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## Experimental Flying Squid Fishery off British Columbia, 1987

G. S. Jamieson and G. D. Heritage

Department of Fisheries and Oceans  
Fisheries Research Branch  
Pacific Biological Station  
Nanaimo, British Columbia V9R 5K6



May 1988

**Canadian Industry Report of  
Fisheries and Aquatic Sciences  
No. 186**



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Department of Fisheries and Oceans  
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Cat. No. Fs 97-14/186E      ISSN 0704-3694

Correct citation for this publication:

Jamieson, G. S. and G. D. Heritage. 1988. Experimental flying squid fishery off British Columbia, 1987. Can. Ind. Rep. Fish. Aquat. Sci. 186: 79 p.

## ABSTRACT

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Experimental fishing for flying squid (Ommastrephes bartrami) was continued in 1987 from both a Japanese vessel and a Canadian vessel in northeastern Pacific Ocean waters off the coast of British Columbia. Average squid catch rates ( $383 \text{ kg km}^{-1}$ ) for the Japanese vessel was the highest obtained over the 3-yr experimental study period. Pomfret and blue shark remained the major bycatch species, but as in 1986, marine mammal catch rate increased substantially over the previous year's level. A total of 90 marine mammals were caught by the two vessels combined, and while the average length of net required to catch one mammal was similar for the Canadian vessel over the past two years, catch rate increased (i.e., the average net length required to catch one mammal decreased) for the Japanese vessel in 1987.

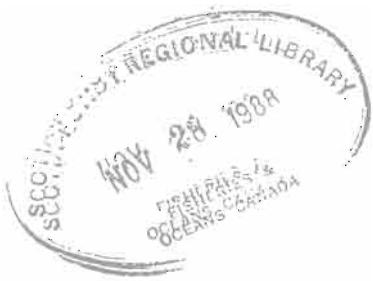
## RÉSUMÉ

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La pêche expérimentale du calmar Ommastrephes bartrami a été poursuivie en 1987. Elle a été réalisée à partir d'un bateau japonais et d'un bateau canadien dans le eaux du nord-est de l'océan Pacifique, au large de la côte de la Colombie-Britannique. Le taux moyen de capture de calmar ( $383 \text{ kg} \cdot \text{km}^{-1}$ ) du bateau japonais a été le plus élevé obtenu au cours de la période d'étude expérimentale de trois ans. La castagnole et le requin bleu sont demeurés les principales espèces accessoires capturées, mais comme en 1986, le taux de capture de mammifères marins a augmenté de façon substantielle par rapport à l'année précédente. Les deux bateaux ont capturé, au total, 90 mammifères marins. La longueur moyenne de filet nécessaire pour capturer un mammifère a été similaire pour le bateau canadien au cours des deux dernières années, mais le taux de capture a augmenté (c.-à-d. que la longueur moyenne du filet nécessaire pour capturer un mammifère a diminué) pour le bateau japonais en 1987.



## INTRODUCTION



Experimental fishing for flying squid (Ommastrephes bartramii) in 1987 was conducted from both a Japanese and a Canadian vessel in northeastern Pacific waters. Fishing was primarily off the coast of British Columbia, and to a lesser extent off Oregon and Washington outside the American 200-mile (320 km) Extended Economic Zone (EEZ). Experimental fishing off Canada has been conducted since 1979 (Bernard 1980), with more extensive investigation of fishing performance and bycatch characteristics conducted during the 1980s (Robinson and Jamieson 1984, Sloan 1984, Jamieson and Heritage 1987). Results indicate that flying squid abundance in the outer portion of the Canadian 320 km EEZ and immediately beyond is sufficient to support commercial fishing, but because available data do not allow estimation of total squid abundance, full fishery potential remains to be determined. It is not clear how large the sustainable catch might be, and as a result, how many vessels might potentially participate.

Experimental fishing to date has used drift gillnets, although some limited jigging was conducted in 1987 by the TOMI MARU #88. This report presents the daily fishing results and a general analysis of the 1987 data for the third year of a study designed to document and evaluate the nature of the catch associated with limited fishing of a commercial nature. Harvest rates over the course of a season are established, with particular emphasis on the nature of the bycatch. This report does not include detailed biological information on the species caught nor an interpretive analysis of fishing in relation to observed oceanographic parameters. These will be discussed in later reports.

## METHODS

The same procedures described by Jamieson and Heritage (1987) were used in monitoring the 1987 squid fishery. Vessels participating in 1987 were the TOMI MARU #88 and the OCEAN PEARL, previously described in Sloan (1984) and Jamieson and Heritage (1987), respectively. Fishing by the OCEAN PEARL began on June 13 and finished on August 5. The TOMI MARU #88 began fishing on June 15 and terminated fishing on August 24.

