakening it to the point where they are easily broken by trawling, Infection was generally greater among larger individuals. Scallops from Station 108A were the most heavily infected. The urchins, *Allocentrotus fragilis* and *Strongylocentrotus* spp., occurred at 20 and 7 stations, respectively, all of which were distant from shore. Station 98D yielded the greatest density of *Allocentrotus* with 417 individuals/km fished. The greatest density of *Strongylocentrotus came* from Station 102G with 1307 individuals/km fished. The brittlestar, *Ophiura sarsi*, occurred in 7 stations, 96F, 102G, 103D, 103F, 104A, 105A, and 106G, all of which, except the latter, were in Priority Area 1. The density of this brittle star was greatest at Station 104A (3603 individuals/km fished).

Data and discussion on the incidence of commensalism between polychaetes, amphipods and hermit crabs is included in Appendix B.

Yakutat Bay Stations

Due to the rough benthic substrate in Yakutat Bay, only three trawl stations were successfully occupied (Stations 4A, 6A, 9C) (Fig. 3 and Appendix A). Taxonomic analysis yielded 4 phyla, 6 classes, 16 families, 19 genera and 23 species (Table IV). Arthropoda, Echinodermata and Mollusca dominated in species representation and biomass; Arthropoda contributed 13 species and 68.6 percent of the total biomass, Echinodermata – 7 species

TABLE III

STATIONS AT WHICH THE DOMINANT EPIFAUNAL INVERTEBRATE SPECIES OCCURRED IN THE NORTHEASTERN GULF OF ALASKA, EXCLUDING YAKUTAT BAY, NOVEMBER 1979

Species	Station	No. /km	g/m^2
Metridium senile	109A	*284*	*7.925*
Pecten caurinus	93C	590	11.568
	108A	249	4*375
Pandalus jordani	103C	314	*0.231*
Cancer magister	94A	195	6.752
Chionoecetes bairdi	10IE	*52*	0.281
	103B	*32*	1.087
	103D	*36*	0.424
	104B	*78*	0.052
	104C	*105*	0.277
Ctenodiscus crispatus	104F	115	0.054
Ophiura sarsi	104A	3603	0.591
Brisaster townsendi	105D	129	0.469
Allocentrotus fragilis	98D	417	0.443
	99E	99	0.802
	104G	56	0.393
Strongylocentrotus spp.	98D	*263*	*0.134*
	99E	*126*	*0.495*
	100E	*1260*	*4.904*
	102G	*1307*	*7.117*

TABLE IV

SPECIES OF INVERTEBRATES TAKEN BY TRAWL FROM YAKUTAT BAY, NOVEMBER 1979

Phylum Cnidaria
- Class Anthozoa
  - Order Alcyonacea
    - Family Pennatulidae
      - *Stylatula gracile* (Gabb)

Phylum Mollusca
- Class Bivalvia
  - Family Pectinidae
    - *Pecten caurinus* Gould
- Class Gastropoda
  - Family Neptuneidae
    - Nep-tunes *lyrata* (Gmelin)

Phylum Arthropoda
- Class Crustacea
  - Order Decapoda
    - Family Pasiphaeidae
      - *Pasiphaea pacifica* Rathbun
    - Family Pandalidae
      - *Pandalus borealis* Kröyer
      - *Pandalus hypsinotus* Brandt
      - *Pandalus danae* Stimpson
      - *Pandalopsis dispar* Rathbun
    - Family Hippolytidae
      - *Eualus* spp.
    - Family Crangonidae
      - *Crangon dalli* (Rathbun)
    - Family Paguridae
      - *Pagurus aleuticus* (Benedict)
      - *Labidochirus splendescens* (Owen)
    - Family Lithodidae
      - *Paralithodes camtschatica* (Tilesius)
    - Family Majidae
      - *Chionoecetes bairdi* Rathbun
    - Family Cancridae
      - *Cancer magister* Dana

Phylum Echinodermata
- Class Asteroidea
  - Family Goniasteridae
    - *Ceramaster potagonicus* (Sladen)
    - *Mediaster aequalis* Stimpson

and 16.0 percent of the biomass, and Mollusca – 2 species and 14.8 percent of the biomass (Tables IV and V).

The mean biomass for all epifaunal species collected was 1.2 g/m^2 (database for calculations on file at NODC).

The dominant arthropod was the Dungeness crab (*Cancer magister*) which contributed 88.1 percent of the arthropod biomass and 60.4 percent of the total invertebrate biomass (Table V). Cancer came from Stations 4A and 6A; the latter station yielded the greatest catch with 84 crab obtained/km of fishing (Appendix A).

The sea stars, *Ceramaster patagonicus* and *Pycnopodia helianthoides*, made up 94.3 percent of the echinoderm biomass and 15.1 percent of the total invertebrate biomass (Table V). *Pycnopodia* dominated the biomass, although only 9 organisms occurred (Appendix A).

Among the two mollusk species encountered, the scallop *Pecten caurinus* dominated. Station 4A yielded the only catch with 24 scallops/km of fishing (Appendix A).

BENTHIC INFAUNAL PROGRAM

Van Veen Grab

Thirty-four van Veen grab stations were sampled for benthic infauna in the offshore Gulf stations as well as in Yakutat Bay (Figs. 1 and 3). Sediments at these stations were primarily silts and clays (Table VI) and the fauna was dominated by polychaete annelids. The abundance of the infauna at these stations ranged from 32 individuals/m^2 in Station 7A within Yakutat Bay to 1704 individuals/m^2 in Station 103D on the outer shelf (Table VII). Biomass ranged from 1 g/m^2 (wet weight) in Station 7A to 303 g/m^2 in Station 2C (outer Yakutat Bay).

A cluster analysis using natural logarithm transformed abundance data (Fig. 4) delineated 5 station groups at the 35 percent similarity level. Three stations (7A, 106A and 97D) did not join any group. Station Group 1 consisted of 3 stations located in Yakutat Bay, an offshore station to the west of Yakutat Bay, a station off of Icy Bay and 10 stations southeast of

TABLE IV

CONTINUED

Phylum Echinodermata (cent'd)
- Family Porcellanasteridae
  - *Ctenodiscus crispatus* (Retzius)
- Family Echinasteridae
  - *Henricia* spp.
- Family Asteridae
  - *Pycnopodia he lianthoides* (Brandt)

Class Ophiuroidea
- Family Gorgonocephalidae
  - *Gorgonocephalus caryi* (Lyman)

TABLE V

NUMBERS, WEIGHTS AND BIOMASS (g/m^2) OF THE MAJOR EPIFAUNAL TAXA OF MOLLUSCA, ARTHROPODA, AND ECHINODERMATA FROM YAKUTAT BAY, NOVEMBER 1979

Phylum	Percent of total weight	Taxon	Number of organisms	Wet weight (g)	Percent of[1] total weight	Percent of phylum weight	Mean biomass per square meter ($\bar{x}$ g/m^2)
Mollusca	14.8	*Pecten caurinus*	90	16300	14.8	99.5	0.18
Arthropoda	68.6	*Pandalus borealis*	238	1695	1.5	2.2	0.02
		Pandalopsis dispar	218	2812	2.5	3.7	0.03
		Chionoecetes bairdi	32	2778	2.5	3.7	0.03
		Cancer magister	151	66700	60.4	88.1	0.72
		Total	639	73985	67.0	'97.7	0.80
Echinodermata	16.0	*Ceramaster patagonicus*	11	2529	2.3	14.3	0.03
		Pycnopodia helianthoides	_9	14100	12.8	79.9	0.15
		Total	20	16629	15.1	94.3	0.18
Grand total	99.4		749	106914	96.8		1,15

[1]Total weight of all epifauna = 110450 g.

TABLE VI

STATION LOCATIONS AND SEDIMENT DESCRIPTIONS FOR SAMPLES OF THE BENTHIC INFAUNA COLLECTED BY VAN VEEN GRAB, NOVEMER 1979

Station Number	Depth (m)	Latitude	Longitude	Sediment description
2C	148	59037.7	140006.7	Soft gray mud
3C	110	59038.7	140002.5	Very soft - almost soupy gray mud
4B	122	59042.4	139057.1	soupy - soft gray mud with rocks mixed in
5C	79	59041.6	139053.2	Soupy gray mud with small rocks
6B	47	59045.1	139046.4	Soft gray/brown mud with gravel, rocks, and shell mixed in
7A	250	59051.7	139042.8	Soupy gray mud with gravel and rocks mixed in
7D	55	59043.9	139043.9	Soupy gray mud with very rough edged rocks mixed in
94B	58	59050.1	141051.8	Soft gray mud
95F	182	59021.8	141032.0	Soft gray mud with sand, gravel, and rocks mixed in
95H	326	59009.5	141033.6	Soft gray mud
96E	329	59020.5	141014.6	Compact gray mud
96F	347	59013.5	141018.6	Compact gray mud
97D	237	59021.7	141.04.8	Compact gray mud with gravel, sand and small rocks mixed in. Some broken shell also
98D	146	59019.2	“140047.0	Soft gray mud with sand, gravel, and small rocks mixed in
99E	136	59017.0	140033.8	Compact gray mud with gravel and rocks mixed in
100E	126	59012.4	140017.6	Compact gray mud with small rocks mixed in

TABLE VI

CONTINUED

Station Number	Depth (m)	Latitude	Longitude	Sediment description
100J	199	58042.1	140 °17.3	Compact gray mud with gravel mixed in
102K	188	58042.0	139047.8	Soft gray mud with gravel, rock, and broken, dead sponge mixed in
103B	152	*59°17.6*	*139032.6*	Soft gray mud
103D	113	*59002.2*	*130028.0*	Compact gray mud
103F	150	*58049.4*	*139029.6*	Soft gray mud with clay - like lumps, occasional small rocks and dead sponge fragments
1031	*261*	58032.2	139032.6	Soft gray mud
104A	*68*	59012.8	139015.5	Soupy/soft gray mud
104B	*91*	59005.1	139013.5	Soft gray mud
104D	*119*	58053.7	139016.6	Soft gray mud with rocks up to 10 cm diameter
104G	164	*58034.2*	*139020.3*	Gray/black compact sand
105A	70	*59007.7*	*139004.2*	Soupy/soft gray mud
105C	146	*58054.6*	*139000.9*	Soft, but sticky gray mud
105E	228	*58″45.2*	139002.5	Soft, gray mud
105F	130	*58038.4*	139002.7	Gray/black compact sand
105G	113	*58031.8*	139002.6	Gray/black compact sand
106A	58	*59005.8*	138″47.3	Soupy/soft gray mud with broken shells (Macoma mostly)
106B	155	58059.3	138042.5	Soupy/soft gray mud
106G	87	58030.0	138054.1	Compact sand (reduced)

TABLE VII

THE ABUNDANCE, BIOMASS AND DIVERSITY OF BENTHIC GRAB SAMPLES ARRANGED BY STATION GROUPS

Station Group	Station	Abundance No /m²	Biomass gm/m²	No of Species	Species Richness	Brillouin Diversity	Brillouin Evenness
1	103B	700	139	51	7.63	3.08	0.82
	106B	1092	74	55	7.71	2.41	0.61
	105C	622	187	50	7.61	2.92	0.78
	104B	986	93	60	8.56	2.86	0.72
	103D	1704	56	70	9.27	2.43	0.59
	104D	1072	67	82	11.61	3.06	0.72
	103F	670	46	68	10.29	3.09	0.58
	105E	748	25	53	7.85	3.16	0.83
	98D	316	20	54	9.20	3.37	0.91
	2C	557	303	33	5.06	2.77	0.82
	4B	466	48	62	9.63	3.25	0.83
	3C	484	166	50	7.92	2.59	0.70
	94B	1116	142	91	12.82	2.94	0.68
	105A	942	32	60	8.61	3.17	0.80
	104A	1152	44	71	9.93	3.31	0.80
2	99E	534	41	79	12.42	3.27	0.80
	100E	488	41	82	13.08	3.51	0.85
	95F	466	15	62	9.92	2.71	0.70
	104G	932	29	77	11.12	3.15	0.76
	105F	1028	18	76	10.81	3.03	0.73
	100J	696	28	68	10.23	2.96	0.74
	102K	1278	44	88	12.16	3.11	0.72
3	96E	1395	33	52	7.04	2.36	0.61
	1031	1032	47	62	8.79	2.91	0.73
	95H	440	80	52	8.37	2.75	0.74
	96F	454	9	36	5.72	2.36	0.69
4	6B	144	46	26	5.03	2.53	0.85
	7D	188	22	32	5.92	2.66	0.84
	5F	560	91	62	9.62	3.55	0.83

TABLE VII

CONTINUED

Station Group	Station	Abundance No/m^2	Biomass gm/m^2	No of Species	Species Richness	Brillouin Diversity	Brillouin Evenness
5	*105G*	*674*	*22*	*72*	*10.90*	*2.95*	*0.73*
	106G	*374*	*53*	*41*	*6.75*	*2.73*	*0.78*
DNC	106A	428	40	41	6.60	2.78	0.79
DNC	7A	32	1	9	2.30	1.41	0.77
DNC	97D	238	15	52	9.31	3.31	0.92

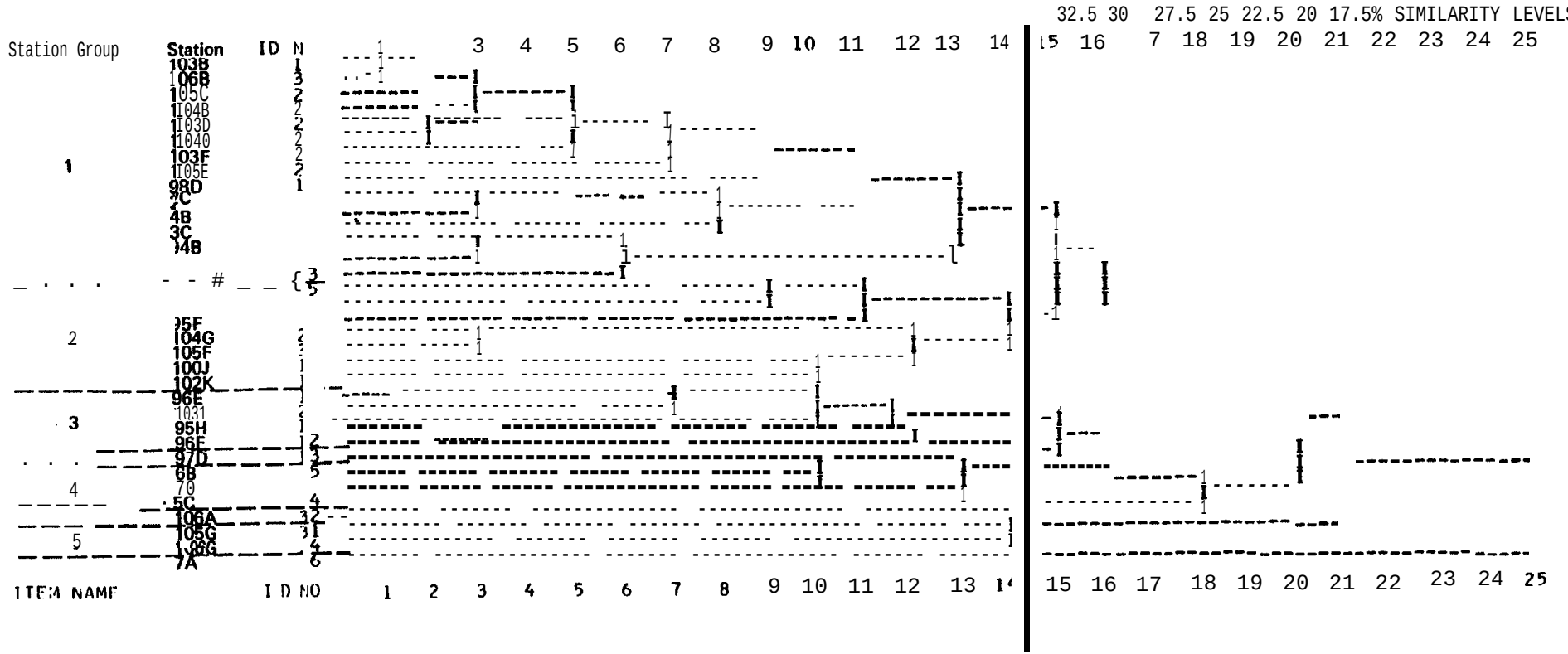

Figure 4. Dendrogram produced by a cluster analysis of *ln* transformed abundance data from benthic grab samples. Stations are linked by vertical bars of progressively lower similarity levels until all stations are joined. Station groups formed at the. 35% similarity level (dark vertical line) are separated by dashed lines.

Yakutat Bay (Fig. 5). Station Group 2 consisted of 7 stations, many of which occurred offshore of the stations in Station Group 1. Station Group 3 consisted of 4 stations outside of the 180 m contour; 3 of these stations were located at the mouth of the Yakutat Bay trough and 1 at the mouth of the Dry Bay trough. Station Group 4 consisted of 3 stations in Yakutat Bay and Station Group 5 was composed of 2 offshore stations located south of Dry Bay which had a sandy substrate (Fig. 5; Tables VI and VII). Stations Groups 1 and 2 joined to form a single station group at the 32.5 percent similarity level (Fig. 4) and Station Group 3 plus Station 97D were linked with Station Groups 1 and 2 at the 30 percent similarity level. However, Station Groups 4 and 5 did not join the other station groups until the 20 and 17.5 percent similarity levels, respectively. This indicates that Station Groups 1, 2 and 3, and Station 97D were considerably more similar to each other in terms of these species composition than they were to Station Groups 4 and 5.

An inverse cluster analysis using *ln* transformed abundance data delineated 61 species groups (Table VIII) at the 41 percent similarity level (Fig. 6). Many of the species groups contained species which occurred at only one or two stations and since they have little effect on formation of station groups these will not be discussed here. The largest species group formed, Species Group 17, consisted of species which were present in all station groups and were most abundant in Station Groups 1, 2 and 3. The abundance of species in Species Group 17 was considerably reduced in Station Groups 4 and 5. The primary difference between stations in Station Groups 1 and 2 was the increased abundance of species from Species Group 17 in Station Group 1. Stations in Station Group 2 were also characterized by Species Groups 21 and 22 (Table IX) and they appeared to have a higher species richness than stations in Station Group 1 (Table VII). Station Group 3 was characterized by the presence of species in Species Group 34 as well as those of Species Group 17 (Table IX). Station Group 4 was characterized by species from Species Groups 53 and 54 and Station Group 5 was characterized by species from Species Group 23. Station 97D, which did not join any of the station groups (Fig. 4), was characterized by species from Species Groups 17, 21, 24 and 36. Station 106A was characterized

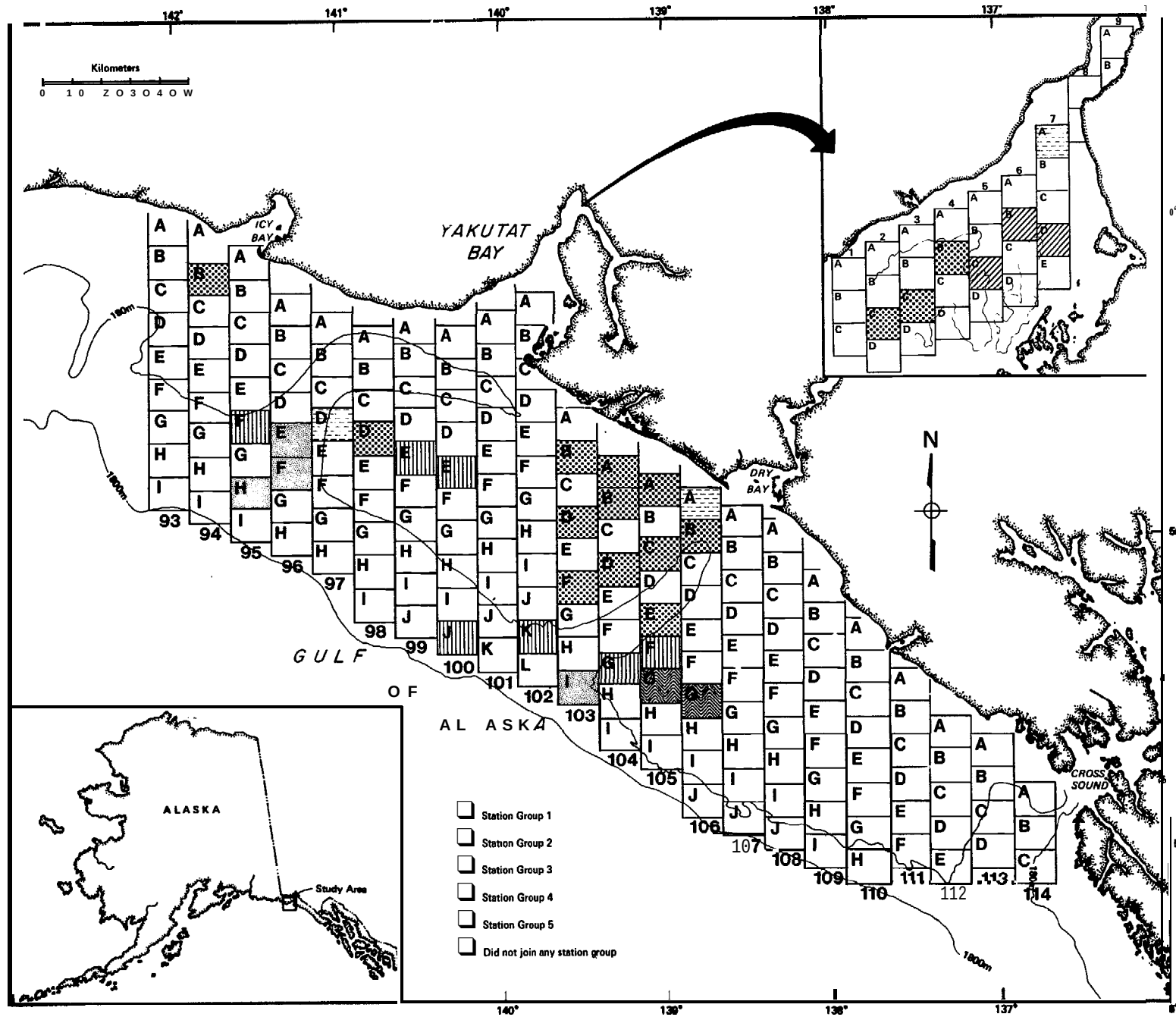

Figure 5. Distribution of stations in station groups formed by a cluster analysis of natural logarithm transformed abundance data-from benthic van Veen grab samples.

TABLE VIII

SPECIES GROUPS FORMED BY CLUSTER ANALYSIS OF NATURAL LOGARITHM TRANSFORMED ABUNDANCE DATA FROM BENTHIC GRAB SAMPLES

SPECIES GROUPS
SPECIES GROUP 1
Trophonopsis pacificus
Leucosyrinx circinata
Yoldia montereyensis
SPECIES GROUP 2
Scalibregma inflatum
Polinices pallida
SPECIES GROUP 3
Capitella capitata
Epitonium caamanoi
SPECIES GROUP 4
Tharyx Sp.
Ampharete acutifrons
SPECIES GROUP 5
Nereis zonata
Yoldia amygdalea
SPECIES GROUP 6
Axiothella rubrocincta
Diastylis alaskensis
Macoma moesta alaskana
SPECIES GROUP 7
Onuphis elegans
Drilonereis falcata minor
SPECIES GROUP 8
Tauberia gracilis
Ampelisca macrocephala
Spiophanes cirrata
Byblis Sp .
Magelona pacifica
Diastylopsis dawsoni
Lumbrineris luti

TABLE VIII

CONTINUED

SPECIES GROUPS	
SPECIES GROUP 9	*Cylichna occulta* *Photis* sp. *Lumbrineris bicirrata* *Lysippe labiata*
SPECIES GROUP 10	*Nephtys ferruginea* *Paraphoxus daubious* *Praxillella affinis* *Melinna elisabethae*
SPECIES GROUP 11	*Heteromastus filiformis*
SPECIES GROUP 12	*Suavodrillia kennicottii* *Anonyx nugax* *Pista elongata*
SPECIES GROUP 13	*Alvinia compacta* *Anonyx ochoticus* *Astarte montagui* *Tachyrynchus lacteolus*
SPECIES GROUP 14	*Asychis disparidentata* *Astarte polaris* *Oenopota* sp.
SPECIES GROUP 15	*Asychis similis* *Cardiomya planetica*
SPECIES GROUP 16	*Maldane sarsi*

TABLE VIII

CONTINUED

SPECIES GROUPS

SPECIES GROUP 17	*Goniada annulata* Lam-ice *cirrata* *Odontogena borealis* *Ophiura sarsi* *Terebellides stroemi* *Thyasira flexuosa* *Myriochele heeri* *Axinopsida serricata* *Nucula tenuis* *Psephidia lordi* *Ninoe gemmea* *Diamphiodia craterodmeta* *Onuphis iridescens* *Axinopsida viridis* *Praxillella gracilis* *Heterophoxus oculatus* *Glycera capitata* *Cyclocardia ventricosa* *Sternaspis scutata*
SPECIES GROUP 18	*Cylichna alba* *Dentalium* **sp.** *Ammotrypane aulogaster*
SPECIES GROUP 19	*Solariella obscura*
SPECIES GROUP 20	*Ctenodiscus crispatus*
SPECIES GROUP 21	*Aricidea suecica* *Notoproctus pacificus* *Euchone analis* *Owenia fusiformis*
SPECIES GROUP 22	*Nuculana radiata* *Harpiniopsis excavata* *Golfingia margaritacea*

TABLE VIII

CONTINUED

SPECIES GROUPS

SPECIES GROUP 23	*Phascolion strombi*
SPECIES GROUP 24	*Hanleya hanleyi*
SPECIES GROUP 25	*Stylatula gracile* *Eudorella emarginata*
SPECIES GROUP 26	*Molpadia intermedia*
SPECIES GROUP 27	*Cardiomya pectenata*
SPECIES GROUP 28	*Cerithiopsis* sp. *Arctomelon stearnsii* *Bittium* sp.
SPECIES GROUP 29	*Prionospio malmgreni* *Chaetozone setosa* *Travisia* sp. *Cirratulus cirratus* *Paraphoxus* sp. *Megalomma splendida* *Ampelisca birulai*
SPECIES GROUP 30	*Harmothoe lunulata* *Travisia forbesii*
SPECIES GROUP 31	*Ampharete arctica* *u~o-thee denticulata* *Crenella dessucata*
SPECIES GROUP 32	*Haploscoloplos elongatus* *Aricidea lopezi*

TABLE VIII

CONTINUED

SPECIES GROUPS

SPECIES GROUP 33

Eudorella pacifica
Nicippe tumida
Diastylis paraspinulosa

SPECIES GROUP 34

Nuculana conceptionis
Cadulus tolmei
Dacrydium pacificum
Aglaophamus rubella anops
Gnathia trilobata
Axinopsida cf. serricata

SPECIES GROUP 35

Mysella planata

SPECIES GROUP 36

Caryophyllia sp.
Puncturella cooperi
Brisaster townsendi
Chirodota sp.
Pecten caurinus
Terebratalina transversa
Hiatella arctica

SPECIES GROUP 37

Peisidice aspera
Paraphoxus robustus
Golfingia vulgaris
Microporina borealis
Idanthyrsus armatus
Laqueus californianus

SPECIES GROUP 38

Brada villosa
Ischnochiton albus

SPECIES GROUP 39

Glycinde picta
Maera danae
Dentalium dalli

TABLE VIII

CONTINUED

SPECIES GROUPS

SPECIES GROUP 40

Argis dentata

SPECIES GROUP 41

Pista sp.

SPECIES GROUP 42

Propebella turricula

SPECIES GROUP 43

Propeamussium alaskense
Anonyx sp.
Onuphis parva
Lumbrineris zonata
Amage anops

SPECIES GROUP 44

Hippomedon sp.
Lycodes brevipes

SPECIES GROUP 45

Leucon nasica
Campylaspis sp.

SPECIES GROUP 46

Amphictene auricoma
Mitrella sp.

SPECIES GROUP 47

Natica clausa

SPECIES GROUP 48

Periploma alaskana
Cadulus sp.

SPECIES GROUP 49

Aphrodita negligens
Paraphoxus oculatus

TABLE VIII

CONTINUED

SPECIES GROUPS

SPECIES GROUP 50

Cerebratulus sp.
Balanus hesperius

SPECIES GROUP 51

Amphissa columbiana

SPECIES GROUT 52

Yoldia myalis
Modiolus modiolus
Pinnixia sp.
Amphissa sp.
Haploops tubicola
Compsomyax subdiaphana
Balanus rostratus

SPECIES GROUP 53

Clinocardium ciliatum
Terebratulina unguicula
Mitrella gouldi

SPECIES GROUP 54

Nephtys punctata
Spiochaetopterus costarum
Melinna cristata
Nuculana fossa

SPECIES GROUP 55

Chaetoderma robusta
Macoma calcarea

SPECIES GROUP 56

Amphicteis gunneri
Turbonilla sp.
Yoldia thraciaeformis

SPECIES GROUP 57

Harmothoe imbricata
Colus halli
Pinnixia schmitti
Lumpenus maculatus

TABLE VIII

CONTINUED

SPECIES GROUPS

SPECIES GROUP 58

Theragra chalcogramma

SPECIES GROUP 59

Nephtys cornuta franciscana
Admete couthouyi

SPECIES GROUP 60

Gattyana sp.
Orchomene sp.
Bathymedon sp.
Ammodytes hexapterus
Westwoodilla sp.
Pandora filosa

SPECIES GROUP 61

Nicomache lumbricalis

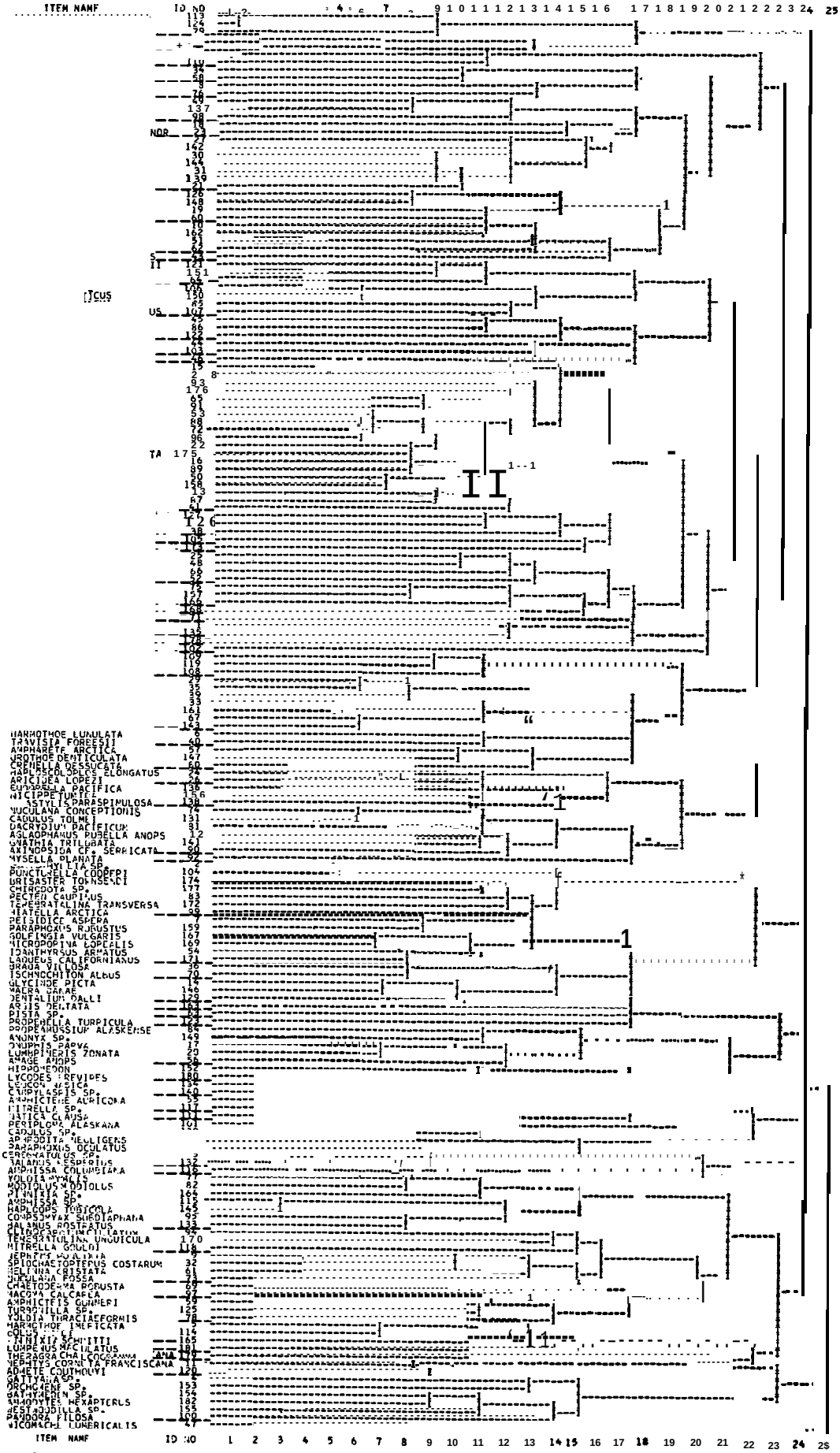

Figure 6. Dendrogram of species groups formed by an inverse cluster analysis of *ln* transformed abundance data.

TABLE IX

TWO WAY COINCIDENCE TABLE OF AVERAGE CELL DENSITY[1] COMPARING THE MAJOR SPECIES GROUPS AND THE STATION GROUPS FORMED BY A CLUSTER ANALYSIS OF *ln* TRANSFORMED ABUNDANCE DATA

Species Group	Station Group 1 (15)[2]	Station Group 2 (7)	Station Group 3 (4)	Station Group 4 (3)	Station Group 5 (2)	Station 106A (1)	Station 97D (1)	Station 7A (1)
8 (7)[2]	6.3	0.9	0.3	0.5	1.0	7.7	1.4	0.0
17 (19)	23.4	14.8	12.7	3.5	2.7	2.2	3.2	0.2
21 (4)	0.8	12.9	1.5	0.0	3.3	0.0	4.5	0.5
23 (1)	0.8	12.9	0.0	0.0	116.0	0.0	0.0	0.0
24 (1)	0.0	3.4	0.0	0.0	0.0	0.0	24.0	0.0
29 (7)	0.0	0.0	0.0	0.0	14.1	0.0	0.0	0.0
34 (6)	1.2	2.7	22.6	0.1	0.3	0.0	2.3	0.0
36 (7)	0.0	0.2	0.1	0.0	0.1	0.0	4.3	0.0
53 (3)	0.6	0.5	0.0	8.8	0.0	0.7	2.0	0.0
54 (4)	12.0	0.9	0.7	18.4	0.0	11.0	0.0	0.0

[1]Average cell density is a total of the abundance of *all* species in a species group-in all stations of a station group divided by the number of stations and species in these groups.

[2]Numbers in parentheses represent the number of stations or species in the group.

by Species Groups 8 and 54 and Station 7A was notable for the low abundance, biomass and diversity of its fauna (Table IX).

A cluster analysis of untransformed abundance data (Figure 7) identified 5 stations groups at the 32 percent similarity level. These groups were quite similar to the station groups formed by a cluster analysis using *ln* transformed abundance data (Table X).

Principal coordinate analyses using the Czekanowski and Canberra "metric" similarity coefficients on both untransformed and *ln* transformed abundance data (Figs. 8, 9, 10 and 11) generally confirmed the results of cluster analyses (Figs. 4 and 7). Stations in the station groups delineated by cluster analyses formed loose groupings on the first and second coordinate axes (Figs. 8a, 9a and 10a) of all plots except Figure 11. Separation between station groups are not as apparent in the principal coordinate analysis using *ln* transformed abundance data and the Canberra "metric" coefficient (Figure 11). The use of the Canberra "metric" coefficient with untransformed abundance data greatly reduces the effect of differences in the abundance of species and stations are distinguished primarily on differences in faunal complement. Station Group 1 formed fairly distinct groupings on the first and second axes (Figs. 8a, 9a and 10a). However, the position (Figs. 8a, 9a, 10a and ha) of Stations 2C, 3C and 4B (Yakutat Bay) between the majority of the stations in Group 1 and Station Group 4 (Yakutat Bay) indicates that these stations may be transitional between these 2 groups in terms of their fauna. An examination of the species assemblages in Stations 2C, 3C and 4B supports this contention. Stations 2C, 3C and 4B, as well as all stations in Station Group 4, are located in Yakutat Bay.

Pipe Dredge

A total of 34 stations was sampled via the pipe dredge; 29 offshore stations and 5 Yakutat Bay stations (Figs. 1 and 2). Pipe dredge samples from seven untrawlable stations (Stations 94G, 97F, 98F, 100J, 1011 and K, and 103G) and one trawled station (Station 98F) were analyzed (identified and enumerated) in the proposed sale lease area (Priority Area 1), and are

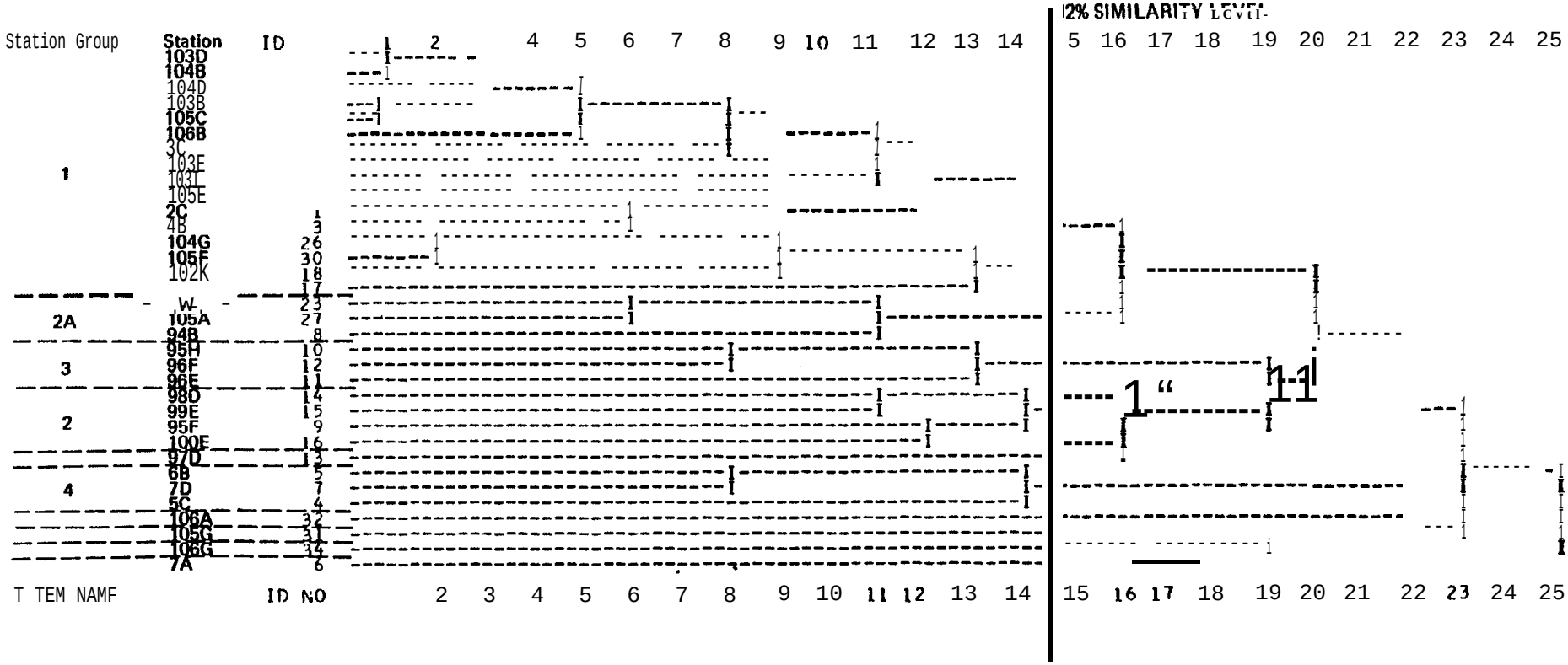

Figure 7. Dendrogram produced by a cluster analysis of untransformed abundance data from benthic grab samples. Station groups delineated at the 32% similarity level (dark vertical line) are separated by dashed lines.

TABLE X

COMPARISON OF STATION GROUPS FORMED BY CLUSTER ANALYSIS USING *ln* TRANSFORMED AND UNTRANSFORMED ABUNDANCE DATA

	ln transformed data	untransformed data
GROUP 1	2C	2C
	3C	3C
	4B	4B
	94B[1]	100J[1]
	98D[1]	102K[1]
	103B	103B
	103D	103D
	103F	103F
	104A	103I[1]
	104B	
	104D	104B
	105A[1]	104D
	105C	104G
	105E	105C
	106B	105E
		105F
		106B
GROUP 2	95F	95F
	99E	98D
	100E	99E
	100J[1]	100E
	102K[1]	
	104G[1]	
	105F[1]	
GROUP 2A		94B
		104A
		105A

TABLE X

CONTINUED

	ln transformed data	untransformed data
GROUP *3*	*95H*	*95H*
	96E	*96E*
	96F	*96F*
	103I[1]	
GROUP 4	5C	5C
	6B	6B
	7D	7D
GROUP 5	105G[1]	
	106G[1]	

[1]Stations which were not classified in the same group by both cluster analysis routines (*ln* transformed and untransformed data).

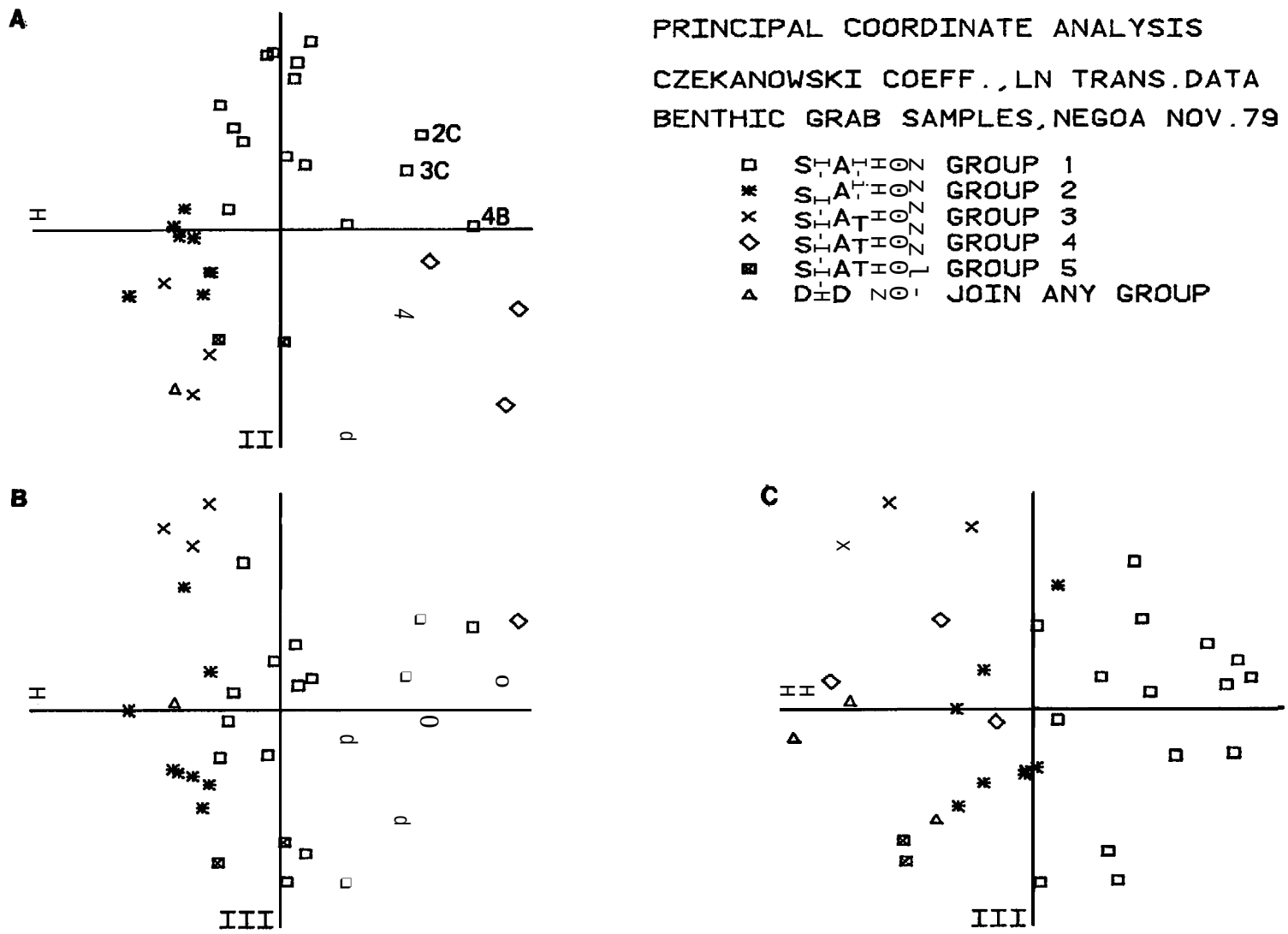

Figure 8. Plots of the first three coordinate axes of a principal coordinate analysis using Czekanowski similarity and *ln* transformed abundance data.

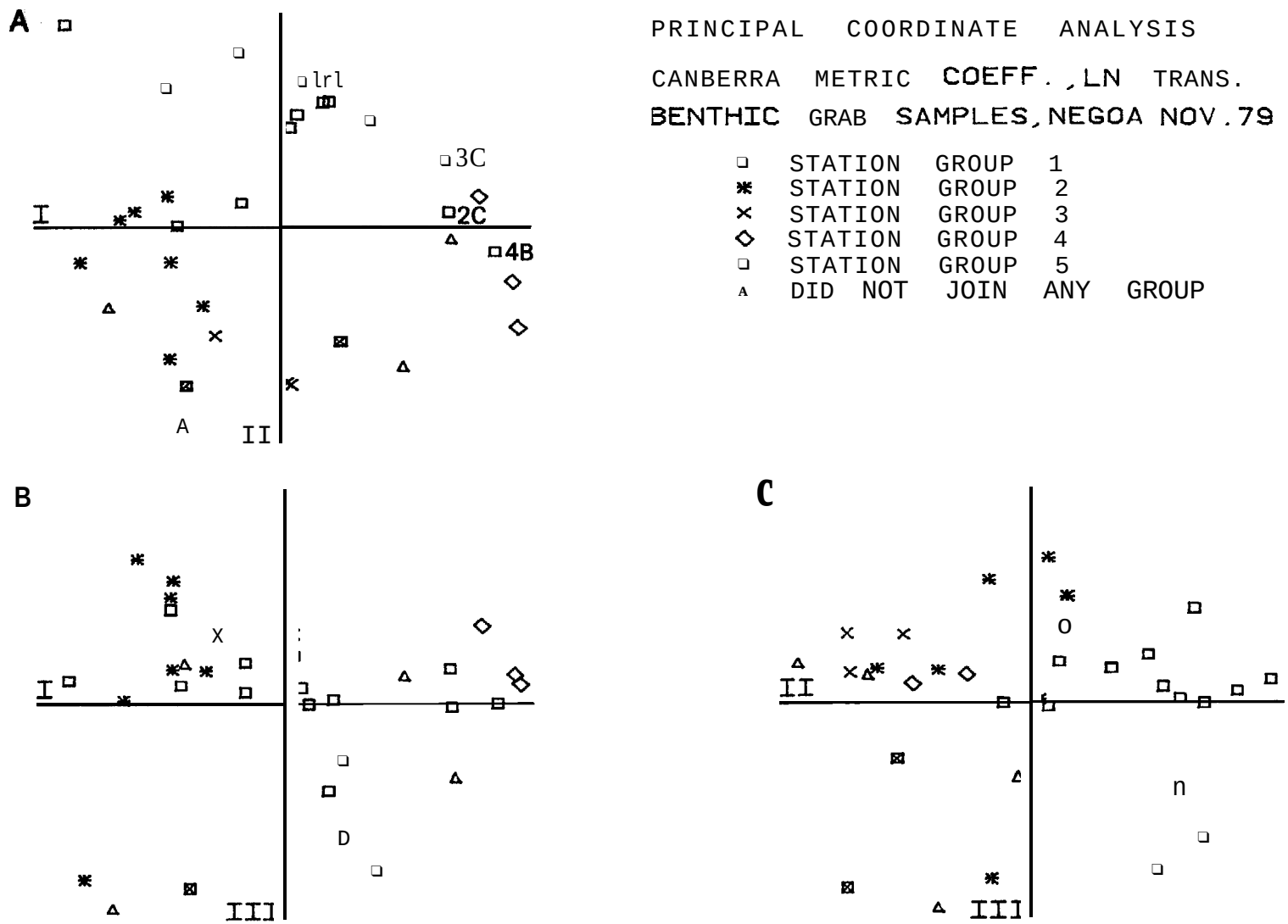

Figure 9. Plots of the first three coordinate axes of a principal coordinate analysis using Canberra metric similarity coefficient and *ln* transformed abundance data.

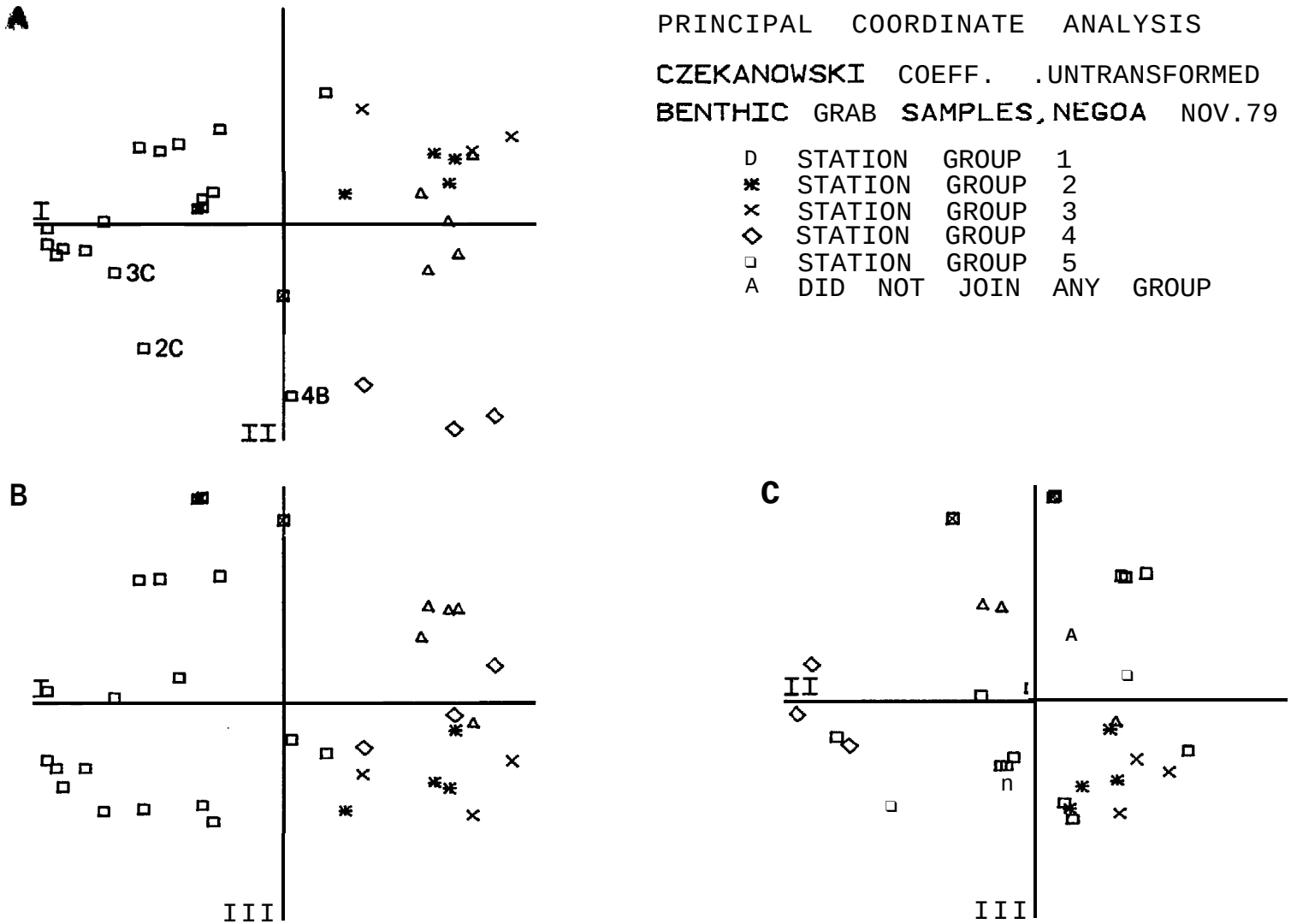

Figure 10. Plots of the first three coordinate axes of a principal coordinate analysis using Czekanowski similarity coefficient and untransformed abundance data.

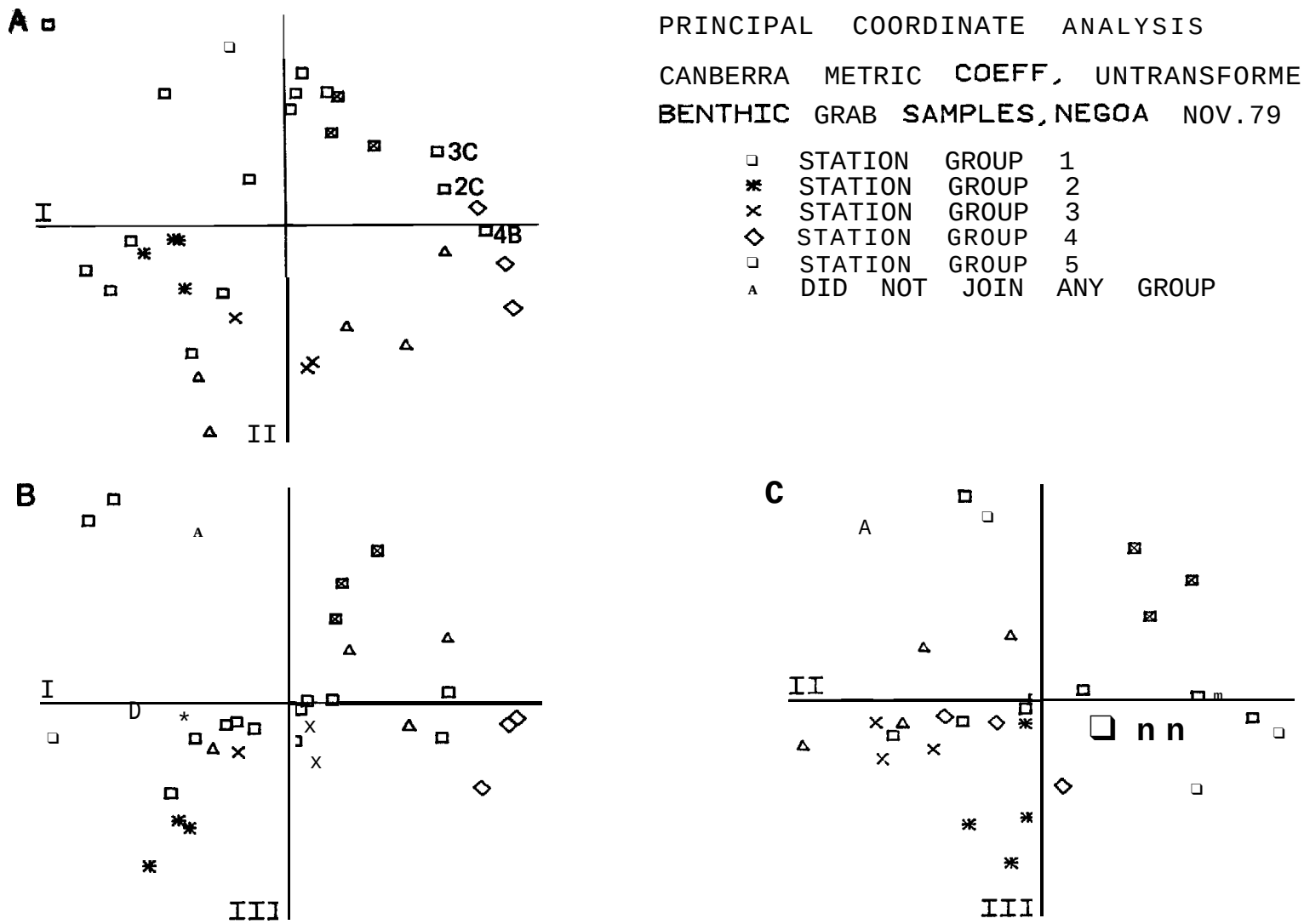

Figure 11. Plots of the first three coordinate axes of a principal coordinate analysis using Canberra metric similarity coefficient and untransformed abundance data.

presented in Appendix C. Four of the stations (97F, 98F, 100J, 103G) had previously been sampled with the van Veen grab. The remainder of the dredge station samples was roughly identified in the field to help characterize the stations. All samples were preserved and archived at the Institute of Marine Science, Fairbanks.

FISHES

Offshore Stations

A total of 64 species of fishes was collected from the offshore stations (Appendix A). Important fish families were Squalidae-sharks (5.9% of total fish biomass), Rajidae-skates (7.1%), Gadidae-cods (12.9%), Anoplopomidae-sablefish (15.7%), and Pleuronectidae-flatfishes (54.3%). Five species made up 71.5 percent of the fish biomass: arrowtooth flounder (*Atheresthes stomias*) -*31.5* percent of the total fish biomass; sablefish (*Anoplopoma fimbria*) - *15.7* percent; walleye pollock (*Theragra chalcogramma*) - *10.1* percent; Pacific halibut (*Hippoglossus stenolepis*) -*8.3* percent; and spiny dogfish (*Squalus acanthias*) — 5.9 percent (Table XI).

Arrowtooth flounder occurred in 40 of the 42 trawl stations. Stations 94A and 105B did not yield this flatfish species. Stations yielding the highest biomass came from the extreme ends of the proposed sale lease area; Stations 95F-H to the west and Stations 1031, 104G, and 105E to the east. These six stations yielded 59.4 percent of the arrowtooth flounder biomass. Station 104G produced the greatest catch with 2370 individuals (1638.5 kg) in a 30 minute tow or 800 fish per kilometer of fishing.

Sablefish (black cod) occurred in 34 (81%) of the offshore trawl stations. Stations 104G and 105F yielded 75.5 percent of the sablefish biomass. At Station 105F, 832 sablefish were caught per kilometer of fishing. The mean fish weight at Station 105F was 0.8 kg.

Walleye pollock occurred in 36 (85.7%) of the offshore trawl stations. Highest biomass stations were 95G and 96E; 83.2 percent of the total walleye pollock biomass. At Station 96E, 1018 individuals per kilometer of fishing were obtained. The mean fish weight at Station 96E was 0.4 kg.

TABLE XI

NUMBERS, WEIGHTS AND BIOMASS (g/m^2) OF THE MAJOR FISHES FROM THE OFFSHORE REGION OF THE NORTHEASTERN GULF OF ALASKA AND YAKUTAT BAY, NOVEMBER 1979

Taxon	Number of fishes		Wet weight (kg)		% of weight wet		$\bar{x}$ g/m^2	
	offshore	Yakutat	offshore	Yakutat	offshore[1]	Yakutat[2]	offshore[3]	Yakutat[4]
Squalus acanthias	610	44	1051.699	57.600	509	25.5	0.73	0.62
Raja binoculata	123	2	270.600	1.400	1.5	0.6	0.19	0.02
Raja rhina	61	3	275.677	11.400	1.6	5.0	0.19	0.12
Raja stellulata	221	12	536.143	950300	3.0	42.2	0.37	1.03
Microgadus proximus	2457	42	327.072	2.030	1.8	0.9	0.23	0.02
Theragra chalcogramma	4502	78	1794.438	2.973	10.1	1.3	1.25	0.03
Anoplopoma fimbria	3332	2	2782.815	1.120	15.7	0.5	1.94	0.01
Atheresthes stomias	11886	21	5578.935	5.070	31.5	2.2	3.89	0.05
Glyptocephalus zachirus	2830	0	414.541	0	2.3	0	0.29	0
Hippoglossoides elassodon	1514	16	551.037	2.944	3.1	1.3	0.38	0.03
Hippoglossus stenolepsis	337	3	1472.567	18.600	8.3	8.2	1.03	0.20
Isopsetta isolepis	3200	26	776.724	5.500	4.4	2.4	0.54	0.06
Lepidopsetta bilineata	490	0	351.402	0	2.0	0	0.25	0
Parophrys vetulus	514	0	257.197	0	1.5	0	0.18	0

[1]Total wet weight - 17689.462 kg
[2]Total wet weight - 225.896 kg
[3]Total area fished - 1434232 m^2
[4]Total area fished - 92598 m^2

Pacific halibut occurred in 33 (78.6%) widely dispersed stations. Highest biomass occurred at Stations 106A and B, 98D, and 93C. These four stations yielded 38.5 percent of the halibut biomass. The mean weight of all halibut caught was 4.3 kg. Station 105F yielded 40 halibut that had an average weight of 2.1 kg.

Spiny dogfish occurred in 33 (78.6%) widely dispersed stations. The high biomass stations of 105G and 109A yielded 56.5 percent of the total spiny dogfish biomass. At Station 105G, 303 individuals were caught in a 30 minute tow. The mean weight at the latter station was 1.4 kg.

Yakutat Bay Stations

A total of 23 fish species was collected in the three Yakutat Bay trawl stations. Elasmobranchs dominated the fish catch yielding 76.8 percent of the fish biomass. Spiny dogfish (*Squalus acanthias*) and starry skate (*Raja stellulata*) dominated. Spiny dogfish occurred at all three stations and made up 25.5 percent of the fish biomass. Starry skate occurred only at Station 4A but accounted for 42.2 percent of the fish biomass in the bay (Table XI).

FEEDING STUDIES

Offshore Stations

An analysis of stomach contents from three species of invertebrates and 20 species of fishes is presented here. Ten of the species of fishes were members of the family Pleuronectidae. The percent frequency of occurrence of food items was calculated for both the total number of stomachs examined and for only those which contained food. Major food groups found in stomachs are listed in Table XII while Table XIII contains all prey items identified to the lowest taxon possible.

The arrowtooth flounder (*Atheresthes stomias*) primarily consumed small fishes such as walleye pollock (*Theragra chalcogramma*) and eulachon (*Thaleichthys pacificus*); shrimps, including *Pandalus* spp., were second in frequency of occurrence as food items among arrowtooth flounders. Rex sole (*Glyptocephalus zachirus*) were found to prey mainly on polychaete worms,

TABLE XII

MAJOR FOOD GROUPS FOUND IN STOMACHS OF SELECTED FISHES AND INVERTEBRATES FROM THE NORTHEASTERN GULF OF ALASKA, EXCLUDING YAKUTAT BAY, NOVEMBER 1979

Numbers in parenthesis are numbers of predators containing that prey item

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Percent frequency of occurrence based on Total stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Fishes			
Atheresthes stomias (Arrowtooth flounder)	N = 120	N = 250	36.6±11.3 (total length)
Empty (130)		52.0	
Pisces (76)	63.3	30.4	
Shrimp (35)	29.2	14.0	
Other Crustacea (12)	10.0	4.8	
Glyptocephalus zachirus (Rex sole)	N = 195	N = 218	28.2±5.9 (total length)
Polychaeta (142)	72.8	65.1	
Amphipoda (66)	33.8	30.3	
Shrimp (40)	20.5	18.4	
Other Crustacea (25)	12.8	11.5	
Empty (23)		10.5	
Bivalves (16)	8.2	7*3	
Hippoglossoides elassodon (Flathead sole)	N=96	N = 168	32.5?8.4 (total length)
Empty (72)		42.9	
Ophiuroidea (62)	64.6	36.9	
Shrimp (31)	32.3	18.5	
Other Crustacea (15)	15.6	8.9	
Pisces (8)	8.3	4.8	
Isopsetta isolepis (Butter sole)	N=53	N=97	28.5?4.2 (total length)
Empty (44)		45.5	
Ophiuroidea (31)	58.5	32.0	
Polychaeta (13)	24.5	13.4	
Crustacea (11)	20.8	11.3	
Parophrys vetulus (English sole)	N=67	N=92	*27.757.5* (total length)
Polychaeta (50)	74.6	54.4	
Empty (25)		27.2	
Ophiuroidea (19)	28.4	20.7	
Crustacea (12)	17.9	13.0	
Bivalves (7)	10.4	7.6	

TABLE XII

CONTINUED

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Percent frequency of occurrence based on Total stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Microstomus pacificus (Dover sole)	N = 74	N = 89	37.9±6.1 (total length)
Ophiuroidea (66)	89.2	74.2	
Mollusca (34)	46.0	38.2	
Polychaeta (33)	44.6	37.1	
Empty (14)		15.7	
Crustacea (13)	17.6	14.6	
Hippoglossus stenolepis (Pacific halibut)	N = 49	N = 74	53.2±12.0 (total length)
Pisces (29)	49.2	39.2	
Empty (25)		33.8	
Chionoecetes bairdi (18)	36.7	24.3	
Other Crustacea (11)	22.5	14.9	
Ophiuroidea (5)	10.2	6.8	
Cephalopod (5)	10.2	6.8	
Platichthys stellatus (Starry flounder)	N = 22	N = 31	*44.9*5.9* (total length)
Ophiuroidea (20)	90.9	64.5	
Empty (9)	40.9	29.0	
Mollusca (2)	9.1	6.5	
Unid. remains (1)	4.5	3.2	
Lepidopsetta bilineata (Rock sole)	N = 26	N = 32	30.1±7.6 (total length)
Crustacea (10)	38.5	31.3	
Ophiuroidea (9)	34.6	28.1	
Polychaeta (6)	23.1	18.8	
Empty (6)	23.1	18.8	
Pisces (4)	15.4	12.5	
Psettichthys melanostictus (Sand sole)	N = 4	N = 10	31.3±3.7 (total length)
Empty		60.0	
Pisces	100 .0	40.0	

TABLE XII

CONTINUED

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Total stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Anoplopoma fimbria (Sablefish)	N = 57	N = 90	47.927.6 (fork length)
Empty (33)		36.7	
Pisces (20)	35.1	22.2	
Scyphozoa (15)	26.3	16.7	
Amphipoda (14)	24.6	15.6	
Other Crustacea (9)	15.8	10.0	
Cephalopoda (6)	10.5	6.7	
Theragra chalcogramma (Walleye pollock)	N=39	N = 70	39.4*5.7 (total length)
Empty (31)		44.3	
Shrimp (22)	56.4	31.4	
Amphipoda (13)	33.3	18.6	
Other Crustacea (8)	20.5	11.4	
Pisces (5)	12.8	7.1	
Gadus *macrocephalus* (Pacific cod)	N=15	N = 15	66.226.9 (total length)
Shrimp (12)	80.0		
Chionoecetes bairdi (9)	60.0		
Cephalopoda (9)	60.0		
Other Crustacea (8)	53.3		
Pisces (3)	20.0		
Sebastolobus alascanus (Shortspine thornyhead)	N=41	N = 50	29.4?4.8 (total length)
Shrimp (37)	90.2	74.0	
Empty (9)		18.0	
Polychaeta (6)	14.6	12.0	
Pisces (6)	14.6	12.0	
Other Crustaceans (5)	12.2	10.0	
Sebastes aleutianus (Rougheye rockfish)	N = 8	N = 10	35.6*5.9 (total length)
Shrimp (6)	75.0	60.0	
Pisces (4)	50.0	40.0	
Empty (2)		20.0	

TABLE XII

CONTINUED

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Percent frequency of occurrence based on Total Stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Sebastes alutus (Pacific Ocean perch)	N = 1 O	N = 10	*37.826.2* (total length)
Empty (lo)	100 .o		
Sebastes paucispinis (Bocaccio)	N = 5	N = 6	40.0±3.4 (total length)
Unid. remains (5)	100.0	83.3	
Empty (1)		16.7	
Squalus acanthias (Spiny dogfish)	N = 25	*N=43*	*71.3*5.1* (total length)
Pisces *(19)*	*76.0*	44.2	
Empty (18)		41.9	
Shrimp (13)	*52.0*	30.2	
Other (7)	*28.0*	16.3	
Dasycottus setiger (Spinyhead sculpin)	*N=57*	N = 6 0	9.42*3.4 (total length)
Crustacea (55)	*96.5*		
Polychaeta (16)	*28.1*		
Pisces (7)	*12.3*		
Unknown material *(4)*	*7.0*		
empty (2)	*3.5*		
Malacocottus kincaidi (Blackfin sculpin)	N = 4 0	N = 4 0	10.3*2.5 (total length)
Crustacea (40)	100 .o		
Polychaeta (27)	*67.5*		
Porifera (9)	*22.5*		
Cnidaria (7)	*17.5*		
Foraminifera (3)	*7.5*		
Mollusca (3)	*7.5*		
Pisces (2)	*5.0*		

TABLE XII

CONTINUED

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Percent frequency of occurrence based on Total stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Invertebrates			
Pycnopodia he lianthoides (Sunflower sea star)	N = 36	N = 61	
Empty (25)			
Gastropoda (18)	50.0	29.5	
Ophiuroidea (18)	50.0	29.5	
Bivalves (16)	44.4	26.2	
Unid. remains (6)	16.7	9.8	
Crustacea (6)	16.7	9.8	
Cancer magister (Dungeness crab)	N = 14	N = 20	13.8?1.1 (carapace width)
Bivalves (14)	100.0	70.0	
Hydrozoa (10)	71.4	50.0	
Ophiuroidea (8)	57.1	40.0	
Polychaeta (7)	50.0	35.0	
Crustacea (6)	42.9	30.0	
Empty (6)		30.0	
Chionoecetes bairdi (Snow crab)	N = 120	*N = 140*	3.2±1.6 (carapace width)
Polychaeta (105)	87.5	75.0	
Mollusca (94)	78.3	67.1	
Foraminifera (80)	66.7	57.1	
Crustacea (77)	64.2	55.0	
Ophiuroidea (64)	53.3	45.7	
Diatoms (54)	45.0	38.6	
Sponge spicules (43)	35.8	30.7	
Unid. material (30)	25.0	21.4	
Empty (20)		14.3	

[1]Based on total stomachs examined.'

TABLE XIII

INDIVIDUAL TAXA FOUND IN STOMACHS OF SELECTED FISHES AND INVERTEBRATES FROM THE NORTHEASTERN GULF OF ALASKA, EXCLUDING YAKUTAT BAY, NOVEMBER 1979

Numbers in parenthesis are number of predators containing that prey item

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Fishes		
Atheresthes stomias (Arrowtooth flounder)	N = 120	N = 250
Empty (130)		52.0
Pisces (55)	45.8	22.0
Shrimp (21)	17.5	8.4
Theragra chalcogramma (walleye pollock) (19)	15.8	7.6
Euphausiacea (krill) (9)	7.5	3.6
Pandalidae (shrimps) (6)	5.0	2.4
Polychaeta (segmented worms) (3)	2.5	1.2
Chionoecetes bairdi (snow crab) (2)	1.7	0.8
Pandalus goniurus (bumpy shrimp) (2)	1.7	0.8
Thaleichthys pacificus (eulachon) (2)	1.7	0.8
Pandalus jordani (ocean pink shrimp) (2)	1.7	0.8
Unid. remains (2)	1.7	0.8
Pandalus borealis (pink shrimp) (1)	0.8	0.4
Pandalopsis dispar (sidestripe shrimp) (1)	0.8	0.4
Eualus macrophthalma (shrimp) (1)	0.8	0.4
Crustacea (1)	0.8	0.4
Octopus sp.(1)	0.8	0.4
Rocks (1)	0.8	0.4
Glyptocephalus zachirus (Rex sole)	N = 195	N = 218
Polychaeta (130)	66.7	59.6
Amphipoda (61)	31.3	28.0
Empty (23)	11.8	10.5
Shrimp (22)	11.3	10.1
Pandalidae (14)	7.2	6.4
Chionoecetes bairdi (12)	6.1	5.5
Unid. remains (9)	4.6	4.1
Bivalves (8)	4.1	3.7
Nucula tenuis (bivalve) (6)	3.1	2.8
Crangonidae (6)	3.1	2.8
Ophiuroidea (brittle stars) (4)	2.1	1.8
Aphrodita sp. (polychaete) (4)	2.1	1.8
Mysidae (4)	2.1	1.8

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Glyptocephalus zachirus (cent'd)		
Sipuncula (peanut worms) (3)	1.5	1.4
Golfingia sp. (Sipuncula) (3)	1.5	1.4
Ampeliscidae (Amphipoda) (3)	1.5	1.4
Crustacea (3)	1.5	1.4
Cumacea (3)	1.5	1.4
Sternaspis scutata (polychaete) (2)	1.0	0.9
Terebellides stroemi (polychaete) (1)	0.5	0.5
Goniada annulata (polychaete) (1)	0.5	0.5
Travesia sp. (polychaete) (1)	0.5	0.5
Neohella sp. (amphipod) (1)	0.5	0.5
Anonyx sp. (amphipod) (1)	0.5	0.5
Isopoda (1)	0.5	0.5
Crangon septemspinosa (1)	0.5	0.5
Pinnixa sp. (pea crab) (1)	0.5	0.5
Pagurus ochotensis (hermit crab) (1)	0.5	0.5
Delolepis gigantea (giant wry mouth) (1)	0.5	0.5
Psephidia lordi (bivalve) (1)	0.5	0.5
Yoldia sp. (bivalve) (1)	0.5	0.5
Ophiura sarsi (1)	0.5	0.5
Hippoglossoides elassodon (Flathead sole)	N = 96	*N = 168*
Empty (72)		42.9
Ophiura sarsi (52)	54.2	31.0
Pandalidae (17)	17.7	10.1
Shrimp (12)	12.5	7.1
Ophiuroidea (12)	12.5	7.1
Chionoecetes bairdi (8)	8.3	4.8
Euphausiacea (6)	6.3	3.6
Stichaeidae (pricklebacks) (5)	5.2	3.0
Pisces (2)	2.1	1.2
Hippolytidae (2)	2.1	1.2
Pandalopsis dispar (1)	1.0	0.6
Lumpenus maculatus (daubed shanny) (1)	1.0	0.6
Caprellidae (amphipod) (1)	1.0	0.6
Gastropoda (1)	1.0	0.6
Yoldia sp. (1)	1.0	0.6
Amphipoda (1)	1.0	0.6

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Isopsetta isolepis (Butter sole)	N = 53	N = 97
Empty (44)		45.4
Ophiura sarsi (23)	43.4	23.7
Polychaeta (12)	22.6	12.4
Ophiuroidea (7)	13.2	7.2
Chionoecetes bairdi (5)	9.4	5.2
Unid. remains (3)	5.7	3.1
Amphipoda (2)	3.8	2.1
Pisces (2)	3.8	2,1
Diamphiodia periercta **(ophiuroid)** (1)	1.9	1.0
Aphrodita sp. **(polychaete)** (1)	1.9	1.0
Echiurus sp. (spoon worm) (1)	1.9	1.0
Crustacea (1)	1.9	1.0
Shrimp (1)	1.9	1.0
Isopoda (1)	1.9	1.0
Pagurus sp. (hermit crab) (1)	1.9	1.0
Nuculana fossa (bivalve) (1)	1.9	1.0
Lyonsia arenosa (bivalve) (1)	1.9	1.0
Parophrys vetulus (English sole)	N = 67	N = 92
Polychaeta (51)	76.1	55*4
Empty (25)		27.2
Ophiuroidea (18)	37.3	19.6
Ophiura sarsi (13)	19.4	14.1
Amphipoda (12)	17.9	13.0
Unid. remains (6)	9.0	6.5
Bivalves (3)	4.5	3.2
Macoma sp. (1)	1.5	1.1
Psephidia lordi (1)	1.5	1.1
Nucula tenuis (1)	1.5	1.1
Yoldia sp. (1)	1.5	1.1
Crangon sp. (shrimp) (1)	1.5	1.1
Microstomus pacificus (Dover sole)	N = 74	N = 89
Ophiuroidea (52)	70.3	58.4
Polychaeta (24)	32.4	27.0

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Microstomus pacificus (cent'd)		
Yoldia sp. (16)	21.6	18.0
Empty (15)		17.0
Amphipoda (11)	14.9	12.4
Ophiura sarsi (9)	12.2	10.1
Scaphapoda (9)	12.2	10.1
Nucula tenuis (8)	10.8	9.0
Diamphiodia craterodmeta (ophiuroid) (7)	9.5	7.9
Bivalves (6)	8.1	6.7
Sternaspis scutata (polychaete) (5)	6.8	5.6
Periploma alaskana (bivalve) (4)	5.4	4.5
Cadulus sp. (scaphapod) (4)	5.4	4.5
Nephtys sp. (polychaete) (3)	4.1	3.4
Polynoidae (polychaete) (3)	4.1	3.4
Owenia fusiformis (polychaete) (3)	4.1	3.4
Pista cristata (polychaete) (2)	2.7	2.3
Goniada annulata (polychaete) (2)	2.7	2.3
Lumbrineris sp. (polychaete) (2)	2.7	2.3
Yoldia myalis (2)	2.7	2.3
Caprellidae (2)	2.7	2.3
Ophiopholis aculeata (ophiuroid) (1)	1.4	1.1
Asychis dispanidentata (polychaete) (1)	1.4	1.1
Nicomachinae (polychaete) (1)	1.4	1.1
Myriochele heeri (polychaete) (1)	1.4	1.1
Ammotrypane alogaster (polychaete) (1)	1.4	1.1
Glyceride (polychaete) (1)	1.4	1.1
Ampharitidae (polychaete) (1)	1.4	1.1
Nephtys cornuta franciscana (polychaete) (1)	1.4	1.1
Etone longa (polychaete) (1)	1.4	1.1
Onuphis iridescens (polychaete) (1)	1.4	1.1
Chone cincta (polychaete) (1)	1.4	1.1
Terebellides stroemi (polychaete) (1)	1.4	1.1
Pectinidae (polychaete) (1)	1.4	1.1
Onuphis sp. (1)	1.4	1.1
Brada sp. (polychaete) (1)	1.4	1.1
Glycinde sp. (polychaete) (1)	1.4	1.1
Amphictene auricoma (polychaete) (1)	1.4	1.1
Prionospio malmgreni (polychaete) (1)	1.4	1.1
Sabellidae (polychaete) (1)	1.4	1.1

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Microstomus pacificus (cent'd)		
Golfingia sp. (1)	1.4	1.1
Rhyncocoela (proboscis worm) (1)	1.4	1.1
Nuculana fossa (1)	1.4	1.1
Odontogena borealis (bivalve) (1)	1.4	1.1
Cardiomya sp. (bivalve) (1)	1.4	1.1
Psephidia lordi (1)	1.4	1.1
Shrimp (1)	1.4	1.1
Crangonidae (1)	1.4	1.1
Diastylis sp. (cumacea) (1)	1.4	1.1
Heterophoxis occulatus (amphipod) (1)	1.4	1.1
Lysianassidae (amphipod) (1)	1.4	1.1
Ampeliscidae (amphipod) (1)	1.4	1.1
Velutina velutina (gastropod) (1)	1.4	1.1
Harpiniopsis excavata (amphipod) (1)	1.4	1.1
Byblis sp. (Amphipoda) (1)	1.4	1.1
Oedicerotidae (Amphipoda) (1)	1.4	1.1
Chionoecetes bairdi (1)	1.4	1.1
Foraminifera (1)	1.4	1.1
Holothuroidea (1)	1.4	1.1
Ctenodiscus sp. (sea star) (1)	1.4	1.1
Anemone (1)	1.4	1.1
Nudibranchia (1)	1.4	1.1
Hippoglossus stenolepis (Pacific halibut)	N = 49	N = 74
Empty *(25)*		33.8
Chionoecetes bairdi (18)	36.7	24.3
Pisces (14)	28.6	18.9
Pleuronectidae (flat fishes) (8)	10.2	6.8
octopus Sp .(4)	8.2	5.4
Ammodytes hexapterus (Pacific sand lance) (3)	6.1	4.1
Gamaridae (amphipod) (3)	6.1	4.1
Ophiura sarsi (3)	6.1	4.1
Ophiuroidea (2)	4.1	2.7
Cottidae (sculpins) (1)	2.0	1.4
Glyptocephalus zachirus (1)	2.0	1.4
Elassochirus sp. (hermit crab) (1)	2.0	1.4
Pagurus ochotensis (hermit crab) (1)	2.0	1.4

TABLE XIII

CONTINUED

-Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Hippoglossus stenolepis (cent'd)		
Hyas sp. (crab) (1)	2.0	1.4
Munida quadrispina (crab) (1)	2.0	1.4
Crangonidae (1)	2.0	1.4
Pandalus sp. (1)	2.0	1.4
Pandalus platyceros (spot shrimp) (1)	2.0	1.4
Isopoda (1)	2.0	1.4
Squid (1)	2.0	1.4
Actiniaria (sea anemone) (1)	2.0	1.4
Platichthys stellatus (Starry flounder)	N = 22	N = 31
Ophiuroidea (10)	45.5	32.3
Ophiura sarsi (10)	45.5	32.3
Empty (9)		29.0
Unid. remains (1)	4.5	3.2
Gastropoda (1)	4.5	3.2
Buccinum sp. (gastropod) (1)	4.5	3.2
Theragra chalcogramma (1)	4.5	3.2
Lepidopsetta bilineata (Rock sole)	N = 26	N = 32
Empty (6)		18.8
Ophiura sarsi (5)	19.2	15.6
Ophiuroidea (4)	15.4	12.5
Chionoecetes bairdi (4)	15.4	12.5
Gammariidae (3)	11.5	9.4
Pisces (3)	11.5	9.4
Amphipoda (2)	7.7	6.3
Crangonidae (2)	7.7	6.3
Unid. remains (2)	7.7	6.3
Ammodytes hexapterus (1)	3.8	3.1
Travesia sp. (polychaete) (1)	3.8	3.1
Glycera capitata (polychaete) (1)	3.8	3.1
Spionidae (polychaete) (1)	3.8	3.1
Onuphis Sp. (1)	3.8	3.1
Aphrodita sp. (1)	3.8	3.1
Polychaeta (1)	3.8	3.1
Rhynchocoela (1)	3.8	3.1
Anonyx sp. (1)	3.8	3.1

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Psettichthys melanostictus (Sand sole)	N = 4	N = 10
Empty (6)		60.0
Pisces (3)	75.0	30.0
Atheresthes stomias (1)	25.0	10.0
Anoplopoma fimbria (Sablefish)	*N=57*	N = 90
Empty (33)		36.7
Pisces (15)	26.3	16.7
Scyphozoa (jelly fish) (15)	26.3	16.7
Amphipoda (12)	21.0	13.3
Shrimp (10)	17.5	11.1
Euphausiacea (7)	12.3	7.8
Squid (3)	5.3	3.3
Hippoglossoides elassodon (2)	3.5	2.2
Pleuronectidae (2)	3.5	2.2
Gamariidae (2)	3.5	2.2
Gonatus sp. (cephalopod) (2)	3.5	2.2
Unid. remains (2)	3.5	2.2
Clupea harengus (herring) (1)	1.8	1.1
Theragra chalcogramma (1)	1.8	1.1
Pandalidae (1)	1.8	1.1
Pandalus goniurus (1)	1.8	1.1
Euphausia pacifica (krill) (1)	1.8	1.1
Thysanoessa inermis (krill) (1)	1.8	1.1
Cumacea (1)	1.8	1.1
Munida quadrispina (1)	1.8	1.1
octopus Sp . (1)	1.8	1.1
Ophiuroidea (1)	1.8	1.1
Theragra chalcogramma (Walleye pollock)	N = 39	N = 70
Empty (31)		44.3
Shrimp (17)	43.6	24.3
Amphipoda (13)	33.3	18.6
Pisces (5)	12.8	7.1
Euphausiacea (5)	12.8	7.1
Pandalidae (3)	7.7	4.3

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Total stomachs
Theragra chalcogramma (cent'd)		
Eualus sp. (shrimp) (2)	5.1	2.9
Parathemisto pacifica (amphipod) (2)	5.1	2.9
Cumacea (2)	5.1	2.9
Unid. remains (2)	5.1	2.9
Thysanoessa sp. (1)	2.6	1.4
Gadus macrocephalus (Pacific cod)	N = 15	N = 15
Shrimp (11)	73.3	
Rocks (11)	73.3	
Chionoecetes bairdi (9)	60.0	
Munida quadrispina (6)	40.0	
Squid (5)	33.3	
octopus Sp. (4)	26.7	
Pisces (3)	20.0	
Crangonidae (2)	13.3	
Pandalus montagui (1)	6.6	
Hyas sp. (1)	6.6	
Rocinela sp. (isopod) (1)	6.6	
Echinodermata (1)	6.6	
Algae (1)	6.6	
Sebastolobus alascanus (Shortspine thornyhead)	N = 41	N = 50
Shrimp (23)	56.1	46.0
Empty (9)		18.0
Pandalidae (8)	19.5	16.0
Eualus sp. (5)	12.2	10.0
Polychaeta (5)	12.2	10.0
Hippolytidae (2)	4.9	4.0
Stichaeidae (2)	4.9	4.0
Zoarchidae (eel pouts) (2)	4.9	4.0
Pandalus borealis (1)	2.4	2.0
Pandalopsis dispar (1)	2.4	2.0
Eualus macrophthalma (1)	2.4	2.0
Cumacea (1)	2.4	2.0
Mysidae (1)	2.4	2.0
Neohella sp. (1)	2.4	2.0
Chionoecetes bairdi (1)	2.4	2.0

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Sebastolobus alascanus (cent'd]		
Polynoidae (1)	2.4	2.0
Yoldia sp. (1)	2.4	2.0
Octopus Sp . (1)	2.4	2.0
Pisces (1)	2.4	2.0
Pleuronectidae (1)	2.4	2.0
Unid. material (1)	2.4	2.0
Crab (1)	2.4	2.0
Sebastes aleutianus (Rougheye rockfish)	N = 8	N = 10
Shrimp (6)	75.0	60.0
Pisces (4)	50.0	40.0
Empty (2)		20.0
Mysidacea (1)	12.5	10.0
Squid (1)	12.5	10.0
Sebastes alutus (Pacific Ocean perch)		N = 10
Empty (10)		100.0
Sebastes paucispinis (Bocaccio)	N = 5	N = 6
Unid. remains (5)	100.0	*83.3*
Empty (1)		*16.7*
Squalus acanthias (Spiny dogfish)	N=25	N = 43
Empty (18)		41.9
Pisces (10)	40.0	23.3
Pandalus jordani (4)	16.0	9.3
Thaleichthys pacificus (4)	16.0	9.3
Pleuronectidae (3)	12.0	7.0
Pandalidae (3)	12.0	7.0
Unid. remains (3)	12.0	7.0
Stichaeidae (2)	8.0	4.6
Atheresthes stomias (2)	8.0	4.6
Shrimp (2)	8.0	4.6
Hippolytidae (shrimp) (2)	8.0	4.6

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Squalus acanthias (cent'd)		
Chionoecetes bairdi (2)	8.0	4.6
octopus Sp. (2)	8.0	4.6
Spirontocarus sp. (shrimp) (1)	4.0	2.3
Crangonidae (1)	4.0	2.3
Dasycottus se-tiger (Spinyhead sculpin)	*N=57*	*N=58*
Natantia (shrimp) (21)	36.8	*36.2*
Crustacea (18)	31.6	*31.0*
Polynoidae (polychaete) (15)	26.3	*25.9*
Mysidacea (15)	26.3	*25.9*
Amphipoda (10)	17.5	*17.2*
Pandalidae (8)	14.0	*13.8*
Crangonidae (6)	10.5	*10.3*
Osteichthyes (fish) (5)	8.8	*8.6*
Crangon septemspinosa (shrimp) (4)	7.0	*6.8*
Pandalus montagui tridens (shrimp) (4)	7.0	*6.8*
Chionoecetes bairdi (4)	7.0	*6.8*
Unknown material (4)	7.0	*6.8*
Pandalus Sp. *(3)*	5.3	*5.2*
Anonyx sp. (amphipod) (3)	5.3	*5.2*
Crangon sp. (shrimp) (3)	5.3	*5.2*
Rhachotropis oculata (isopod) (2)	3.5	*3.4*
Orchomene sp. (amphipod) (1)	1.8	1.7
Polychaeta (1)	1.8	*1.7*
Nuculana sp. (bivalve) (1)	1.8	*1.7*
Cumacea (1)	1.8	*1.7*
Isopoda (1)	1.8	*1.7*
Crangon dalli	1.8	*1.7*
Argis alaskensis (shrimp) (1)	1.8	*1.7*
Lebbeus washingtonianus (shrimp) (1)	1.8	*1.7*
Pandalus jordani (1)	1.8	*1.7*
Reptantia (crab) (1)	1.8	*1.7*
Ophiuroidea (1)	1.8	*1.7*
Ammodytes hexapterus (fish) (1)	1.8	*1.7*
Cottidae (fish) (1)	1.8	*1.7*
Empty (1)	1.8	*1.7*