Fishing began off the coast of northern California outside the American EEZ and quickly moved north into Canadian waters as surface water temperatures increased (Figs. 1-2). A total of 66 and 49 sets were made by the TOMI MARU #88 and OCEAN PEARL, respectively, and average net lengths fished by each vessel were 46.7 km and 28.4 km, respectively.

Each net group fished by the TOMI MARU #88 consisted of 160, 50 m tans of green 8 gauge monofilament with stretched mesh sizes from 115-121 mm. One of the 8 net groups had 20 consecutive tans (115 mm mesh) with 2 meshes of hollow core 3-thread filament woven into the 80 mesh deep net at meshes 39 and 40. The rationale for this modification was that air trapped inside the thread might improve detection of the net by marine mammals by presenting stronger acoustic feedback, resulting in a possible reduction of the marine mammal bycatch. The net group containing this 1 km of hollowcore net was fished on 17 nights.

The OCEAN PEARL fished up to 6 net groups, each consisting of up to 120, 50 m tans with no hollow core filaments and stretched mesh sizes from 118-121 mm.

The TOMI MARU #88 and the OCEAN PEARL generally fished the same area each night, with their nets deployed in an east-west direction and about 5° apart in latitude. Fishing areas usually changed on a nightly basis, and were determined by water temperature and recent fishing experience.

Limited jigging was also carried out by the TOMI MARU #88, which was equipped with 4 jiggers (2 automatic and 2 manual) midships on its starboard side (Fig. 3). Jigging was conducted on 19 nights between June 15 and July 23 in the time interval between drift net deployment and retrieval. Each line had 26, forest green, 11 cm jigs on it. Conventional 10 cm squid jigs have 2 circular arrays of 10 mm long, unbarbed hooks facing upwards, but the jigs used in this study had lower and upper arrays of 15 and 12 mm long, unbarbed hooks, respectively. The larger size of both the jig itself and the hooks was justified because of the relatively large size of the squid being fished (average weight caught in the nets was 2.34 kg).

## RESULTS

### DRIFT GILLNET FISHING

Species caught during the 1987 experimental flying squid fishery are listed in Table 1, with their estimated or measured average weights given in Table 2. Proportion of the major bycatch species in the total catch (Table 3) differed between the two vessels, as in 1986, with the TOMI MARU #88 catching more blue shark than pomfret by weight, and the OCEAN PEARL showing the converse. However, this difference was not statistically significant ( $t$ -test,  $p>.05$ ). For both vessels, the bycatch proportion by weight of pomfret increased substantially over that in 1986 (Jamieson and Heritage 1987): from 3.3% in both 1985 and 1986 to 10.6% in 1987 for the TOMI MARU #88, and from 2.1% in 1986 to 10.7% in 1987 for the OCEAN PEARL. Blue shark catch proportion remained relatively constant (about 14%) over this time interval

for the TOMI MARU #88 but increased from 1.8% in 1986 to 9.9% in 1987 for the OCEAN PEARL. The net result was a decrease in 1987 in the percentage of the catch represented by squid: from 79% to 71% for the TOMI MARU #88, and from 85% to 73% for the OCEAN PEARL.

All remaining species combined accounted for 3.4% and 6.5% by weight of the catches of the TOMI MARU #88 and OCEAN PEARL, respectively. By weight, the third major bycatch species was salmon shark and jack mackerel for the TOMI MARU #88 and OCEAN PEARL, respectively, whereas by piece, it was jack mackerel for both vessels.

Daily driftnet catches by both vessels are given in Table 4. Marine mammal bycatch (Table 5) showed the basic pattern established in previous years, with the main species caught being Dall porpoise (58 animals). Pacific white-sided dolphins (16 animals) were the next most common marine mammal caught. Catch rate, expressed as average net length required to catch one marine mammal, was again higher (i.e., less net was required to catch a mammal) for the OCEAN PEARL than for the TOMI MARU #88, although this difference was less in 1987 than in previous years. The marine mammal catch rate of the OCEAN PEARL in 1987 was similar to its rate in 1986, whereas the mammal catch rate of the TOMI MARU #88 significantly increased in 1987 over that in previous years.

Catch per unit effort (CPUE), expressed as either pieces or weight (kg) per 10 km of net fished (Tables 7 and 8, respectively), is provided for each species fished. Average CPUE for squid (Table 7a) decreased by 8% for the OCEAN PEARL between 1986 and 1987, whereas for the TOMI MARU #88, it increased by 41%, and was the highest obtained by any of the vessels fishing off British Columbia over the past 3 years (Table 9).