TABLE XIII

CONTINUED

Stomach contents	Percent frequency of occurrence based on: Stomachs with food	Total stomachs
Malacocottus kincaidi (Blackfin sculpin)	N = 40	N = 40
Rocks or sand (21)	52.5	
Polynoidae (19)	47.5	
Pandalidae (15)	37.5	
Crustacea (14)	35.0	
Natantia (shrimp) (14)	35.0	
Mysidacea (13)	32.5	
Diastylis sp. (cumacean) (11)	27.5	
Porifera (9)	22.5	
Plastic line (8)	20.0	
Meterythrops robusta (mysid) (7)	17.5	
Sertulariidae (Cnidaria) (6)	15.0	
Polychaeta (6)	15.0	
Lysianassidae (amphipod) (6)	15.0	
Unknown annual tissue (6)	15.0	
Rhachotropis sp. (amphipod) (5)	12.5	
Caprellidae (amphipod) (5)	12.5	
Amphipoda (4)	10.0	
Orchomene sp. (amphipod) (4)	10.0	
Pandalus sp. (4)	10.0	
Formainifera (3)	7.5	
Aphrodita sp. (3)	7.5	
Anonyx sp. (amphipod) (3)	7.5	
Melphidippidae (amphipod) (3)	7.5	
Stegocephalidae (amphipod) (3)	7.5	
Stenothoidae (amphipod) (3)	7.5	
Hydrozoa (2)	5.0	
Ampharetidae (polychaete) (2)	5.0	
Trochidae (gastropod) (2)	5.0	
Pseudomma truncata (mysid) (2)	5.0	
Cumacea (2)	5.0	
Gammaridae (2)	5.0	
Westwoodilla caecula (amphipod) (2)	5.0	
Hippolytidae (2)	5.0	
Heptacarpus sp. (shrimp) (2)	5.0	
Osteichthyes (fish) (2)	5.0	
Antinoella macrolepida (polychaete) (1)	2.5	
Cirratulidae (polychaete) (1)	2.5	
Glyceride (polychaete) (1)	2.5	

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Total stomachs
Malacocottus kincaidi (cent'd)		
Goniada annulata (polychaete) (1)	2.5	
Glycera capitata (polychaete) (1)	2.5	
Pelecypoda (1)	2.5	
Pycnogonida (1)	2.5	
Gaetanus sp. (copepod) (1)	2.5	
Acanthomysis (mysid) (1)	2.5	
Holmesiella anomala (mysid) (1)	2.5	
Neomysis sp. (mysid) (1)	2.5	
Piastylidae (cumacean) (1)	2.5	
Leptostylis sp. (cumacean) (1)	2.5	
Isopoda (1)	2.5	
Bopyridae (isopod) (1)	2.5	
Gnathiidae (isopod) (1)	2.5	
Eusirus sp. (amphipod) (1)	2.5	
Anonyx nugax pacifica (amphipod) (1)	2.5	
Prachynella lodo (amphipod) (1)	2.5	
Hippomedon sp. (amphipod) (1)	2.5	
Socarnes bidenticulatus (amphipod) (1)	2.5	
Valettiopsis pentatus (amphipod) (1)	2.5	
Pardaliscidae (amphipod) (1)	2.5	
Nicippe tumida (amphipod) (1)	2.5	
Euphausia sp. (amphipod) (1)	2.5	
Decapoda (1)	2.5	
Crangonidae (1)	2.5	
Heptacarpus moseri (shrimp) (1)	2.5	
Reptantia (crab) (1)	2.5	
Unid. eggs (1)	2.5	
Plant material (1)	2.5	
Invertebrates		
Pycnopodia helianthoides (Sunflower sea star) N = 37		N = 61
Empty (24)		39.3
Nuculana sp. (11)	29.7	18.0
Ophiuroidea (10)	27.0	16.4
Ophiura sarsi (9)	24.3	14.8
Unid. remains (6)	16.2	9.8
Mitrella gouldi (gastropod) (4)	10.8	6.6
Clinocardium ciliatum (bivalve) (4)	10.8	6.6

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Pycnopodia he lianthoides (cent' d)		
Buccinum polare (gastropod) (3)	8.1	4.9
Natica clausa (gastropod) (3)	8.1	4.9
Clinocardium californiense (3)	8.1	4.9
Aphrodita Sp. (3)	8.1	4.9
Colus halli (gastropod) (2)	5.4	3.3
Neptunea lyrata (gastropod) (2)	5.4	3.3
Propebela sp. (gastropod) (2)	5.4	3.3
Chionoecetes bairdi (2)	5.4	3.3
Gastropoda (1)	2.7	1.6
Neptunea sp. (1)	2.7	1.6
Natica sp. (1)	2.7	1.6
Polinices pallida (gastropod) (1)	2.7	1.6
Pandora grandis (bivalve) (1)	2.7	1.6
Bivalve (1)	2.7	1.6
Musculus niger (bivalve) (1)	2.7	1.6
Clinocardium sp. (1)	2.7	1.6
Macoma sp. (1)	2.7	1.6
Amphipoda (1)	2.7	1.6
Cancer sp. (1)	2.7	1.6
Pagurus ochotensis (1)	2.7	1.6
Holothuroidea (1)	2.7	1.6
Crangon sp. (1)	2.7	1.6
Plant material (1)	2.7	1.6
Cancer *magister* (Dungeness crab)	N = 14	N = 20
Bivalve (14)	100.0	70.0
Sediment (14)	100.0	70.0
Hydroids (10)	71.4	50.0
Ophiuroidea (9)	64.3	45.0
Empty (6)	42.9	30.0
Polychaeta (5)	35.7	25.0
Crustacea (3)	21.4	15.0
Unid. animal tissue (3)	21.4	15.0
Crab (3)	21.4	15.0
Plant material (3)	21.4	15.0
Amphipoda (2)	14.3	10.0

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total stomachs
Cancer magister (cent'd)		
Isopoda (3)	21.4	15.0
Pisces (2)	14.3	10.0
Lumbrineridae (polychaete) (2)	14.3	10.0
Polyplacophora (chiton) (1)	7.1	5.0
Polynoidae (1)	7.1	5.0
Ampharetidae (polychaete) (1)	7*1	5.0
Spionidae (polychaete) (1)	7.1	5.0
Chionoecetes bairdi (Snow crab)	N = 120	N = 140
Foraminifera (80)	66.7	57.1
Ophiuriodea (63)	52.5	45.0
Bivalvia (56)	46.7	40.0
Polychaeta (54)	45.0	38.6
Cosinodisceae (diatom) (52)	43.3	37.1
Sponge spicules (43)	35.8	30.7
Maldanidae (polychaete) (43)	35.8	30.7
Crustacea (42)	35.0	30.0
Nucula sp. (39)	32.5	27.9
Nephthyidae (polychaete) (32)	26.7	22.9
Capitellidae (polychaete) (32)	26.7	22.9
Crab fragments (31)	25.8	22.1
Sabellidae (polychaete) (30)	25.0	21.4
Spionidae (polychaete) (39)	24.2	20.7
Lumbrineridae (polychaete) (26)	21.7	18.6
Empty (20)		14.3
Pisces (19)	*15.8*	13.6
Trochidae (18)	*15.0*	12.9
Unid. organic debris (18)	*15.0*	12.9
Gastropoda (15)	*12.5*	10.9
Unid. animal tissue (13)	*10.8*	9.3
Nematoda (11)	*9.2*	7.9
Onuphidae (polychaete) (10)	*8.3*	7.1
Polynoidae (polychaete) (9)	*7.5*	6.4
Scaphopoda (8)	*6.7*	5.7
Psephidia lordi (7)	*5.8*	5.0
Unid. plat material (7)	*5.8*	5.0
Amphipoda (6)	*5.0*	4.3

TABLE XIII

CONTINUED

Stomach contents[1]	Percent frequency of occurrence based on: Stomachs with food	Percent frequency of occurrence based on: Total Stomachs
Chionoecetes bairdi (cent'd)		
Rhizosolenia sp. (diatom) (4)	3.3	2.9
Lumbrineris sp. (4)	3.3	2.9
Chionoecetes bairdi (4)	3.3	2.9
Nucula tenuis (3)	2.5	2.1
Unid. material (3)	2.5	2.1
Gramatophora sp. (diatom) (2)	1.7	1.4
Nereidae (2)	1.7	1.4
Goniadidae (2)	1.7	1.4
Goniada annulata (2)	1.7	1.4
Onuphis sp. (2)	1.7	1.4
Pennate diatoms (1)	0.8	0.7
Melosira sp. (diatom) (1)	0.8	0.7
Stephanopyxis sp. (diatom) (1)	0.8	0.7
Aphrodita sp. (1)	0.8	0.7
Nereis sp. (1)	0.8	0.7
Nephtys sp. (1)	0.8	0.7
Glyceride (1)	0.8	0.7
Glycera capitata (1)	0.8	0.7
Scalibregmidae (polychaete) (1)	0.8	0.7
Pectinariidae (polychaete) (1)	0.8	0.7
Ampharetidae (polychaete) (1)	0.8	0.7
Terebellidae (polychaete) (1)	0.8	0.7
Solariella sp. (1)	0.8	0.7
Chiton (1)	0.8	0.7
Axinopsida sp. (1)	0.8	0.7
Cardiomya sp. (1)	0.8	0.7
Dentalium sp. (1)	0.8	0.7
Copepoda (1)	0.8	0.7
Nicippe tumida (Amphipod) (1)	0.8	0.7
Shrimp fragments (1)	0.8	0.7
Ophiura sarsi (1)	0.8	0.7
Holothurian plates (1)	0.8	0.7
Avian"feathers (1)	0.8	0.7
Unid. eggs (1)	0.8	0.7

[1]Stomach contents are lowest level of identification.

including *Aphrodita* sp. and *Sternaspis scutata*; gammarid amphipods were second in frequency of occurrence. The brittle star (*Ophiura sarsi*) was the most frequent prey of flathead sole (*Hippoglossoides elassodon*); pandalid shrimps and other Crustacea, including snow crab, were secondary in occurrence. Butter sole (*Isopsetta isolepis*) mainly consumed O. *sarsi*. Unidentified polychaetes were second in frequency of occurrence in stomachs from the latter species. Polychaetes were also found to be the most frequent prey of English sole (*Parophrys vetulus*). Ophiuroids, including O. *sarsi*, were second in frequency of occurrence in stomachs from this species. Brittle stars, including O. *sarsi*, were also the most frequent prey of clover sole (*Microstomus pacificus*); bivalves, including *Yoldia* sp. and *Nucula tenuis*, and scaphopods, including *Cadulus* sp. were secondary in occurrence. Pacific halibut (*Hippoglossus stenolepis*) preyed mainly on small fishes, including other pleuronectids, sculpins (Cottidae), and the Pacific sand lance (*Ammodytes hexapterus*); second in frequency of occurrence among Pacific halibut were snow crab (*Chionoecetes bairdi*). The starry flounder (*Platichthys stellatus*) was also found to prey almost entirely on ophiuroids, including O. *sarsi*; gastropod and unidentified remains were of secondary importance. Rock sole (*Lepidopsetta bilineata*) preyed primarily on crustaceans, including snow crab and gammarid amphipods; brittle stars and polychaetes were second and third in frequency of occurrence, respectively. Sand sole (*Psettichthys melanostictus*) primarily consumed small fishes, including arrowtooth flounders. The sablefish (*Anoplopoma fimbria*) also preyed primarily on other fishes (including pleuronectids, herring [*Clupea harengus pallasi*] and walleye pollock) and on jellyfishes (Scyphozoa). The sable fish (15) that contained jellyfishes seldom contained other prey. *Also,* all *15* stomachs were full of this unlikely prey. Amphipods and other crustaceans were also important prey in sablefish. Walleye pollock consumed mainly unidentifiable shrimp, with amphipods and other small crustaceans occurring secondarily. Pacific cod (*Gadus macrocephalus*) consumed mainly unidentified shrimps, with snow crab and cephalopods occurring slightly less frequently. The shortspine thornhead (*Sebastolobus alascanus*) preyed almost entirely on shrimps, including Pandalidae and Hippolytidae. Rougheye rockfish (*Sebastes aleutianus*) also preyed primarily on unidentified shrimps.

Unidentified fishes were second in frequency of occurrence in stomachs from rougheye rockfish. All Pacific ocean perch (*Sebastes alutus*) examined were empty. Bocaccio (*Sebastes paucispinis*) contained unidentifiable animal remains; many were empty. Spiny dogfish (*Squalus acanthias*) also preyed mainly on fishes, including pleuronectids, eulachon, and pricklebacks (Stichaeidae). Pandalid and other shrimps were second in frequency of occurrence in spiny dogfish. The two sculpins, *Dasycottus setiger* and *Malacocottus kincaidi*, consumed mainly crustaceans, including shrimps, mysids, and amphipods; polychaetes, particularly polynoids were also important prey.

There was some tendency toward a spatial distribution in range and food habits for some of the species mentioned above. Rock sole, flathead sole, and English sole, occurring at stations farther from shore, consumed mainly ophiuroids. At more near-shore stations these same species consumed a much greater diversity of prey, including amphipods, polychaetes, shrimp and small bivalves. Butter sole, English sole, and starry flounders occurred more frequently at near-shore stations, while clover sole were generally found in deeper water (Feder and Jewett, unpub. OCSEAP data).

Yakutat Bay Stations

Two species of invertebrates and four species of fishes were analyzed for stomach contents from the three Yakutat Bay trawl stations (Table XIV).

Ten flathead sole from Station 4A were examined; four contained food. Two of the fish contained unidentifiable shrimp, one contained the sidestripe shrimp (*Pandalopsis dispar*), and one contained the protobranch clam (*Nuculana* sp.). Among the 20 butter sole examined only one contained food – a polychaete and a snail (*Mitrella gouldi*). Six starry flounder were examined but only one contained food. The food was unidentifiable. The seven out of nine spinyhead sculpin (*Dasycottus setiger*) with food in stomachs mainly contained shrimp.

Among the five out of nine sunflower sea stars (*Pycnopodia helianthoides*) with stomach contents, sediment was found in three of the individuals. *Mitrella gouldi* and the basket star (*Gorgonocephalus caryi*) occurred as food once.

TABLE XIV

INDIVIDUAL TAXA FOUND IN STOMACHS OF SELECTED FISHES AND INVERTEBRATES FROM YAKUTAT BAY, NOVEMBER 1979

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Percent frequency of occurrence based on Total stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Fishes			
Hippoglossoides elassodon (Flathead sole)	N = 4	N = 10	27.8?5.1 (total length)
Empty (6)		60.0	
Shrimp (2)	50.0	20.0	
Nuculana sp. (1)	25.0	10.0	
Pandalopsis dispar (1)	25.0	10.0	
Isopsetta isolepis (Butter sole)	N = 1	N = 20	*27.98?4.6* (total length)
Empty (19)		95.0	
Polychaeta (1)	100.0	5.0	
Mitrella gouldi (1)	100.0	5.0	
Platichthys stellatus (Starry flounder)	N = 1	N = 6	*43.7?5.2* (total length)
Unid. remains (1)	100.0	16.7	
Empty (5)		83.3	
Dasycottus setiger (Spinyhead sculpin)	N = 7	N = 9	11.0±3.3 (total length)
Shrimp (2)	28.6	22.2	
Empty (2)	28.6	22.2	
Polynoidea (1)	14.3	11.1	
Orchomene sp. (1)	14.3	11.1	
Pandalus borealis (1)	14.3	11.1	
Pandalidae (1)	14.3	11.1	
Crangon communis (1)	14.3	11.1	
Chionoecetes bairdi (1)	14.3	11.1	
Crustacea (1)	14.3	11.1	
Invertebrates			
Pycnopodia helianthoides (Sunflower sea star)	N = 5	N = 9	
Empty (4)		*44.4*	
Sediment (3)	75.0	*33.3*	
Mitrella gouldi (1)	20.0	11.1	
Gorgonocephalus caryi (1)	20.0	11.1	
Unid. material (1)	20.0	11.1	

TABLE XIV

CONTINUED

Stomach contents	Percent frequency of occurrence based on Stomachs with food	Percent frequency of occurrence based on Total stomachs	Size (cm)[1] $\bar{x}$ ± S.D.
Cancer magister (Dungeness crab)	N = 55	N = 57	14.1?2.1 (total length)
Sediment (55)	100.0	96.5	
Centric diatoms (40)	72.7	70.2	
Nuculana sp. (30)	54.5	52.6	
Yoldia sp. (21)	38.2	36.8	
Bivalvia (18)	32.7	31.6	
Unid. organic debris (16)	29.1	28.1	
Nephtyidae (14)	25.5	24.6	
Unid. animal tissue (12)	21.8	21.1	
Gastropoda (8)	14.5	14.0	
Foraminifera (6)	10.9	10.5	
Pennate diatoms (5)	9.1	8.8	
Polychaeta (5)	9.1	8.8	
Crab (5)	9.1	8.8	
Pisces (5)	9.1	8.8	
Shrimp (4)	7.3	7.0	
Capitellidae (Polychaeta) (4)	7.3	7.0	
Nematoda (3)	5.5	5.3	
Flagellates (3)	5.5	5.3	
Plant material (2)	3.6	3.5	
Empty (2)	3.6	3.5	
Lumbrineridae (1)	1.8	1.8	
Amphipoda (1)	1.8	1.8	
Pandalidae (1)	1.8	1.8	
Kinorhyncha (1)	1.8	1.8	
Mitrella sp. (1)	1.8	1.8	
Pinnixa sp. (1)	1.8	1.8	
Clinocardium sp. (1)	1.8	1.8	
Crangonidae (1)	1.8	1.8	
Tindaria sp. (bivalve) (1)	1.8	1.8	
Cephalopoda (1)	1.8	1.8	
Pagurus sp. (1)	1.8	1.8	

[1]Based on total stomachs examined.

The largest number of stomachs examined was from the Dungeness crab (*Cancer magister*) at Stations 4A and 6A. Fifty-seven (57) crab were examined, and 55 contained food. Sediment occurred in 100 percent of the feeding crab. Other items frequently found were centric diatoms (72.7%), *Nuculana* sp. (54.5%), *Yoldia* sp. (38.2%), and unidentifiable bivalves (32.7%) (Table XIV).

POLLUTANTS ON THE BOTTOM

The frequency of occurrence of man-made debris in trawls from the northeastern Gulf of Alaska is listed in Table XV. Fragments of plastic, probably from refuse bags, were the most common items found.

VII. DISCUSSION

BENTHIC EPIFAUNAL PROGRAM

Offshore Stations

The overall mean biomass of 1.7 g/m^2 was generally less than values obtained in previous offshore OCSEAP studies for more western areas of the Gulf of Alaska and the southeastern Bering Sea. The biomass for the NEGOA region from Montague Island to Yakutat Bay, taken in 1975, was 2.6 g/m^2 (Jewett and Feder, 1975, unpublished OCSEAP data on file, National Oceanographic Data Center). The biomass value for the Kodiak shelf area in 1978-79 was 2.5 g/m^2 (Feder and Jewett, 1980a). Values for the southeastern Bering Sea ranged from 3.3 to 5.0 g/m^2 for similar studies in 1975 and 1976, respectively (Feder and Jewett, 1980b). Thus, there appears to be an overall decrease in the epifaunal biomass of the Bering Sea and Gulf of Alaska from west to east.

An apparent tendency for decrease in species richness of offshore epifauna from west to east is observable. The southeastern Bering Sea had the greatest richness with 233 species (Feder and Jewett, 1980b). The NEGOA region from Montague Island to Yakutat Bay yielded 168 epifaunal species (Jewett and Feder, 1975, unpublished OCSEAP data on file, National Oceanographic Data Center). Species richness in the offshore region of the present study was 134 species. Localized regions of the Kodiak shelf had only 35 to 53 species, depending on the particular area examined (Feder and

TABLE XV

FREQUENCY OF OCCURRENCE OF MAN-MADE DEBRIS ON THE NORTHEASTERN GULF OF ALASKA SEA FLOOR

Type of debris	Number of trawls in which debris was found	Percent of total N = 45
All types	11	24%
Metal	1	2%
Glass	1	2%
Plastic	10	22%
Rubber	1	2%

Jewett, 1980a). The few species characteristic of the Kodiak shelf reflect the larger catches of snow and king crab in this region.

The biomasses of Arthropoda, Echinodermata, and Mollusca from the offshore region of the present study were relatively similar, i.e., 26.2, 27.4, and 21.1 percent, respectively. In contrast, values for the region of the Gulf of Alaska west of the study area (Montague Island to Yakutat Bay) showed Arthropoda with 71.4 percent of the total biomass, Echinodermata with 19.8 percent and Mollusca with 4.6 percent of the total biomass (Jewett and Feder, 1976). Biomass values for Arthropoda, Echinodermata, and Mollusca from the Kodiak shelf region were 77.4, 8.3, and 8.5 percent of the total biomass, respectively (Feder and Jewett, 1980a). The biomass from the southeastern Bering Sea was also dominated by Arthropoda (59.4%); with Echinodermata (18.9%) and Mollusca (5.5%) next in importance (Feder and Jewett, 1980b). The dominance of Arthropoda in previous studies resulted from an abundance of the snow crab *Chionoecetes bairdi*. Jewett and Feder (1975, unpublished OCSEAP data on file, National Oceanographic Data Center) found *C. bairdi* responsible for 66.2 percent of the total biomass from the northeastern Gulf of Alaska. However, in the present study, this species accounted for only 7.0 percent of the total biomass. *Cancer magister* was the major crab species present in the study reported here, but accounted for only 16.6 percent of the total biomass. *Chionoecetes bairdi* approaches the southern limit of its range in the Yakutat area (Ronholt *et aZ.,* 1976).

The biomass of mollusks was considerably higher for the present study than for previous studies in the Gulf of Alaska or the southeastern Bering sea (Jewett and Feder, (1975, unpublished OCSEAP data on file, National Oceanographic Data Center; Feder and Jewett, 1980a, b). This was due to the high biomass of weathervane scallop (*Pecten caurinus*) at near-shore station in the vicinities of Icy Bay, Dry Bay and Yakutat Bay. *Pecten caurinus* contributed 18.3 percent of the overall biomass. These areas coincide with historical commercial exploitation (Ronholt *et aZ.,* 1978).

Yakutat Bay Stations

Based on the present study in Yakutat Bay and previous near-shore OCSEAP studies, there also appears to be a tendency for epifaunal biomass and species richness to decrease from west to east in embayments. Ugak and Alitak

Bay (Kodiak Island) epifaunal biomass and species richness were 3.5-6.2 g/m^2 and 79-84 species, respectively (Feder and Jewett, 1977). Izhut and Kiluida Bay (Kodiak Island) epifaunal biomass and species richness were 1.6-9.5 g/m^2 and 101-153 species, respectively (Feder and Jewett, 1980a). The epifaunal biomass and species richness of Cook Inlet, an embayment of the northern Gulf of Alaska, were 2.4 g/m^2 and nearly 300 species, respectively (Feder et al., 1980b). The biomass and number of species in three bays in Prince William Sound were 0.3-1.2 g/m^2 and 39-86 species, respectively (Feder and Hoberg, 1981). The present study in Yakutat Bay yielded an epifaunal biomass of 1.2 g/m^2 from 23 species. Presumably the richness recorded in the Cook Inlet study is a reflection of the smaller trawling gear used in that study. Small trawls typically collect small epifaunal species not taken by large trawls with an increase in species resulting.

The limited number of trawl stations in Yakutat Bay precluded meaningful comparison of dominant species with other OCSEAP bay studies.

BENTHIC INFAUNAL PROGRAM

Van Veen Grab

The bulk of the stations sampled in this study (Station Groups 1, 2 and 3; Table IX) contained fine grained sediments (Table VI), and their fauna was similar to that of stations located in areas with fine sediments throughout the northeastern Gulf of Alaska (Feder and Matheke, 1980). The fauna in these stations was dominated by deposit feeding organisms.

Stations located in Yakutat Bay, Stations 2C, 3C and 4B of Station Group 1 and Stations in Station Group 4, differed slightly in their species composition from the bulk of the stations in this study, perhaps responding to changes in some environmental parameters in Yakutat Bay. Stations 2C, 3C and 4B appear to be transitional in terms of their fauna between the remainder of stations in Station Group 1 and Station Group 4.

Stations in Station Group 5 and Station 7A, which were located in areas with a sandy substrate, were notable for the low abundance, biomass and diversity of their fauna.

Pipe Dredge

The pipe dredge is a "qualitative sampling device, and can be used to effectively supplement species composition data collected quantitatively with sampling devices like grabs and trawls.

The pipe dredge functioned well to (1) provide a benthic sample at stations where grab and trawling sampling was not possible, (2) allow qualitative comparisons of the pipe dredge organisms with those obtained *via* grabs, and (3) identify organisms that are potential prey for benthic invertebrates and demersal fishes.

In general, the seven dredge stations analyzed were similar to most grab stations in that they were dominated by polychaetes, bivalves, and ophiuroids. Stations 1011 and 103G also contained several amphipods (Appendix C). Stations at which species were found in the pipe dredge but not in the grabs were: 97F - *Pandalus* sp. and *Capheira mollis*; *98F* - *Allocentrotus fragilis* and Crinoidea; 103G - *Paraonis gracilis* and *Nebalia* sp; and 100J - *Thelepus cincinnatus*, *Psolus chitinoides*, Crinoidea, and *Ascidia* spp.

The data obtained at stations where only pipe dredges were used (94G, 1011, 101K) was similar to data in adjacent stations where grabs were used.

FISHES

Offshore Stations

Flatfishes, family Pleuronectidae, dominated the fishes in the present study (54.3% of the total fish biomass) , as well as in the 1976 NEGOA study from Yakutat Bay to Cape Cleare (53%) (Ronholt *et* aZ., 1976). The single dominant species in each study was the arrowtooth flounder (*Atheresthes stomias*). *Atheresthes* accounted for a larger percent of the total fish biomass (31.5%) and total flatfish (58%) in the present study than the total

fish biomass (24%) and the total flatfish (44%) in the 1976 study (Ronholt *et* aZ., 1976). In the 1976 study the overall mean biomass of arrowtooth flounder increased from west (0.8 g/m^2) to east (2.0 g/m^2). The mean biomass continued to increase eastward in the present study, i.e., 3.9 g/m^2 for the entire offshore study area. In a summary of the overall foreign fish catch in the Yakutat and southeast Alaska region in 1978, arrowtooth flounder was the second-most important species (Pacific Ocean perch was most important), in terms of biomass (Smith and Hadley, 1979). The arrowtooth flounder catch was highest during October through December when the mean catch per unit effort (CPUE) was 868.4 kg/hr. Most of the catch as this time was south of Yakutat Bay and Icy Bay in 220-318 m of water.

Catches of the Pacific halibut (*Hippoglossus stenolepis*) were also greater in the present study than in the 1976 survey. Pacific halibut made up 3 percent of the total fish biomass and 7 percent of the flatfish biomass in the 1976 survey (Ronholt *et* aZ., 1976), whereas, in the present study this species accounted for 8.3 percent of the total fish biomass and 15.3 percent of the flatfish biomass. The overall biomass of the Pacific halibut in the 1976 survey was 0.2 g/m^2, whereas, the overall biomass in the present study was 1.0 g/m^2.

Sablefish (*Anaplopoma fimbria*) in the present study also had a higher mean biomass (1.9 g/m^2) then overall mean sablefish biomass from Yakutat Bay to Cape Cleare in 1976 (0.1 g/m^2) (Ronholt *et* aZ., 1976). Sablefish was included in a summary of overall foreign catch statistics from Yakutat and southeast Alaska in 1978 (Smith and Hadley, 1979). The highest CPUE (52.1 kg/hr) was reported for the final quarter of 1978, October-December.

Walleye pollock (*Theragra chalcogramma*) in the present study had a similar mean biomass (1.2 g/m^2) to the pollock catch in the 1976 survey (1.4 g/m^2) (Ronholt *et al.*, 1976). A summary of foreign fish catch observed in the Yakutat and southeast Alaska region revealed walleye pollock as the third-most important fish species throughout most of 1978 catches (Smith and Hadley, 1979). The CPUE was highest (702.3 kg/hr) during October through December.

The overall mean biomass of spiny dogfish in the present study (0.7 g/m^2) was greater than the overall mean biomass of spiny dogfish from the 1976

survey from Yakutat Bay to Cape Cleare (0.01 g/m^2) (Ronholt *et al.*, 1976). The biomass did however increase from west to east in the 1976 survey.

FEEDING STUDIES

Arrowtooth flounder (*Atheresthes stomias*)

Feder and Jewett (1980a) found fishes to be the main prey of arrowtooth flounder from the Kodiak Island area. Simenstad (1977) reported mysids and fishes in stomachs of this species also near Kodiak Island. Smith *et al.* (1978) found fishes and crustaceans as the most frequently occurring prey of this species from the northeastern Gulf of Alaska. Fishes, shrimps and other crustaceans were also the most important prey of the arrowtooth flounder examined for the present study.

Rex sole (*Glyptocephalus zachirus*)

Stomachs of rex sole examined for the present study contained mainly polychaetes, with amphipods, shrimps and other crustaceans occurring secondarily. Smith *et al.* (1978) also found polychaetes to be the primary food of rex sole. Pelecypods and crustaceans were next in importance. The results of the present study are consistent with those of Smith *et al.* (1978), and indicate that the rex sole from the northeastern Gulf of Alaska preys mainly on polychaete annelids.

Flathead sole (*Hippoglossoides elassodon*)

Ophiuriods, (especially *Ophiura sarsi*), shrimps, and other crustaceans were the most important prey of flathead sole from the northeastern Gulf of Alaska in the present study. This agrees, in general, with Smith *et al.* (1978); who found euphausiids and *Ophiura sarsi* to be the main prey of flathead sole from other areas in the northeastern Gulf of Alaska. The few flathead sole that were examined from Cook Inlet were mainly feeding on ophiuroids and crangonid shrimps (Feder *et* aZ., 1980b). Rogers *et al.* (1979) found *Pandalus borealis* to be the most important prey of flathead sole from waters near Kodiak Island. Simenstad (1977) reported mysids,

shrimps and fishes were important prey, in decreasing frequency of occurrence, in flathead sole near Kodiak Island.

Butter sole (*Isopsetta isolepis*)

Over half the butter sole examined for this study were empty. Those which were feeding contained mainly ophiuroids (primarily *Ophiura sarsi*), polychaetes, and crustaceans. Simenstad (1977) found polychaetes, bivalves and gastropod in stomachs of this species near Kodiak Island. Hart (1973) listed the food of butter sole from Washington state waters as chaetopod marine worms, young herring, shrimps, and sand dollars (no order of importance was given). In general, these results are in agreement as to the major groups of food utilized by butter sole. Specific differences are probably attributable to geographic variation in the distribution of prey.

English sole (*Parophrys vetulus*)

The English sole examined for this study contained mainly polychaetes, with ophiuriods, crustaceans and bivalves occurring less frequently. Hart (1973) listed clams, other mollusks, marine worms, small crabs and shrimps, and brittle stars as the prey of English sole (no order of importance was given). In general, these results are in agreement as to the major groups of food utilized by English sole.

Dover sole (*Microstomus pacificus*)

Smith et *al.* (1978) reported polychaetes, ophiuroids, pelecypods and crustaceans as the dominant food of clover sole from stations in the northeastern Gulf of Alaska. Simenstad (1977) found gammarid amphipods, polychaetes, and shrimp, in decreasing order of importance, in stomachs from this species near Kodiak Island. In the present study, ophiuroids, mollusks, and polychaetes were the most frequent prey of this species. Thus, feeding habits of clover sole appear, in general, to be uniform throughout the northeastern Gulf of Alaska.

Pacific halibut (*Hippoglossus stenolepsis*)

The items most frequently consumed by Pacific halibut in the present study (53 cm in length) were fishes, snow crab, and other crustaceans. Reports from the International Pacific Halibut Commission (IPHC) state that fishes become the predominant food of individuals over 10 inches (25 cm) in length (IPHC Rept. No. 28, 1960). Novikov (1968) found that Pacific halibut less than 30 cm fed primarily on crustaceans while those from 30 to 60 cm consumed mainly fishes, with crustaceans second in frequency of occurrence. Feder *et* aZ. (1980b) found unidentifiable fishes, snow crab, and miscellaneous crabs, shrimps and fishes as the most frequently found prey in Pacific halibut in Cook Inlet. Rosenthal (1978) reported crabs (*Cancer branneri* and *Pugettia gracilis*) were most frequently found in stomachs of this species from the northeastern Gulf of Alaska. Gray (1964) found Dungeness, king and snow crabs to be important food items in Pacific halibut near Kodiak Island. In general, Pacific halibut food habits are similar throughout their range.

Starry flounder (*Platichthys stellatus*)

Jewett and Feder (1975, unpublished OCSEAP data on file, National Oceanographic Data Center) found that starry flounder, collected from the northeastern Gulf of Alaska (principally collected adjacent to Icy Bay) in June, fed exclusively on clams. In the present study, in November, one third of the starry flounder examined were empty and the remainder contained mainly ophiuroids. Starry flounder examined in Cook Inlet in October were mainly feeding on the clam *Spisula polynyma* (Feder *et aZ.,* 1980b). Rosenthal (1978) reported herring eggs, brown algae and eelgrass were most frequently found from stomachs of this species in Prince William Sound. Ophiuroids were also a major source of food for starry flounders in the northeastern Bering *Sea* (Feder and Jewett, 1978, Jewett and Feder, 1980). Starry flounder from Washington fed mainly on priapulids, nemerteans, polychaetes, and lamellibranchs (Miller, 1967). The starry flounder exhibits seasonal variation in feeding (Jewett and Feder, 1976). It ceases feeding in winter, and does not begin again until about June. From the present study, it appears that consumption of food may taper off by mid-November.

Rock sole (*Lepidopsetta bilineata*)

Crustaceans, ophiuroids, and polychaetes were the main prey of the rock sole examined for this study. In general, food of rock sole from the northeastern Gulf of Alaska in the present study was similar to that described by other authors (Feder and Jewett, 1980a; Feder *et al.*, 1980b; Smith *et* aZ., 1978; Rogers *et* aZ., 1979; Simenstad, 1977). Rosenthal (1978) reported herring eggs and sand lance (*Ammodytes hexapterus*) as frequent prey in stomachs of this species in Prince William Sound.

Sand sole (*Psettichthys melanostictus*)

Miller (1967) found sand sole to feed primarily on fishes, with mysids, shrimps and squids playing less important roles. Four of the ten sand sole examined for the present study contained food, and contained the remains of fishes in their stomachs.

Sablefish (*Anaplopoma fimbria*)

The most frequently found prey in stomachs of sablefish examined for this study were fishes, jellyfishes, amphipods and shrimps. Feder and Jewett (1980a) reported sablefish from the Kodiak Island area to feed exclusively on Pacific sand lance (*Ammodytes hexapterus*). Rogers *et aZ.* (1979) reported fishes, primarily osmerids, and euphausiids as the primary food of sablefish. Thus, with the exception of jellyfishes, food of sablefish is generally similar throughout the Gulf of Alaska.

Walleye Pollock (*Theragra chalcogramma*)

Walleye pollock examined for the present study contained mainly shrimps, amphipods (probably *Parathemisto*) and euphausiids. Smith *et aZ.* (1978) found euphausiids to be the predominant prey of walleye pollock from another area in the northeastern Gulf of Alaska. The walleye pollock examined in Cook Inlet mainly contained crangonid and pandalid shrimps and unidentified Crustacea (Feder *et* aZ., 1980b). Rogers *et aZ.* (1979) and Simenstad (1977) found mainly shrimp, euphausiids, and fishes in walleye pollock near Kodiak Island. Pink shrimp (*Pandalus borealis*) and euphausiids were the major

prey of walleye pollock examined by Feder and Jewett (1980a), also from waters near Kodiak Island. Feder and Paul (1977) report the amphipod *Parathemisto* and the pink shrimp as dominant prey for walleye pollock in Prince William Sound.

pacific cod (*Gadus macrocephalus*)

Jewett (1978) and Feder and Jewett (1980a) found fishes, snow crab, shrimps, and amphipods to be the most important prey of Pacific cod, near Kodiak Island, Alaska. Simenstad (1977) found euphausi.ids, shrimps and fishes as the most important prey in Pacific cod, also near Kodiak Island. Miller *et al.* (1978) found shrimp to be the main prey of this species in Port Townsend Bay, Washington. Feder *et* aZ. (1980b) found snow crab and crangonid shrimp to be most frequently found prey in Pacific cod from Cook Inlet. The present study yielded similar results i.e., shrimps, snow crab and cephalopods *were* the most frequently consumed prey.

Rockfishes (*Sebastes* spp.)

Little is known about the food or feeding habits of the Scorpaenidae. Of the four species examined for this study (shortspine thornyhead, Pacific Ocean perch, rougheye rockfish, and bocaccio) Hart (1973) listed food of only bocaccio. Five of the six bocaccio examined for this study contained unidentifiable remains. Small fishes were considered by Hart (1973) and Feder et *al.* (1974) as the main prey of this species. Crabs, squid and octopus also form part of the diet for California representatives of the latter species (Feder *et al.*, 1974).

Rosenthal (1978) examined stomach contents of four species of rockfishes from the northeastern Gulf of Alaska. Quillback rockfish (*Sebastes maliger*) preyed on gammarid amphipods, mysids, cumaceans, and caridean shrimps. China rockfish (*Sebastes nebulosus*) consumed mainly the ophiuroid *Ophiopholis aculeata* and small crabs, including *Pugettia gracilis* and *Cancer oregonensis*. Black rockfish (*Sebastes melanops*) contained mainly pelagic organisms *in*-cluding jellyfishes, fishes, amphipods, and swimming polychaetes. Two yelloweye rockfish (*Sebastes ruberimus*) examined by Rosenthal contained

the lithodid crab *Placetron wosenssenskii*. Hart (1973) reported crustaceans and lingcod eggs as food for this species. Pereyra *et al.* (1969) reported the food of yellowtail rockfish (*Sebastes flavidus*) from Washington state to be northern lampfish (*Stenobrachius leucopsarus*), crustaceans, and squid. In near-shore waters, this species consumed mainly amphipods (Miller *et al.*, 1976).

All Pacific Ocean perch (*Sebastes alutus*) examined for this study were empty; probably the result of regurgitation due to barotrauma. Carlson (1976) found that small Pacific ocean perch fed primarily on copepods and euphausiids. Larger fish consumed larger prey, including pandalid shrimps and fishes. Somerton (1978) also found Pacific ocean perch to prey mainly on planktonic crustaceans; especially the euphausiid *Thysanoessa spinifera*.

Rougheye rockfish from the present study preyed mainly on shrimps and small fishes. Shortspine thornyheads were also found to prey mainly on shrimps. No record of feeding habits for these two species was found.

Spiny dogfish (*Squalus acanthias*)

Fishes and shrimps were the most frequent prey of spiny dogfish examined for this study from the northeastern Gulf of Alaska. Hart (1973) listed fishes, euphausiids and other crustaceans, including shrimp as the principal prey of this shark (no order of importance was given). Spiny dogfish were considered by Hart to be opportunistic feeders. Thus, the type of prey utilized probably depends on the prey species present in a particular area.

Sculpins (Cottidae)

Both blackfin (*Malacocottus kincaidi*) and spinyhead sculpins (*Dasycottus setiger*) examined for this study preyed predominantly on crustaceans, especially shrimps, mysids, and amphipods and on polynoid polychaetes. No previous reports of feeding habits for these species have been reported. Two larger species of sculpins in Kodiak waters, *Myoxocephalus* spp. and *Hemilepidotus jordani*, were shown to feed primarily on crabs, including *Chionoecetes bairdi* and *Hyas lyratus*, with a variety of other organisms occurring secondarily (Jewett and Powell, 1979). Rosenthal (1978) reported antlered sculpins

(*Enophrys diceraus*) most frequently feed on the green urchin (*Strongylocentrotus droebachiensis*), limpets, and hermit crabs in the northeastern Gulf of Alaska. *Myoxocephalus* sp. consumed mainly brachyuran crabs, pacific herring (*Clupea harengus pallasi*), and herring eggs. Simenstad (1977) found *Myoxocephalus* spp. near Kodiak Island and Cook Inlet feeding primarily on pandalid shrimps, fishes and euphausiids. Thus, sculpins appear to be voracious benthic predators, consuming a wide variety of organisms opportunistically.

Sunflower sea star (*Pycnopodia helianthoides*)

Pycnopodia helianthoides examined for the present study, consumed primarily gastropod, ophiuroids, and bivalves. The gastropod included *Mitrella gouldi*, *Natica* sp., *Buccinum polare*, and *Neptunea* sp. *Nuculana* SP. was the most common bivalve and *Ophiura sarsi* was the common ophiuroid. Jewett and Feder (1975, unpublished OCSEAP data on file, National Oceanographic Data Center; Feder *et al.*, 1980) also found mollusks and echinoderms to be the dominant prey of *P. helianthoides* from the northeastern Gulf of Alaska with the echinoderms *Ctenodiscus crispatus* and *Ophiura sarsi* the most frequent items encountered. The gastropod *Colus halli*, *Mitrella gouldi*, *Solariella obscura*, *Natica clausa* and *Oenopota* sp., and the bivalves *Serripes groenlandicus* and *Clinocardium ciliatum* were also common. Feder and Hoberg (1981) also found gastropod and bivalves as the main prey of *P. helianthoides* from Prince William Sound.

Paul and Feder (1975) found *P. helianthoides* from intertidal and subtidal areas in Prince William Sound feeding mainly on small bivalves, especially *Mytilus edulis* in the former area and *Nuculana fossa* in the latter. Prey in excess of 30 mm was rarely taken.

Thus, *P. helianthoides* is an opportunistic generalist in feeding habits. Its diet is probably determined by the relative abundance of suitable prey species.

Dungeness crab (*Cancer magister*)

Dungeness crab examined in the present study fed mainly on bivalves, with crustaceans and polychaetes occurring less frequently. *Nuculana* spp. and *Yoldia* spp. were the bivalves most often found in stomachs. Both of

these genera occurred commonly in van Veen grabs. Some items such as diatoms, Foraminifera, and Hydrozoa were probably consumed inadvertently, along with sediment, while the crab was foraging for food.

Feder and Paul (1980) also found small bivalves to be the most common prey of C. *magister* from stations in Cook Inlet, Alaska. In this case, juvenile *Spisula polynyma* was most frequently utilized. However, since juveniles of this bivalve species did not occur commonly in benthic samples from these stations, the high incidence of predation on them was probably a reflection of preferential selection of prey by size (Feder and Paul, 1980).

In general, the Dungeness crab appears to be opportunistic in feeding habits, preying selectively on small bivalves. Utilization of particular species probably depends on size as well as abundance.

Snow crab (*Chionoecetes bairdi*)

Snow crab examined for this study preyed predominantly on polychaetes, mollusks, small crustaceans and brittle stars. Other common items such as Foraminifera, diatoms and sponge spicules were probably consumed inadvertently with sediment during feeding. Adult C. *bairdi* from the southeastern Bering Sea fed mainly on polychaetes while juveniles fed mainly on crustaceans, polychaetes and mollusks (Tarverdieva, 1976) . Paul *et al.* (1979) and Feder *et aZ.* (1980b) examined stomachs of C. *bairdi* from lower Cook Inlet and found the main food to be clams (*Macoma* spp., *Spisula polynyma*, and *Nucula tenuis*), hermit crabs (*Pagurus* spp.), barnacles (*Balanus* spp.) and sediment. *Chionoecetes bairdi* from Port Valdez contained polychaetes, clams, young *C. bairdi*, other crustaceans and detrital material (Feder, unpublished data). Snow crab with carapace widths ≤ 40 mm, from waters near Kodiak Island, consumed mainly mollusks, crustaceans, polychaetes, and foraminiferans , while those > 40 mm contained crustaceans, fishes, mollusks and polychaetes (Feder and Jewett, 1980a).

Snow crab from lower Cook Inlet apparently fed on organisms in proportion to their abundance in a particular area (Paul *et al.*, 1979; Feder *et* aZ., 1980b). However, Feder and Jewett (1980a) suggested that the organisms

preyed upon in Kodiak waters were not necessarily the dominant benthic species present. *Chionoecetes bairdi* appeared to have preferences for certain prey. The general food-groups utilized by *Chionoecetes* spp. were shown to be similar throughout the range of these crab (Feder and Jewett, 1980a) . Thus, C. *bairdi* probably selected items belonging to specific food-groups which were also relatively abundant in the area.

POLLUTANTS ON THE BOTTOM

A variety of materials , including plastic refuse bags, were reported from the northeastern Gulf of Alaska by Jewett (1976). Fifty-seven percent of trawls from this area contained refuse. Feder *et* aZ. (1978) also reported man-made debris in 41 percent of trawls from the Bering Sea in 1976. Similar materials were found in 24 percent of trawls from the present study. Since all stations from which refuse was found were within approximately 45 km of shore, this material was either deposited well within the 50 mile limit or represented debris from an onshore movement of refuse originally deposited at a greater distance from shore.

VIII . CONCLUSIONS

Trawl data and feeding data that have been analyzed to date broaden our knowledge of various aspects of the distribution, abundance, and general biology of the more important invertebrate components of the NEGOA shelf. Implicit in the current study is the vast amount of the survey region that could not be sampled by trawl, grab and/or dredge.

Trawl data were obtained from 42 offshore and 3 Yakutat Bay stations. Van Veen grab data were obtained from 27 offshore and 7 Yakutat Bay stations. Data were mainly obtained in Priority Area 1. These stations represent a reasonable nucleus around which a monitoring program can be developed.

The phyla Cnidaria, Mollusca, Arthropoda, and Echinodermata made up 88.4 percent of the invertebrate biomass of the offshore stations. Important taxa within each phylum were *Metridium senile* (Cnidaria), *Pecten caurinus* (Mollusca), *Cancer magister* (Arthropoda), and *Strongylocentrotus* spp. (Echinodermata), respectively.

The feeding data compiled for numerous benthic species in this report, in conjunction with similar data compiled for these species from other areas investigated by OCSEAP, should contribute to an understanding of the trophic role of these organisms.

IX. NEEDS FOR FURTHER STUDY

Many of the species encountered in trawling operations undergo seasonal migrations. For this reason, it is important to obtain seasonal data on the distribution, abundance and biomass of these organisms, as well as their trophic relationships. As a result of the current study, a data base for the designated area was established for the month of November 1979. If disturbances to the environment occur during other months, no data are available for comparison. Therefore, if further study is conducted within the study area, a seasonal approach is strongly advised. In addition, studies on the toxic effects of hydrocarbons on the biology of many of the commercially-important and ecologically-important species should be initiated prior to petroleum exploration and development.

X. PROBLEMS ENCOUNTERED

During the November 1979 NEGOA cruise, aboard the NOAA ship *Miller Freeman,* problems were encountered with gear inadequacy. The research proposal stated that "at least three 400-mesh Eastern otter trawls" be supplied by OCSEAP. Subsequent phone conversations with OCSEAP-Juneau verified that two new trawl nets would be supplied by the National Marine Fisheries Service. Once the cruise began, it was realized that only two well-worn nets had been supplied, rather than new ones. The used nets were easily torn and trawling on marginal bottom was precluded. As a result, many of the 26 stations deemed untrawlable might have been trawled if proper gear had been available.

Only a limited number (7) of the pipe dredge samples were analyzed due to time constraints.

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APPENDIX A

TRAWL DATA

NORTHEAST GULF OF ALASKA

NOAA SHIP *MILLER FREEMAN*

Cruise No. 795, November 1979

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	106G	1	OTB	791106	0759	58 29.6N	138 56.3W	58 30.1N	138 53.3W			30	2.78	86.0 -	91.5	8 8 * 8

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES										
5333110302	ELASSOCHIRUS CAVIMANUS		1	0.4	0.4	0.00003	2*O	0.4	0.7	0.00006
6801040501	MEDIASTER AEQUALIS		1	0.4	0.4	0.00003	4.0	0.8	1.4	0.00012
6603090611	OPHIURA SARSI		250	99.2	89.9	0.00737	480.0	98.8	172.7	0.01415
		TOTAL			90.6	0.00743			174.8	0.01433
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		3	4.3	1.1	0.00009	7300.0	20.3	2625.9	0.21524
7917020102	ATHERESTHES STOMIAS		10	14.5	3.6	0.00029	170.0	0.5	61.2	0.00501
79170.20701	HIPPOGLOSSUS STENOLEPIS		13	18.8	4.7	0.00038	17200.0	47.8	6187.1	0.50714
7917020901	LEPIDOPSETTA BILINEATA		43	62.3	15.5	0.00127	1130000	31.4	4064.7	0.33318
		TOTAL			24.8	0.00203			12938.8	1.06056

COMMENTS

STOMACHS: 20 ROCK SOLE; 4 DOGFISH SHARI(; 11 HALIBUT. ALL HALIBUTWERE CAUGHT ON 9 NOVEMBER WHILE TRAWLING FOR LOST CTD. ELASSOCHIRUS CAVIMANUS IN BUCCINUM SP. SHELL.

BOTTOM WATER TEMPERATURE "C = 10.4

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMN	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	105G	2	OTB	791106	1036	58 33.1N	139 0.3W	58 32.2N	139 2.4W			30	2.22	111.6 -	113.5	112.6

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES										
3200000000	PORIFERA						15.0	0.1	608	0.00055
3302003090	SCYPHOZOA		1	O*2	005	0.00004	330.0	3.1	148.6	0.01218
3303000000	ANTHOZOA		1	0.2	0*5	0.00004	8.0	0.1	3.6	0.00030
4801700201	CRUCIGERA IRREGULARS		100	19.2	45.0	0.00369	10000	0.9	45.0	0.00369
4904O8U1O2	CHLAMYS RUBIDA		4	0.8	1.8	0.00015	80.0	0.7	36.0	0.00295
490529O1O1	FUSITRITON OREGONENSIS		11	2.1	5.0	0.00041	840.0	7.9	378.4	0.03101
4905320128	BUCCINUM PLECTRUM		7	1.3	3.2	0.00026	62.0	0.6	27.9	0.00229
4905330202	BERINGIUS KENNICOTTI		7	1.3	3.2	0.00026	620.0	5.8	279.3	0.02289
4905330801	NE?TUNEA LYRATA		7	1*3	3.2	0.00026	295.0	2.8	132.9	0.01089
4907010101	ROSSIA PACIFICA		20	3.8	9.0	0.00074	765.0	7.2	344.6	0.02825
+907120200	OCTOPUS		2	O*4	0.9	0.00007	5.0	O*O	2.3	0.00018
5333060107	CRANGON DALLI		2	0.4	0.9	0.00007	1.0	0.0	0.5	0.00004
5333060301	ARGIS LAR		7	1.3	3.2	0.00026	10*0	0.1	4.5	0.00037
5333110206	PAGURUS SETOSUS		6	1.1	2.7	0.00022	75.0	0.7	33.8	0.00277
5333110216	PAGURUS CONFRAGOSUS		11	2*1	5.0	0.00041	114500	IO*7	51508	0.04228
53331103OZ	ELASSOCHIRUS CAVIMANUS		14	2.7	6.3	0.00052	187.0	1.8	84.2	0.00690
5333121002	LOPHOLITHODES FORAMINATUS		1	0.2	0.5	0.00004	508.0	4.8	228.8	0.01876
5333170201	HYAS LYRATUS		3	0.6	1.4	0.00011	95.0	0.9	42.8	0.00351
6702050301	LAGUEUS CALIFORNIANUS		110	21.1	49.5	0.00406	35.0	0.3	1508	0.00129
6801020100	DIPSACASTER SPP.		6	1.1	2.7	0.00022	25.0	0.2	11.3	0.00092
6801040104	CERAMASTER PATAGONICUS		8	1.5	3.6	0.00030	215.0	2.0	96.8	0.00794
6801040S01	MEDIASTER AEQUALIS		65	12.5	29.3	0.00240	1425.0	13.3	641.9	0.05261
6E01040602	PSEUDARCHASTER PARELII		48	9.2	21.6	0.00177	753.0	7*0	339.2	0.02780
68010$30105	HENRICIA LEVIUSCULA		2	0.4	0.9	0.00007	6.0	0.1	2.7	0.00022
6801110103	CROSSASTER PAPPOSUS		46	8.8	2007	0.00170	563.0	5.3	253.6	0.02079
6801120408	LEPTASTERIAS HOLODES		8	1.5	3.6	0.00030	25.0	0.2	11.3	0.00092
6801120901	LETHASTERIAS NANIMENSIS		19	3.6	8.6	0.00070	285.0	2.7	128.4	0.01052
6802040101	ALLOCENTROTUS FRAGILIS		1	0.2	0.5	0.00004	9.0	0.1	4.1	0.00033
7203030402	HALOCYNTHIA IGABOJA		5	1.0	2.3	0.00018	200.0	1.9	90.1	0.00738
9111111111	UNIDENTIFIED ANIMAL MATERIAL						2000.0	18.7	900.9	0.07384
		TOTAL			235.1	0.01927			4811.7	0.39440
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		303	33.6	136.5	0.01119	438200.0	87.6	197387.4	16.17929
7903010201	CLUPEA HARENGUS PALLASI		1	0.1	0.5	0.00004	115.0	0.0	51.8	0.00425
7909020701	THERAGRA CHALCOGRAMMA		43	4.8	19.4	0.00159	376.0	0.1	169.4	0,01388
7915043301	PSYCHROLUTES PARADOXUS		1	0.1	0.5	0.00004	10*0	0.0	4.5	0.00037
7915043101	RADULINUS ASPRELLUS		2	0.2	099	0.00007	20.0	0.0	9*0	0.00074
791504403	TRIGLOPS MACELLUS		20	2.2	9.0	0.00074	197.0	0.0	88.7	0.00727
7')15050401	ASTEROTHECA ALASCANA		3	0.3	1.4	0.00011	30.0	0.0	13*5	0.00111
7917022102	ATHERESTHES STOMIAS		419	46.4	188.7	0.01547	11100.0	2.2	5000.0	0.40984
7917020501	GLYPTOCEPHALUS ZACHIRUS		76	8.4	34.2	0.00281	3800.0	0,8	1711.7	0.14030
7917020601	HIPPOGLOSSOIDES ELASSODON		1	091	0.5	0.00004	810.0	0.2	364.9	0.02991
7917020701	HIPPOGLOSSUS STENOLEPIS		25	2.8	11*3	0.00092	43100*0	806	19414.4	1.59135
7917020901	LEPIDOPSETTA BILINEATA		5	006	2.3	0.00018	2371.0	0.5	1068.0	0.08754

NOR HEAST GULF OF ALASKA BENTH TRAWL DATA - MILLER FREEMAN 795 - NOV. 979 BR6B 4/81 AGE

TAXON CODE	TAXONOMIC NAME					WEIGHT (GRAMS)			
		NUMBER	%	/KM	/M SQ	RAW	%	/KM	/M SQ
79 702 301	MICROSTOMUS PACIFICUS	4	0.4	1.8	0.00015	85.0	0.0	38.3	0.00314
	TOTAL			406.8	0.03334			25321.6	18.46899

COMMENTS

ARGIS SP.: 3 W/AQUA EGGS. HYAS LYRATAS: 2 MALES, 1 FEMALE W/ORANGE EGGS. STOMACHS: 20 DOGFISH; 20 PACIFIC HALIBUT; 3 ROCK SOLE.

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	105F	3	0T!3	791106	1257	5838.5N	139 2*2W	58 37.0N	139 3.3W			29	2.59	146.4	- 146.4	146.4

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
5333121002	LOPHOLITHODES FORAMINATUS		2	100.0	0.8	0000006	4594.0	100.0	1773.7	0.14539
		TCJTAL			0.8	0.00006			1773.7	0.14539
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		16	0.7	6.2	0.00051	26400.0	1.3	10193.1	0.83550
7909020401	GADUS MACROCEPHALUS		8	0.3	3.1	0.00025	49800.0	2.4	19227.8	1.57605
7915IJ301O1	ANOPLOPOMA FIMBRIA		2154	87.6	831.7	0.06817	1736400.0	84.3	670424.7	54.95284
7917020102	ATHERESTHES STOMIAS		154	6.3	59.5	0.00487	123400.0	6.0	47644.8	3.90531
7917020501	GLYPTOCEPHALUS ZACHIRUS		58	2.4	22.4	0000184	13600.0	0.7	5251.0	0.43041
7917020701	HIPPOGLOSSUS STENOLEPIS		40	1.6	15.4	0000127	86200.0	4.2	3328109	2.72802
7917020901	LEPIDOPSETTA BILINEATA		2	0.1	0.8	0.00006	1800.0	0.1	695.0	0.05697
7917021401	PAROPHRYS VETULUS		26	1.1	10.0	0.00082	22600.0	1*1	8725.9	0.71524
		TOTAL			949*0	0.07779			795444.0	65.20033

COMMENTS

STOMACHS: 20 BLACK COD; 13 ENGLISH SOLE; 15 PACIFIC HALIBUT.

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE OEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	105E	4	OTB	791106	1610	58 46.5N	139 4*4W	58 45.0N	139 3*9W			30	'2.78	223.3 -	241.6	232.5

TAxON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
4005?%0101	FUSITRITON OREGONENSIS	28	21.7	10.1	0.00083	2346.0	51.0	843.9	0.06917
5333040103	PANDALUS JORDANI	44	34.1	15.8	0.00130	356.0	7.7	128.1	0.01050
5333040204	PANDALOPSIS DISPAR	15	11.6	5.4	0.00044	316.0	6.9	113.7	0.00932
5333170302	CHIONOECETES BAIRDI	3	2.3	1.1	0.00009	143.0	3.1	51.4	0.00422
6801040501	MEDIASTER AEQUALIS	4	3.1	1.4	0.00012	138.0	3.0	49.6	0.00407
6801049602	PSEUDARCHASTER PARELII	4	3.1	1.4	0.00012	52.0	1.1	18.7	0.00153
6801060101	CTENODISCUS CRISPATUS	24	18.6	8.6	0.00071	150.0	3.3	54.0	0.00442
6901121201	PYCNOPODIA HELIANTHOIDES	1	0.8	0.4	0.00003	503.0	10.9	180.9	0.01483
6802030101	BRISASTER TOWNSENDI	4	3.1	1.4	0.00012	154.0	3.3	55.4	0.00454
6802040101	ALLOCENTROTUS FRAGILIS	2	1.6	0.7	0.00006	442.0	9.6	159.0	0.01303
	TOTAL			46.4	0s00380			1654.7	0.13563
vERTEBRATES									
7602050201	SQUALUS ACANTHIAS	35	3.3	12.6	0.00103	54000.0	7.1	19424.5	1.59217
7603020106	RAJA KINCAIDI	5	0.5	1.8	0.00015	3600.0	0.5	1295.0	0.10614
7903010201	CLUPEA HARENGUS PALLASI	1	0*1	0.4	0.00003	144.0	0.0	51.8	0.00425
7904020302	OSMERUS MORDAX	7	0.7	2.5	0.00021	280.0	0*0	100.7	0.00826
7909020701	THERAGRA CHALCOGRAMMA	23	2.2	8.3	0.00068	6000.0	0.8	2158.3	0.17691
7915010101	SEBASTES ALEUTIANUS	1	0.1	0.4	0.00003	500.0	0*1	179.9	0.01474
7915010127	SEBASTES PAUCISPINUS	1	0*1	0.4	0.00003	900.0	0.1	323.7	0.02654
7915010201	SEBASTOLOBUS ALASCANUS	32	3.0	11.5	0.00094	17700.0	203	6366.9	0.52188
7915030101	ANOPLOPOMA FIMBRIA	22	2.1	7.9	0.00065	34900.0	4.6	12554.0	1.02901
7917020102	ATHERESTHES STOMIAS	765	72.1	275.2	0.02256	542500.0	71.6	195143.9	15.99540
7917020501	GLYPTOCEPHALUS ZACHIRUS	21	2.0	7.6	0.00062	4100.0	0.5	1474.8	0.12089
7917020601	HIPPOGLOSSOIDES ELASSODON	122	11.5	43.9	0.00360	59000.0	7.8	21223.0	1.73959
7917020701	HIPPOGLOSSUS STENOLEPIS	7	0.7	2.5	0.00021	13600.0	1.8	4892.1	0.40099
7917020901	LEPIDOPSETTA BILINEATA	19	1.8	6.8	0.00056	20900.0	2.8	7518.0	0.61623
	TOTAL			381.7	0.03128			272706.5	22*35299

COMMENTS

SPONGE GROWING ONFUSITRITON (3) 12 PANDALOPSISDISPAR FEMALES W/AMBERLGGSONPLEOPODS; 22 PANDALUS JORDANI FEMALES W/BLUEISH EGGS ON PLEOPODS. STOMACHS: 10 ARROWTOOTH FLOUNDER: 10 FLATHEAD SOLE.

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	104G	5	OTB	791107	0739	58 34.1N	139 21.4W	58 35.0N	139 18.9W			30	2.96	164.7	166.5	16506

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
490529O1O1	FUSITRITON OREGONENSIS	15	6.0	5.1	0,00042	1469.7	9.0	496.5	0.04070
4907010101	ROSSIA PACIFICA	3	1.2	1.0	0.00008	24.2	O.1	8.2	0.00067
5333110203	PAGURUS ALEUTICUS	3	1.2	100	0000008	72.7	0.4	24.6	0*00201
5333110302	ELASSOCHIRUS CAVIMANUS	6	2.4	2.0	0.00017	106.1	0.7	35.8	0.00294
5333170302	CHIONOECETES BAIRDI	9	3.6	3.1	0s00025	42.4	O*3	14.3	0.00117
6801040602	PSEUDARCHASTER PARELII	42	16.7	14.3	0.00117	354.5	2.2	119.8	0.00982
6801060101	CTENODISCUS CRISPATUS	3	1*2	1.0	0.00008	3.0	0.0	1*0	0.00008
6802040101	ALLOCENTROTUS FRAGILIS	167	65.5	56.3	0.00462	14197.0	87.2	4796.3	0.39314
6803060102	OPHIOPHOLIS RAKERI	6	2.4	2.0	0.00017	3.0	0.0	1*0	0.00008
	TOTAL			86.0	0-00705			5497.5	0.45062
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	12	0.4	4.1	0.00034	10909.1	0.5	3685.5	0.30209
7603020106	RAJA KINCAIDI	9	0.3	3.1	0.00025	5454.5	0.2	1842.8	0.15105
7909020701	THERAGRA CHALCOGRAMMA	12	0.4	4.1	0.00034	793.9	0.0	268.2	0.02199
7915010100	SEBASTES SPP.	3	0.1	1.0	0.00008	448.5	O*O	151.5	0.01242
791503Cl1O1	ANOPLOPOMA FIMBRIA	424	12.6	143.3	0.01175	364242.4	15.8	123054.9	10.08647
7915042200	MYOXOCEPHALUS SPP.	3	0.1	100	0.00008	54.5	O*O	18.4	0.00151
7917020102	ATHERESTHES STOMIAS	2370	70.2	800.6	0s06562	1638484.8	71.2	553542.2	45.37231
7917020501	GLYPTOCEPHALUS ZACHIRUS	394	1107	133*1	0.01091	119697.0	5.2	40438.2	3.31460
7917020601	HIPPOGLOSSOIDES ELASSODON	100	3.0	33.8	0.00277	82424.2	3.6	27846.0	2.28246
7917020701	HIPPOGLOSSUS STENOLEPIS	15	0.4	5.1	0.00042	45454.5	2.0	15356.3	1.25871
7917020901	LEPIDOPSETTA BILINEATA	27	0.8	9.2	0.00076	26060.6	1.1	8804.3	0.72166
7917021401	PAROPHRYS VETULUS	6	0*2	2.0	0.00017	6969.7	O*3	2354.6	0.19300
	TOTAL.	--		1140.5	0.09348			777362*8	63*71826

COMMENTS

2 FUSITRITON HAVE GASTROPOD EGGS AND SERPULID TUBES ON OUTSIDE OF SHELL. 1 FUSITRITON COVERED W/SPONGE. ELASSOCHIRUS CAVIMANUS ARE FEMALE WITH BLACKISH COLORED EGGS.
STOMACHS: 10 REX SOLE;
10 BLACK COD; 9 DOVER SOLE; 3 HALIBUT; 10 FLATHEAD SOLE;
10 ARROWTOOTH FLOUNDER. 2 OPHIUROIDEA LIVING IN THE SHELL OF ELASSOCHIRUS CAVIMANUS.

BOTTOM WATER TEMPERATURE "C = 6.0

CRUISE #	STAT #	TOW #	GEAR CODE	START DATE TIME YYMMDD HHMM	START LATITUDE DEG M I N	START LONGITUDE DEG MIN	Finish LATITUDE DEG MIN	Finish LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	104F	6	OTB	791107 1019	58 42.3N	139 17.1W	58 41.6N	139 19.6W			30	2.96	247.1 -	247.1	247.1

TAXON CODE	TAXONOMIC NAME		COUNTS RAw	%	/KM	/M so	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
4801740101	APHRODITA JAPONICA		5	0.8	1.7	0000014	60.0	0.7	20.3	0.00166
4801740102	APHRODITA NEGLIGENS		4	0.6	1.4	0.00011	50.0	0.6	16.9	0.00138
4905290101	FUSITRITON OREGONENSIS		17	2.6	5.7	0.00047	1210.0	13.8	408.8	0.03351
4905330300	COLUS SPP.		1	O*2	0.3	0.00003	7.0	0.1	2.4	0.00019
4905330901	NEPTUNEA LYRATA		5	0.8	1.7	0000014	354.0	4.0	119.6	0.00980
5333040103	PANDALUS JORDANI		113	17.3	38.2	0.00313	921.0	10.5	311.1	0.02550
5333040204	PANDALOPSIS DISPAR		32	4.9	10.8	0.00069	490.0	5.6	165.5	0.01357
5333060000	CRANGONIDAE		1	0.2	093	0.00003	1*O	0.0	0.3	0.00003
5333110216	PAGURUS CONFRAGOSUS		2	O*3	0.7	0.00006	48.0	0.5	16.2	0.00133
5333170302	CHIONOECETES BAIRDI		3	0.5	1.0	0.00008	12.0	0.1	4.1	0.00033
6RO1O4O6O2	PSEUDARCHASTER PARELII		21	3.2	7.1	0.00058	260.0	3.0	87.8	0.00720
6801060101	CTENODISCUS CRISPATUS		342	52.4	115*5	0.00947	1941.0	22.2	655.7	0.05375
6802030101	BRISASTER TOWNSENDI		106	16.2	35.8	0.00294	3273.0	37.4	1105.7	0.09063
6803040201	GORGONOCEPHALUS CARYI		1	0.2	0.3	0.00003	13400	1*5	45.3	0.00371
		TOTAL			220.6	0.01808			2959.8	0.24261
VERTEBRATES										
7602059201	SQUALUS ACANTHIAS		13	3.5	4.4	0.00036	20400.0	7.4	6891.9	0.56491
7904020402	SPIRINCHUS THALEICHTHYS		36	9.6	12.2	0.00100	1589.0	0.6	536.8	0.04400
7909023701	THERAGRA CHALCOGRAMMA		25	6.7	8.4	0.00069	19600.0	7.2	6621.6	0.54276
7915010101	SEBASTES ALEUTIANUS		28	7.5	9.5	0.00078	22200.0	8.1	7500.0	0.61475
7915010105	SEBASTES BABCOCKI		1	O*3	0.3	0.00003	2100.0	0.8	709.5	0.05815
7915010127	SEBASTES PAUCISPINUS		2	0.5	0.7	0.00006	900.0	0.3	304.1	0.02492
7915010201	SEBASTOLOBUS ALASCANUS		65	17.3	22.0	0.00180	29900.0	10*9	10101.4	0.82798
7915030101	ANOPLOPOMA FIMBRIA		7	1.9	2.4	0.00019	15000.0	5.5	5067.6	0.41537
7915042200	MYOXOCEPHALUS SPP.		1	O*3	0.3	0.00003	8.0	090	2.7	0.00022
7916110000	STICHAEIDAE		1	0.3	0.3	0.00003	4*O	0.0	1.4	0.00011
7917020102	ATHERESTHES STOMIAS		76	20.3	25.7	0.00210	85300.0	31.1	28817.6	2.36210
7917020501	GLYPTOCEPHALUS ZACHIRUS		14	3.7	4.7	0.00039	504.0	0.2	170.3	0.01396
7917020601	HIPPOGLOSSOIDES ELASSODON		103	27.5	34.8	0.00285	53300.0	19.5	18006.8	1.47596
7917020701.	HIPPOGLOSSUS STENOLEPIS		2	0.5	0.7	0.00006	22200.0	8.1	7500.0	0.61475
7917020901	LEPIDOPSETTA BILINEATA		1	O*3	0.3	0.00003	900.0	0.3	304.1	0.02492
		TOTAL			'126.7	0.01038			92535.5	7.58487

COMMENTS

SNAIL EGG CASES ON 1 NEPTUNEA LYRATA. STOMACHS: 10 TURBOT: 10 FLATHEAD SOLE; 10 ROUGH-EYED ROCKFISH, 10 IDIOTS. PANDALOPSIS DISPAR FENALES WITH AMBER EGGS; PANDALUS JORDANI FEMALES WITH BLUEISH-GREEN EGGS.

CRUSE #	STAT #	TOW #	CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN N	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	103G	7	OTB	791107	1225	58 44.7N	139 33.2W	58 44.4N	139 34.8W			20	2.00	166.5 -	166.5	166.5

COMMENTS TRAWL RIPPED.

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	1031	8	OTB	791107	1613	58 31.6N	139 33.1W	58 32.5N	139 31.9W			30	2004	261.7 -	263.5	262.6

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
3303000000	ANTHOZOA		2	1.6	1.0	0.00008	35.0	0.8	17.2	0.00141
4905290101	FUSITRITON OREGONENSIS		11	8.5	5.4	0.00044	1307.0	30.5	640.7	0.05252
4905360101	ARCTOMELON STEARNSII		1	0.8	0.5	0.00004	38.0	0.9	18.6	0.00153
4905660101	TRITONIA EXSULANS		10	7.8	4.9	0.00040	465.0	10.8	227.9	0.01868
5333040103	PANDALUS JORDANI		32	24.8	15.7	0.00129	316.0	7.4	154*9	0.01270
5333940204	PANDALOPSIS DISPAR		24	18*6	11.8	0.00096	468.0	10.9	229.4	0.01880
5333110216	PAGURUS CONFRAGOSUS		1	0.8	0.5	0.00004	3.0	0.1	1.5	0.00012
6801030201	LUIDIASTER DAWSONI		8	6.2	3.9	0.00032	24400	5.7	119.6	0.00980
6801060602	PSEUDARCHASTER PARELII		9	7.0	4.4	0.00036	101.0	2.4	49.5	0.00406
6801060101	CTENODISCUS CRISPATUS		23	17.8	11.3	0.00092	109*0	2.5	5394	0.00438
ORCI1100101	DIPLOPTERASTER MULTIPES		1	0.8	0.5	0.00004	302.0	7.0	148.0	0.01213
6802030101	BRISASTER TOWNSENDI		3	2.3	1.5	0.00012	153.0	3.6	75.0	0.00615
6602040101	ALLOCENTROTUS FRAGILIS		4	3.1	2.0	0.00016	750.0	17.5	367.6	0.03014
		TOTAL			63.2	0.00518			2103.4	0.17241
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		6	0.6	2.9	0.00024	15400.0.	1.9	7549,0	0.61877
76030201(.)6	RAJA KINCAIDI		5	0.5	2.5	0.00020	7700.0	1.0	3774*5	0.30939
7904020302	OSMERUS MORDAX		18	1.8	8.8	0.00072	647.0	0.1	317.2	0.02600
7909020701	THERAGRA CHALCOGRAMMA		26	2.6	12.7	0.00104	17700.0	2.2	8676.5	0.71119
7915010102	SEBASTES ALUTUS		3	0.3	1.5	0.00012	359.0	0.0	176.0	0.01442
791501L)1O6	SEBASTES BREVISPINIS		1	0.1	0.5	0.00004	1400.0	0.2	686.3	0.05625
7915010201	SEBASTOLOBUS ALASCANUS		52	5.2	25.5	0.00209	12300.0	105	6029.4	0.49421
7915030101	ANOPLOPOMA FIMBRIA		68	6.8	33.3	0.00273	103900.0	1301	50931.4	4.17470
7915040000	COTTIDAE		1	0.1	0.5	0.00004	8.0	0.0	3.9	0.00032
7917020102	ATHERESTHES STOMIAS		322	32.4	157.8	0.01294	357400*0	45.0	175196,1	14.36033
7917020501	GLYPTOCEPHALUS ZACHIRUS		177	17.8	86.8	0.00711	37200.0	4.7	18235.3	1.49470
7917020601	HIPPOGLOSSOIDES ELASSODON		27	2.7	13.2	0.00108	12200.0	195	5980.4	0.49020
7917020901	LEPIDOPSETTA BILINEATA		288	29.0	141.2	0.01157	228600.0	28.8	112058.8	9.18515
		TOTAL			487.3	0003994			389614.7	31.93563

COMMENTS "

PANDALOPSIS DISPAR FEMALES WITH AMBER EGGS; PANDALUS JORDANI FEMALES WITH BLUE-GREEN EGGS; 1 DEAD YOLDIA SP.
STOMACHS: 10 DOVER SOLE; 10 SHORTSPINE THORNYHEAD; 10 FLATHEAD SOLE.
BOTTOM WATER TEMPERATURE °C = 5.8

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	Finish LATITUDE DEG MIN	Finish LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH	(KM) DIST FISHED	MIN DEPTH FISHED (METERS) MAX	MIN DEPTH FISHED (METERS) AVG
FN795	102K	9	OTB	791108	0919	58 41.9N	139 47.1W	58 41.8N	139 46.4W			5	0.	181.2 - 183.0	182.1

COMMENTS

ROUGH BOTTOM, QUALITATIVE STATION SHORT TOW DURATION.
SPONGE HAD HIATELLA ARCTICA AND SMALL POLYCHAETES LIVING WITHIN IT.

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	1o. I	10	OTB	791109	0752	58 51.6N	140 5.4W	58 51.3N	140 3.8W			15	1.00	170.2	- 170.2	170.2

COMMENTS

NET R PPED. LARGE ROCK IN COD END. ^O DATA OBTAINED.

CRUSE #	STAT #	TOW 4	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINI LATITUDE DEG MIN	FINI LONGITUDE DEG MIN	MI POINT LATITUDE DEG MIN	MI POINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	100H	11	OTB	791109	1559	58 54.1N	140 15.6W	58 54.1N	140 15.7W			1	0.	170.2 -	170.2	170.2

COMMENTS

UNTRAWLABLE, NET HUNG UP ON BOTTOM; ONLY 1 MINUTE ON BOTTOM.

NORTHEAST GULF OF ALASKA BENTHIC TRAWL DATA – MILLER FREEMAN 795 – NOV.1979 BR6B 02/14/81

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	96F	12	OTB	791110	1156	59 12.8N	141 20.0W	59 13.8N	141 17.4W			30	2.96	351.4	351.4	351.4

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
4907050202	GONATUS MAGISTER	8	44.4	N.7	6.00022	2700.0	82.2	912.2	0.07477
5333040204	PANDALOPSIS DISPAR	4	22.2	N.4	0.00011	506.0	1.5	16.9	0.00138
6801020102	DIPSACASTER BOREALIS	2	11.1	N.7	0.00006	440.0	13.4	148.6	0.01218
6801040501	MEDIASTER AEQUALIS	1	5.6	0.3	0.00003	22.0	0.7	7.4	0.00061
6801060101	CTENODISCUS CRISPATUS	1	5.6	0.3	0.00003	10.0	0.3	3.4	0.00028
6802040101	ALLOCENTROTUS FRAGILIS	1	5.6	0.3	0.00003	52.0	1.6	17.6	0.00144
6803090611	OPHIURA SARSI	1	5.6	0.3	0.00003	10.0	0.3	3.4	0.00028
	TOTAL			6.1	0.00050			1109.5	0.09094
VERTEBRATES									
7909020701	THERAGRA CHALCOGRAMMA	91	35.1	30.7	0.00252	52600.0	60.4	7770.3	1.45658
7915010102	SEBASTES ALUTUS	6	2.3	2.0	0.00017	1527.0	0.6	515.9	0.04229
7915010201	SEBASTOLOBUS ALASCANUS	32	12.4	10.8	0.00089	9500.0	3.7	3209.5	0.26307
7915030101	ANOPLOPOMA FIMBRIA	4	1.5	1.4	0.00011	10000.0	3.9	3378.4	0.27692
7916090103	BATHYMASTER SIGNATUS	1	0.4	0.3	0.00003	169.0	0.1	57.1	0.00468
7917020102	ATHERESTHES STOMIAS	75	29.0	25.3	0.00208	02000.0	39.6	34459.5	2.82455
7917020501	GLYPTOCEPHALUS ZACHIRUS	5	1.9	1.7	0.00014	1400.0	0.5	473.0	0.03877
7917020701	HIPPOGLOSSUS STENOLEPIS	8	3.1	2.7	0.00022	56300.0	21.9	19020.3	1.55904
7917020901	LEPIDOPSETTA BILINEATA	37	14.3	12.5	0.00102	24000.0	9.3	8108.1	0.66460
	TOTAL			7.5	0.00717			86991.9	7.13048

COMMENTS

STOMACHS: 10 TURBOT; 10 DOVER SOLE; 10 WALLEYE POLLOCK; 10 SHORTSPINE THORNYHEAD.
BOTTOM WATER TEMPERATURE °C = 5.4

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUD DEG MIN	FINISH LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	97G	13	OTB	791111	0929	59 2.0N	141 3.6W	59 1.7N	141 2.5W			15	1.67	347.7 -	347.7	347*7

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (Grams) RAW	%	/KM	/M SQ
INVERTEBRATES										
3200000000	PORIFERA						130600.0	94.9	78203s6	6,41013
3303330100	PRIMNOA SPP.		1	0.1	0.6	0.00005	100.0	0.1	59.9	0.00491
3303470201	STYLATULA GRACILE		1	001	0.6	0.00005	74.0	001	44.3	0.00363
4801010504	EUNOE SENTA		1	001	0.6	0.00005	2.0	0.0	1.2	0.00010
4s01100104	EUPHROSINE HORTENSIS		50	4.2	29.9	0.00245	100.0	O*1	59.9	0,00491
4801230400	NEREIS SPP.		1	0.1	0.6	0.00005	10.0	O*O	6.0	0.00049
4904290201	HIATELLA ARCTICA		500	42.3	299.4	0.02454	500.0	0.4	299.4	0.02454
49052$0101	FUSITRITON OREGONENSIS		3	0.3	1.8	0s00015	213.0	0.2	127.5	0.01045
4905360101	ARCTOMELON STEARNSII		1	001	0.6	0.00005	48.0	0.0	28.7	0.00236
490712020(1	OCTOPUS		1	0.1	0.6	0.00005	11.0	0.0	6.6	0.00054
5333040102	PANDALUS GONIURUS		6	O*5	3.6	0.00029	27.0	0.0	16.2	0.00133
5333040105	PANDALUS PLATYCEROS		3	0.3	1.8	0.00015	185.0	0.1	110.8	0.009 0 8
5333120101	ACANTHOLITHODES HISPIDUS		2	0.2	1.2	0.00010	71.0	0.1	42.5	0.00348
5233121002	LOPHOLITHODES FORAMINATUS		1	001	0.6	0.00005	77.0	0.1	46.1	0,00378
5333170701	SCYRA ACUTIFRONS		1	0.1	0.6	0.00005	190	0.0	0.6	0.00005
6801O2O1CJ2	DIPSACASTER BOREALIS		2	0.2	1.2	0.00010	426.0	0.3	255.1	0.02091
6801040104	CERAMASTER PATAGONICUS		3	0.3	1*8	0.00015	84.0	0.1	50.3	0.00412
6801C40403	HIPPASTERIAS SPINOSA		2	092	1.2	0.00010	404.0	0.3	241.9	0.01983
6801(.JMO1O1	HENRICIA ASPERA		2	0.2	1.2	O*OOO1O	6690	0.0	39.5	0.00324
6801080103	HENRICIA BERINGIANIA		2	O*2	1.2	0.00010	180.0	O*1	10708	0.00883
6801080105	HENRICIA LEVIUSCULA		15	1.3	9.0	0.00074	144.0	O*1	86.2	0.00707
6801060201	PORANIOPSIS INFLATA		1	0.1	0.6	0.00005	1.0	0.0	0.6	0.00005
6801103101	DIPLOPTERASTER MULTIPES		6	0.5	3.6	0.00029	474.0	0.3	283.8	0s02326
6S01110201	LOPHASTER FURCILLIGER		1	091	0.6	0.00005	1.0	O*O	0.6	0.00005
6803050115	OPHIACANTHA GRATIOSA		160	13.5	95.8	0.00785	480.0	0.3	287.4	0.02356
6803060101	OPHIOPHOLIS ACULEATA		330	27.9	197.6	0.01620	960.0	0.7	574.9	0.04712
6803090101	AMPHIOPHIURA PONDEROSA		2	0.2	1.2	0.00010	47.0	0.0	28.1	0.00231
6804070101	PSEUDOSTICHOPUS MOLLIS		35	3.0	21.0	0.00172	1094.0	0.8	655.1	0905370
6904070400	BATHYPLOTES SPP.		40	304	24.0	0.00196	840.0	0.6	503.0	0.04123
7203030402	HALOCYNTHIA IGABOJA		10	0.8	6.0	0.00049	390.0	0.3	233.5	0.01914
		TOTAL			708.4	0.05806			82401.2	6.75420
VER1'EBRATES										
7602050201	SQUALUS ACANTHIAS		2	0.5	1.2	0.00010	5900.0	1.7	3532.9	0.28958
7603020111	RAJA STELLULATA		1	0.3	0.6	0.00005	900.0	0.3	538.9	0.04417
7909020401	GADUS MACROCEPHALUS		1	O*3	0.6	0.00005	6400.0	1.8	3832.3	0.31413
7909020701	THERAGRA CHALCOGRAMMA		19	4.8	11.4	0.00093	770080	2.2	4610.8	0.37793
7915010101	SEBASTES ALEUTIANUS		2	0.5	1.2	0.00010	900.0	0.3	538.9	0.04417
7915010102	SEBASTES ALUTUS		181	45.8	108.4	0.00888	154700.0	44.6	92634.7	7.59301
7915010105	SEBASTES BARCUCKI		5	1.3	3.0	0.00025	2300.0	0.7	137702	0.11289
7915010106	SEBASTES BREVISPINIS		9	2.3	5.4	0.00044	19000.0	5*5	11377.2	0.93256
7915010118	SEBASTES HELVOMACULATUS		19	4.8	11.4	0.00093	5900.0	1.7	3532.9	0.28958
7915010127	SEBASTES PAUCISPINUS		65	16.5	38.9	0.00319	75300.0	21.7	45089.8	3.69589
7915010136	SEBASTES VARIEGATUS		2	0.5	1.2	0.00010	900.0	O*3	538.9	0.04417
7915010201	SEBASTOLOBUS ALASCANUS		10	2.5	6.0	0.00049	2300.0	0.7	1377.2	0.11289

TAxON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SC	WEIGHT (GRAMS) RAW	%	/KM	/M SC
7915G30101	ANCPLOPOMA FINGRIA	4	1.0	2.4	0.00020	4500.0	1*3	2694.6	0.22087
7915041901	MALACOCOTTUS KINCAIDI	21	5.3	12.6	0 0 0 0 1 0 3	1100.0	0*3	658.7	0.05399
79160%0103	BATHYMASTER SIGNATUS	8	2.0	4.8	0.00039	1175.0	0.3	703.6	0.05767
7916150101	ZAPRORA SILENUS	1	0.3	0.6	0.00005	546.0	0.2	326.9	0.02680
7917020101	ATHERESTHES EVERMANNI	25	6.3	15.0	0.00123	11300.0	3*3	6766.5	0.55463
7917020591	GLYPTOCEPHALUS ZACHIRUS	17	4.3	1002	0.00083	5900.0	1*7	3532.9	0.28958
7917020701	HIPPOGLOSSUS STENOLEPIS	3	0.8	1.8	0000015	40400.0	11.6	24191.6	1.9S292
	TOTAL			236.5	0001939			207856.9	17.03745

COMMENTS

APPROXIMATELYFOUR SPECIES OF SPONGE WITH TWO sPECIES OF BRITTLE STARS FOUND IN THE INCURRENT/EXCURRENT PORES. HIATELLA ARCTICA NOTED AS LIVING IN ONE OF THE SP ONGE SPECIES.
STOMACHS: 10 PACIFIC OCEAN PERCH: 10 POLLOCK; 10 REX SOLE: 10 TURBOT; 6 BOCACCIO; 21 BLACKFIN SCULPIN.

BOTTOM WATER TEMPERATURE "C = 5.5

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	95H14		OTB	791111	1329	598.6N	141 33.2W	59 10.0N	141 33.8W			29	2.78	325.7	- 325,7	325.7

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
3303120000	ALCYONACEA NEPHTHEIDAE		2	2.8	0.7	0.00006	21.0	0.2	7.6	0.00062
3303550000	ACTINIIDAE		3	4.2	1.1	0.00009	56.0	0.5	2001	0.00165
4905290.101	FUSITRITON OREGONENSIS		1	1*4	O*4	0.00003	440.0	3.7	158.3	0.01297
4905330202	BERINGIUS KENNICOTTI		16	22.5	5.8	0.00047	90.0	0.8	3204	0.00265
4907010101	ROSSIA PACIFICA		2	2.8	0.7	0.00006	9100.0	75*9	3273.4	0.26831
533304(.)204	PANDALOPSIS DISPAR		3	4.2	1.1	0000009	35.0	0.3	12.6	0.00103
68D102o1O2	DIPSACASTER BOREALIS		1	1.4	0.4	0900003	41.0	0.3	14*7	0.00121
6Bo1OHO1O3	HENRICIA BERINGIANIA		1	1*4	0.4	0900003	103.0	0.9	37.1	0.00304
6801080112	HENRICIA CLAPKI		1	1.4	0.4	0900003	17.0	0.1	6.1	0.00050
6802030101	BRISASTER TOWNSENDI		2	2.8	0.7	0.00006	12.0	0.1	4.3	0.00035
6RO2O4O1O1	ALLOCENTROTUS FRAGILIS		1	1*4	094	0900003	193.0	1.6	69.4	0.00569
6803040201	GORGONOCEPHALUS CARYI		1	1*4	094	0900003	212.0	1.8	76.3	0.00625
6303090101	AMPHIOPHIURA PONDEROSA		16	22.5	5.8	0.00047	242.0	2.0	87.1	0.00714
6804000000	HOLOTHUROIDEA		22	31.0	7.9	0.00065	1434.0	12.0	515.8	0.04228
		TOTAL			25.5	0.00209			4315.1	0.35370
VERTEBRATES										
7909020701	THERAGRA CHALCOGRAMMA		.159	21.7	57.2	0.00469	78500.0	.21.5	28237.4	2s31454
7915010102	SEBASTES ALUTUS		8	1.1	2.9	0.00024	4500.0	1.2	161807	0.13268
7915010118	SEBASTES HELVOMACULATUS		1	0.1	0.4	0.00003	500.0	0.1	179.9	0.01474
7915010127	SEBASTES PAUCISPINUS		1	0.1	0.4	0000003	90090	0.2	323.7	0.02654
7915010201	SEBASTOLOBUS ALASCANUS		40	5.4	14.4	0.00118	8200.0	2.2	2949.6	0.24177
7915030101	ANOPLOPOMA FIMBRIA		18	2.5	6.5	0.00053	21800.0	6.0	7841.7	0.64276
7915041901	MALACOCOTTUS KINCAIDI		8	1.1	2.9	0.00024	57490	0.2	206.5	0.01692
7915044201	ULCA BOLINI		1	0.1	0.4	0.00003	5000.0	1*4	1798.6	0-14742
7917020101	ATHERESTHES EVERMANNI		450	61.3	161.9	0.01327	210500.0	57.6	75719.4	6.20651
7917020501	GLYPTOCEPHALUS ZACHIPUS		14	1.9	5.0	0.00041	2300.0	0.6	827.3	0-06781
7917020701	HIPPOGLOSSUS STENOLEPIS		4	O*5	1.4	0,00012	18600.0	5.1	6690.6	0.54841
7917020901	LEPIDOPSETTA BILINEATA		30	491	1008	0.00088	141OO*O	3.9	5071.9	0.41573
		TOTAL			264.0	0.02164			131465.5	10*77586

130

COMMENTS ,

STOMACHS: 10 POLLOCK; 10 REX SOLE: 10 TURBOT; 10 IDIOT; 10 DOVER SOLE: 10 SABLE FISH: 8 BLACK FIN SCULPIN.