The above results are averages for the full fishing season by each vessel, and it should be noted that considerable daily variation was observed over the approximately 2-month fishing period (Table 4a,c). In particular, there were significant differences (ANOVA) in CPUE of some species caught before and after July 24 (Table 10); surface water temperature was generally above 14°C in this latter time period. This was particularly evident for the bycatch of marine mammals by the TOMI MARU #88, with 42 mammals caught in the first 38 nights of fishing (June 15-July 24) and 4 mammals caught in the last 28 nights of fishing (July 25-August 24). For the TOMI MARU #88, squid CPUE was 31% higher after July 24. With other major bycatch species, average CPUE of pomfret, albacore, blue shark and salmon shark increased after August 24, while catches of jack mackerel, salmon and steelhead decreased. Pomfret CPUE was 34% greater. A similar pattern was observed for the OCEAN PEARL, but the relative change in CPUE of flying squid and pomfret, the two major species caught, before and after July 24 by this vessel was significant, in contrast to no significant differences in the catch rates of these species by the TOMI MARU #88.

## JIG FISHING

Jig fishing results for each night are given in Table 4b, and it is evident that jigging, as conducted by the TOMI MARU #88 in this study, yielded few flying squid. The maximum squid catch per night was 31 squid, and a total of only 40 squid were caught during 19 nights of jigging. Thus, an insufficient number of squid were caught to allow any catch pattern to be evaluated.

## DISCUSSION

As in previous years, the CPUE of flying squid was sufficiently high to allow profitable driftnet fishing. However, this positive statement is compromised by the substantial, discarded bycatch associated with driftnet fishing, and in particular by the significant increase in marine mammal bycatch over the past two years. The concerns associated with this bycatch have been previously discussed by Jamieson and Heritage (1987), and it is evident that with both the gear and fishing protocol currently being employed, avoidance of at least some bycatch is impossible. Reasons why the bycatches of some species, notably marine mammals, have fluctuated so much over the past 3 years are not apparent at this time. Fishing technique has not varied in any obvious way, and so this may indicate a change in total abundance within the study area.

The suggestion by Jamieson and Heritage (1987) that mammals might be becoming accidentally entangled as they tried to eat fish caught in the driftnets now appears unlikely, as observation of the stomach contents (D. McFarlane and A. Anaka, pers. comm.) of some of the mammals caught show no evidence of remains of species caught in the driftnets. This strengthens the argument that marine mammals are simply blundering into the net, and are apparently often unable to detect its presence and avoid it.

Four primary options exist to deal with the bycatch issue:

- (1) terminate the current driftnet fishery;
- (2) further investigate fishing methods which have no bycatch (e.g. jigging);
- (3) develop new fishing procedures, which while perhaps not eliminating a bycatch completely, will significantly reduce it for at least some specified species;
- (4) establish the level of catch for each bycatch species which might be removed without detrimentally affecting the status of that species' stock, and regulate fishing of flying squid so that bycatches do not exceed the designated maximum levels for any specified species.

The option, or combination of options, chosen to deal with possible future continuation of the driftnet squid fishery will be determined following consideration of factors relating to biology, economics, available research resources, and social concerns.

#### ACKNOWLEDGMENTS

We thank the observers M. Copland, A. Anaka, and D. McFarlane for data collections; Fishing Master Y. Hudo and Capt. S. Onadera of the TOMI MARU NO. 88 and Capt. J. Pearl of the OCEAN PEARL for their cooperation; Mr. K. Okano of Kanai Fisheries Co. Ltd., Hokkaido; H. McElderry for coordinating the observer program and E. Zyblut, B. Ackerman, B. Turris and K. Kurita for logistical arrangements.

Table 1. Scientific and common names of all species caught during 1987 offshore squid fisheries.