BOTTOM WATER TEMPERATURE "C = 6.3

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	Finish LATITUDE DEG MIN	Finish LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	DEPTH FISHED (METERS) MAX	DEPTH FISHED (METERS) AVG
FN795	95G	15	OTB	791112	0706	59	15.8N 141	30.8W 59	17.1N 141	30.1W		30	2.59	334.9	338.6	336.8

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES										
4EO3O1O1OO	NOTOSTOMOBDELLA SPP.		1	3.6	O*4	0.00003	1.0	O*O	O*4	0.00003
4507050292	GONATUS MAGISTER		4	14.3	1.5	0000013	1763.0	32.2	680.7	0.05579
5333040294	PANDALOPSIS DISPAR		4	14.3	"1.5	0s00013	96.0	1.8	37.1	0.00304
5333120702	PARALITHODES PLATYPUS		1	3.6	094	0900003	1131.0	20.6	436.7	0.03579
6801020102	DIPSACASTER BOREALIS		15	53.6	5.8	0.00047	2162.0	39.4	834.7	0.06842
6801110101	CROSSASTER BOREALIS		1	3.6	0.4	0 9 0 0 0 0 3	189.0	3.4	73*()	0.00598
6802O4O1O1	ALLOCENTROTUS FRAGILIS		2	7.1	0.8	0.00006	141.0	2.6	54.4	0.00446
		TOTAL			10.8	0.00089			2117.0	0017352
VERTEBRATES										
7603020111	RAJA STELLULATA		5	1.1	1.9	0000016	1040090	2.0	4015.4	0.32913
7909020701	THERAGRA CHALCOGRAMMA		309	64.9	119.3	0s00978	174600.0	32.9	67413.1	5.52567
7915010127	SEBASTES PAUCISPINUS		1	0.2	0.4	0.00003	700.0	0.1	270.3	0.02215
7915010136	SEBASTES VARIEGATUS		1	0.2	0.4	0.00003	200.0	0.0	77.2	0-00633
7915010201	SEBASTOLOBUS ALASCANUS		28	5.9	1008	0.00089	8600.0	1.6	3320.5	0.27217
7915030101	ANOPLOPOMA FIMBRIA		19	4.0	7.3	0.00060	24900.0	4.7	9613.9	0.78802
7917020101	ATHERESTHES EVERMANNI		80	16.8	30.9	0-00253	214000.0	4003	82625.5	6.77258
7917020501	GLYPTOCEPHALUS ZACHIRUS		7	1*5	2.7	0.00022	900.0	0.2	347.5	0.02848
7917020701	HIPPOGLOSSUS STENOLEPIS		9	1.9	3.5	0.00028	82100.0	15.5	31698.8	2.59827
7917020901	LEPIDOPSETTA BILINEATA		17	3.6	6.6	0.00054	14500.0	2.7	5598.5	0.45889
		TOTAL			183.8	0.01506			204980.7	16.80170

COMMENTS

4 PANDALOPSIS DISPAR: 3 WITH LIGHT BROWN EGGSO STOMACHS: 10 POLLOCK; 10 DOVER SOLE; 10 TURBOT; 10 BLACK COD; 10 IDIOTS.

BOTTOM WATER TEMPERATURE "C = 4.3

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN N	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	95F	16	OTB	791112	1306	59 21.8N	141 30.8W	59 21.4N	141 33.3W			30	2.41	184.8	186s7	185.8

TAXON CODE	TAXONOMIC NAME	COUNT RAW	COUNT %	COUNT /KM		WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT //KM	WEIGHT /M SQ
INVERTEBRATES									
3200000000	PORIFERA					136000.0	77.0	56431.5	4.62554
3303330100	PRIMNOA SPP.					50.0	0.0	20.7	0.00170
3303540101	STOMPHIA COCCINEA	1	0.1	"004	0.00003	105.0	0.1	43.6	0.00357
3303550000	ACTINIIDAE	61	4.1	25.3	0.00207	24950.0	14.1	10352O7	0.84858
4801230400	NEREIS SPP.	100	6*7	41.5	0.00340	200.0	0.1	83.0	0.00680
4801740100	APHRODITA SPP.	2	0.1	0.8	0.00007	27.0	0.0	11.2	0.00092
4904290201	HIATELLA ARCTICA	500	33.7	207.5	0.01701	500.0	0.3	207.5	0.01701
4905290101	FUSITRITON OREGONENSIS	15	1.0	6.2	0.00051	1722.0	1.0	714.5	0.05857
4905330202	BERINGIUS KENNICOTTI	4	0.3	1*7	0.00014	547.0	0.3	227.0	0.01860
5333040103	PANDALUS JORDANI	150	10.1	62.2	0.00510	1500.0	0.8	622.4	0.05102
5333110203	PAGURUS ALEUTICUS	1	0.1	0.4	0.00003	25.0	0.0	1094	0.00085
5333121002	LOPHOLITHODES FORAMINATUS	3	0.2	1.2	O*OOO10	1450.0	0.8	601.7	0.04932
5333170201	HYAS LYRATUS	2	091	0.8	0.00007	85.0	0.0	35.3	0.00289
5333170302	CHIONOECETES BAIRDI	2	0.1	0.8	0.00007	100*0	O*1	41.5	0.00340
6702030101	TEREBRATULINA UNGUICULA	10	0.7	4.1	0.00034	5.0	0.0	2.1	0.00017
6702050301	LAQUEUS CALIFORNIANUS	50	3.4	20.7	0.00170	100.0	0.1	41.5	0.00340
6801020102	DIPSACASTER BOREALIS	4	0.3	1.7	0.00014	392.0	0.2	162.7	0.01333
6801060101	CTENODISCUS CRISPATUS	1	0.1	094	0.00003	5.0	0.0	2.1	0.00017
6801080104	HENRICIA DERJUGINI	1	0.1	0.4	0.000003	77.0	0.0	32.0	0.00262
6801080105	HENRICIA LEVIUSCULA	1	n*1	O*4	0.00003	50.0	0.0	20.7	0.00170
6801080201	PORANIOPSIS INFLATA	2	091	0.8	0.00007	273.0	0.2	113*3	0.00929
6801100101	DIPLOPTERASTER MULTIPES	25	1.7	10.4	0.00085	2750.0	1.6	1141.1	0.09353
6801100306	PTERASTER TESSELATUS	6	0.4	2.5	0.00020	995.0	0.6	412.9	0.03384
6801110201	LOPHASTER FURCILLIGER	4	0.3	1.7	0.00014	150.0	0.1	62.2	0.00510
6801110302	SOLASTER ENDECA	1	0.1	0.4	0.00003	297.0	O*2	123.2	0.01010
6802040101	ALLOCENTROTUS FRAGILIS	8	0.5	3.3	0.00027	1790.0	1.0	742.7	0.06088
6802040201	STRONGYLOCENTROTUS DROEBACHIENSIS	1	0.1	0.4	0.000003	50.0	0.0	2007	0.00170
6803040201	GORGONOCEPHALUS CARYI	8	0.5	3.3	0,00027	1336.0	0.8	554.4	0.04544
6803060101	OPHIOPHOLIS ACULEATA	500	33.7	207.5	0.01701	50090	0.3	207.5	0.01701
6804000000	HOLOTHUROIDEA	1	0.1	0.4	0.00003	60.0	O*O	24.9	0.00204
6804060101	PARASTICHOPUS CALIFORNICUS	1	0.1	0.4	0000003	38.0	O*O	15.8	0.00129
7203030402	HALOCYNTHIA IGABOJA	20	1.3	8.3	0.00068	580.0	0.3	240.7	0.01973
	TOTAL			616.2	0.05051			73323.2	6.01010
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	11	044	4.6	0000037	22700.0	2.3	9419.1	0.77206
7603020106	RAJA KINCAIDI	13	0.5	5.4	0.00044	4100.0	0.4	1701.2	0.13945
7904020402	SPIRINCHUS THALEICHTHYS	87	3.5	36.1	0s00296	2720.0	0.3	1128.6	0.09251
7909020401	GADUS MACROCEPHALUS	6	0.2	2.5	0000020	7700.0	0.8	3195.0	0.26189
7909020701	THERAGRA CHALCOGRAMMA	41	1.6	17.0	0.00139	15900.0	1.6	6597.5	0.54078
7915010101	SEBASTES ALEUTIANUS	5	0.2	2.1	0.00017	5000.0	0.5	2074.7	0.17006
7915010102	SEBASTES ALUTUS	28	1.1	11.6	0000095	24000.0	2.4	9958.5	0.81627
7915010105	SEBASTES BABCOCKI	3	0.1	1.2	O*OOO1O	900.0	0.1	373.4	0.03061
7915010106	SEBASTES BREVISPINIS	1	0.0	0.4	0.00003	700.0	O*1	290.5	0.02381
7915010127	SEBASTES PAUCISPINUS	9	O*4	3.7	0900031	7700.0	0.8	3195.0	0.26189

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
7915010201	SEBASTOLOBUS ALASCANUS	2	0.1	0.8	0000007	70090	0.1	290.5	0.02381
7915020291	OPHIODON ELONGATUS	3	0.1	1.2	0*00010	3200.0	0.3	1327.8	0.10884
7915030101	ANOPLOPOMA FIMBRIA	" 222	8.9	92.1	0.00755	224500.0	22.5	" ' " 93153.5	7.63554
7916090103	BATHYMASTER SIGNATUS	140	5.6	58.1	0.00476	26300.0	2.6	10912.9	0-89450
7916150101	ZAPRORA SILENUS	3	0.1	1.2	0.00010	1800.0	0.2	746.9	0.06122
791702u102	ATHERESTHES STOMIAS	1152	46.0	478.0	0,03918	352400.0	35.3	146224.1	11.98558
7917020501	GLYPTOCEPHALUS ZACHIRUS	165	6.6	68.5	0.00561	31800.0	3.2	13195.0	1.08156
79170<0601	HIPPOGLOSSOIDES LLASSODON	563	2 2.5	23306	0001915	193700.0	19.4	80373.4	6.58799
7%17020701	HIPPOGLOSSUS STENOLEPIS	21	0.8	8.7	0.00071	61200.0	6.1	2539402	2.08149
7917021301	MICROSTOMUS PACIFICUS	28	1.1	11.6	0000095	10900.0	1.1	4522.8	0.37072
	TOTAL			103806	0s08513			414074.7	33.94055

COMMENTS

HYAS HYRATUS: 1 MALE: 1 FEMALE M/ORANGE EGGS.
STOMACHS: 10 DovER SOLE; 10 POLLOCK; 10 TURBOT; 10 REx SOLE; 15 HALIBUT; 10 FLATHEAD SOLE.
BOTTOM WATER TEMPERATURE 'C = 6.0

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG	START LATITUDE MIN	START LONGITUDE DEG	START LONGITUDE MIN	FINISH LATITUDE DEG	FINISH LATITUDE MIN	FINISH LONGITUDE DEG	FINISH LONGITUDE MIN	MIDPOINT LATITUDE DEG	MIDPOINT LATITUDE MIN	MIDPOINT LONGITUDE DEG	MIDPOINT LONGITUDE MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	96E	17	OTB	791112	1642	59	20.0N	141	13.8W	59	21.6N	141	14.1W					30	2.96	311.1	318.4	314.8

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT /KM	WEIGHT /M SQ
INVERTEBRATES									
4S07050202	GONATUS MAGISTER	36	85.7	12.2	O*OO1OO	2876.0	90.5	971.6	0.07964
5333040204	PANDALOPSIS DISPAR	2	4.8	0.7	0.00006	38.0	1.2	12.8	0.00105
6802030101	BRISASTER TOWNSENDI	2	4.8	0.7	0.00006	36.0	1.1	1202	0.00100
6802040101	ALLOCENTROTUS FRAGILIS	2	4.8	0.7	0.00006	228,0	7.2	77.0	0.00631
	TOTAL			1402	0000116			107306	0.08800
VERTEBRATES									
79092 0701	THERAGRA CHALCOGRAMMA	3014	91.6	1018.2	0.08346	1318600.0	86.2	445473.0	36.51418
7915010201	SEBASTOLOBUS ALASCANUS	50	1.5	1609	0.00138	15400.0	1.0	5202.7	0.42645
7915030101	ANOPLOPOMA FIMBRIA	18	0.5	6.1	0.00050	20800.0	1.4	7027.0	0.57599
7917020102	ATHERESTHES STOMIAS	64	1.9	21.6	0.00177	46200.0	3.0	1560801	1.27935
7917020501	GLYPTOCEPHALUS ZACHIRUS	60	1.8	20.3	0.00166	16400.0	1.1	5540.5	0.45414
7917020601	HIPPOGLOSSOIDES ELASSODON	30	0.9	10.1	0s00083	15400.0'	1.0	5202.7	0.42645
7917020701	HIPPOGLOSSUS STENOLEPIS	8	0.2	2.7	0.00022	60800.0	4*Q	20540.5	1.68365
7917021301	MICROSTOMUS PACIFICUS	48	1.5	16.2	0.00133	3540000	2.3	11959.5	0.98028
	TOTAL			1112.2	0.09116			516554.1	42.34050

COMMENTS

STOMACHS: 10 POLLOCK; 10 DOVER SOLE; 10 FLATHEAD SOLE; 10 REX SOLE.
BOTTOM WATER TEMPERATURE "C = 4.7

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MID POINT LATITUD DEG MIN	MID POINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS)	AVG
FN795	97D	18	OTB	791113	0721	59 23.9N	141 6.0W	59 22.9N	141 6.9W			25	2.04	283.6 - 283.6	283.6

	TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATE										
	3200603000	PORIFERA					581.0	13.4	284.8	0.02334
	3303550000	ACTINIIDAE	19	28.8	9.3	0.00076	1000.0	23.1	490.2	0.04018
	4905360101	ARCTOMELON STEARNSII	2	3.0	1.0	0.00008	146.0	3.4	71.6	0.00587
	4907050202	GONATUS MAGISTER	7	10.6	3.4	0.00028	666.0	15.4	326.5	0.02676
	5333040204	PANDALOPSIS DISPAR	17	25.8	8.3	0.00068	330.0	7.6	161.8	0.01326
	5333110213	PAGURUS CORNUTUS	1	1.5	O*5	0.00004	18.0	O*4	8.8	0.00072
	5333110302	ELASSOCHIRUS CAVIMANUS	1	1.5	0.5	0900004	20.0	095	9.8	0.00080
	6801O4O6O2	PSEUDARCHASTER PARELII	1	1.5	0.5	0.00004	20.0	005	9.8	0.00080
	6801LJ6O1O1	CTENODISCUS CRISPATUS	1	1.5	0.5	0900004	2.0	090	1.0	0.00008
	6801100101	DIPLOPTERASTER MULTIPES	3	4.5	1.5	0.00012	634.0	14.7	310.8	0.02547
	6801110101	CROSSASTER BOREALIS	1	1.5	0.5	0.00004	18.0	0.4	8.8	0.00072
	6801110201	LOPHASTER FURCILLIGER	2	3.0	1.0	0900008	33*O	0.8	16.2	0.00133
	6801121201	PYCNOPODIA HELIANTHOIDES	1	1*5	085	0.00004	232.0	5.4	113.7	0.00932
	6802030101	BRISASTER TOWNSENDI	2	3.0	1.0	0.00008	37.0	0.9	18.1	0.00149
	6802040101	ALLOCENTROTUS FRAGILIS	8	12.1	3.9	0.00032	59o0o	13.6	289.2	0.02371
		TOTAL			32.4	0.00265			2121.1	0.17386
VERTEBRATES										
	7904020402	SPIRINCHUS THALEICHTHYS	17	3.2	8.3	0.00068	594.0	0.2	291.2	0.02387
	7909020701	THERAGRA CHALCOGRAMMA	143	26.8	70.1	0.00575	65800.0	26.8	32254.9	2.64384
	7915010102	SEBASTES ALUTUS	1	0.2	0.5	0.00004	200.0	0.1	98.0	0.00804
	7915010201	SEBASTOLOBUS ALASCANUS	41	7*7	20.1	0s00165	11800.0	4.8	5784.3	0.47412
	7915030101	AMCPLOPOMA FIMBRIA	14	2.6	6.9	0.00056	12300.0	5*O	6029.4	0.49421
	7915041901	MALACOCOTTUS KINCAIDI	7	1.3	3*4	0.00028	184.0	0.1	90.2	0.00739
	7917020102	ATHERESTHES STOMIAS	50	9*4	24.5	0.00201	36300.0	14.8	17794.1	1.45853
	7917020501	GLYPTOCEPHALUS ZACHIRUS	104	19.5	51.0	0.00418	3000090	12.2	14705.9	1.20540
	7917020601	HIPPOGLOSSOIDES ELASSODON	103	1903	50.5	0900414	51800.0	21.1	25392.2	2.08132
	7917021301	MICROSTOMUS PACIFICUS	53	9*9	26.0	0.00213	35800.0	14.6	17549.0	1.43844
	7917021401	PARCPHRYS VETULUS	1	0.2	0.5	0.00004	500.0	0.2	245.1	0.02009
		TOTAL			261.8	0.02146			120234.3	9.85527

COMMENTS

STOMACHS: 10 DOVER SOLE; 10 FLATHEAD SOLE; 10 REX SOLE; 10 ARROWTOOTH FLOUNDER; 7 BLACKFIN SCULPIN.

BOTTOM WATER TEMPERATURE ° C = 5.4

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START-Y LATITUDE DEG MIN	START-Y LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MD POINT LATITUDE DEG MIN	MD POINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	98D	19	OTB	791113	1130	59 18.5N	140 45*7W	59 17.8N	140 43.7W			30	2.22	144.6	146.4	14505

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (Grams) RAW	%	/KM	/M SQ
INVERTEBRATES									
490529C1101	FUSITRITON OREGONENSIS	10	0.6	4.5	0.00037	694.0	3*5	312.6	0.02562
49'35331001	PYRULOFUSUS HARPA	3	0.2	1.4	0.00011	445.0	2.2	200.5	0.01643
4907010101	ROSSIA PACIFICA	1	0.1	0.5	0.00004	9.0	0.0	4.1	0.00033
5333040103	PANDALUS JORDANI	5	0*3	2.3	0.00018	50.0	0.3	22.5	0.00185
5333110302	ELASSOCHIRUS CAVIMANUS	2	0*1	0.9	0.00007	50.0	0.3	22.5	0.00185
5333121002	LOPHOLITHODES FORAMINATUS	1	0*1	O*5	0.00004	522.0	2.6	235.1	0.01927
5333170302	CHIONOECETES BAIRDI	5	0.3	2.3	0.00018	170.0	0.9	76.6	0.00628
6702050301	LACUEUS CALIFORNIANUS	22	1.4	9.9	0.00081	88.0	0.4	39.6	0.00325
6801040301	MEDIASTER AEQUALIS	5	0.3	2.3	0.00018	81.0	0.4	36.5	0.00299
6801030105	HENRICIA LEVIUSCULA	1	0.1	0.5	0.00004	10*0	0.1	4.5	0.00037
6a 0100101	DIPLOPTERASTER MULTIPES	2	0.1	O*9	0.00007	983.0	4.9	442.8	0.03629
68 01110103	CROSSASTER PAPPOSUS	2	0*1	0.9	0.00007	61.0	0*3	27.5	0.00225
6S01110201	LOPHASTER FURCILLIGER	7	0.4	3.2	0.00026	357.0	1.8	160.8	0.01318
6802030101	BRISASTER TOWNSENDI	1	0.1	0.5	0.00004	30.0	0.2	13.5	0.00111
6S02040101	ALLOCENTROTUS FRAGILIS	925	58.5	416.7	0.03415	12000.0	60.4	5405.4	0.44307
6802040200	STRONGYLOCENTROTUS SPP.	585	37.0	263.5	0.02160	3630.0	18.3	1635.1	0.13403
6803040201	GORGONOCEPHALUS CARYI	2	0.1	0.9	0.00007	608.0	3.1	273.9	0.02245
1203030402	HALOCYNTHIA IGABOJA	2	0*1	099	0.00007	79*0,	0*4	35.6	0.00292
	TOTAL			712.2	0.05837			8949.1	0.73353
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	6	0.8	2.7	0.00022	10400.0	2.5	4684.7	0.38399
7603020106	RAJA KINCAIDI	5	0.7	2.3	0000018	5900.0	1.4	2657.7	0.21784
7904020402	SPIRINCHUS THALEICHTHYS	98	13.4	44.1	0.00362	3342.0	0.8	1505.4	0.12339
7909020401	GADUS MACROCEPHALUS	1	0.1	005	0000004	3600.0	0.9	162106	0.13292
7909020701	THERAGRA CHALCOGRAMMA	7	1.0	3.2	0000026	3200.0	0.6	1441.4	0.11815
7915010102	SEBASTES ALUTUS	9	1.2	4.1	0.00033	1800.0	0*4	810.8	0.06646
7915030101	ANOPLOPOMA FIMBRIA	101	1308	45.5	0.00373	83100s0	2092	37432.4	3.06823
7916090103	BATHYMASTER SIGNATUS	12	1.6	5.4	0*00044	1963.0	0.5	884.2	0.07248
7917020102	ATHERESTHES STOMIAS	395	54.0	177.9	0.01458	127600.0	31.0	57477.5	4.71127
7917020501	GLYPTOCEPHALUS ZACHIRUS	63	806	28.4	0.00233	14500.0	3.5	653105	0.53537
7917020601	HIPPOGLOSSOIDES ELASSODON	22	3.0	9.9	0.00081	9100.0	2.2	4099.1	0.33599
7917020701	HIPPOGLOSSUS STENOLEPIS	8	1.1	3.6	0.00030	146763.0	35.6	66109.5	5.41881
7917021301	MICROSTOMUS PACIFICUS	4	0.5	1.8	0.00015	900.0	092	405.4	0.03323
	TOTAL			329.3	0.02699			18566103	15.21814

COMMENTS

ELASSOCHIRUS CAVIMANUS: 1 FEMALE WITH DARK PURPLE EGGS.
PANDALUS JORDANI: 4 WITH AQUA BLUE EGGS. POLLUTANTS: 1 = EC
OF PLASTIC BAG.
STOMACHS: 10 REX SOLE; 10 FLATHEAD SOLE; 10 BLACKCOD; 9 TURBOT.
BOTTOM WATER TEMPERATURE °C = 6.3

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	6A	20	OTB	791114	1323	59 46.2N	139 49.0W	59 47.7N	139 49.3W			15	1.48	43.9 -	56.7	50.3

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
4905330301	NEPTUNEA LYRATA	1	0.3	0.7	0.00006	83.0	0.2	56.1	0.00460
5333010101	PASIPHAEA PACIFICA	1	0.3	0.7	0.00006	5.0	0.0	3.4	0.00028
5333040101	PANDALUS BOREALIS	73	23.7	49.3	0.00404	311.0	0.6	210.1	0.01722
5333040107	PANDALUS DANAE	1	0.3	0.7	0.00006	10.0	0.0	6*8	0.00055
5333050400	EUALUS SPP.	1	0.3	0.7	0.00006	2.0	0.0	1.4	0.00011
5333043107	CRANGON DALLI	103	33.4	69.6	0.00570	504.0	0.9	340.5	0.02791
5333110203	PAGURUS ALEUTICUS	1	0.3	0.7	0.00006	25.0	0.0	16.9	0.00138
5333120701	PARALITHODES CAMTSCHATICA	1	0.3	0.7	0.00006	900.0	1.7	608.1	0.04984
5333160104	CANCER MAGISTER	124	40.3	83.8	0.00687	51300.0	96.4	34662.2	2.84116
68C104CI1O4	CERAMASTER PATAGONICUS	1	0.3	0.7	0.00006	73.0	0.1	49.3	0.00404
6801040501	MEDIASTER AEQUALIS	1	0.3	0.7	0.00006	23.0	0.0	15.5	0.00127
	TOTAL			208.1	0.01706			35970,3	2.94838
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	24	6.2	16.2	0.00133	31300.0	67.1	21148s6	1.73350
7603O2J1O3	RAJA BINOCULATA	2	0.5	1.4	0.00011	1400.0	3.0	945.9	0907754
7'934020402	SPIRINCHUS THALEICHTHYS	296	76.9	200.0	0.01639	2275.0	4.9	1537s2	0. 12600
79090206O1	MICROGADUS PROXIMUS	42	10.9	28.4	0.00233	1733.0	3.7	1170.9	0.09598
7915041801	LEPTOCOTTUS ARMATUS	1	0.3	0.7	0.00006	170.0	0.4	114.9	0.00942
7917020601	HIPPOGLOSSOIDES ELASSODON	2	0.5	1.4	0.00011	200.0	0.4	135.1	0.01108
7917020801	ISOPSETTA ISOLEPIS	12	3.1	8.1	0.00066	2300.0	4.9	1554*1	0.12738
7917021501	PLATICHTHYS STELLATUS	6	1.6	4.1	0.00033	7300.0	15,6	4932.4	0.40430
	TOTAL			260.1	0002132			31539.2	2.58518

COMMENTS

PANDALUS BOREALIS: 1 5 W/AQUA EGGS. CRANGON DALLI: NO EGGS.
CANCER MAGISTER: 122 MALES; 2 FEMALES. STOMACHS: 37 MALE
DUNGENESS CRABS; 6 STARRY FLOUNDERS; 10 BUTTER SOLE.

BOTTOM WATER TEMPERATURE "C 10.0

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE TIME YYMMDD HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE C E G MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	99D	21	OTB	791115 0729	59 24.9N	140 34.1W	59 24.9N	140 37.0W			30	2.96	139.1 -	142.7	140.9

TAxON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM		WEIGHT (GRAMS) RAW	%	/KM	/M so
INVERTEBRATES										
3303540101	STOMPHIA COCCINEA		1	O*5	0.3	0.00003	35*O	0.2	11.8	0.00097
4504290201	HIATELLA ARCTICA		2	0.9	0.7	0.00006	2*O	090	0.7	0.00006
4$04310101	BANKIA SETACEA		11	5.0	.3.7	0.00030	10.0	0.1	3.4	0.00028
490525o1O1	FUSITRITON OREGONENSIS		28	12.8	9.5	0.00078	2361.0	12.5	797.6	0.06538
4905320128	BUCCINUM PLECTRUM		1	0.5	O*3	0.00003	21.0	0.1	7.1	0.00058
4905331001	PYRULOFUSUS HARPA		6	2.7	2.0	0.00017	727.0	3.9	245.6	0.02013
490536O1O1	ARCTOMELON STEARNSII		2	0.9	0.7	0.00006	228.0	1.2	77.0	0.00631
4907010101	ROSSIA PACIFICA		4	1.8	1.4	0.00011	60.0	0.3	20.3	0.00166
5330040101	LIMNORIA LIGNOSUM		3	1.4	1.0	0.00008	1.0	O*O	093	0.00003
5333040102	PANDALUS GONIURUS		4	1.8	1.4	0.00011	27.0	0.1	9.1	0.00075
533304L)1O3	PANDALUS JORDANI		15	6.8	5.1	0.00042	17000	0.9	57.4	0.00471
5333110200	PAGURUS SPP.		10	4.6	3.4	0.00028	153.0	0.8	51.7	0.00424
5333110302	ELASSOCHIRUS CAVIMANUS		14	6.4	4.7	0.00039	376.0	2.0	127.0	0.01041
5333121002	LOPHOLITHODES FORAMINATUS		11	5.0	3.7	0.00.030	4100.0	21.8	1385*1	0.11354
5333170201	HYAS LYRATUS		19	8.7	6.4	0.00053	915.0	4.9	309.1	0.02534
5333170302	CHIGNOECETES BAIRDI		22	10.0	7.4	0.00061	908.0	4.8	306.8	0.02514
5333180104	CANCER MAGISTER		3	104	1.0	0.00008	932.0	4.9	314.9	0.02581
6801040104	CERAMASTER PATAGONICUS		4	1.8	1.40	.00011	265.0	1.4	89.5	0.00734
68(J104O5O1	MEDIASTER AEQUALIS		1	0.5	0.3	0.00003	75.0.	0.4	25.3	0.00208
6801040602	PSEUDARCHASTER PARELII		1	O*5	093	0.00003	50.0	0.3	16.9	0.00138
6801080101	HENRICIA ASPERA		8	3.7	2.7	0.00022	76.0	O*4	25.7	0.00210
6801080105	HENRICIA LEVIUSCULA		3	1*4	1.0	0S00008	62.0	0.3	20.9	0.00172
6$01080111	HENRICIA SANGUINOLENTA		7	3.2	2.4	0.00019	120.0	0.6	40.5	0.00332
6801100101	DIPLOPTERASTER MULTIPES		12	5*5	4.1	0.00033	3817.0	20.3	1289.5	0.10570
6801110103	CROSSASTER PAPPOSUS		1	0.5	0.3	0.00003	13.0	0.1	4*4	0.00036
6801110201	LOPHASTER FURCILLIGER		9	4.1	3.0	0S00025	315*O	1*7	106.4	0.00872
6801120901	LETHASTERIAS NANIMENSIS		1	0.5	O*3	0.00003	181.0	1.0	61.1	0.00501
6802040101	ALLOCENTROTUS FRAGILIS		8	3.7	2.7	0-00022	2527.0	1304	853.7	0.06998
6804070400	BATHYPLOTES SPP.		7	3.2	204	0.00019	278.0	1.5	93*9	0.00770
7200000000	UROCHORDATA		1	005	0.3	0000003	35.0	O*2	11.8	0.00097
		TOTAL			74.0	0.00606			6364.9	0.52171
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		1	0.2	0.3	0.00003	1400.0	0.6	473.0	0.03877
76030201O6	RAJA KINCAIDI		10	2.1	3.4	0.00028	3600.0	1*7	1216.2	0.09969
7904020501	THALEICHTHYS PACIFICUS		26	5.5	8.8	0.00072	899.0	004	30307	0.02489
7909020401	GADUS MACROCEPHALUS		5	1*O	1.7	0.00014	17300.0	8.0	5844.6	0.47907
7909020701	THERAGRA CHALCOGRAMMA		10	2.1	3.4	0.00028	1805.0	0.8	609.8	0.04998
7915030101	ANOPLOPOMA FIMBRIA		58	12.2	19.6	0.00161	51800.0	24.0	17500.0	1.43443
7915041801	LEPTOCOTTUS ARMATUS		3	0.6	1.0	0.00008	900.0	0.4	304.1	0.02492
7915042200	MYOXOCEPHALUS SPPO		3	0.6	1.0	0.00008	28.0	0.0	9.5	0.00078
7916090103	BATHYMASTER SIGNATUS		1	0.2	0.3	0.00003	117*O	0.1	39.5	0.00324
7917020102	ATHERESTHES STOMIAS		264	55*3	89.2	0.00731	95800.0	44.4	32364.9	2.65286
7917020501	GLYPTOCEPHALUS ZACHIRUS		76	15.9	25.7	0.00210	16300.0	7.6	5506.8	0.45137
7917020601	HIPPOGLOSSOIDES ELASSODON		10	2.1	3.4	0.00028	5400.0	2.5	1824.3	0.14953

13W

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
7917020701	HIPPOGLOSSUS STENOLEPIS	9	1.9	3.0	0.00025	19500.0	9.0	6587.8	0.53999
7917021501	PLATICHTHYS STELLATUS	1	0.2	0.3	0.00003	900.0	0.4	304.1	0.02492
	TOTAL			161.1	0.01321			72888.2	5.97444

COMMENTS

HYAS LYRATUS: 7 MALES; 10 FEMALES, 9 WITH ORANGE EGGS.
CHIONOECETES BAIRDI: ALL JUVENILES. BANKIA SP. PRESENT IN WOOD.
STOMACHS: 10 SABLEFISH; 5 PACIFIC COD; 10 FLATHEAD SOLE; 10 TURBOT; 10 REX SOLE.

BOTTOM WATER TEMPERATURE °C 6.3

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	9YE	22	OTB	791115	0925	59 18.3N	140 34.1W	59 19.8N	140 34.5W			30	2.78	133.6	137.3	135.5

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES										
3303000000	ANTHOZOA		1	0.1	0.4	0.00003	39.0	0.1	14.0	0.00115
49052'90101	FUSITRITON OREGONENSIS		53	6.7	19.1	0.00156	4100.0	7.1	1474.8	0.12089
4905331001	PYRULOFUSUS HARPA		1	0.1	0.4	0.00003	101.0	0.2	36.3	0.00298
490536O1O1	ARCTOMELON STEARNSII		4	0.5	1*4	0.00012	445.0	0.8	160.1	0.01312
4907010101	ROSSIA PACIFICA		8	1.0	2.9	0.00024	14200	002	51.1	0.00419
5333110216	PAGURUS CONFRAGOSUS		8	1*0	2.9	0.00024	302.0	0.5	10896	0.00890
53331103CI2	ELASSOCHIRUS CAVIMANUS		6	0.8	2.2	0.00018	216.0	0.4	77.7	0.00637
5333121,302	LOPHOLITHODES FORAMINATUS		9	1.1	3.2	0.00027	6400.0	11*0	2302.2	0.18870
5333170201	HYAS LYRATUS		4	0.5	1.4	0.00012	344.0	0.6	123.7	0.01014
5333170302	CHIONOECETES BAIRDI		4	0.5	1.4	0000012	205.0	0.4	73.7	0.00604
6801030201	LUIDIASTER DAWSONI		1	0.1	0.4	0.00003	125.0	0.2	45.0	0.00369
6901040100	CERAMASTER SPP.		5	0.6	1.8	0.00015	159.0	0.3	57.2	0.00469
L801O4O5O1	MEDIASTER AEQUALIS		5	0.6	1.8	0.00015	120.0	0.2	43.2	0.00354
6801080100	HENRICIA SPP.		3	0.4	1.1	0*00009	72.0	0.1	25.9	0.00212
6.201060191	HENRICIA ASPERA'		1	0.1	0.4	0000003	10.0	0.0	3.6	0.00029
6801080105	HENRICIA LEVIUSCULA		1	0*1	0.4	0.00003	10.0	0.0	3.6	0.00029
6801080201	PORANIOPSIS INFLATA		1	091	0.4	0.00003	41.0	0.1	14.7	0.00121
6801110103	CROSSASTER PAPPOSUS		15	1*9	5.4	0.00044	215.0	0.4	77.3	0.00634
6801110201	LOPHASTER FURCILLIGER		26	3*3	9.4	0.00077	510.0	0.9	183.5	0.01504
6801110301	SOLASTER DAWSONI		1	0*1	0.4	0.00003	16.0	0*0	5.8	0.00047
6801121101	STYLASTERIAS FORRERI		1	0.1	004	0*00003	39.0	0*1	14.0	0.00115
6902040101	ALLOCENTROTUS FRAGILIS		275	34.9	98.9	0.00611	27200.0	46.8	9784.2	0.80198
6802040201	STRONGYLOCENTROTUS DROEBACHIENSIS		350	44.5	125.9	0001032	1680000	28.9	6043.2	0.49534
6803040201	GORGONOCEPHALUS CARYI		1	0.1	0.4	0.00003	431*0	0.7	155.0	0.01271
7203030402	HALOCYNTHIA IGABOJA		3	0.4	1*1	0.00009	95.0	0*2	34.2	0.00280
		TOTAL			283.1	0.02320			20912.6	1.71415
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		2	003	0.7	0,00006	2700.0	1.1	971.2	0.07961
7603020103	RAJABINOC ULATA		1	0.2	0.4	0,00003	32200.0	13.2	11582.7	0.94940
76G302O1OO	BAJA KINCAIDI		1	0.2	0.4	0.00003	140090	0.6	503.6	0.04128
7904029402	SPIRINCHUS THALEICHTHYS		44	7.0	15.8	0000130	1512.0	0.6	543.9	0.04458
790902040l	GADUS MACROCEPHALUS		3	0.5	1.1	0.00009	14500.0	5.9	5215.8	0.42753
7909020701	THERAGRA CHALCOGRAMMA		8	1.3	2.9	0.00024	1410.0	0.6	507.2	0.04157
7915010102	SEBASTES ALUTUS		2	0.3	0.7	0000006	324.0	0.1	116.5	0.00955
7515030101	ANOPLOPOMA FIMBRIA		19	3*O	6.8	0.00056	15900.0	6.5	5719.4	0.46881
7916090103	BATHYMASTER SIGNATUS		8	1.3	2.9	0.00024	980.0	0.4	352.5	0.02889
7917020102	ATHERESTHES STOMIAS		479	76.5	172.3	0.01412	13210OCO	54.2	47518.0	3.89492
7917020551	GLYPTOCEPHALUS ZACHIRUS		44	7.0	15.8	0,00130	5000.0	2*0	1798.6	0.14742
7917020601	HIPPOGLOSSOIDES ELASSODON		9	1.4	3.2	0.00027	5000.0	2*0	1798.6	0.14742
7917020701	HIPPOGLOSSUS STENOLEPIS		6	100	2.2	0,00018	30900.0	1207	11115*1	0.91107
		TOTAL			225.2	0.01846			87743.2	7.19206

COMMENTS

HYAS LYRATUS: 2 MALES; 2 FEMALES WITH LIGHT ORANGE EGGS.
CHIONOECETES BAIRDI: 1 MALE; 3 FEMALES WITH ORANGE EGGS, FULL CLUTCH. POLLUTANTS: ONE PLASTIC BAG.
STOMACHS: 10 BLACK COD; 10 FLATHEAD SOLE; 10 REX SOLE; 10 ARROWTOOTH FLOUNDER; 3 PACIFIC COD.
BOTTOM WATER TEMPERATURE °C = 6.8

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	100E	23	OTB	791115	1303	59 11.6N	140 14.7W	5.9 10*7N	140 17.3W			30	3.52	. 122.6 -	126.3	12405

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT /KM	WEIGHT /M SQ
INVERTEBRATES									
4905060701	LISCHKEIA CIDARIS	22	0.5	6.3	0.00051	194.0	0.1	55*1	0.00452
4905290101	FUSITRITON OREGONENSIS	42	0.9	11.9	0.00098	2414.0	1*1	685.8	0.05621
4905330202	BERINGIUS KENNICOTTI	4	001	1.1	0.00009	168*0	0.1	47.7	0.00391
490"/010101	ROSSIA PACIFICA	16	0.3	4.5	0.00037	220.0	0.1	62.5	0.00512
5333040104	PANDALUS MONTAGUI TRIDENS	18	0.4	5.1	0.00042	52.0	0.0	14.8	0.00121
5333110206	PAGURUS SETOSUS	2	0.0	0.6	0.00005	30.0	0.0	8.5	0.00070
53331103O2	ELASSOCHIRUS CAVIMANUS	22	0.5	6.3	0.00051	392.0	O*2	111*4	0.00913
5333121002	LOPHOLITHODES FORAMINATUS	2	0.0	0.6	0.00005	1340.0	0.6	380.7	0.03120
53331702O1	HYAS LYRATUS	16	O*3	4.5	0.00037	994.0	O*4	282.4	0.02315
6801043104	CERAMASTER PATAGONICUS	22	O*5	6.3	0.00051	1708.0	0.8	485.2	0.03977
6801040501	MEDIASTER AEQUALIS	10	0.2	2.8	0.00023	224.0	0.1	63.6	0.00522
6801080101	HENRICIA ASPERA	4	0.1	1.1	0.00009	96.0	0.0	27.3	0.00224
6801100302	PTERASTER MILITARIS	4	0.1	1.1	0.00009	340.0	0.2	96.6	0.00792
6801110103	CROSSASTER PAPPOSUS	16	0.3	4*5	0.00037	180.0	0.1	51.1	0.00419
6801110301	SOLASTER DAWSONI	2	0.0	0.6	0.00005	40.0	O*O	11.4	0.00093
6801120901	LETHASTERIAS NANIMENSIS	2	0.0	0.6	0.00005	100.0	090	28.4	0.00233
6802040101	ALLOCENTROTUS FRAGILIS	48	1.0	13.6	0.00112	2200.0	1.0	625.0	0.05123
6802040290	STRONGYLOCENTROTUS SPP.	4434	94.6	1259.7	0.10325	210600C0	95.2	59829.5	4.90406
	TOTAL			133103	0010912			62867*0	5.15304
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	20	3.0	5.7	0.00047	30800.0	10.9	8750.0	0.71721
7904020501	THAL ICHTHYS PACIFICUS	88	13.4	25.0	0.00205	3076.0	1.1	873.9	0S07163
7909020401	GADUS MACROCEPHALUS	14	2.1	4.0	0.00033	61800.0	21.9	17556.8	1.43908
7909020701	THERAGRA CHALCOGRAMMA	24	3.7	6.8	0.00056	316.0	0.1	89.8	0.00736
7915010102	SEBASTES ALUTUS	6	0.9	1.7	0.00014	40090	0.1	113.6	0.00931
7915020201	OPHIODON ELONGATUS	4	0.6	1.1	0.00009	1800.0	0.6	511.4	0.04192
7915030101	ANOPLOPOMA FIMBRIA	4	0.6	1.1	0.00009	2800.0	1.0	795.5	0.06520
7915044103	TRIGLOPS MACELLUS	10	1.5	2.8	0.00023	646.0	0.2	183.5	0.01504
7915090103	BATHYMASTER SIGNATUS	88	13*4	25.0	0.00205	1000O*O	3.5	2840.9	0.23286
791"?OZO1O2	ATHERESTHES STOMIAS	368	56.1	10495	0.00857	104400.0	37.0	29659.1	2.43107
7917020501	GLYPTOCEPHALUS ZACHIRUS	16	2.4	4.5	0.00037	2800.0	1.0	795.5	0.06520
7917020601	HIPPOGLOSSOIDES ELASSODON	6	0.9	1.7	0.00014	2800.0	1.0	795.5	0.06520
791"7020701	HIPPOGLOSSUS STENOLEPIS	8	1.2	2.3	0.00019	60800.0	21.5	1727207	1.41580
	TOTAL			186.4	0.01528			80238.1	6.57689

COMMENTS

STRONGYLOCENTROTUS MEAN WT. 9.5 GM PER 2 INDIVIDUALS;
ALLOCENTROTUS ALSO 2 PER 95 GM.
HYAS LYRATUS: 1 MALE; 7 FEMALES WITH ORANGE EGGS. STOMACHS: 10
ARROWTOOTH FLOUNDER: 7 PACIFIC COD. 1 SLIME STAR PRESERVED,
2 SLIM SCULPIN PRESERVED,
BOTTOM WATER TEMPERATURE °C = 6.5

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MD POINT LATITUD DEG MIN	MD POINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	100D	24	OTB	791115	1521	59 21.9N	140 17.9W	59 20.4N	140 17.9W			30	2.78	135.4 -	150.0	142.7

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES									
3200000000	PORIFERA					1593.0	12.7	573.0	0.04697
4905290101	FUSITRITON OREGONENSIS	10	5.0	3.6	0.00029	834.0	6.7	300.0	0.02459
4935360101	ARCOMALLON STEARNSII	1	0.5	0.4	0.00003	216.0	1.7	77.7	0.00637
5333C1401O3	PANDALUS JORDANI	94	47.0	33.8	0.00277	1052.0	8.4	378.4	0.03102
5333049204	PANDALOPSIS DISPAR	3	1.5	1.1	0.00009	116.0	0.9	4107	0.00342
5333110206	PAGURUS SETOSUS	1	0.5	0.4	0.00003	3000	0.2	1008	0.00088
5333110216	PAGURUS CONFRAGOSUS	1	0.5	0.4	0.00003	30.0	0.2	10.8	0.00088
5333121oO2	LOPHOLITHODES FORAMINATUS	5	2.5	1.8	0.00015	4100.0	32.7	147498	0.12089
5333170302	CHIONOECETES BAIRDI	35	17.5	12.6	0.00103	760.0	6.1	273.4	0.02241
6201040104	CERASTER PATAGONICUS	12	6.0	4.3	0.00035	966.0	7.7	347.5	0.02848
6801040501	MEDIASTER AEQUALIS	14	7.0	5.0	0.00041	510.0	4.1	183.5	0.01504
6801040602	PSEUDARCHASTER PARELII	4	2.0	1.4	0.00012	90.0	0.7	32.4	0.00265
6901O8O1OO	HENRICIA SPP.	1	0.5	0.4	0.00003	10*0	0.1	3.6	0.00029
6801080101	HENRICIA ASPERA	1	0.5	0.4	0.00003	10.0	0.1	3.6	0.00029
6801080105	HENRICIA LEVIUSCULA	1	0.5	0.4	0.00003	1090	0.1	306	0.00029
66[J1100101	DIPLOPTERASTER MULTIPES	2	100	0.7	0.00006	953*0	7.6	342.8	0.02810
6.501110301	SOLASTER DAWSONI	2	1.0	0.7	0.00006	170.0	1.4	61.2	0.00501
680204J101	ALLOCENTROTUS FRAGILIS	8	4.0	2.9	0.00024	661.0	5.3	237.8	0.01949
7203030402	HALICYNTHIA IGABOJA	5	2.5	1.8	0.00015	43090	394	154.7	0.01268
	TOTAL			71.9	0.00590			4511.2	0.36977
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	5	0.5	1.8	0.00015	10900.0	5.6	3920.9	0.32138
7603020106	RAJA KINCAIDI	5	0.5	1.8	0.00015	590090	3.0	2122.3	0.17396
7904020501	THALEICHTHYS PACIFICUS	283	27.5	101.8	0.00834	6156.0	3.2	2214.4	0.18151
7909020701	THERAGRA CHALCOGRAMMA	8	0*8	2.9	0.00024	1213.0	0.6	436.3	0.03576
7909041110	LYCODES PALEARIS	1	0.1	0.4	0.00003	200.0	0.1	71*9	0.00590
7915010201	SEBASTOLOBUS ALASCANUS	55	5.3	19.8	0.00162	21300.0	1099	7661.9	0.62802
791503I)1O1	ANOPLOPOMA FIMBRIA	4	0.4	1.4	0.00012	3200.0	1.6	1151.1	0.09435
7915044201	ULCA BOLINI	1	0*1	0.4	0.00003	30.0	0.0	10.8	0.00088
7917029102	ATHERESTHES STOMIAS	521	50.6	187.4	0.01536	128900.0	6602	46366.9	3.80057
7917020501	GLYPTOCEPHALUS ZACHIRUS	115	11.2	41.4	0.00339	12700.0	6.5	4568.3	0.37445
7917020601	HIPPOGLOSSOIDES ELASSODON	28	2.7	10.1	0.00083	3600.0	1.8	1295.0	0.10614
7917021301	MICROSTOMUS PACIFICUS	3	0.3	1.1	0.00009	500.0	0.3	179.9	0.01474
	TOTAL			370.1	0.03034			69999.6	5.73768

COMMENTS

PANDALUS JORDANI: 75% WITH AQUAEGGS. CHIONECETES BAIRDI:
17 MALES: 18 FEMALES.
STOMACHS: 10 FLATHEAD SOLE;10 REX-SOLE; 10 ARROWTOOTH FLOUNDER,
POLLUTANTS: 1 PLASTIC BAG; 1 5 GAL. FUEL CAN.
BOTTOM WATER TEMPERATURE "C = 6.6

CRUSE	STAT	TOW #	GEAR #	GEAR CODE	DATE YYMMDD	TIME HHMN	START LATITUDE D E G MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	101E	25	OTB		791115	1745	59 16.1N	140 0.7W	59 17*7N	140 1.5W			30	3*33	139.1 -	146.4	142.8

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
49052%u1O1	FUSITRITON OREGONENSIS	2	1.1	0.6	0.00005	181.0	1*3	54.4	0.00446
5333040204	PANDALOPSIS DISPAR	2	1.1	0.6	0.00005	47.0	0.3	14.1	0.00116
5333050401	EUALUS BARBATA	1	0.5	0.3	0.00002	14.0	0*1	4.2	0.00034
533312'1002	LOPHOLITHODES FORAMINATUS	1	0.5	0.3	0.00002	932.0	6.5	279.9	0.02294
5333170302	CHIONOECETES BAIRDI	174	93.0	52.3	0.00428	11400.0	79.9	3423.4	0.28061
68CI10494O3	HIPPASTERIAS SPINOSA	1	0.5	0.3	0.00002	217.0	1.5	65.2	0.00534
6601O6OIO1	CIENODISCUS CRISPATUS	1	0.5	0*3	0*00002	1600	0.1	4.8	0.00039
660111o3O1	SOLASTER DAWSONI	4	2.1	1*2	0.00010	607.0	4.3	182.3	0.01494
6801121201	PYCNOPODIA HELIANTHOIDES	1	0.5	0.3	0900002	862.0	6.0	258.9	0.02122
	TOTAL			56.2	0.00460			4287.1	0.35140
VERTEBRATES									
7603020106	RAJA KINCAIDI	15	4.4	4.5	0.00037	21300.0	8.1	6396.4	0.52429
7603020108	RAJA RHINA	18	5.3	5*4	0.00044	113000.0	43.2	33933.9	2.78147
7904010206	ONCORHYNCHUS ISHAWYTSCHA	1	0.3	0*3	0.00002	574.0	0.2	172.4	0.01413
7904020501	THALEICHTHYS PACIFICUS	24	7*O	7.2	0.00059	830.0	0.3	249.2	0.02043
7909020701	THERAGRA CHALCOGRAMMA	21	6.1	6.3	0.00052	1800.0	0*7	540.5	0.04431
791501o1O2	SEBASTES ALUTUS	1	0.3	0.3	0.00002	100.0	0.0	30.0	0.00246
7915010201	SEBASTOLOBUS ALASCANUS	24	7*O	7,2	0.00059	14500.0	5.5	4354*4	0s35691
7915030101	ANOPLOPOMA FIMERIA	2	0.6	0.6	0.00005	1400.0	0.5	420.4	0.03446
7915040901	DASYCOTTUS SETIGER	1	0.3	0.3	0.00002	31.0	0.0	9.3	0.00076
7917020102	ATHERESITHES STOMIAS	225	65.8	67.6	0.00554	96300.0	36.8	28918.9	2.37040
7917020501	GLYPTOCEPHALUS ZACHIRUS	7	2.0	2*1	0.00017	900.0	0.3	270.3	0.02215
7917020701	HIPPOGLOSSUS STENOLEPIS	3	.0.9	0.9	0.00007	10900*0	4.2	3273.3	0.26830
	TOTAL			102.7	0.00842			78569. 1	6.44009

COMMENTS

STOMACHS: 20 JUVENILE SNOW CRAB. SNOW CRABS: 71 FEMALES: 103 MALES.

BOTTOM WATER TEMPERATURE °C = 6.3

CRUSE #	STAT #	TOW #	GEAR CODE	DATE E YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	9C	26	OTB	791116	1433	59 57.5N	139 34.8W	59 56.2N	139 35.7W			30	2.41	" 239.7 -	243.4	241.6

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
3303030000	ANTHOZOA		2	2*O	0.8	0.00007	510.0	37.8	211.6	0.01735
3303470201	STYLATULA GRACILE		2	2.0	0.8	0.00007	184.0	13.6	76.3	0.00626
5333040101	PANDALUS BOREALIS		40	39.6	16.6	0.00136	176.0	13.1	73.0	0.00599
5333040204	PANDALOPSIS DISPAR		50	49.5	20.7	0.00170	75.0	5.6	31.1	0.00255
5333060107	CRANGON DALLI		1	1.0	0.4	0.00003	5.0	0.4	2.1	0.00017
5333110401	LABIDOCHIRUS SPLENDESCENS		1	1.0	0.4	0.00003	16.0	1.2	6*6	0.00054
5333170302	CHIONOECETES BAIRDI		3	3.0	1.2	0.00010	216.0	16.0	89.6	0.00735
6801080100	HENRICIA SPP.		1	1*O	0.4	0.00003	90.0	6.7	37.3	0.00306
6803040201	GORGONOCEPHALUS CARYI		1	1.0	0.4	0.00003	76.0	5.6	31.5	0.00258
		TOTAL			41.9	0.00344			559.3	0.04585
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		11	12.5	4.6	0.00037	15900.0	73.6	6597.5	0.54078
7303010201	CLUPEA HARENGUS PALLASI		9	10.2	3.7	0.00031	590.0	2.7	244.8	0.02007
7904020201	MALLOTUS VILLOSUS		1	1.1	0.4	0.00003	19.0	0*1	7.9	0.00065
7909020701	THERAGRA CHALCOGRAMMA		58	65.9	24.1	0000197	2230.0	10*3	925.3	0.07585
7915040901	DASYCOTTUS SETIGER		2	2.3	0.8	0.00007	256.0	1.2	10602	0.00871
7917OZO1O2	ATHERESTHES STOMIAS		4	4.5	1.7	0.00014	970.0	4.5	402.5	0.03299
7917020601	HIPPOGLOSSOIDES ELASSODON		2	2.3	0.8	0.00007	444.0	2.1	184.2	0.01510
7917021501	PLATICHTHYS STELLATUS		1	1.1	0.4	0.00003	1183.0	5*5	490.9	0.04024
		TOTAL			36.5	0.00299			8959.3	0.73437

COMMENTS

NUMEROUS ROCKS-APPROX. 1850 KG. CHIONOECETES BAIRDI: 1 FEMALE; 1 MALE; 1 UNKNOWN. POLLUTANTS: ; ONE PLASTIC BAG.

BOTTOM WATER TEMPERATURE "C= 5.7 ,

CRUSE #	STAT #	TOW #	GEAR CODE	DATETIME YYMMDD HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	103B	27	OTB	791117 1116	59 16.6N	139 32.6W	59 18.0N	139 33.3W			30	3.15	150.1 -	161.0	155.6

	TAXON CODE	TAXONOMIC NAME	COUNT RAW	COUNT %	COUNT /KM	COUNT /M SQ	WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT /KM	WEIGHT /M SQ
INVERTEBRATES										
	3303009300	ANTHOZOA	1	0.5	0.3	0.00003	121.0	0.3	38.4	0.00315
	4905290101	FUSITRITON OREGONENSIS	1	0.5	0.3	0.00003	99.0	0.2	31.4	0.00258
	4905330305	NEPTUNEA PRIBILOFFENSIS	1	095	0.3	0.00003	98.0	O*2	31.1	0.00255
	490566O1O1	TRITONIA EXSULANS	1	0.5	0.3	0,00003	50.0	0.1	15.9	0.00130
	4907123200	OCTOPUS	1	0.5	0.3	0.00003	60.0	091	19.0	0.00156
	5333040101	PANDALUS BOREALIS	50	26.5	15.9	0.00130	405.0	099	12006	0.01054
	5333040204	PANDALOPSIS DISPAR	19	10.1	6.0	0.00049	400.0	099	127.0	0.01041
	5333110203	PAGURUS ALEUTICUS	1	0.5	0.3	0.00003	20.0	090	6.3	0.00052
	5333110216	PAGURUS CONFRAGOSUS	1	0.5	0.3	0.00003	10.0	0.0	3.2	0.00026
	5333170302	CHIONOECETES BAIRDI	101	53.4	32.1	0.00263	41800.0	93.3	13269.8	1.08769
	6801060101	CTENODISCUS CRISPATUS	10	5.3	3.2	0.00026	121.0	0.3	38.4	0.00315
	6801121201	PYCNOPODIA HELIANTHOIDES	2	1.1	0.6	0.00005	1599.0	3.6	507.6	0.04161
		TOTAL			60.0	0.00492			14216.8	1.16531
VERTEBRATES										
	7602050201	SQUALUS ACANTHIAS	8	4.8	2.5	0.00021	14100.0	13*3	4476.2	0.36690
	7603O2O1O6	RAJA KINCAIDI	9	5.4	2.9	0.00023	9500.0	9.0	301509	0.24720
	7603OZO1O8	RAJA RHINA	1	0.6	0.3	0.00003	8600.0	8.1	2730.2	0.22378
	7909041110	LYCODES PALEARIS	1	0.6	0.3	0.00003	100.0	0.1	31.7	0.00260
	7915010102	SEBASTES ALUTUS	2	1.2	0.6	0.00005	90090	0.8	285.7	0.02342
	7915040901	DASYCOTTUS SETIGER	10	6.0	3.2	0.00026	500.0	0.5	158.7	0.01301
	7915044201	ULCA BOLINI	1	0.6	O*3	0 9 0 0 0 0 3	2700.0	2.5	857.1	0.07026
	7917020102	ATHERESTHES STOMIAS	136	81.0	43.2	0s00354	69500.0	65.6	22063.5	1s80848
		TOTAL			53.3	0.00437			33619.0	2.75566

COMMENTS

PANDALOPSIS DISPAR: 10 WITH TAN EGGS. PAN@LUS BOREEALIS: 15 WITH AQUA EGGS. LOGS RIDDLED WITH BANKIASETACEA.
CHIONOECETES BAIRDI: 63 MALES, 38 FEMALES-ALL OLD HARD SHELLsO
STOMACHS: 10 FLATHEAD SOLE; 10 TURBOT: 20 SNOW CRAB.
POLLUTANTS: 5 PLASTIC BAGS, 1 RUBBER GLOVE.
BOTTOM WATER TEMPERATURE "C 7.4

CRUSE	STAT	TOW	GEAR	DATE	TIME	START LATITUDE	START LONGITUDE	FINISH LATITUDE	FINISH LONGITUDE	MIDPOINT LATITUDE	MIDPOINT LONGITUDE	TIME FISH	DIST FISHED	DEPTH FISHED (METERS) MIN	MAX	AVG
*	*	#	CODE	YYMMDD	HHMM	DEG MIN	DEG MIN	DEG MIN	DEG MIN	DEG MIN	DEG MIN	MINS	(KM)			
FN795	103C	29	OTB	791117	1346	59 5.3N	139 30.6W	59 6.3N	139 28.3W			30	2.96	115.3	117.1	116.2

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
3200000000	PORIFERA		6	0.6	2.0	0.00017	200.0	1.1	6706	0.00554
4905290101	FUSITRITON OREGONENSIS		16	1.5	5.4	0.00044	380.0	201	128.4	0.01052
4907011)101	ROSSIA PACIFICA		931	87.3	314.5	0.02578	216.0	1*2	73.0	0.00598
5333040103	PANDALUS JORDANI		25	2.3	8.4	0.00069	8358.0	46.7	2823.6	0.23145
5333050401	EUALUS BARBATA		15	1.4	5.1	0.00042	250.0	1.4	84.5	0.00692
5333060107	CRANGON DALLI		1	0.1	0.3	0.00003	75.0	0*4	25.3	0.00208
5333110203	PAGURUS ALEUTICUS		1	0.1	0.3	0.00003	23.0	0*1	7.8	0.00064
5333110216	PAGURUS CONFRAGOSUS		2	0.2	0.7	0.00006	23.0	0.1	7.8	0.00064
5333121002	LOPHOLITHODES FORAMINATUS		68	6.4	23.0	0.00188	2300.0	12.8	777*O	0.06369
5333170302	CHIONOECETES BAIRDI		1	O*1	0.3	0.00003	5842.0	32.6	1973.6	0.16177
6801060101	CTENODISCUS CRISPATUS		1	O*1	0.3	0.00003	15*O	0.1	5.1	0.00042
6802040101	ALLOCENTROTUS FRAGILIS						221.0	102	74.7	0.00612
		TOTAL			360.5	0.02955			6048.3	0.49576
VERTEBRATES										
76020 50201	SQUALUS ACANTHIAS		9	0.9	3.0	0000025	13200.0	5.4	4459.5	0.36553
7603020106	RAJA KINCAIDI		25	2.4	8.4	0.00069	29100.0	11.9	9831.1	0.80583
7603020108	RAJA RHINA		3	0.3	1*O	0.00008	12300.0	5.0	4155.4	0.34061
7904020501	THALEICHTHYS PACIFICUS		325	31.3	109.8	0000900	815.0	0.3	275.3	0.02257
7909020701	THERAGRA CHALCOGRAMMA		219	21*1	74.0	0.00606	4468.0	1.8	150905	0.12373
7909041110	LYCODES PALEARIS		24	2.3	8.1	0.00066	986.0	0*4	333.1	0.02730
7915010101	SEBASTES ALEUTIANUS		7	007	2.4	0.00019	1926.0	0.8	650.7	0.05333
7515030101	ANOPLOPOMA FIMBRIA		3	003	1.0	0.00008	2700.0	1.1	912.2	0.07477
7917020102	ATHERESTHES STOMIAS		377	36.3	127.4	0.01044	144800.0	59.0	48918.9	4.00975
7917020501	GLYPTOCEPHALUS ZACHIRUS		18	197	6.1	0.00050	1800.0	0.7	608.1	0.04984
7917020601	HIPPOGLOSSOIDES ELASSODON		24	2.3	8.1	0.00066	2300.0	0.9	777.0	0.06369
7917020701	HIPPOGLOSSUS STENOLEPIS		4	0.4	1.4	0.00011	30900.0	12.6	10439.2	0.85567
		TOTAL			350.7	0.02874			82869.9	6.79262

COMMENTS

CRYPTONISCIDAE PARASITES ON PANDALUS JORDANI. GASTROPOD EGG CASES.
CHIONOECETES BAIRDI: 33 MALES: 35 FEMALES*
STOMACHS: 10 REXSOLE; 10 TURBOT: 68 SNOW CRAB; 10 FLATHEAD SOLE; 20 SPINYHEAD SCULPIN.
PANDALUS JORDANI:
W/ AQUA OVARY 63
W/ ISOPOD PARASITES 42
W/ EGGS 331
NEITHER OF ABOVE 493
BOTTOM WATER TEMPERATURE "C = 7.9

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	104A	29	OTB	791117	1406	59 12.1N	139 15.0W	59 13.7N	139 16.0W			30	3.15	64.1	67.7	65.9

TAXON CODE	TAXONOMIC NAME	COUNT RAW	COUNT %	COUNT /KM		WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT //KM	WEIGHT /M SQ
INVERTEBRATES									
4801230201	CHEILONEREIS CYCLURUS	1	O*O	O*3	0*00003	10*O	O*O	3.2	0.00026
4801740101	APHRODITA JAPONICA	91	0.8	28.9	0.00237	3902.0	6.4	1238.7	0.10154
4904080401	PECTEN CAURINUS	32	0.3	10.2	0.00083	9100.0	14.9	2888.9	0.23679
4905320128	BUCCINUM PLECTRUM	20	O*2	6.3	0.00052	100.0	0.2	31.7	0.00260
5333040107	PANDALUS DANAE	1	0.0	0.3	0.00003	10.0	0.0	3.2	0.00026
5333110202	PAGURUS OCHOTENSIS	30	0.3	9.5	0.00078	1060.0	1.7	336.5	0.02758
5333170302	CHIONOECETES BAIRDI	5	090	106	0000013	2700.0	4.4	857.1	0.07026
6801050101	LUIDIA FOLIOLATA	25	0.2	7.9	0.00065	6800.0	11.2	2158.7	0.17695
6801121201	PYCNOPODIA HELIANTHOIDES	12	0.1	3.8	0.00031	14500s0	23.8	4603.2	0.37731
6803090611	OPHIURA SARSI	11350	98.1	360302	0,29534	22700,0	37.3	7206.3	0.59068
	TOTAL			3672.1	0.30099			19327.6	1.58423
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	11	0.9	3.5	0.00029	16800.0	3.1	5333.3	0.43716
7603020103	RAJA BINOCULATA	122	9.5	38.7	0-00317	238400.0	44.4	75682.5	6.20349
7603020108	RAJA RHINA	1	0.1	0.3	0.00003	4500.0	0.8	1428.6	0.11710
7909020601	MICROGADUS PROXIMUS	440	34.4	139.7	0.01145	61300.0	11.4	19460.3	1.59511
7915030101	ANOPLOPOMA FIMBRIA	3	0.2	1.0	0.00008	92.0	0.0	29.2	0.00239
7915051301	AGONUS ACIPENSERINUS	4	0.3	1.3	0.00010	124.0	0.0	39.4	0.00323
7916080201	TRICHODON TRICHODON	3	0.2	1.0	0.00008	215.0	0.0	68.3	0.00559
7917020102	ATHERESTHES STOMIAS	23	1.8	7.3	0.00060	10900.0	2.0	3460.3	0.28363
7917020501	GLYPTOCEPHALUS ZACHIRUS	173	13.5	54.9	0900450	109OO*O	2.0	3460.3	0.28363
7917020701	HIPPOGLOSSUS STENOLEPIS	26	2.0	8.3	0.00068	52700.0	9.8	16730.2	1.37132
7917020801	ISOPSETTA ISOLEPIS	442	34.6	140.3	0.01150	126200.0	23.5	40063.5	3.28389
7917021401	PAROPHRYS VETULUS	24	1.9	7.6	0.00062	2700.0	095	857.1	0.07026
7917021501	PLATICHTHYS STELLATUS	7	095	2.2	0.00018	12300.0	203	3904.8	0.32006
	TOTAL			406.0	0.03328			170517.8	13,97687

COMMENTS

1 DEAD CLINOCARDIUM CILIATUM. OPHIURA SARSI STCHS. 950G;
5@ 10GO STOMACHS: APPROX. 475 OPHIURA SARSI; 7 STARRY FLOUNDER;
10 REX SOLE; 10 ENGLISH SOLE; 10 BUTTER SOLE. POLLUTANTS:
5 1602 GLASS JARS.
20 BIG SKATE CASES EACH W/ 1-2 YOUNG W/ ATTACHED YOLK SACS.
DANKIA SLTAE IN WOOD.

BOTTOM WATER Temperature °C = 9.8

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	104B	30	OTB	791117	1810	59 4.5N	139 12.8W	59 5.7N	139 14.2W			30	2.59	89.7	91.5	90.6

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
4B01740100	APHRODITA SPP.	59	14*9	22.8	0.00187	2183.0	19.1	842.9	0.06909
4904080401	PECTEN CAURINUS	8	2*0	3.1	0.00025	1400.0	12.2	54095	0.04431
4905320120	BUCCINUM PLECTRUM	4	1.0	1*5	0.00013	65.0	0.6	25.1	0.00206
4905330801	NEPTUNEA LYRATA	2	0.5	0.8	0.00006	120.0	1.0	46.3	0.00380
4905660101	TRITONIA EXSULANS	7	1.8	2.7	0.00022	760.0	6*6	293.4	0.02405
4905670101	ARMINIA CALIFORNICA	2	0.5	0.8	0.00006	5.0	0*0	1.9	0.00016
49C1701010L	ROSSIA PACIFICA	8	200	3.1	0.00025	100.0	0.9	38.6	0.00316
4907120200	OCTOPUS	2	0.5	0.8	0.00006	83.0	0.7	32.0	0.00263
5333040101	PANDALUS BOREALIS	46	11.6	17.8	0.00146	426.0	3.7	164.5	0.01348
5333060111	CRANGON COMMUNIS	17	4.3	6.6	0.00054	47.0	0.4	1801	0.00149
5333060303	ARGIS OVIFER	1	0.3	0.4	0.00003	5.0	090	1.9	0.00016
5333110202	PAGURUS OCHOTENSIS	20	5.0	7.7	0.00063	498.0	4.4	192.3	0.01576
5333110203	PAGURUS ALEUTICUS	2	0.5	0.8	0.00006	17.0	0.1	6.6	0.00054
5333110216	PAGURUS CONFRAGOSUS	2	005	0.8	0.00006	30.0	0.3	11.6	0.00095
5333121002	LOPHOLITHODES FORAMINATUS	5	193	1.9	0.00016	2300.0	20.1	888.0	0.07279
5333170201	HYAS LYRATUS	4	1*0	1.5	0.00013	213.0	1.9	82.2	0.00674
5333170302	CHIONOECETES BAIRDI	203	51.1	78.4	0.00642	1661.0	14.5	641.3	0.05257
6801040501	MEDIASTER AEQUALIS	2	095	0.8	0.00006	150.0	1.3	57.9	0.00475
6801060101	CTENODISCUS CRISPATUS	1	0*3	0.4	0.00003	10.0	0.1	3*9	0.00032
6801121201	PYCNOPODIA HELIANTHOIDES	2	0.5	0.8	0.00006	1356.0	11.9	523.6	0.04291
	TOTAL			153.3	0.01256			4412.7	0.36170
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	9	6.1	3.5	0.00028	10400*0	22*1	401594	0.32913
7603020106	RAJA KINCAIDI	1	0.7	0.4	0.00003	341.0	0.7	131*7	0.01079
7603020108	RAJA RHINA	2	1.4	0.8	0.00006	1835.0	3.9	708.5	0.05807
7903010201	CLUPEA HARENGUS PALLASI	2	194	0.8	0.00006	143.0	0.3	55.2	0.00453
7904020501	THALEICHTHYS PACIFICUS	2	1*4	0.8	0.00006	78.0	0.2	3091	0.00247
7909020601	MICROGADUS PROXIMUS	1	0*7	0*4	0.00003	44.0	0.1	17.0	0.00139
7909020701	THERAGRA CHALCOGRAMMA	62	41.9	23.9	0.00196	2080.0	4.4	803.1	0.06583
7909041110	LYCODES PALEARIS	5	3*4	199	0.00016	540.0	1.1	208.5	0.01709
7915030101	ANOPLOPOMA FIMBRIA	2	1*4	0.8	0.00006	269.0	0.6	10309	0.00851
7915040901	DASYCOTTUS SETIGER	5	3*4	1*9	0.00016	292.0	0.6	112.7	0.00924
7915043101	RADULINUS ASPRELLUS	2	1.4	0.8	0.00006	10*0	0.0	3*9	0.00032
7915050401	ASTEROTHECA ALASCANA	1	0.7	0.4	0.00003	5.0	0.0	1.9	0.00016
7917020102	ATHERESTHES STOMIAS	38	25.7	14.7	0.00120	14100.0	29.9	5444.0	0.44623
7917020501	GLYPTOCEPHALUS ZACHIRUS	9	6.1	3.5	0.00028	1267.0	2.7	489.2	0.04010
7917020701	HIPPOGLOSSUS STENOLEPIS	4	2.7	1.5	0.00013	15000*0	31.8	5791*5	0.47471
7917020801	ISOPSETTA ISOLEPIS	2	1.4	0.8	0.00006	660.0	1.4	254.8	0.02089
7917020901	LEPIDOPSETTA BILINEATA	1	0.7	0*4	0.00003	70.0	0.1	27.0	0.00222
	TOTAL			57.1	0.00468			18198s5	1-49168

COMMENTS

SERPULIDAE AND SPONGE ON PECTEN CAURINUS DORSAL VALVE.
PANDALUS BOREALIS.: 90% W/ AQUA EGGS.
STOMACHS: 2 PYCNOPODIA HELIANTHOIDES; 35 CHIONOECETES BAIRDI:
5 DASYCOTTUS SETIGER. CRANGON SP.: 17 PRESERVED, 4/17
W/APOROBUPYRUS SP. HYAS LYRATUS: 1 FENALE W/ ORANGE EGGS.
BOTTOM WATER TEMPERATURE °C=10.0

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	106B	31	OTB	791118	0655	5a 58.5N	138 41.5w	58 59.8N	138 43.7w			30	3.15	151.9	151.9	151.9

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
4904080401	PECTEN CAURINUS		9	1*7	2.9	0.00023	1620.0	1.9	514.3	0.04215
4905290101	FUSITRITON OREGONENSIS		7	1.3	2.2	0.00018	556.0	0.7	176.5	0.01447
4905330801	NEPTUNEA LYRATA		11	2*1	3.5	0.00029	830.0	1*O	263.5	0.02160
490566O1O1	TRITONIA EXSULANS		10	1.9	3.2	0.00026	247.0	0.3	78.4	0.00643
4907120200	OCTOPUS		1	0.2	0.3	0.00003	33.0	0.0	10.5	0.00086
533304U1O1	PANDALUS BOREALIS		250	47.8	79.4	0.00651	2300.0	2.8	730.2	0.05985
5333040204	PANDALOPSIS DISPAR		22	4.2	7.0	0.00057	500.0	0.6	158.7	0.01301
5333110203	PAGURUS ALEUTICUS		35	6.7	11.1	0.00091	1207.0	1.4	383.2	0.03141
5333121002	LOPHOLITHODES FORAMINATUS		1	0.2	0.3	0.00003	545.0	0.7	173.0	0.01418
5333170302	CHIONOECETES BAIRDI		132	25.2	41.9	0.00343	74900.0	90.0	23777.8	1.94900
6801040602	PSEUDARCHASTER PARELII		3	0.6	1.0	0.00008	54.0	0.1	17.1	0.00141
6801060101	CTENODISCUS CRISPATUS		40	7.6	12.7	0.00104	356.0	0.4	113.0	0.00926
6801120901	LETHASTERIAS NANIMENSIS		1	0.2	0.3	0.00003	54.0	O*1	17.1	0.00141
6804050101	MOLPADIA INTERMEDIA		1	092	0.3	0.00003	40.0	0.0	12.7	0.00104
		TOTAL			16600	0.01361			26426.0	2.16607
VERTEBRATES										
76020 50201	SQUALUS ACANTHIAS		5	0.5	1.6	0 0 0 0 0 0 1 3	590090	.1*4	1873.0	0.15353
7603OZO1O6	RAJA KINCAIDI		11	1.1	3.5	0.00029	12300s0'	3.0	3904.8	0.32006
7603020108	RAJA RHINA		2	0.2	0.6	0.00005	13600s0	3.3	4317.5	0.35389
7903010201	CLUPEA HARENGUS PALLASI		13	193	4.1	0.00034	500.0	O*1	158.7	0.01301
7904O1O2O6	ONCORHYNCHUS TSHAWYTSCHA		2	0.2	0.6	0.00005	6400.0	1.6	2031.7	0.16654
7904020501	THALEICHTHYS PACIFICUS		1	0.1	O*3	0.00003	10090	O*O	31.7	0.00260
7909020701	THERAGRA CHALCOGRAMMA		10	1.9	3.2	0.00026	2300.0	0.6	730.2	0.05985
7915010101	SEBASTES ALEUTIANUS		4	0*4	1.3	0.00010	535*O	0.1	169.8	0.01392
7915010201	SEBASTOLOBUS ALASCANUS		1	0.1	0.3	0 9 0 0 0 0 3	446.0	0.1	141.6	0.01161
7915030101	ANOPLOPOMA FIMBRIA		8	0.8	2.5	0.00021	5500.0	103	1746.0	0.14312
7915040901	DASYCOTTUS SETIGER		9	0.9	2.9	0.00023	758.0	002	240.6	0.01972
7915051301	AGONUS ACIPENSERINUS		1	001	0.3	0.00003	37*O	0.0	11.7	0.00096
7917020102	ATHERESTHES STOMIAS		641	64.6	203.5	0.01668	161200.0	39.2	51174s6	4.19464
7917020501	GLYPTOCEPHALUS ZACHIRUS		34	3.4	10.8	0.00088	5000.0	1.2	1587.3	0.13011
7917020601	HIPPOGLOSSOIDES ELASSODON		247	24.9	78.4	0.00643	24500.0	6.0	7777.8	0.63752
7917020701	HIPPOGLOSSUS STENOLEPIS		3	0*3	1.0	0000008	172580.0	41.9	54787*3	4.49076
		TOTAL			314.9	0.02581			13068404	10.71184

COMMENTS

PANDALUS BOREALIS: 80% WITH AQUA EGGS. PANDALOPSIS DISPAR: 50 WITH TAN EGGS. PAGURUS ALEUTICUS: 1 W/ PARASITIC BARNACLES; 15 W/BLACK EGGS. BANKIA SETACEA PRESENT. STOMACHS: 20 SNOW CRABS; 9 SPINYGHEAD SCULPIN; 10 REX SOL; 10 TURBOT; 10 FLATHEAD SOLE.
POLLUTANTS: 2 PIECES OF PLASTIC.
BOTTOM WATER TEMPERATURE °C = 6.3

CRUSE #	STAT #	TOW #	GEAR CODE	DATETIME YYMMDD HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	106A	32	OTB	791118 0825	59 6.2N	138 49.3W	59 6.7N	138 52.6W			30	3.33	54*9 -	56.7	5508

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
4201740100	APHRODITA SPP.		2	2*2	0.6	0.00005	152.0	5.8	45.6	0.00374
49(.)5320126	BUCCINUM POLARE		4	4.3	1.2	0.00010	47.0	1.8	14.1	0.00116
4$05339301	NEPTUNEA LYRATA		1	1.1	O*3	0.00002	103.0	3.9	30.9	0.00254
5333040101	PANDALUS BOREALIS		50	53.8	1500	0s00123	900.0	34*5	270.3	0.02215
5.333110202	PAGURUS OCHOTENSIS		36	38.7	10.8	0.00089	1407.0	53*9	422,5	0.03463
		TOTAL			27.9	0.00229			78305	0.06422
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		2	0.2	0.6	0.00005	2300.0	0.5	690.7	0.05661
7603020108	RAJA RHINA		5	0.6	1.5	0.00012	54900.0	13.0	16486.5	1.35135
7603020111	RAJA STELLULATA		59	6.9	17.7	0.00145	90800.0	21.5	27267.3	2.23502
7904020501	THALEICHTHYS PACIFICUS		44	5.1	13.2	0.00108	887.0	0.2	266.4	0.02183
7909020601	MICROGADUS PROXIMUS		451	52.4	135.4	0.01110	24500.0	5.8	735704	0.60306
7909020701	THERAGRA CHALCOGRAMMA		4	0.5	1.2	0.00010	73.0	0.0	21.9	0.00180
7909041110	LYCODES PALEARIS		1	0.1	0.3	0.00002	95.0	0.0	28.5	0.00234
7915020201	OPHIODON ELONGATUS		1	0.1	0.3	0.00002	17700.0	4.2	5315.3	0.43568
7915040901	DASYCOTTUS SETIGER		1	O*1	0.3	0.00002	38.0	0.0	11.4	0.00094
7915051301	AGONUS ACIPENSERINUS		27	3.1	8.1	0.00066	841.0	0.2	252.6	0.02070
7916080201	TRICHODON TRICHODON		1	0.1	0.3	0.00002	57.0	0.0	17.1	0.00140
7917020102	ATHERESTHES STOMIAS		19	2.2	5.7	0.00047	5000.0	1.2	1501.5	0.12307
7917020501	GLYPTOCEPHALUS ZACHIRUS		46	5.3	13.8	0.00113	5500.0	1.3	1651.7	0.13538
7917020701	HIPPOGLOSSUS STENOLEPIS		15	1.7	4.5	0.00037	126478.0	30.0	37981.4	3.11323
7917020801	ISOPSETTA ISOLEPIS		89	10.3	26.7	0.00219	31300.0	7.4	9399*4	0.77044
791702140l	PAROPHRYS VETULUS		43	5.0	12.9	0.00106	4300.0	1.0	1291s3	0.10584
7917021501	PLATICHTHYS STELLATUS		51	5*9	15.3	0.00126	57200.0	13.5	1717702	1.40797
7917021801	PSETTICHTHYS MELANOSTICTUS		1	0.1.	0.3	0.00002	240.0	0.1	72.1	0.00591
		TOTAL			258.3	0.02117			126789.5	10.39258

COMMENTS

PANDALUS BOREALIS 50% W/AQUA EGGS.
STOMACHS: 10 ENGLISH SOLE; 10 STARRY FLOUNDERS: 10 BUTTER SOLE; 10 REX SOLE.

BOTTOM WATER TEMPERATURE 'C = 10.5

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LAT DEG MIN	START LONG DEG MIN	FINISH LAT DEG MIN	FINISH LONG DEG MIN	MIDPOINT LAT DEG MIN	MIDPOINT LONG DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	105A	3	3 OTB	791118	0949	59 8.0N	139 5.7W	59 8.9N	139 8.7W			30	3.33	69.5	- 71.4	7094

TAXON COOE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
4905323126	BUCCINUM POLARE	2	3.6	0.6	0.00005	26.0	0.8	7.8	0.00064
533311.3202	PAGURUS OCHOTENSIS	1	1.8	0.3	0.00002	25.0	0.8	7.5	0.00062
6801121201	PYCNOPODIA HELIANTHOIDES	2	3.6	0.6	0.000 05	3000.0	95.2	900.9	0.07384
6803090611	OPHIURA SARSI	50	90.9	15.0	0.00123	100.0	3.2	30.0	0.00246
	. TOTAL			16.5	0.00135			946.2	0.07756
VERTEBRATES									
7602059201	SQUALUS ACANTHIAS	23	3.9	6.9	0.00057	29500.0	16.4	8858.9	0.72614
7603020111	RAJA STELLULATA	9	1.5	2.7	0.00022	550090	3.1	1651.7	0.13538
7904010206	ONCORHYNCHUS TSHAWYTSCHA	1	0.2	0.3	0.00002	900.0	O*5	270.3	0.02215
7904020501	THALEICHTHYS PACIFICUS	4	0.7	1.2	0.00010	142.0	0.1	42.6	0.00350
7909020401	GADUS MACROCEPHALUS	1	0.2	0.3	0.00002	3600.0	2.0	1081.1	0.08861
7909020601	MICROGADUS PROXIMUS	59	9.9	17.7	0.00145	1000O*O	5.6	3003.0	0.24615
7909020701	THERAGRA CHALCOGRAMMA	23	3.9	6.9	0.00057	39990	0.2	119.8	0.00982
7'30%041110	LYCODES PALEARIS	14	2.3	4.2	0.00034	1225.0	0.7	367.9	0.03015
7915051301	AGONUS ACIPENSERINUS	3	0.5	0.9	0.00007	10600	0.1	31.8	0.00261
7916080201	TRICHODON TRICHODON	8	1.3	2.4	0.00020	363.0	0.2	109.0	0.00894
7917020101	ATHERESTHES EVERMANNI	96	16.1	28.8	0.00236	7300.0	4.1	2192.2	0.17969
7917020501	GLYPTOCEPHALUS ZACHIRUS	49	8.2	14.7	0.00121	41OO*O	2.3	1231.2	0.10092
7917020601	HIPPOGLOSSOIDES ELASSODON	3	0.5	0.9	0.00007	422.0	O*2	126.7	0.01039
7917020701	HIPPOGLOSSUS STENOLEPIS	19	3.2	5.7	0.00047	28600.0	15.9	8588.6	0.70398
7917020801	ISOPSETTA ISOLEPIS	255	42.8	76.6	0.00628	77600.0	43.2	23303.3	1.91011
7917021401	PAROPHRYS VETULUS	29	4.9	8.7	0.00071	10000*0	5.6	3003.0	0.24615
	TOTAL			179.0	0.01467			5398101	4.42468

COMMENTS

STOMACHS: 2 PYCNOPODIA HELIANTHOIDES 10 REX SOLE: 9 ENGLISH SOLE; 10 BUTTER SOLE: 10 ARROWTOOTH FLOUNDER.

BOTTOM WATER TEMPERATURE *C = 9.7

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE D E G MIN	START LONGITUDE DEG MIN	FINIS-H LATITUDE DEG MIN	FINIS-H LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	105B	34	OTB	791118	1137	59 3.8N	138 59.6W	59 3.9N	139 2.7W			3 0	3.33	84,2	84.2	84.2

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES										
3303470201	STYLATULA GRACILE		1	3*7	0.3	0.00002	46.0	0.5	13.8	0.00113
4801740100	APHRODITA SPP.		3	11.1	0.9	0.00007	262.0	3.0	78.7	0.00645
4905290101	FUSITRITON OREGONENSIS		1	3*7	0.3	0.00002	47*O	0.5	14.1	0.00116
4905330801	NEPTUNEA LYRATA		3	11.1	0.9	0.00007	207.0	2.4	62.2	0.00510
5333110202	PAGURUS OCHOTENSIS		9	33.3	2.7	0.00022	400.0	4.6	120.1	0.00985
5333121002	LOPHOLITHODES FORAMINATUS		2	7.4	0.6	0.00005	2340.0	26.8	702.7	0.05760
5333170302	CHIONOECETES BAIRDI		4	14.8	1.2	0.00010	64.0	0.7	19.2	0.00158
6801121201	PYCNOPODIA HELIANTHOIDES		4	14.8	1.2	0.00010	5373.0	61.5	1613.5	0.13226
		TOTAL			8.1	0000066			2624.3	0.21511
VERTEBRATES										
7'304020501	THALEICHTHYS PACIFICUS'		18	13*5	5.4	0.00044	897.0	11*5	269.4	0.02208
7909020601	MICROGADUS PROXIMUS		4	3.0	1.2	0.00010	350.0	4.5	105.1	0.00862
7909020701	THERAGRA C HALCOGRAMMA		51	38,3	15.3	0.00126	2024.0	25.9	607.8	0.04982
7909041110	LYCODES PALEARIS		41	30.8	12.3	0.00101	1925.0	24.7	578. 1	0.04730
7915010101	SEBASTES ALEUTIANUS		1	0.8	0.3	0900002	100.0	1.3	30.0	0.00246
7915030101	ANOPLOPOMA FIMBRIA		3	2.3	099	0.00007	598.0	7*7	179.6	0001472
7917020601	HIPPOGLOSSOIDES ELASSODON		15	11.3	4.5	0.00037	1910.0	2405	573.6	0.04701
		TOTAL			39.9	0.00327			2343.5	0,19209

COMMENTS

CHIONOECETES 2 MALES: 2 FEMALES.
STOMACHS: 10 FLATHEAD SOLE; 10 TURBOT; 10 REX SOLE; 9 BUTTER SOLE:
4 PYCNOPODIA HELIANTHOIDES. POLLUTANTS: 1 PIECE PLASTICS
BOTTOM WATER TEMPERATURE "C = 9.9

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN N	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	105C	35	OTB	791118	1345	58 53.3N	139 2.4W	59 54.5N	139 1.3W			30	3.33	148.2	- 151.9	150.1

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
4904080401	PECTEN CAURINUS		31	12.8	9.3	0.00076	7300.0	31.4	2192.2	0.17969
49052SO1O1	FUSITRITON OREGONENSIS		47	19*3	14.1	0.00116	3052.0	13.1	916.5	0.07512
4905330801	NEPTUNEA LYRATA		1	0*4	0.3	0.00002	53.0	0.2	15.9	0.00130
4907010101	ROSSIA PACIFICA		2	0.8	0.6	0000005	41.0	0.2	12.3	0.00101
5330050202	ROCINELA BELLICEPS		1	0.4	0.3	0.00002	1*O	o*0	0.3	0.00002
5333040101	PANDALUS BOREALIS		20	8.2	6.0	0.00049	161.0	0.7	48.3	0.00396
5333040204	PANDALOPSIS DISPAR		9	3.7	2.7	0.00022	133*O	0.6	39.9	0.00327
533311(.)202	PAGURUS OCHOTENSIS		2	0.8	0.6	0.00005	57.0	0.2	17.1	0.00140
5333110203	PAGURUS ALEUTICUS		8	3.3	2.4	0.00020	364.0	1.6	109.3	0.00896
5333110216	PAGURUS CONFRAGOSUS		42	17.3	12.6	o*OO1O3	810.0	3.5	243.2	0.01994
5333121002	LOPHOLITHODES FORAMINATUS		4	1.6	1.2	0.00010	1898.0	8.2	570.0	0.04672
5333170302	CHIONOECETES BAIRDI		39	16.0	11.7	0.00096	2481.0	10.7	745.0	0.06107
6801O4O1O4	CERAMASTER PATAGONICUS		5	2.1	1.5	0.00012	47.0	0.2	14.1	0.00116
6801040602	PSEUDARCHASTER PARELII		2	0.8	0.6	0-00005	40.0	0.2	1280	0.00098
6801060101	CTENODISCUS CRISPATUS		2	0.8	0.6	0.00005	13.0	0.1	3*9	0.00032
6801121201	PYCNOPODIA HELIANTHOIDES		4	106	1.2	0.00010	2318.0	1000	696.1	0.05706
6802040101	ALLOCENTROTUS FRAGILIS		24	9.9	7.2	0.00059	4500.0.	19.3	135104	0.11077
		TOTAL			73.0	0.00598			6987.7	0.57276
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		8	1.0	2.4	0.00020	860090	2.8	2582.6	0.21169
7603020106	RAJA KINCAIDI		24	2.9	7.2	0.00059	28100*O	9*O	8438.4	0.69168
76030201O8	RAJA RHINA		7	0.9	2.1	0.00017	4500.0	1.4	1351.4	0.11077
7603020111	RAJA STELLULATA		1	0.1	0.3	0.00002	500.0	0.2	150.2	0.01231
7904020501	THALEICHTHYS PACIFICUS		41	5.0	12.3	O*OO1O1	1516.0	0.5	455.3	0.03732
7909020701	THERAGRA CHALCOGRAMMA		5	0.6	1*5	0.00012	1800.0	0.6	540.5	0.04431
7909041110	LYCODES PALEARIS		30	3.7	9.0	0.00074	1207.0	0.4	362.5	0.02971
7915010101	SEBASTES ALEUTIANUS		6	097	1.8	0000015	2033.0	0.7	610.5	0.05004
7915030101	ANOPLOPOMA FIMBRIA		7	0.9	2*1	0.00017	4500.0	104	1351.4	0.11077
7916080201	TRICHODON TRICHODON		1	O*1	0.3	0.00002	110.0	0.0	33.0	0.00271
7916110000	STICHAEIDAE		1	0.1	O*3	0.00002	154*O	O*O	46.2	0.00379
7917020101	ATHERESTHES EVERMANNI		649	79.2	194*9	0.01597	246100.0	79.0	73903.9	6.05770
7517020501	GLYPTOCEPHALUS ZACHIRUS		19	2.3	5.7	0.00047	2300.0	0.7	690.7	0.05661
79170,20601	HIPPOGLOSSOIDES ELASSODON		7	0.9	2.1	0.00017	3200.0	100	961oO	0.07877
7917020701	HIPPOGLOSSUS STENOLEPIS		3	0.4	0.9	0.00007	3200,0	1.0	961.0	0.07877
7917021301	MICROSTOMUS PACIFICUS		10	1.2	3.0	0.00025	3600.0	1.2	1081.1	0.08861
		TOTAL			245.9	0.02016			93519*5	7.66553

COMMENTS

CHIONOECETES BAIRDI:24FEMALES,15 MALES;1FEMALE W/ORGANGE EGGS.
PANDALUS BOREALIS: 90% WITH AQUA EGGS. 2 PAGURUS ALEUTICUS W/ 15
PARASITIC BARANCLE;2 FEMALES W/ BLACK EGGS.
SOMACHS: 10 REX SOLE: 10 TURBOT; 10 DOVER SOLEO
PAGURUS CONFRAGOSUS: 6 FEMALES W/ BLACK EGGS.

BOTTOM WATER TEMPERATURE °C = 6.4

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FSH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	1050	36	OTB	791118	1722	58 50.1N	13a 59.2W	58 49.5N	138 57.3W			30	2*22	208.6	- 208.6	208,6

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
4801740100	APHRODITA SPP.		4	0.7	1.8	0.00015	70.0	0.3	31.5	0.00258
4905290101	FUSITRITON OREGONENSIS		104	17.4	46.8	0.00384	7700.0	32.5	3468.5	0.28430
4905320126	BUCCINUM POLARE		1	0.2	0.5	0.00004	20.0	0.1	9.0	0.00074
49(35330801	NEPTUNEA LYRATA		7	1.2	3.2	0.00026	415.0	1.8	186.9	0.01532
4905330805	NEPTUNEA PRIBILOFFENSIS		1	0.2	0.5	0.00004	78.0	0.3	35.1	0.00288
5333040204	PANDALOPSIS DISPAR		7	1.2	3.2	0.00026	139.0	0.6	6206	0.00513
5333110203	PAGURUS ALEUTICUS		8	1.3	3.6	0000030	321.0	1.4	144.6	0901185
5333170302	CHIONOECETES BAIRDI		11	1.8	5.0	0000041	170.0	0.7	76.6	0000628
6801O4O6O2	PSEUDARCHASTER PARELII		9	1*5	4.1	0.00033	143.0	0.6	64.4	0.00528
6801060101	CTENODISCUS CRISPATUS		154	25.7	69.4	0000569	1154.0	4.9	519.8	0.04261
6802030101	BRISASTER TOWNSENDI		287	47.9	129.3	0.01060	12712.0	53.7	5726.1	0.46935
6802040101	ALLOCENTROTUS FRAGILIS		3	0.5	1.4	0.00011	647.0	2.7	291.4	0.02389
6804050101	MOLPADIA INTERMEDIA		3	0*5	1*4	0.00011	124.0	0.5	55.9	0.00458
		TOTAL			26908	0.02212			10672.5	0-87480
VER1'EBRATES										
7602050201	SQUALUS ACANTHIAS		2	0.8	0.9	0.00007	1800,0"	1.2	810.8	0.06646
7603020106	RAJA KINCAIDI		7..	2.8	3.2	0.00026	7300.0	408	3288.3	0.26953
7603020108	RAJA RHINA		5	2*0	2.3	0000018	29100,0	19.1	13108.1	1.07444
7904020501	THALEICHTHYS PACIFICUS		12	4.8	5.4	0.00044	535.0	0.4	241.0	0.01975
7909020701	THERAGRA CHALCOGRAMMA		22	8.8	9.9	0.00081	1590.0	190	716.2	0.05871
7915010101	SEBASTES ALEUTIANUS		4	1.6	1.8	0.00015	3200.0	2.1	1441.4	0.11815
7915010201	SEBASTOLOBUS ALASCANUS		5	2*0	2.3	0.00018	2700.0	1.8	1216.2	0.09969
7915030101	ANOPLOPOMA FIMBRIA		6	2.4	2.7	0.00022	5900.0	3.9	2657.7	0.21784
7917020101	ATHERESTHES EVERMANNI		166	66.7	74,8	0.00613	92200.0	60.6	41531.5	3.40422
7917020501	GLYPTOCEPHALUS ZACHIRUS		7.	2.8	3.2	0000026	13500	0.1	60.8	0.00498
7917020601	HIPPOGLOSSOIDES ELASSODON		10	4.0	4.5	0,00037	3600.0	2.4	1621.6	0.13292
7917020701	HIPPOGLOSSUS STENOLEPIS		2	0.8	099	0.00007	3600.0	2.4	1621.6	0013292
7917021301	MICROSTOMUS PACIFICUS		1	0*4	O*5	0.00004	500.0	O*3	225.2	0.01846
		TOTAL			112.2	0.00919			68540.5	5.61808

COMMENTS

SNAIL EGG CASES. CHIONOECETES BAIRDI: 10 FEMALES: 1 MALE.
PAGURUS ALEUTICUS: 7 MALES: 1 FEMALE*
PCLLUTANT: 1 PLASTIC FRAGMENT.
BOTTOM WATER TEMPERATURE 'C = 6.5

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	4A	37	OTB	791119	0815	59 42.8N	139 57.4W	59 44.2N	139 54.8W			30	3.70	87.8	- 104.3	96.1

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	
INVERTEBRATES										
4$04060401	PECTEN CAURINUS		90	16.3	24.3	0.00199	16300.0	29.2	4405.4	0.36110
5333040101	PANDALUS BOREALIS		125	22.6	33.8	0.00277	1208.0	2.2	326.5	0.02676
5333040106	PANDALUS HYPSINOTUS		1	0.2	0.3	0.00002	28.0	0.1	7.6	0.00062
5333040204	PANDALOPSIS DISPAR		168	3004	45.4	0.00372	2737.0	4.9	739.7	0.06063
5333110203	PAGURUS ALEUTICUS		7	193	1.9	0.00016	243.0	0*4	65.7	0.00538
5333110401	LABIDOCHIRUS SPLENDESCENS		4	0.7	1.1	0.00009	23.0	0.0	6.2	0.00051
5333170302	CHIONOECETES BAIRDI		29	502	7.8	0.00064	2562.0	4.6	692.4	0.05676
5333180104	CANCER MAGISTER		27	4.9	7.3	0.00060	15400.0	27.6	4162.2	0.34116
6801O4O1O4	CERAMASTER PATAGONICUS		10	1.8	2.7	0.00022	2456.0	4.4	663.8	0.05441
6801060101	CTENODISCUS CRISPATUS		82	14.8	22.2	0.00182	748.0	1.3	202.2	0.01657
6801121201	PYCNOPODIA HELIANTHOIDES		9	1.6	2.4	0.00020	14100.0	25.2	3810.8	0.31236
6803040201	GORGONOCEPHALUS CARYI		1	0.2	0.3	0.00002	61.0	0.1	16.5	0.00135
		TOTAL			14905	0.01225			15098.9	1.23762
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		9	6.8	2.4	0.00020	10400.0	6.6	2810.8	0.23039
7603020106	RAJA KINCAIDI		11	8.3	3.0	0.00024	7700.0	4.9	2081.1	0.17058
7603020108	RAJA RHINA		3	2.3	0.8	0.00007	11400.0	7.2	3081.1	0.25255
7603020111	RAJA STELLULATA		12	9.0	3.2	0.00027	95300.0	60.5	25756.8	2.11121
7903010201	CLUPEA HARENGUS PALLASI		1	0.8	0.3	0.00002	47.0	0,0	12.7	0.00104
7904020201	MALLOTUS VILLOSUS		1	0.8	0.3	0.00002	10.0	0.0	2.7	0.00022
7909020601	MICROGADUS PROXIMUS		5	3.8	1.4	0.00011	297.0	0.2	80.3	0.00658
7909020701	THERAGRA CHALCOGRAMMA		20	15.0	5.4	0.00044	743.0	0.5	200.8	0.01646
7909041103	LYCODES BREVIPES		2	1.5	0.5	0*00004	25.0	0.0	698	0.00055
7909041110	LYCODES PALEARIS		5	3*8	104	0.00011	485.0	093	131.1	0.01074
7915010101	SEBASTES ALEUTIANUS		2	1*5	0.5	0900004	289.0	0*2	78.1	0.00640
7915030101	ANOPLOPOMA FIMBRIA		2	1*5	0.5	0.00004	1120.0	0.7	302.7	0.02481
7915040901	DASYCOTTUS SETIGER		9	6.8	2.4	0.00020	571.0	0*4	154.3	0.01265
7915051301	AGONUS ACIPENSERINUS		2	1.5	0*5	0.00004	41.0	0.0	11.1	0.00091
7917020102	ATHERESTHES STOMIAS		17	12.8	4.6	0.00038	4100.0	2.6	1108.1	0.09083
7917020601	HIPPOGLOSSOIDES ELASSODON		12	9.0	3.2	0.00027	2300.0	1.5	621.6	0.05095
7917020701	HIPPOGLOSSUS STENOLEPIS		3	2.3	0.8	0.00007	18600.0	11.8	5027.0	0.41205
7917020801	ISOPSETTA ISOLEPIS		14	10.5	3.8	0000031	3200.0	2.0	864.9	0.07089
7917021301	MICROSTOMUS PACIFICUS		2	1.5	0.5	0.00004	243.0	0.2	65.7	0.00538
7917021501	PLATICHTHYS STELLATUS		1	0.8	0.3	0900002	755.0	0.5	204.1	0.01673
		TOTAL			35,9	0.00295			42601.6	3.49194

COMMENTS

CHIONOECETES BAIRDI: 14 MALES: 15 FEMALES. 1 PANDALUS
HYPSINOTUS W/ BLUE EGGS. CANCER MAGISTER: 11 MALES: 16 FEMALES:
20 PANDALUS BOREALIS: 95% W/WHITE OR AQUA EGGS.
STOMACHS: 9 PYCNOPODIA HELIANTHOIDES; 10 F L A T H E A C S O L E :
10 BUTTER SOLE: 9 SPINYHEAD SCULPIN: 20 C ANCER MAGISTER.
BOTTOM WATER TEMPERATURE "C = 10.0

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUD DEG MIN	FINISH LONGITUDE DEG MIN	MID POINT LATITUDE DEG MIN	MID POINT LONGITUDE DEG MIN	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	DEPTH FISHED (METERS) MAX
FN795	94A	38'	OTB	791123	0654	59 52.9N	141 51.3W	.59. 52.3N	141 48.8W			30	4.26	27.5 -	29.3 28.4

TAXON CODE	TAXONOMIC NANE	COUNT RAW	COUNT %	COUNT /KM		WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT /KM	WEIGHT /M SQ
INVERTEBRATES									
3303000000	ANTHOZOA	3	0.3	.007	0000006	34*O	O*O	8.0	0,00065
3303120101	EUNEPHTHYA RUBIFORMIS					68.0	0.0	16.0	0.00131
4904080401	PECTEN CAURINUS	2	0.2	0.5	0.00004	260.0	0.1	61.0	0.005 00
5318020108	BALANUS HESPERIUS	50	5*3	11.7	0000096	5 0 9 0	0.0	11.7	0.00096
5333040107	PANDALUS DANAE	51	5*4	12.0	0.00098	571.0	0.2	134.0	O*O1O99
5333060107	CRANGON PALLI	4	O*4	0.9	0.00008	10.0	0.0	2.3	0.00019
5333110202	PAGURUS OCHOTENSIS	3	0.3	0.7	0.00006	134.0	0.0	31.5	0.00258
5333180104	CANCER MAGISTER	833	88.1	195.5	0001603	350900.0	99.7	82370.9	6.75171
	TOTAL			222.1	0.01820			82635.4	6.77340
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	7	2.0	1.6	0.00013	10400.0	43.3	2441.3	0.20011
7603020111	RAJA STELLULATA	9	2.6	2.1	0.00017	933.0	3.9	219.0	0.01795
7904020501	THALEICHTHYS PACIFICUS	1	0.3	0.2	0.00002	70.0	0.3	16.4	0.00135
7909020601	MICROGADUS PROXIMUS	280	80.0	65.7	0.00539	5125.0	21.3	1203.1	0.09861
7915041402	HEMILEPIDOTuS HEMILEPIDOTUS	2	0.6	095	0900004	255.0	1.1	59*9	0.00491
7915050903	OCCELLA VERRUCOSA	3	0.9	0.7	0.00006	25.0	0.1	5.9	0.00048
7915051301	AGONUS ACIPENSERINUS	4	1.1	0.9	0.00008	138.0	0.6	32.4	0.00266
7917020801	ISOPSETTA ISOLEPIS	26	7.4	6.1	0.00050	4100.0	17.1	962.4	0.07889
7917021100	LIOPSETTA SPP.	2	0.6	O*5	0.00004	32.0	0.1	7.5	0.00062
7917021301	MICROSTOMUS PACIFICUS	14	4.0	3.3	0.00027	260.0	1.1	61.0	0.00500
7917021501	PLATICHTHYS STELLATUS	2	0.6	0.5	0.00004	2700.0	11*2	633.8	0.05195
	TOTAL			82.2	0.00673			5642.7	0.46252

COMMENTS

PANDALUS DANAE: 95% WITH AQUA EGGS. ALL COLLECTED FOR FOOD ANALYSIS. CANCER MAGISTER: 6 FEMALES, 1 W/ ORANGE EGGS; 927 MALES. STOMACHS: 20 DUNGENESS CRAB: 10 BUTTER SOLE.

BOTTOM WATER TEMPERATURE "C = 9.4

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	94t3	3 9	oTB	791123	0814	59 49.9N	141 52.4W	59 49.4N	141 50.2W			30	2*22	58.6 -	5806	58.6

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
Invertebrate									
3303009000	ANTHOZOA	46	22.4	20.7	0.00170	22300.0	47.1	10045.0	0.82336
4801740100	APHRODITA SPP.	30	14.6	13.5	0.00111	1815.0	3.8	817.6	0.06701
4904020401	PECTEN CAURINUS	1	0.5	0.5	0.00004	110.0	0.2	49.5	0.00406
4904200101	CLINOCARDIUM CILIATUM	1	095	0.5	0.00004	17.0	0.0	7.7	0.00063
4905290101	FUSITRITON OREGONENSIS	1	0.5	0.5	0.00004	18.0	0.0	8.1	0.00066
4905339s01	NEPTUNEA LYRATA	1	0.5	0.5	0.00004	14.0	0.0	6.3	0.00052
5333040107	PANDALUS DANAE	58	28.3	26.1	0.00214	640.0	1.4	288.3	0.02363
5333110202	PAGURUS OCHOTENSIS	52	25.4	23.4	0.00192	1500.0	3.2	675.7	0.05538
5333110401	LABIDOCHIRUS SPLENDESCENS	2	1.0	0.9	0.00007	10.0	0.0	4.5	0.00037
5333170201	HYAS LYRATUS	1	0.5	0.5	0.00004	27.0	0.1	12*2	0.00100
6801121201	PYCNOPODIA HELIANTHOIDES	12	5.9	5.4	0.00044	20900.0	4401	9414.4	0.77167
	TOTAL			92,3	0000757			21329.3	1074830
vERTEBRATE									
7602050201	SQUALUS ACANTHIAS	9	1.3	4.1	0.00033	18600.0	7.4	8378.4	0.68675
7603020111	RAJA STELLULATA	59	8.7	26.6	0.00218	174300.0	69.7	78513.5	6.43553
7903010201	CLUPEA HARENGUS PALLASI	1	0.1	0.5	0.00004	20.0	0.0	9.0	0.00074
7904010206	ONCORHYNCHUS TSHAWYTSCHA	1	0.1	0.5	0.00004	861.0	0.3	387.8	0.03179
7904020501	THALEICHTHYS PACIFICUS	5	0.7	2.3	0.00018	166.0	0.1	74.8	0.00613
7909020601	MICROGADUS PROXIMUS	475	70.4	214.0	0.01754	10442sO	4.2	4703.6	0.38554
7915030101	ANOPLOPOMA FIMBRIA	1	0.1	0.5	0.00004	109.0	0.0	49.1	0.00402
7915041801	LEPTOCOTTUS ARMATUS	2	0.3	0.9	0.00007	554.0	0.2	249.5	0.02045
7915050000	AGONIDAE	26	3.9	11.7	0.00096	538.0	0.2	242.3	0.01986
7916090103	BATHYMASTER SIGNATUS	3	0*4	194	0.00011	220.0	0.1	99.1	0.00812
7917020102	ATHERESTHES STOMIAS	1	0.1	0.5	0.00004	84.0	O*O	37.8	0.00310
7917020601	HIPPOGLOSSOIDES ELASSODON	1	0.1	095	0.00004	53.0	0.0	23.9	0.00196
7917020701	HIPPOGLOSSUS STENOLEPIS	5	0.7	2.3	0.00018	13600.0	5.4	6126.1	0.50214
7917020801	ISOPSETTA ISOLEPIS	49	7.3	2291	0.00181	7300.0	2.9	3288.3	0.26953
79170211OO	LIOPSETTA SPP.	2	0.3	0.9	0.00007	50.0	0.0	22.5	0.00185
7917021301	MICROSTOMUS PACIFICUS	1	0.1	0.5	0.00004	15.0	090	6*8	0.00055
7917021401	PAROPHRYS VETULUS	16	2.4	7.2	0.00059	1800.0	0.7	810.8	0.06646
7917021501	PLATICHTHYS STELLATUS	18	2.7	8.1	0.00066	21300.0	8.5	9594.6	0.78644
	TOTAL			304.1	0-02492.			112618.0	9-23099

COMMENTS

PANDALUS DANAE - 60% FEMALES WITH EGGSO
STOMACHS: 10 BUTTER SOLE; 10 STARRY FLOUNDER: 10 ENGLISH SOLE;
12 PYCNOPODIA.
BOTTOM WATER TEMPERATURE 'C = 11.0

CRUSE #	STAT #	TOW #	GEAR CODE	DATE Y YMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	93C	40	OT3	791123	1001	59 50.3N	142 0.9W	59 50.1N	141 58.1W			30	1.85	65.9	- 65,9	65.9

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT /KM	WEIGHT /M SQ
INVERTEBRATES									
3303003030	ANTHOZOA	9	O*7	4.9	0.00040	4100.0	1.4	2216.2	0018166
4801740100	APHRODITA SPP.	56	4.6	30.3	0.00248	2253.0	O*7	1217.8	0.09982
4904080401	PECTEN CAURINUS	1093	89.3	590.8	0.04843	261100CO	86.3	141135.1	11.56845
490421O3O1	COMPSOMYAX SUBDIAPHANA	1	0.1	0.5	0.00004	40.0	O*O	21.6	0.00177
5333040107	PANDALUS DANAE	3	0.2	1.6	0.00013	47.0	0.0	25.4	0.00208
5333110202	PAGURUS OCHOTENSIS	25	2.0	13.5	0.00111	1203.0	o*4	650.3	0.05330
6801050101	LUIDIA FOLIOLATA	16	1*3	8.6	0.00071	2598.0	009	1404.3	0.11511
6801121201	PYCNOPODIA HELIANTHOIDES	21	1.7	11.4	0.00093	31300.0	1003	16918.9	?.38680
	TOTAL			661.6	0.05423			163589.7	13.40899
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	9	4.4	4.9	0.00040	14100.0	5.7	7621.6	0.62472
7603020111	RAJA STELLULATA	35	17.0	18.9	0.00155	86700.0	35.3	46864.9	3.84138
7909020601	MICROGADUS PROXIMUS	71	34.5	38.4	0900315	175390	007	947.6	0.07767
7909020701	THERAGRA CHALCOGRAMMA	1	0.5	0.5	0.00004	75*O	0.0	40.5	0.00332
7915030101	ANOPLOPOMA FIMBRIA	3	1.5	1.6	0000013	443*O	0.2	239.5	0.01963
7915040901	DASYCOTTUS SETIGER	1	O*5	0.5	0.00004	70.0	0.0	37.8	0.00310
7915041801	LEPTOCOTTUS ARMATUS	1	0.5	0.5	0.00004	250.0	0.1	135.1	0.01108
7915050000	AGONIDAE	1	0.5	0.5	0.00004	20.0	0.0	10.8	0.00089
7915051301	AGONUS ACIPENSERINUS	11	5*3	5.9	0.00049	300.0	0.1	162.2	0.01329
7917020102	ATHERESTHES STOMIAS	4	1*9	2.2	0.00018	296.0	0.1	160.0	0.01311
7917020501	GLYPTOCEPHALUS ZACHIRUS	9	4.4	4.9	0.00040	408.0	O*2	220.5	0.01808
7917020701	HIPPOGLOSSUS STENOLEPIS	4	1.9	2.2	0.00018	120892.0	49.3	65347.0	5.35631
7917020801	ISOPSETTA ISOLEPIS	50	24.3	27,0	0.00222	12700.0	5.2	6864.9	0.56269
7917021401	PAROPHRYS VETULUS	2	1.0	1.1	0.00009	555.0	0.2	300.0	0.02459
7917021501	PLATICHTHYS STELLATUS	4	1.9	2.2	0000018	680000	2.8	3675.7	0.30128
	TOTAL			111.4	0.00913			132628*1	10,87116

COMMENTS

STOMACHS: 4 STARRY FLOUNDER; 10 BUTTER SOLE; 21 PYCNOPODIA.
BOTTOM WATER TEMPERATURE °C 9.7

CRUSE #	STAT #	TOW #	GEAR CODE	START DATETIME YYMMDD HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	Finish LATITUDE DEG MIN	Finish LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	94A	41	OTB	791123 1043	59 52.7N	141 52.1W	59 53.8N	141 52.5W			60	5.00	29.3	32.9	31.1

COMMENTS GUALITATIVE TOW.

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	102	G 42	OTY	791124	0735	59 5.2N	139 48.5W	59 5.9N	139 49.4W			15	1.48	115.3	115.3	115.3

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
4002020300	CEREBRATULUS SPP.	2	0*1	1.4	0000011	24.0	0.0	16.2	0.00133
4905060701	LISCHKEIA CIDARIS	3	0*1	2.0	0.00017	25.0	0.0	16.9	0.00138
4905290101	FUSITRITON OREGONENSIS	29	1.2	19.6	0.00161	1739.0	1.2	1175.0	0.09631
4905331001	PYRULOFUSUS HARPA	1	O*O	0.7	0.00006	164.0	0.1	110.8	0.00908
4905570300	ARCHIDORIS SPP.	4	0.2	2.7	0.00022	240.0	0.2	162.2	0.01329
4907010101	ROSSIA PACIFICA	10	0.4	6.8	0.00055	124.0	O*1	83.8	0.00687
5333040103	PANDALUS JORDANI	4	0.2	2.7	0.00022	27.0	0.0	1892	0.00150
5333040104	PANDALUS MONTAGUI TRIDENS	8	0.3	5.4	0900044	29.0	0.0	1906	0.00161
5333060111	CRANGON COMMUNIS	7	0.3	4.7	0.00039	17.0	0.0	11.5	0.00094
5333060118	CRANGON RESIMA	3	001	2*0	0.00017	3.0	O*O	2*0	0.00017
5333110206	PAGURUS SETOSUS	3	0.1	2*0	0000017	33*O	0.0	22.3	0.00183
5333110216	PAGURUS CONFRAGOSUS	2	0.1	1*4	0.00011	34*O	0.0	23.0	0.00188
5333110302	ELASSOCHIRUS CAVIMANUS	3	O*I	2.0	0.00017	34.0	0.0	23.0	0.00188
5333121002	LOPHOLITHODES FORAMINATUS	3	0*1	2*0	0.00017	1315.0	0.9	888.5	0.07283
5333130101	MUNIDA QUADRISPINA	3	0.1	2.0	0.00017	15.0	0.0	10.1	0.00083
5333170201	HYAS LYRATUS	8	0.3	5.4	0.00044	471.0	0.3	318.2	0.02609
5333170302	CHIONOECETES BAIRDI	6	0.3	4.1	0.00033	84.0	001	56.8	0.00465
5333180104	CANCER MAGISTER	1	0.0	0.7	0.00006	396.0	0.3	267.6	0.02193
5900000000	SIPUNCULIDA	1	000	0.7	0900006	20.0	0.0	13.5	0.00111
6702050301	LAQUFUS CALIFORNIANUS	18	0.8	12.2	O*00100	60.0	0.0	40.5	0.00332
6801040104	CERAMASTER PATAGONICUS	5	O*2	3.4	0.00028	34390	O*2	231.8	0.01900
6801040501	MEDIASTER AEQUALIS	7	O*3	4.7	0.00039	326.0	O*2	220.3	0.01805
6801080100	HENRICIA SPP.	4	0.2	2.7	0*00022	113.0	O*1	76.4	0.00626
6801080101	HENRICIA ASPERA	2	0.1	1*4	0.00011	25.0	090	16.9	0.00138
6801110103	CROSSASTER PAPPOSUS	28	1.2	18.9	0.00155	432.0	0.3	291.9	0.02393
6801110201	LOPHASTER FURCILLIGER	3	0.1	2.0	0.00017	76.0	0.1	51.4	0.00421
6801110301	SOLASTER DAWSONI	3	0.1	2.0	0900017	6300	0.0	42.6	0.00349
6801120901	LETHASTERIAS NANIMENSIS	2	0.1	1.4	O*OOII	340*0	0.2	229.7	0.01883
6802040201	STRONGYLOCENTROTUS DROEBACHIENSIS	1934	82.1	1306.8	0.10711	128500.0	89.9	86824.3	7.11675
6803090611	OPHIURA SARSI	7	0.3	4.7	0.00039	10.0	0.0	6.8	0.00055
6804070400	BATHYPLOTES SPP.	191	8.1	129.1	0.01058	7651.0	5*4	5169.6	0.42374
6805000000	CRINOIDEA	51	202	34.5	0.00282	127.0	0.1	85.8	0.00703
	TOTAL			1591.9	0.13048			96527.0	7.91205
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	5	1*9	3.4	0.00028	8600.0	12.8	5810.8	0.47630
7603020106	RAJA KINCAIDI	1	0.4	0.7	0.00006	1400.0	2.1	945.9	0.07754
7903010201	CLUPEA HARENGUS PALLASI	6	2.3	4.1	0.00033	650.0	1.0	439.2	0.03600
7904020501	THALEICHTHYS PACIFICUS	1	094	0.7	0.00006	20.0	0.0	13*5	0.00111
7509020701	THERAGRA CHALCOGRAMMA	41	15*9	27.7	0.00227	1343*O	2.0	907.4	0.07438
7915010102	SEBASTES ALUTUS	2	0.8	1.4	0.00011	37090	0.5	250.0	0.02049
7915030101	ANOPLOPOMA FIMBRIA	9	3.5	6.1	0.00050	7300.0	10.8	4932.4	0.40430
7915040901	DASYCOTTUS SETIGER	2	0.8	1.4	0.00011	3090	0.0	20.3	0.00166
7915041706	ICELUS SPINIGER	1	0.4	0.7	0.00006	10*O	0.0	6,8	0.00055
7915041901	NALACOCOTTUS KINCAIDI	3	1.2	2.0	0.00017	50.0	0.1	33.8	0.00277

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
7915044103	TRIGLOPS MACELLUS	3	1.2	2.0	0.00017	30.0	0.0	20.3	0.00166
7915050401	ASTEROTHECA ALASCANA	2	0.8	1.4	0.00011	10.0	O*O	6.8	0.00055
791609o1O3	BATHYMASTER SIGNATUS	6	2.3	4.1	0.00033	626.0	0.9	423.0	0.03467
7917020102	ATHERESTHES STOMIAS	142	55.0	95.9	0.00786	24100.0	35.8	16283.8	1.33474
7917020501	GLYPTOCEPHALUS ZACHIRUS	12	4.7	8.1	0.00066	631.0	0.9	426.4	0.03495
7917020601	HIPPOGLOSSOIDES ELASSODON	2	O*8	1.4	0.00011	590.0	0.9	398.6	0.03268
7917020701	HIPPOGLOSSUS STENOLEPIS	14	5.4	9.5	0.00078	21300.0	31.6	14391.9	1.17966
7917021301	MICROSTOMUS PACIFICUS	6	2.3	4.1	0.00033	239.0	0.4	161.5	0.01324
	TOTAL			174.3	0.01429			45472.3	3.72724

COMMENTS

STOMACHS: 10 TURBOT; 3 BLACKFIN SCULPIN; 2 SPINYHEAD SCULPIN.....
CHIONOECETES BAIRDI: 4 FEMALES; 2 MALES.
BOTTOM WATER TEMPERATURE 'C = 9.6

CRUSE	STA'T #	TOW #	GEAR CODE	DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME OF DISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	1030	43	OTB	791124	0914	59 2.4N	139 30.1W	59 1.4N	139 27.6W			30	2.96	113.5 -	115.3	114.4

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
3200000000	PORIFERA					50.0	0.2	16.9	0.00138
4905290101	FUSITRITON OREGONENSIS	4	2.3	1.4	0.00011	166.0	0.8	56.1	0.00460
4907010101	ROSSIA PACIFICA	4	2.3	1*4	0.00011	64.0	0.3	21.6	0.00177
5333040103	PANDALUS JORDANI	22	12.6	7.4	0.00061	152.0	0.7	51*4	0.00421
5333110216	PAGURUS CONFRAGOSUS	11	6.3	3.7	0.00030	117*O	0.6	39.5	0.0 324
5333121002	LOPHOLITHODES FORAMINATUS	6	3.4	2.0	0.00017	4396.0	20.8	1485.1	0.1?173
5333170201	HYAS LYRATUS	1	0.6	0.3	0.00003	161.0	0.8	54.4	0.00446
5333170302	CHIONOECETES BAIRDI	106	60.6	35.8	0.00294	15310.0	72.5	5172.3	0.42396
6702050301	LACUEUS CALIFORNIANUS	3	1.7	1.0	0.00008	14*O	0.1	4.7	0.00039
6801040104	CERAMASTER PATAGONICUS	1	0.6	0*3	0.00003	100.0"	0.5	33.8	0.00277
6801040501	MEDIASTER AEQUALIS	1	0.6	0.3	0.00003	27.0	0.1	9.1	0 . 0 0 0 7 5
6801080101	HENRICIA ASPERA	1	0.6	0*3	0.00003	25.0	0.1	8.4	0.00069
68U11101O3	CROSSASTER PAPPOSUS	2	1.1	0.7	0.00006	37.0	0.2	12.5	0.00102
6801110301	SOLASTER DAWSONI	1	0.6	0.3	0000003	35.0	0.2	11*8	0.00097
6801120901	LETHASTERIAS NANIMENSIS	1	0.6	0*3	0.00003	170.0	0.8	57.4	0.00471
6802040201	STRONGYLOCENTROTUS DROEBACHIENSIS	1	0.6	0*3	0.00003	66.0	0.3	22.3	0.00183
6803050411	OPHIURA SARSI	3	1.7	1.0	0.00008	10.0'	O*O	3.4	0.00028
6804070400	BATHYPLOTES SPP.	7	4.0	2.4	0.00019	21900	100	74.0	0.00606
	TOTAL			59*1	0.00485	"-"		7134.8	0.58482
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	5	1.4	1.7	0.00014	12300.0	10.4	4155.4	0s34061
7603020106	RAJA KINCAIDI	9	2.5	3.0	0.00025	1000000	8.4	3378.4	0,27692
7603020108	RAJA RHINA	1	0.3	0*3	0.00003	1400.0	1.2	473*0	0,03877
7603020111	RAJA STELLULATA	2	0.6	007	0.00006	11800.0	10.0	3986.5	0,32676
7903010201	CLUPEA HARENGUS PALLASI	1	0.3	0.3	0 . 0 0 0 0 3	115.0	0.1	38.9	0.00318
7904020531	THALEICHTHYS PACIFICUS	48	13.6	16.2	0.00133	1971.0	1.7	665.9	0.05458
7909020701	THERAGRA CHALCOGRAMMA	8	2.3	2.7	0.00022	464.0	O*4	156.8	0.01285
7909041110	LYCODES PALEARIS	15	4.2	5.1	0.00042	1636.0	1.4	552.7	0.04530
7915010101	SEBASTES ALEUTIANUS	11	3.1	3.7	0.00030	4440.0	3.7	1500.0	0.12295
7915020201	OPHIODON ELONGATUS	1	0.3	0*3	0000003	286.0	0.2	96.6	0.00792
7915030101	ANOPLOPOMA FIMBRIA	1	0.3	0*3	0.00003	504.0	0.4	170.3	0.01396
7915040901	DASYCOTTUS SETIGER	5	1.4	1.7	0.00014	106.0	0.1	35.8	0.00294
7915041801	LEPTOCOTTUS ARMATUS	1	0.3	003	0 . 0 0 0 0 3	195.0	0.2	65.9	0 0 0 5 4 0
7915059000	AGONIDAE	2	0.6	0.7	0.00006	16.0	0.0	5*4	0.00044
7917OZQ1O2	ATHERESTHES STOMIAS	208	58.9	70.3	0.00576	58100.0	49.0	19628.4	1.60888
7917020501	GLYPTOCEPHALUS ZACHIRUS	20	5.7	6.8	0.00055	1227.0	1*O	414.5	0.03398
7917020601	HIPPOGLOSSOIDES ELASSODON	8	2.3	2.7	0900022	2030.0	1.7	685.8	0.05621
7917020701	HIPPOGLOSSUS STENOLEPIS	4	1.1	1*4	0.00011	11800.0	10.0	3986.5	0.32676
7917021301	MICROSTOMUS PACIFICUS	3	0.8	1*0	0.00008	193*0	0.2	65.2	0.00534
	TOTAL,			119.3	0.00978			40061.8	3.28376

COMMENTS

PANDALUS JORDANI: 4 W/AQUA EGGS; 3 W/ PARASITIC ISOPOD.
CHIONOECETES BAIRDI: 56 MALES; 50 FEMALES. STOMACHS: 10
TURBOT; 10 REX SOLE; 5 SPINYHEAD SCULPIN.
POLLUTANTS: 1 GREEN PLASTIC BAG.
BOTTOM WATER TEMPERATURE °C = 8.9

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	103	F 44	OTB	791124	1254	58 51.7N	139 36.0W	58 50.8N	139 33.6W			30	3*70	142.7 -	146.4	144.6

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES									
32000000000	PORIFERA					1524.0	3*7	411.9	0.03376
4801220201	PIONOSYLLIS GIGANTEA	1	0.3	0.3	0.00002	1.0	0.0	O*3	0.00002
4601650000	AMPHARETIDAE	1	0.3	0.3	0.00002	1.0	090	O*3	0.00002
4801660700	PISTA SPP.	1	0.3	0.3	0.00002	1.0	0.0	O*3	0.00002
490529o1O1	FUSITRITON OREGONENSIS	13	3.4	3.5	0.00029	1022*0	2.5	276.2	0.02264
4907010101	ROSSIA PACIFICA	5	1.3	1.4	0.00011	80.0	0.2	2106	0.00177
5333040103	PANDALUS JORDANI	104	26.9	28.1	0.00230	730.0	1.8	19703	0.01617
5333050401	EUALUS BAREATA	1	0.3	0.3	0.00002	2.0	0.0	O*5	0.00004
5333110216	PAGURUS CONFRAGOSUS	3	0.8	0.8	0.00007	102.0	0.3	27.6	0.00226
5333121002	LOPHOLITHODES FORAMINATUS	23	5.9	6.2	0.00051	1360000	33.4	3675.7	0.30128
5333170302	CHIONOECETES BAIRDI	47	1291	12.7	0.00104	3731.0	9.2	1008.4	0.08265
6801040501	MEDIASTER AEQUALIS	1	0.3	0.3	0.00002	24.0	001	6.5	0.00053
6801040602	PSEUDARCHASTER PARELII	1	0.3	0.3	0.00002	20.0	0.0	5*4	0.00044
6801110103	CROSSASTER PAPPOSUS	1	0.3	0.3	0.00002	5*0	0.0	1.4	0.00011
6BO11211O1	STYLASTERIAS FORRERI	2	095	0.5	0.00004	95.0	0.2	25.7	0.00210
6802040201	STRONGYLOCENTROTUS DROEBACHIENSIS	107	27.6	28.9	0.00237	19500.0	47.9	5270.3	0.43199
6803040201	GORGONOCEPHALUS CARYI	2	0.5	0.5	0.00004	178.0	0.4	48.1	0.00394
6803060101	OPHIOPHOLIS ACULEATA	40	10.3	10.8	0.00089	40.0	0.1	10.8	0.00089
6803090611	OPHIURA SARSI	34	8.8	9.2	0.00075	.7190,	0.2	1902	0.00157
	TOTAL			104.6	0.00857			11OO7*3	0.90224
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	16	1.6	4.3	0.00035	21300.0	9.5	5756.8	0.47187
7603020106	RAJA KINCAIDI	9	0*9	2.4	0.00020	8200.0	3.7	2216.2	0.18166
7603020108	RAJA RHINA	8	0.8	2.2	0.00018	1820000	8.2	4918.9	0.40319
7904020501	THALEICHTHYS PACIFICUS	495	48.2	133*8	O*01097	16300.0	7.3	4405.4	0.36110
7909020701	THERAGRA CHALCOGRAMMA	6	0.6	1.6	0s00013	806.0	0*4	217.8	0.01786
7909041110	LYCODES PALEARIS	2	092	0.5	0900004	59.0	0.0	15.9	0.00131
7915010101	SEBASTES ALEUTIANUS	4	0.4	1.1	0.00009	1443*0	0.6	390.0	0.03197
7915010201	SEBASTOLOBUS ALASCANUS	1	0*1	0.3	0.00002 ;	1267.0	0.6	342.4	0.02807
7915020201	OPHIODON ELONGATUS	1	0.1	O*3	0.00002	10000.0	4.5	2702.7	0.22153
7915030101	ANOPLOPOMA FIMBRIA	9	0.9	2.4	0.00020	7300.0	3.3	1973.0	0.16172
7915040901	DASYCOTTUS SETIGER	4	0.4	1.1	0000009	217.0	0.1	58.6	0.00481
7917020102	ATHERESTHES STOMIAS	405	39.4	109.5	0.00897	133000.0	59.6	35945.9	2.94639
7917020501	GLYPTOCEPHALUS ZACHIRUS	42	4.1	11*4	0.00093	1400.0	0.6	37804	0.03101
7917020601	HIPPOGLOSSOIDES ELASSODON	23	2.2	6.2	0.00051	3600.0	1.6	973.0	0.07975
7917021301	MICROSTOMUS PACIFICUS	2	092	005	0.00004	139.0	0.1	37.6	0.00308
	TOTAL			277.6	0.02275			60332,7	4.94530

COMMENTS

PANDALUS JORDANI: 75% W/ AQUA EGGS. CHIONOECETES BAIRDI:
34 MALES; 13 FEMALES. STOMACHS: 10 TURNIT; 10 FLATHEAD SOLE;
10 DOGFISH;4 SPINYHEAD SCULPIN. GLASS SPONGE WITH SEVERAL
SPECIES OF BRITTLE STAR IN INCURRENT/EXCURRENT PORES;HIATELLA
ARTICA,LAQUEUS CALIFORNIANUS* SERPULIDAE WORMS; 2 POLYCHAETES.
BOTTOM WATER TEMPERATURE °C = 7.6

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LAT DEG MIN	START LONG DEG MIN	FINISH LAT DEG MIN	FINISH LONG DEG MIN	MIDPOINT LAT DEG MIN	MIDPOINT LONG DEG MIN	F	I	S	H	TIME FISHED MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	1040	45	OTB	791124	1459	58 53.2N	139 15.9W	58 54.1N	139 18.7W			..				30	3,15	118.9 -	118.9	118.9

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	COUNTS %	COUNTS /KM	COUNTS /M SQ	WEIGHT (GRAMS) RAW	WEIGHT (GRAMS) %	WEIGHT (GRAMS) /KM	WEIGHT (GRAMS) /M SQ
INVERTEBRATES									
3303470201	STYLATULA GRACILE	1	0.5	0.3	0.00003	14700	0.9	46.7	0.00383
4801740100	APHRODITA SPP.	1	0.5	0.3	0.00003	20.0	0.1	6.3	0.00052
4905290101	FUSITRITON OREGONENSIS	31	16.5	9.8	0.00081	2950.0	18.0	936.5	0.07676
4905320126	BUCCINUM POLARE	1	0.5	0.3	0.00003	8.0	0.0	2.5	0.00021
4905331001	PYRULOFUSUS HARPA	1	0.5	0.3	0.00003	88.0	0.5	27.9	0.00229
4905660101	TRITONIA EXSULANS	1	0.5	0.3	0.00003	52.0	0*3	16.5	0.00135
4907010101	ROSSIA PACIFICA	3	1.6	1.0	0.00008	71.0	0*4	22.5	0.00185
5333040103	PANDALUS JORDANI	19	10.1	6.0	0.00049	127.0	0.8	40.3	0.00330
5333110216	PAGURUS CONFRAGOSUS	2	1.1	0.6	0.00005	44.0	0.3	14*0	0.00114
5333121002	LOPHOLITHODES FORAMINATUS	15	8.0	4.8	0.00039	6800,0	41.4	2158.7	0.17695
5333170302	CHIONOECETES BAIRDI	61	32.4	19.4	0.00159	1398.0	8.5	443.8	0.03638
6702030101	TEREBRATULINA UNGUICULA	22	11.7	7.0	0.00057	12.0	0.1	308	0.00031
6702050301	LAGUEUS CALIFORNIANUS	2	1.1	0.6	0.00005	4*O	0.0	1.3	0.00010
6801060101	CTENODISCUS CRISPATUS	5	2.7	1.6	0.00013	22.0	0.1	7.0	0.00057
6801110301	SOLASTER DAWSONI	1	0.5	0.3	0.00003	7790	0,5	24.4	0.00200
6802040101	ALLOCENTROTUS FRAGILIS	21	11.2	6.7	0.00055	450090	27.4	1428.6	0.11710
6803040201	GORGONOCEPHALUS CARYI	1	0.5	0.3	0.00003	110.0	0.7	34.9	0.00286
	TOTAL			59.7	0.00489			5215.9	0.42753
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	8	1.9	2.5	0.00021	10900.0	19.0	3460.3	0.28363
7603020106	RAJA KINCAIDI	1	0.2	0.3	0.00003	1800.0	3.1	571.4	0.04684
7603020108	RAJA RHINA	2	0.5	0.6	0.00005	14200	0.2	45.1	0.00370
7904020501	THALEICHTHYS PACIFICUS	36	8.7	11.4	0.00094	1236.0	2.2	392.4	0.03216
7909020701	THERAGRA CHALCOGRAMMA	2	0.5	0.6	0.00005	184.0	0.3	58.4	0.00479
7909041110	LYCODES PALEARIS	3	0.7	1.0	0.00008	6000	0.1	19.0	0.00156
7915010101	SEBASTES ALEUTIAN(JS	1	0.2	0.3	0.00003	253.0	0*4	80.3	0.00658
7915010102	SEBASTES ALUTUS	1	O*2	0.3	0.00003	200.0	093	63.5	0.00520
7915040901	DASYCOTTUS SETIGER	1	0.2	0.3	0.00003	20.0	090	6.3	0.00052
7915041901	MALACOCOTTUS KINCAIDI	1	092	0.3	0.00003	10.0	0.0	3.2	0.00026
7915051301	AGONUS ACIPENSERINUS	1	0.2	0.3	0.00003	26.0	090	8.3	0.00068
7916090103	BATHYMASTER SIGNATUS	1	0.2	0.3	0.00003	180.0	0.3	57.1	0.00468
7917020102	ATHERESTHES STOMIAS	291	70.3	92.4	0.00757	37700.0	65.7	11968.3	0.98100
7917020501	GLYPTOCEPHALUS ZACHIRUS	53	12.8	16.8	0.00138	2700.0	4.7	857.1	0.07026
7917020601	HIPPOGLOSSOIDES ELASSODON	11	2.7	3.5	0.00029	1265.0	2.2	401.6	0.03292
7917021401	PAROPHRYS VETULUS	1	0.2	0.3	0.00003	732.0	1.3	232.4	0.01905
	TOTAL			131.4	0.01077			18224.8	1.49383

COMMENTS

CHIONOECETES BAIRDI: 31 FEMALES, 566G; 30 MALES, 832G.
STOMACHS: 10 TURBUT; 10 REX SOLE; 1 BLACKFIN SCULPIN;
1 DASYCOTTUS SETIGER; 61 SNOW CRAB.

BOTTOM WATER TEMPERATURE °C = 8.7

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	104C	46	OTB	791124	1659	58 59.6N	139 19.5W	58 58.1N	139 18.4W			30	2.96	107.9 -	111.6	109.8

TAXON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
4905290101	FUSITRITON OREGONENSIS		21	5.1	7.1	0.00058	1662.00	5.8	561.5	0.04602
4905330801	NEPTUNEA LYRATA		1	0.2	0.3	0.00003	52	0.2	17.6	0.00144
4905331001	PYRULOFUSUS HARPA		1	0.2	0.3	0.00003	128	0.4	43.2	0.00354
4907010101	ROSSIA PACIFICA		2	0.5	0.7	0.00006	18	0.1	6.1	0.00050
5333110203	PAGURUS ALEUTICUS		2	0.5	0.7	0.00006	50	0.2	16.9	0.00138
5333110216	PAGURUS CONFRAGOSUS		27	6.5	9.1	0.00075	586	2.0	198.0	0.01623
5333110302	ELASSOCHIRUS CAVIMANUS		3	0.7	1.0	0.00008	26	0.1	8.8	0.00072
5333121002	LOPHOLITHODES FORAMINATUS		12	2.9	4.1	0.00033	8200	28.4	2770.3	0.22707
5333170302	CHIONOECETES BAIRDI		312	75.4	105.4	0.00864	0000	34.6	3378.4	0.27692
6801040602	PSEUDARCHASTER PARELII		1	0.2	0.3	0.00003	14	0.0	4.7	0.00039
6801060101	CTENODISCUS CRISPATUS		2	0.5	0.7	0.00006	12	0.0	4.1	0.00033
6801110301	SOLASTER DAWSONI		1	0.2	0.3	0.00003	122	0.4	41.2	0.00338
6801121201	PYCNOPODIA HELIANTHOIDES		1	0.2	0.3	0.00003	3200	11.1	1081.1	0.08861
6802040101	ALLOCENTROTUS FRAGILIS		13	3.1	4.4	0.00036	2904	10.0	981.1	0.08042
6803040201	GORGONOCEPHALUS CARYI		15	3.6	5.1	0.00042	1923	6.7	649.7	0.05325
		TOTAL			139.9	0.01146			9762.5	0.80020
VERTEBRATES										
7603020106	RAJA KINCAIDI		2	0.9	0.7	0.00006	1653.0	2.4	558.4	0.04577
7603020108	RAJA RHINA		6	2.6	2.0	0.00017	13600	20.1	4594.6	0.37661
7903010201	CLUPEA HARENGUS PALLASI		2	0.9	0.7	0.00006	161	0.2	54.4	0.00446
7909020701	THERAGRA CHALCOGRAMMA		19	8.2	6.4	0.00053	1154	1.7	389.9	0.03196
7909041110	LYCODES PALEARIS		2	0.9	0.7	0.00006	43	0.1	14.5	0.00119
7915010102	SEBASTES ALUTUS		3	1.3	1.0	0.00008	320	0.5	108.1	0.00886
7915040901	DASYCOTTUS SETIGER		4	1.7	1.4	0.00011	293	0.4	99.0	0.00811
7917020102	ATHERESTHES STOMIAS		170	73.3	57.4	0.00471	5400	67.2	15337.8	1.25720
7917020501	GLYPTOCEPHALUS ZACHIRUS		18	7.8	6.1	0.00050	1272	1.9	429.7	0.03522
7917020601	HIPPOGLOSSOIDES ELASSODON		3	1.3	1.0	0.00008	427	0.6	144.3	0.01182
7917020701	HIPPOGLOSSUS STENOLEPIS		2	0.9	0.7	0.00006	3200	4.7	1081.1	0.08861
7917021301	MICROSTOMUS PACIFICUS		1	0.4	0.3	0.00003	65.0	0.1	22.0	0.00180
		TOTAL			78.4	0.00642			2283.8	1.87162

COMMENTS

CHIONOECETES BAIRDI: 157 FEMALES; 155 MALES. STOMACHS: 20 FEMALE SNOW CRABS; 20 MALE SNOW CRABS; 4 SPINYHEAD SCULPIN; 1 PYCNOPODIA-EMPTY.
POLLUTANTS: PLASTIC BLEACH BOTTLE FULL OF MUD.

BOTTOM WATER TEMPERATURE °C = 8.8

CRUSE #	STAT #	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	108A	47	OTB	791105	0640	58 59.5N	138 23.3W	58 58.2N	138 21.3W			30	2.96	62.2 -	65.8	64.0

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
3303000000	ANTHOZOA	21	2.6	7.1	0.00058	10000.	5.4	3378.4	0.27692
4904080401	PECTEN CAURINUS	736	90.2	248.6	0.02038	158000.	84.9	53378.4	4.37528
4905250201	NATICA CLAUSA	1	0.1	0.3	0.00003	1	0.0	0.3	0.00003
4905320100	BUCCINUM SPP.	2	0.2	0.7	0.00006	11	0.0	3.7	0.00030
4905330202	BERINGIUS KENNICOTTI	1	0.1	0.3	0.00003	85	0.0	28.7	0.00235
5333040101	PANDALUS BOREALIS	2	0.2	0.7	0.00006	16	0.0	5.4	0.00044
5333110200	PAGURUS SPP.	1	0.1	0.3	0.00003	1	0.0	0.3	0.00003
5333110202	PAGURUS OCHOTENSIS	19	2.3	6.4	0.00053	105	0.1	35.5	0.00291
5333110206	PAGURUS SETOSUS	1	0.1	0.3	0.00003	2	0.0	0.7	0.00006
5333110216	PAGURUS CONFRAGOSUS	2	0.2	0.7	0.00006	7	0.0	2.4	0.00019
5333110401	LABIDOCHIRUS SPLENDESCENS	1	0.1	0.3	0.00003	5	0.0	1.7	0.00014
5333170302	CHIONOECETES BAIRDI	10	1.2	3.4	0.00028	298	0.2	100.7	0.00825
5333180104	CANCER MAGISTER	1	0.1	0.3	0.00003	9	0.0	3.0	0.00025
6801040501	MEDIASTER AEQUALIS	1	0.1	0.3	0.00003	20	0.0	6.8	0.00055
6801050101	LUIDIA FOLIOLATA	3	0.4	1.0	0.00008	311	0.2	105.1	0.00861
6801121201	PYCNOPODIA HELIANTHOIDES	14	1.7	4.7	0.00039	7300	9.3	5844.6	0.47907
	TOTAL			275.7	0.02260			62895.6	5.15538
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	3	0.6	1.0	0.00008	5000.	2.9	1689.2	0.13846
7603020111	RAJA STELLULATA	9	1.7	3.0	0.00025	25000.	14.9	8750.0	0.71721
7904020501	THALEICHTHYS PACIFICUS	2	0.4	0.7	0.00006	60.	0.0	20.3	0.00166
7909020401	GADUS MACROCEPHALUS	1	0.2	0.3	0.00003	2000.	1.3	777.0	0.06369
7909020601	MICROGADUS PROXIMUS	31	6.0	10.5	0.00086	1376.	1.0	600.0	0.04918
7909020701	THERAGRA CHALCOGRAMMA	23	4.4	7.8	0.00064	4120.	2.8	1625.7	0.13325
7909041110	LYCODES PALEARIS	14	2.7	4.7	0.00039	1880.	1.1	635.1	0.05206
7915030101	ANOPLOPOMA FIMBRIA	8	1.5	2.7	0.00022	2800	1.6	912.2	0.07477
7915040901	DASYCOTTUS SETIGER	1	0.2	0.3	0.00003	26	0.0	8.8	0.00072
7917020102	ATHERESTHES STOMIAS	25	4.8	8.4	0.00069	2000	1.2	675.7	0.05538
7917020501	GLYPTOCEPHALUS ZACHIRUS	95	18.3	32.1	0.00263	6800.	3.9	2297.3	0.18830
7917020601	HIPPOGLOSSOIDES ELASSODON	10	1.9	3.4	0.00028	10400.	6.0	3513.5	0.28799
7917020701	HIPPOGLOSSUS STENOLEPIS	31	6.0	10.5	0.00086	41800.	24.1	14121.6	1.15751
7917020801	ISOPSETTA ISOLEPIS	211	40.7	71.3	0.00584	53100.	30.6	17939.2	1.47043
7917020901	LEPIDOPSETTA BILINEATA	20	3.9	6.8	0.00055	6800.	3.9	2297.3	0.18830
7917021001	LIMANDA ASPERA	1	0.2	0.3	0.00003	2300.	1.3	777.0	0.06369
7917021301	MICROSTOMUS PACIFICUS	2	0.4	0.7	0.00006	110.	0.1	37.2	0.00305
7917021401	PAROPHRYS VETULUS	31	6.0	10.5	0.00086	5900.	3.4	1993.2	0.16338
	TOTAL			175.0	.01434			58670.	4.80904

COMMENTS

CHIONOECETES BAIRDI: 7 MALES; 3 FEMALES.
STOMACHS: 14 PYCNOPODIA HELIANTHOIDES; 10 REX SOLE; 9 BUTTER SOLE; 9 ROCK SOLE; 10 FLATHEAD SOLE; 10 ENGLISH SOLE.
PECTEN CCURINUS: DORSAL VALVES DETERICRATING, AGENT NOT KNOWN. APPROXIMATELY 100% OF SPECIMENS CAUGHT INFESTED.
BOTTOM WATER TEMPERATURE °C = 9.3

CRUSE #	STAT *	TOW #	GEAR CODE	DATE YYMMDD	TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	Midpoint LATITUDE DEG MIN	Midpoint LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	OEPTH FISHED(METERS) MIN	MAX	AVG
FN795	109A	48	OTB	791125	0839	58 49.2N	138 6.2W	58 50.5N	138 7.9W			30	2.78	109.8 - 117.1		11305

TAxON CODE	TAXONOMIC NAME		COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES										
3303470201	STYLATULA GRACILE		1	0.1	0.4	0.00003	100.0	0.0	36.0	0.00295
3303570101	METRIDIUM SENILE		790	96.7	284.2	0.02329	268800.0	98.3	96690.6	7.92546
5333110202	PAGURUS OCHOTENSIS		7	0*9	2.5	0.00021	6000	0.0	21.6	0.00177
5333170201	HYAS LYRATUS		1	0*1	0.4	0.00003	22.0	0.0	7.9	0.00065
5333170302	CHIONOECETES BAIRDI		1	0*1	0.4	0.00003	16.0	090	5.8	0.00047
6801040501	MEDIASTER AEQUALIS		2	002	0.7	0.00006	44*O	0.0	15.8	0.00130
6801050101	LUIDIA FOLIOLATA		13	1.6	4.7	0.00038	2183.0	0.8	785.3	0.06436
6801120416	LEPTASTEPIAS FISHERI		1	0*1	0.4	0.00003	23.0	0.0	8.3	0.00068
6801121201	PYCNOPODIA HELIANTHOIDES		1	0.1	0.4	0.00003	2300.0	0.8	827.3	0.06781
		TOTAL			293.9	0.02409			98398.6	8.06546
VERTEBRATES										
7602050201	SQUALUS ACANTHIAS		11	0*3	4.0	0.00032	156390.0	12.9	56255.4	4.61110
7603020111	RAJA STELLULATA		25	0.7	9.0	0900074	92510.0	7.7	33277.0	2.72762
7904020501	THALEICHTHYS PACIFICUS		28	0.8	10D1	0.00083	1249.0	091	449.3	0.03683
7909020601	MICROGADUS PROXIMUS		465	13.8	167.3	0.01371	187220.0	15.5	67345.3	5.52011
7909020701	THERAGRA CHALCOGRAMMA		2	0.1	0.7	0.00006	1467.0	0.1	527.7	0.04325
7915030101	ANOPLOPOMA FIMBRIA		3	0.1	1.1	0.00009	469.0	090	168.7	0.01383
7915040901	DASYCOTTUS SETIGER		4	0.1	1.4	0.00012	360.0	0.0	129.5	0.01061
7915051301	AGONUS ACIPENSERINUS		16	0.5	5.8	0.00047	446.0	0.0	160.4	0.01315
7915061200	LIPARIS SPP.		1	0.0	084	0.00003	22.0	0.0	7.9	0.00065
7917020102	ATHERESTHES STOMIAS		89	2.6	32.0	0.00262	83700.0	6.9	30107.9	2.46786
7917020501	GLYPTOCEPHALUS ZACHIRUS		300	8.9	107.9	0.00885	12300s0	190	4424.5	0.36266
7917020601	HIPPOGLOSSOIDES ELASSODON		11	0.3	4.0	0.00032	1085DO	0.1	390.3	0.03199
7917020701	HIPPOGLOSSUS STENOLEPIS		10	0.3	3.6	0.00029	6800.0	0.0	2446.0	0.20050
7917020801	ISOPSETTA ISOLEPIS		2067	6103	743.5	0.06094	462200.0	38.3	166259.0	13.62779
7917021301	MICROSTOMUS PACIFICUS		22	0.7	7.9	0.00065	448.0	0.0	161.2	0.01321
7917021401	PAROPHRYS VETULUS		301	8.9	108.3	0.00887	196040.0	16.2	70518.0	5.78016
7917021801	PSETTICHTHYS MELANOSTICTUS		15	0.4	5.4	0.00044	5000.0	0.4	1798.6	0.14742
		TOTAL			1212.2	0.09936			434426s6	35.60874

COMMENTS

STOMACH: 1 PYCNOPODIA-EMPTY; 10 HALIBUT; 10 BUTTER SOLE; 10 ENGLISH SOLE; 4 SPINYHEAD SCULPIN.

BOTTOM WATER TEMPERATURE 'C = 9.3

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LATITUDE DEG MIN	START LONGITUDE DEG MIN	FINISH LATITUDE DEG MIN	FINISH LONGITUDE DEG MIN	MIDPOINT LATITUDE DEG MIN	MIDPOINT LONGITUDE DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	109B	49	OTB	791125	1014	58 43.9N	138 1.4W	58 44.9N	138 3.5W			30	2.78	84.2 -	84.2	84.2

TAXON CODE	TAXONOMIC NAME	COUNTS RAW	%	/KM	/M SQ	WEIGHT (GRAMS) RAW	%	/KM	/M SQ
INVERTEBRATES									
3303000000	ANTHOZOA	2	6.7	0.7	0.00006	894.0	27.2	321.6	0.02636
3303470201	STYLATULA GRACILE	4	13.3	1.4	0.00012	178.0	5*4	64.0	0.00525
4801740100	APHRODITA SPP.	1	3.3	0.4	0.00003	22.0	0.7	7.9	0.00065
4904080401	PECTEN CAURINUS	2	6.7	0.7	0.00006	470.0	14.3	169.1	0.01386
4905660101	TRITONIA EXSULANS	3	10.0	1.1	0.00009	151.0	4.6	54.3	0.00445
4907010101	ROSSIA PACIFICA	1	3.3	0.4	0.00003	22*O	0.7	7.9	0.00065
5333040101	PANDALUS BOREALIS	2	6.7	0.7	0.00006	11.0	0.3	49 0	0.00032
5333110202	PAGURUS OCHOTENSIS	1	3.3	0.4	0.00003	6.0	0*2	2.2	0.00018
5333170201	HYAS LYRATUS	1	3.3	0.4	0.00003	1800	0.5	6.5	0.00053
5333170302	CHIONOECETES BAIRDI	10	33.3	3.6	0.00029	474.0	14.4	170.5	0.01398
6801040501	MEDIASTER AEQUALIS	2	6.7	0.7	0.00006	60.0	1.8	21.6	0.00177
6601121201	PYCNOPODIA HELIANTHOIDES	1	3.3	0.4	0.00003	979.0	29.8	352.2	0.02887
	TOTAL			10.8	0.00088			1181.7	0.09686
VERTEBRATES									
7602050201	SQUALUS ACANTHIAS	25	3.3	9.0	0.00074	34100.0	21.1	12266.2	1.00543
7603020111	RAJA STELLULATA	7	0*9	2.5	0.00021	35900.0	22*2	12913.7	1.05850
7904020501	THALEICHTHYS PACIFICUS	106	13.9	38.1	0.00313	3789.0	2.3	1362.9	0.11172
7909020601	MICROGADUS PROXIMUS	139	18.2	50.0	0.00410	21362.0	13.2	7684.2	0.62985
7909020701	THERAGRA CHALCOGRAMMA	19	2.5	6.8	0.00056	1359.0	0.8	488.8	0.04007
7909041110	LYCODES PALEARIS	6	0.8	2.2	0.00018	653.0	0.4	23409	0.01925
7915010121	SEBASTES MELANOPS	2	003	0.7	0.00006	4500.0	2.8	1618.7	0.13268
7915020201	OPHIODON ELONGATUS	1	091	004	0800003	1360000	8.4	4892.1	().40099
7915030101	ANOPLOPOMA FIMBRIA	2	0.3	0.7	0.00006	289.0	0.2	104.0	0.00852
7915040900	COTTIDAE	1	0.1	0.4	0.00003	17990	0.1	64.4	0.00528
7915040901	DASYCOTTUS SETIGER	5	0*7	1.8	0.00015	198.0	0.1	71.2	0.00584
7915053000	AGONIDAE	1	0.1	O*4	0.00003	56.0	0.0	2001	0.00165
7915051301	AGONUS ACIPENSERINUS	2	0.3	0.7	0000006	5100	0.0	1803	0.00150
7917020102	ATHERESTHES STOMIAS	46	6.0	16.5	0.00136	12300.0	7.6	4424.5	0.36266
7917020501	GLYPTOCEPHALUS ZACHIRUS	349	45.6	125.5	0.01029	22000.0	13.6	7913.7	0064866
7917020601	HIPPOGLOSSOIDES ELASSODON	8	100	2.9	0.00024	541.0	0*3	194.6	0.01595
7917020701	HIPPOGLOSSUS STENOLEPIS	2	0.3	0.7	0.00006	4100.0	2.5	1474.8	0.12089
7917020801	ISOPSETTA ISOLEPIS	9	1.2	3.2	0.00027	1564$0	1.0	562.6	0.04611
7917021301	MICROSTOMUS PACIFICUS	1	0.1	0.4	0.00003	57.0	0.0	20.5	0.001168
7917021401	PAROPHRYS VETULUS	34	4*4	12*2	0.00100	5100.0	3.2	1834*5	0.15037
	TOTAL			275.2	0.02256			58164.7	4.76760

COMMENTS

STOMACHS: 10 ENGLISH SOLE; 10 REX SOLE; 10 DOGFISH; 1 PYCNOPOD; 5 SPINYHEAD SCULPIN. CHIONOECETES BAIRD : 6 MALES; 4 FEMALES.
BOTTOM WATER TEMPERATURE °C = 9.4

CRUSE #	STAT #	TOW #	GEAR CODE	START DATE YYMMDD	START TIME HHMM	START LAT DEG MIN	START LONG DEG MIN	FINISH LAT DEG MIN	FINISH LONG DEG MIN	MIDPOINT LAT DEG MIN	MIDPOINT LONG DEG MIN	TIME FISH MINS	DIST FISHED (KM)	DEPTH FISHED (METERS) MIN	MAX	AVG
FN795	11OA	50	OTB	791125	1159	58 40.2N	137 51.9W	58 41.4N	137 53.4W			30	2.59	58.6	60.4	59.5

TAXON CODE	TAXONOMIC NAME		COUNT RAW	COUNT %	COUNT /KM	COUNT /M SQ	WEIGHT (GRAMS) RAW	WEIGHT %	WEIGHT /KM	WEIGHT /M SQ
INVERTEBRATES										
3303470201	STYLATULA GRACILE		6	9.2	2.3	0.00019	204.0	1.5	78.8	0.00646
4904080401	PECTEN CAURINUS		46	70.8	17.8	0.00146	7700.0	58.0	2973.0	0.24369
5333110202	PAGURUS OCHOTENSIS		1	1.5	0.4	0.00003	9.0	0.1	3.5	0.00028
5333170302	CHIONOECETES BAIRDI		4	6.2	1*5	0.00013	575.0	4*3	222.0	0.01820
5333150104'	CANCER MAGISTER		4	6.2	1.5	0.00013	3600.0	27.1	1390.0	0911393
6801O5OIO1	LUIDIA FOLIOLATA		4	6.2	1.5	0.00013	1184.0	8.9	457.1	0.03747
		TOTAL			25.1	0.00206			5124.3	0.42003
VERTEBRATES										
7903010201	CLUPEA HARENGUS PALLASI		1	0.2	O*4	0.00003	95.0	0.2	36.7	0.00301
7904020501	THALEICHTHYS PACIFICUS		59	12*2	22.8	0.00187	2700.0	4.3	1042.5	0.08545
7909020601	MICROGADUS PROXIMUS		36	7*4	13.9	0.00114	3200.0	5.1	1235.5	0.10127
7909020701	THERAGRA CHALCOGRAMMA		2	0*4	0.8	0.00006	126.0	0.2	48.6	0.00399
7909041110	LYCODES PALEARIS		3	0.6	1*2	0.00009	130.0	0.2	50.2	0.00411
7915030101	ANOPLOPOMA FIMBRIA		102	21.0	3904	0.00323	12700.0	20*1	4903.5	0.40192
7915041801	LEPTOCOTTUS ARMATUS		6	1.2	2.3	0.00019	2514.0	400	970.7	0.07956
7915051301	AGONUS ACIPENSERINUS		2	0.4	0.8	0.00006	75.0	0.1	29.0	0.00237
7917020102	ATHERESTHES STOMIAS		96	19.8	37.1	0.00304	15000.0	23.8	5791.5	0.47471
7917020501	GLYPTOCEPHALUS ZACHIRUS		144	2907	55.6	0.00456	15000.0	23.8	5791.5	0.47471
7917020601	HIPPOGLOSSOIDES ELASSODON		7	1.4	2.7	0.00022	580.0	0.9	223.9	0.01836
7917021301	MICROSTOMUS PACIFICUS		1	0.2	0.4	0.00003	62.0	0.1	23.9	0.00196
7917021501	PLATICHTHYS STELLATUS		2	O*4	0.8	0.00006	3200.0	5.1	1235.5	0.10127
7917021801	PSETTICHTHYS MELANOSTICTUS		24	4.9	9.3	0.00076	770090	1282	2973.0	0.24369
		TOTAL			187.3	0 0 0 1 5 3 5			24356.0	1.99639

COMMENTS

CHIONOECETES BAIRDI: 3 FEMALES; 1 MALE.
STOMACHS: 10 ENGLISH SOLE; 10 BUTTER SOLE; 10 SAND SOLE.
BOTTOM WATER TEMPERATURE 'C = 9.5

APPENDIX B

POLYCHAETES AND AMPHIPODS AS COMMENSALS WITH HERMIT CRABS FROM THE NORTHEASTERN GULF OF ALASKA

M. K. Hoberg

and

S. G. McGee

INTRODUCTION

Numerous commensal associations involving polychaetes have been reported previously. These associations involve Paguridae, Opistobranchia, Echiura, Asteroidea, Stichopidae, Solasteridae, Gastropoda, Pelecypoda, and other Polychaeta (Andrews, 1891; Barrington, 1897; Hartman, 1948; Pettibone, 1953; Nicol, 1960; Hatfield, 1965; MacGinitie and MacGinitie 1968; Ricketts and Calvin, 1968). Most of this literature has dealt primarily with interactions between polychaetes and sea stars, sea cucumbers, gastropod, pelecypods, or echiuroids with relatively little information on hermit crab - polychaete associations. Much of the information available on associations between polychaetes and pagurid crabs is from original descriptions of the polychaetes from papers on specific aspects of pagurid or polychaete biology or in general discussions from invertebrate textbooks (see Barrington, 1967; Barnes, 1980). Although associations involving *Cheiloneres cyclurus* (Barrington, 1897) and *Polydora commensalis* (Andrews, 1891) with specific pagurids have been well documented (Hatfield, 1965; Seaborn, 1975), relationships involving other species have not.

The present study represents the first comprehensive examination of commensal relationships involving hermit crabs from the northeastern Gulf of Alaska.

METHODS AND MATERIALS

Invertebrates were collected during November, 1979, on board the NOAA Ship *Miller Freeman,* using a standard 400 mesh Eastern otter trawl. Gastropod shells containing hermit crabs were broken to expose the crab and possible symbionts. All specimens were sorted and given tentative identifications in the field. Representative specimens were preserved in 10% neutral buffered formalin or 70% isoproponol for later confirmation at the Institute of Marine Science, Fairbanks, Alaska.

RESULTS

The shells of the gastropod *Fusitriton oregonensis* and *Neptunea lyrata* were the most frequent habitat of the following hermit crabs: *Pagurus*

confragosus; Pagurus setosus; Pagurus ochotensis; Pagurus aleuticus; and *Elassochirus cavimanus*. Shells from *Beringius kennicotti; Arctomelon stearnsi; Buccinum plectrum; Natica clausa*, and the sponge *Subrites ficus* were utilized occasionally (Table I). The following five species of polychaetes were found cohabiting the same shells: *Eunoe depressa* (Polynoidae); *Cheilonereis cyclurus* (Nereidae); *Polydora commensalis* (Spionidae); *Eusyllis blomstrandi* (Syllidae); and *Crucigera zygophora* (Serpulidae) (Table 1). The following amphipods were also found in association with the above hermit crabs: *Melita* sp. (Gammariidae), *Podoceropsis* sp., and a species from the family Pleustidae.

Commensals occurred with 40.9% of all pagurids collected during this study (Table II). Frequency and percent frequency of occurrence for all commensals with each of the five species of pagurids are presented by station. The percent frequencies for individual species are presented in Table III. Amphipods alone, particularly *Melita* sp., were associated with hermit crabs in 16.7% of all symbioses. In four instances, both amphipods and polychaetes were found with the same crab. Rarely (6.4%) did more than one commensal occur with the same crab.

Eunoe depressa and *Melita* were the dominant commensals associated with *Pagurus confragosus* (Table III). Both symbionts were always located in the spire of the gastropod shell. *Eunoe depressa, Eusyllis blomstrandi* and *Melita* sp. were each found once in association with *Pagurus setosus* (Table 111) . *Polydora commensalis* was located within the columella, while the others were in the spire of the shell. *Eunoe depressa, Cheilonereis cyclurus* and *P. commensalis* were the commensals most frequently associated with *Pagurus ochotensis* (Table III). *Polydora commensalis* was again located within the columella; the others in the spire were *Eunoe depressa, P. commensalus* and *Melita* sp. were most often associated with *Pagurus aleuticus*. *Polydora commensalis* and *Melita* sp. were the species most often found with *Elassochirus cavimanus*. These commensals were always positioned in their characteristic locations within the shell.

TABLE I

Numbers of commensals occurring with five species of hermit crabs in seven species of shells from the northeastern Gulf of Alaska, November 1979.

	Hermit crab					
Shell	*Pagurus confragosus*	*Pagurus setosus*	*Pagurus ochotensis*	*Pagurus aleuticus*	*Elassochirus cavimanus*	Totals
Fusitriton oregonensis	27	3	6	11	13	60
Neptunea lyrata	13		59	1	1	74
Beringius kennicotti	1					1
Subrites ficus		1	1			2
Arctomelon stearnsi					1	
Buccinum plectrum			5			5
Natica clausa			13			13
TOTALS	41	4	84	12	15	156

TABLE II

Numbers of hermit crabs with commensals/total number of crabs from stations in the northeastern Gulf of Alaska, November 1979.

Station	*Pagurus confragosus*	*Pagurus setosus*	*Pagurus ochotensis*	*Pagurus aleuticus*	*Elassochirus cavimanus*	Totals
104 G				0/3	1/6	1/9
104 F	1/2					1/2
99 D					1/14	1/14
99 E	2/8				3/6	5 /14
100 E		1/2			8/22	9/24
100 D	1/1	0/1				1/2
104 B	0/2		1/20	0/2		1/24
106 B				8/35		8/35
106 A			24/36			24/36
105 A			1/1			1/1
105 B			7/9			7/9
105 c	12 /42		1/2	3/8		16/52
94 B			17/52			17/52
93 c			20/25			20/25
102 G	1/2	2/3			1/3	4/8
103 D	4/11					4/11
104 D	1/2					1/2
104 c	19/27			1/2	1/3	21/32
108 A	0/2	1/1	9/19			10/22
TOTALS	4/99 (41.4%)	4/7 (57.1%)	84/171 (49.1%)	12 /50 (24,0%)	15/54 (27.8%)	156/381 (40.9%)

TABLE III

Percent frequency of occurrence of commensals with five species of hermit crabs.
Numbers in parentheses are for crabs with commensals only.

Commensal	*Pagurus confragosus* N = 99 (41)	*Pagurus setosus* N = 7 (4)	*Pagurus ochotensis* N = 171 (84)	*Pagurus aleuticus* N = 50 (12)	*Elassochirus cavimanus* N = 54 (15)	Totals N = 381 (156)
Eunoe depressa	*20.2 (48.8)*	*14.3 (25.0)*	*27.5 (56.0)*	*12.0 (50.0)*	*1.9 (6.7)*	19.7 (48.1)
Polydora commensalis	1.0 (2.4)	14.3 (25.0)	2.9 (6.0)	8.0 (33.3)	7.4 (26.7)	3.9 (9.6)
Eusyllis blomstrandi	*2.0 (4.9)*	*14.3 (25.0)*	*1.8 (3.6)*			1.6 (3.9)
Cheilonereis cyclurus	*4.0 (9.8)*		*17.5 (35.7)*	*2.0 (8.3)*		9.2 (22.4)
Melita sp.	16.2 (39.0)	14.3 (25.0)	0.6 (1.2)	4.0 (16.7)	16.7 (60.0)	7.6 (18.6)
Pleustidae	1.0 (2.4)		0.6 (1.2)		1.9 (6.7)	0.8 (1.9)
Podoceropsis sp.				2.0 (8.3)		0.3 (0.6)

Crucigera zygophora was recovered from a. single N. *lyrata* shell containing a *Pagurus confragosus*. This worm formed a calcareous tube within the columella of the gastropod.

DISCUSSION

Paguridae are primarily opportunistic omnivores with tendencies toward scavenger/predator habits (Warner, 1977). Most of the commensal polychaetes have similar feeding habits as Pagurid crabs (Fauchald and Jumars, 1979). Thus, food would be readily available to the symbiont during the feeding processes of the crab.

Moore (1905, 1908) and Hartman (1948) described *Eunoe depressa* as a commensal "messmate" of unspecified hermit crabs and as a symbiont in the branchial chamber of the King crab, *Paralithodes camtschatica*. These worms were located in the spire of the gastropod shell, just behind and above the carapace of the hermit crab. In the present study, *E. depressa* was by far the most frequently found commensal; occurring with 19.7% of all hermit crabs examined and with 47.8% of those with symbionts. It occurred with all five species of crabs. Occurrences as high as this have not been reported previously.

Polydora commensalis was originally described by Andrews (1891) from the shells of *Ilyanassa obsoleta* inhabited by *Pagurus longicarpus*. Hatfield (1965) reported this species from the east coast in the shells of *Lunatia heros; Polinices duplicatus; Busycon canaliculatum* and *Buccinum undatum* all inhabited by *Pagurus pollicaris*. It has also been reported from British Columbia in shells of *Thais lamellosa* inhabited by *Pagurus granosimanus*; Berkeley and Berkeley, 1936). The present report extends its range to the northeastern Gulf of Alaska and the list of possible symbionts to five additional pagurid species in three additional types of shells. *Polydora commensalis* has a calcareous tube in the terminal spire of the gastropod shell with an opening through the columella into the aperture (Hatfield, 1965). The tube is never visible unless the shell is broken. The worm is capable of extending itself out through the aperture for feeding (Andrews, 1891; Hatfield, 1965).

Cheilonereis cyclurus was first described by Barrington (1897) as emerging from the aperture and proceeding' to the mouth parts of the hermit crab. Barrington found this species in Puget Sound with *Pagurus armatus* and *Pagurus tenuimanus* in shells of *Lunatia* sp., *Natica* sp. and *Pterenotus* sp. Seaborn (1975) reported C. *cyclurus* with *Pagurus aleuticus* and several unspecified pagurids from the same area. He suggested *P. aleuticus* was the preferred host. In this study, however, C. *cyclurus* was most often associated with *P. ochotensis*.

Eusyllis blomstrandi has not been previously described as a commensal with hermit crabs. Its low prevalence with three species of hermit crabs probably indicates a more facultative relationship. *Eusyllis blomstraudi* has been reported in the sponge *Ectyodoryx parasitica* growing on shells of *Pecten hindsi* (Berkeley and Berkeley, 1948). Pettibone (1954) reported this species on female *Hyas coarctatus alutaceus* from Point Barrow, Alaska.

Serpulids have not been previously reported as symbionts. They are generally filter-feeders, and although permanent association with a hermit crab might provide an abundance of food, the presence of a single *Crucigera zygophora* within a shell occupied by a *P. confragosus* was probably accidental.

The only report found for a commensal relationship involving amphipods and pagurids was that of Jackson (1913). He sights *Podoceropsis excavata* as "infesting the dirt *at* the bottom of shells" inhabited by pagurids. Only one specimen of *Podoceropsis* sp. was recovered during this study. Specimens of *Melita* sp., however, were present in 7.6% of all hermit crabs examined and made up 18.6% of those with commensals. Another species, from the family Pleustidae, was found three times, with three different pagurids. No known commensal relationships have been previously reported, and it is possible that the presence of these amphipods was accidental.

Research on the role of chemical factors in mediating host-commensal interactions has been reported by Davenport (1950, 1953, 1966); Davenport and Hickok (1951); Dimock and Davenport (1971); and Seaborn (1975). These authors have demonstrated that chemoreception is used by commensal polychaetes to locate potential hosts. In associations involving pagurids,

the size of the aperture of the shell may be a factor in determining successful entry once the polychaete has located the host by chemoreception (Seaborn, 1975)., Seaborn found commensal C. *cyclurus* more frequently in shells with an ‘aperture width greater than 2.2 cm.

Pagurids tend to inhabit the largest, most abundant shells present in their habitat (Reese, 1962). Thus, commensals would be expected to do the same. In the northeastern Gulf of Alaska, the shells of *Fusitriton oregonensis* and *Neptunea lyrata* were most frequently utilized by hermit crabs. These are relatively large shells and therefore were expected to more frequently contain commensals as well.

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APPENDIX C

PIPE DREDGE DATA
NORTHEAST GULF OF ALASKA
NOAA SHIP *MILLER FREEMAN*
Cruise No. 795, November 1979

APPENDIX TABLE C. 1

Station: 97F
Sample date: 10 November 1979
Latitude: 59°09.3′
Latitude: 141°02.2′
Depth: 188 m

Taxon	Count No.	PCT
Porifera	1.0	1.8
Annelida		
Glycera capitata	1.0	1.8
Ninve gemmea	1.0	1.8
Notomastus **spp.**	1.0	1.8
Maldanidae	1.0	1.8
Owenia fusiformis	1.0	1.8
Myriochele heeri	17.0	29.8
Pista cristata	3.0	5.3
Sabellidae	1.0	1.8
Megalomma splendida	2.0	3*5
Serpulidae	1.0	1.8
Mollusca (Gastropoda)		
Puncturella cooperi	1.0	1.8
Natica clausa	1.0	1.8
Arthropoda		
Heterophoxus oculatus	1.0	1.8
Pandalus spp.	1.0	1.8
Sipuncula		
Golfingia margaritacea	1.0	*1.8*
Phascolion strombi	1.0	*1.8*
Ectoprocta		
Microporina borealis	1.0	*1.8*
Brachiopoda		
Terebratulina unguicula	*6.0*	10.5

APPENDIX TABLE C.1

CONTINUED

Taxon	Count No.	Count PCT
Echinodermata		
Ctenodiscus crispatus	*2.0*	*3.5*
Brisaster townsendi	*2.0*	*3.5*
Diamphiodia craterodmeta	*2.0*	*3.5*
Ophiura sarsi	*5.0*	*8.8*
Molpadia intermedia	**1.0**	**1.8**
Capheira mollis	**1.0**	**1.8**
Urochordata		
Ascidia **spp.**	*1.0*	*1.8*

Comments

Dead and drilled: **1** *Natica clausa*, **1** *Neptunea Lyrata*, **1** *Admete couthouyi*.

APPENDIX TABLE C.2

Station: 98F
Sample date: 10 November 1979
Latitude: 59°06.4′
Longitude: 140°53.3′
Depth: 176 m

Taxon	Count No.	PCT
Annelida		
Onuphis iridescens	1.0	2.7
Lumbrinereis spp.	2.0	5.4
Ninve gemmea	1.0	2.7
Maldanella robusta	1.0	2.7
Notoproctus pacificus	1.0	2.7
Praxillella gracilis	2.0	5.4
Pista cristata	1.0	2.7
Mollusca		
Nucula tenuis	1.0	2.7
Yoldia thraciaeformis	1.0	2.7
Cyclocardia ventricosa	1.0	2.7
Axinopsida serricata	2.0	5.4
Odontogena borealis	1.0	2.7
Arthropoda		
Heterophoxus oculatus	1.0	2.7
Echinodermata		
Ctenodiscus crispatus	5.0	13.5
Allocentrotus fragilis	1.0	2.7
Diamphiodia craterodmeta	13.0	35.1
Ophiura sarsi	1.0	2.7
Crinoidea	l.O	2.7

APPENDIX TABLE C.3

Station: 94G
Sample date: 12 November 1979
Latitude: 59°20.2′
Longitude: 141°53.6′
Depth: 199 m

Taxon	Count No.	Count PTC
Porifera	1.0	7.1
Cnidaria		
Anthozoa	1.0	7.1
Annelida		
Maldanidae	2.0	14.3
Myriochele heeri	*4.0*	*28.6*
Sabellidae	2.0	14.3
Arthropoda		
Ampelisca birulai		
Echinodermata		
Brisaster townsendi	*1.0*	*7.1*
Diamphiodia craterodmeta	*1.0*	*7.1*
Ophiura sarsi	1.0	7.1
Molpadia intermedia	1.0	*7.1*

Comments

Dead and drilled: **Hydroids,** 1 *Macoma* sp., *2 Astarte* sp., 1 *Puncturella galeata,* 1 *Chlamys* sp., 1 *Balanus* **sp.,** 2 *Lima* **sp.**

APPENDIX TABLE C. 4

Station: 103G
Sample date: 9 November 1979
Latitude: 58°44.2′
Longitude: 139°33.2′
Depth: 166.5 m

Taxon	Count No.	Count PCT
Sarcodina		
Sarcodina rhizopodea	41.0	17.5
Annelida		
Polychaeta	1.0	0.4
Anaitides spp.	1.0	0.4
Nephtys punctata	2.0	0.9
Glycera capitata	3.0	1.3
Goniada annulata	2.0	0.9
Onuphis iridescens	4.0	1.7
Lumbrinereis spp.	4.0	1.7
Ninve gemmea	23.0	9.8
Driloneries longa	1.0	0.4
Paraonis gracilis	2.0	0.9
Laonice cirrata	2.0	0.9
Spiochaetopterus costarum	1.0	0.4
Maldanidae	1.0	0.4
Praxillella gracilis	8.0	3*4
Owenia fusiformis	19.0	8.1
Myriochele heeri	32.0	13.7
Amage anops	1.0	0.4
Ampharete SPP.	1.0	0.4
Melinna cristata	1.0	0.4
Melinna elisabethae	1.0	0.4
Pista cristata	2.0	0.9
Mollusca		
Pelecypoda	l.O	0.4
Nucula tenuis	7.0	3.0
Nuculana radiata	1.0	0.4
Dacrydium pacificum	1.0	0.4
Cyclocardia ventricosa	1.0	0.4
Axinopsida serricata	23.0	9.8
Thyasira flexuosa	1.0	0.4
Odontogena borealis	2.0	0.9
Psephidia lordi	2.0	0.9
Natica clausa	1.0	0.4
Dentalium spp.	2.0	0.9

APPENDIX TABLE C.4

CONTINUED

Taxon	Count No.	Count PCT
Arthropoda		
Nebalia sp.	1.0	0.4
Diastylis paraspinulosa	1.0	0.4
Ampelisca spp.	1.0	0.4
Haploops tubicula	1.0	0.4
Orchomene spp.	1.0	0.4
Harpiniopsis excavata	6.0	2.6
Heterophoxus oculatus	1.0	0.4
Syrrhoe longifrons	1.0	0.4
Sipuncula		
Golfingia margaritacea	*5.0*	*2.1*
Golfingia vulgaris	*5.0*	*2.1*
Echinodermata		
Diamphiodia craterodmeta	*7.0*	*3.0*
Molpodia intermedia	*3.0.*	*1.3*

Comments

Dead and drilled: *Dentalium* sp., *2 Yoldia* **sp.**, *2 Cyclocardia ventricosa*, 1 *natica clausa*, 1 *Nuculana*, 1 *Oenopota* **sp.**, 1 *Pandora* sp., *Terebratulina unquicula*.

APPENDIX TABLE C .5

Station: 1011
Sample date: 9 November 1979
Latitude: 58°51.1′
Longitude: 140 °02.6'
Depth: 170.2 m

Taxon	Count No.	Count PCT
Annelida		
Goniada annulata	1.0	1.9
Onuphis parva		
Lumbrineries spp.	2.0	3.8
Lumbrinereis bicirrata	1.0	1.9
Ninve gemmae	3.0	5.7
Laonice cirrata	1.0	1.9
Maldanidae	1.0	1.9
Owenia fusiformis	4.0	7.5
Myriochele heeri	8.0	15.1
Pista cristata	2.0	3.8
Megalomma splendida	1.0	1.9
Mollusca		
Pelecypoda	2.0	3.8
Nucula tenuis	3.0	5.7
Nuculana radiata	1.0	1.9
Yoldia **spp.**	2.0	3.8
Pectinidae	1.0	1.9
Astarte spp.	1.0	1.9
Thyasira flexuosa	1.0	1.9
Odontogena borealis	4*0	7.5
Gastropoda	1.0	1.9
Amphissa spp.	1.0	1.9
Arthropoda		
Leucon nasica	1.0	1.9
Amphipoda	1.0	1.9
Nicippe tumida	1.0	1.9
Harpiniopsis excavata	1.0	1.9
Heterophoxus oculatus	1.0	1.9
Paraphoxus oculatus	1.0	1.9
Sipuncula		
Phascolion strombi	1.0	1.9
Brachiopoda		
Laqueus californianus	1.0	1.9
Echinodermata		
Ctenodiscus crispatus	2.0	3.8
Diamphiodia craterodmeta	1.0	1.9
Ophiura sarsi	1.0	1.9

APPENDIX TABLE C. 6

Station: 100J
Sample date: 9 November 1979
Latitude: 58°41.5′
Longitude: 140°16.5′
Depth: 204 m

Taxon	Count No.	Count PCT
Sarcodina		
Sarcodina rhizopodea	*5.0*	10.2
Porifera	*16.0*	33.3
Cnidaria		
Hydrozoa	1.0	2.0
Anthozoa	1.0	2.0
Rhynchocoela	1.0	2.0
Annelida		
Lepidonotus squamatus	1.0	2.0
Typosyllis alternata	1.0	2.0
Typosyllis armillaris	1.0	2.0
Onuphis pap-vu	1.0	2.0
Spiochaetopterus costarum	1.0	2.0
Thelepus cincinnatus	1.0	2.0
Sabellidae	1.0	2.0
Mollusca		
Hanleya hanleyi	3.0	6.1
Pelecypoda	1.0	2.0
Propeamussium alaskense	1.0	2.0
Arthropoda		
Bylisis **spp.**	1.0	2.0
Ectoprota		
Brachiopoda		
Terebratulina unguicula	2.0	*4.1*
Echinodermata		
Ophiuroidea	1.0	2.0
Psolus chitinoides	1.0	2.0
Crinoidea	1.0	2.0
Chordata		
Ascidia spp.	5.0	10.2

Comments

Dead and drilled: 1 *Cyclocardia ventricosa*, 1 gastropod.

APPENDIX TABLE C.7

Station: 10 1K
Sample date: 9 November 1979
Latitude: 58°38.9′
Longitude: 140°01.8′
Depth: 190 m

Taxon	Count No.	Count PCT
Cnidaria		
Hydrozoa	2.0	9.5
Anthozoa	4.0	19.0
Annelida		
Goniadidae	1.0	4.8
Laonice cirrata	1.0	4.8
Myriochele heeri	1.0	4.8
Megalomma splendida	2.0	9.5
Sipuncula		
Sipuncula	1.0	4.8
Phascolion strombi	2.0	9.5
Brachiopoda		
Terebratulina unguicula	2.0	9.5
Echinodermata		
Ophiuroidea	1.0	4.8
Diamphiodia craterodmeta	4.0	19.0

Comments

Dead and drilled: 1 *Astarte* sp., 1 *Propeamussium alaskense*, 2 *Spiochaetopterus* tubes (empty).