|                                      |   |
|--------------------------------------|---|
| <u>Ommastrephes bartrami</u>         | Flying Squid                            |
| <u>Onychoteuthis borealijaponica</u> | Nail Squid                              |
| <u>Ocythoe tuberculata</u>           | Pelagic Octopus                         |
| <u>Oncorhynchus gorbuscha</u>        | Pink Salmon                             |
| <u>Oncorhynchus keta</u>             | Chum Salmon                             |
| <u>Oncorhynchus kisutch</u>          | Coho Salmon                             |
| <u>Oncorhynchus nerka</u>            | Sockeye Salmon                          |
| <u>Salmo gairdneri</u>               | Steelhead                               |
| <u>Isurus oxyrinchus</u>             | Bonito Shark                            |
| <u>Prionace glauca</u>               | Blue Shark                              |
| <u>Lamna ditropis</u>                | Salmon Shark                            |
| <u>Alopias vulpinus</u>              | Thresher Shark                          |
| <u>Cetorhinus maximus</u>            | Basking Shark                           |
| <u>Galeorhinus zyopterus</u>         | Soupfin Shark                           |
| <u>Dasyatis violacea</u>             | Pelagic Stingray                        |
| <u>Brama japonica</u>                | Pomfret                                 |
| <u>Taractes asper</u>                | Rough Pomfret                           |
| <u>Thunnus alalunga</u>              | Albacore                                |
| <u>Trachurus symmetricus</u>         | Jack Mackerel                           |
| <u>Scomber japonicus</u>             | Chub Mackerel                           |
| <u>Seriola lalandi</u>               | Yellowtail                              |
| <u>Pentaceros richardsoni</u>        | Pelagic Armourhead                      |
| <u>Eriolepis zonifer</u>             | Skilfish                                |
| <u>Cololabis saira</u>               | Pacific Saury                           |
| <u>Mola mola</u>                     | Ocean Sunfish                           |
| <u>Alepisaurus ferox</u>             | Longnose Lancetfish                     |
| <u>Phocoenoides dalli</u>            | Dall Porpoise                           |
| <u>Lissodelphis borealis</u>         | Northern Right-whale Dolphin            |
| <u>Lagenorhynchus obliquidens</u>    | Pacific White-Sided Dolphin             |
| <u>Globicephala macrorhynchus</u>    | Short-finned Pilot Whale                |
| <u>Phocoena phocoena</u>             | Harbour Porpoise                        |
| <u>Callorhinus ursinus</u>           | Northern Fur Seal                       |
| <u>Eumetopias jubatus</u>            | Stellar Sea Lion                        |
| Family Diomedaeidae                  | Albatrosses                             |
| <u>Puffinus tenuirostris</u>         | Slender-billed Shearwater               |
| <u>Puffinus praeceps</u>             | Sooty Shearwater                        |
| Family Oceanitidae                   | Storm-petrels                           |
| Family Alcidae                       | Murres, Murrelets, Aukletes and Puffins |
| <u>Uria aagle</u>                    | Common Murre                            |
| <u>Ptychoramphus aleuticus</u>       | Cassin's Auklette                       |
| <u>Cerorhinca monocerata</u>         | Rhinoceros Auklette                     |
| Subfamily Sterninae                  | Terns                                   |

Table 2. Estimated average weights and measured average weights (in kilograms) for all species caught and killed by the TOMI MARU No. 88 and the OCEAN PEARL in 1987.

| Common name          | Average weight (kg) |           | Measured    |
|----------------------|---------------------|-----------|-------------|
|                      | Estimated           | TOMI MARU |             |
|                      | Net                 | Jig       | OCEAN PEARL |
| Flying Squid         | 2.28                | 2.33      | 1.77        |
| Pelagic Octopus      | 1.00                | 1.00      | -           |
| Unidentified Squid   | 1.00                | 1.00      | -           |
| Nail Squid           | 1.00                | 1.00      | -           |
| Pink Salmon          | 1.08                | 1.01      | -           |
| Chum Salmon          | 2.31                | 1.99      | -           |
| Coho Salmon          | 2.25                | 2.00      | -           |
| Sockeye Salmon       | 1.39                | 1.20      | -           |
| Steelhead            | 1.96                | 1.90      | -           |
| Bonito Shark         | 36.00               | 25.00     | -           |
| Blue Shark           | 4.99                | 5.49      | -           |
| Salmon Shark         | 24.88               | 28.78     | -           |
| Thresher Shark       | 260.00              | 122.50    | -           |
| Basking Shark        | 2500.00             | -         | -           |
| Soupfin Shark        | 1.00                | -         | -           |
| Pelagic Stingray     | 1.00                | 2.00      | -           |
| Pomfret              | 2.34                | 2.34      | -           |
| Rough Pomfret        | 2.34                | -         | -           |
| Albacore             | 5.74                | 4.90      | -           |
| Jack Mackerel        | 2.40                | 2.41      | -           |
| Chub Mackerel        | 0.30                | -         | -           |
| Pacific Bonito       | 1.00                | 38.00     | -           |
| Yellowtail           | 4.00                | 2.29      | -           |
| Pelagic Armourhead   | 0.37                | 0.37      | -           |
| Skilfish             | 0.50                | 0.75      | -           |
| Pacific Saury        | 0.07                | -         | -           |
| Long Nose Lancetfish | 2.00                | 2.83      | -           |
| Ocean Sunfish        | 28.00               | 7.00      | -           |
| Unidentified Fish    | 1.00                | 1.00      | -           |

Table 2 (cont'd)

| Common name                               | Average weight (kg) |           | Measured    |
|---|---------------------|-----------|-------------|
|   | Estimated           | TOMI MARU |             |
|   | Net                 | Jig       | OCEAN PEARL |
| Dall Porpoise                             | 148.00              | 148.00    | -           |
| Northern Right<br>Whale Dolphin           | 182.00              | 182.00    | -           |
| Pacific White-<br>Sided Dolphin           | 136.00              | 136.00    | -           |
| Short-finned<br>Pilot Whale               | 2283.00             | 2283.00   | -           |
| Harbour Porpoise                          | 50.00               | 50.00     | -           |
| Fur Seal                                  | 34.00               | 34.00     | -           |
| Stellar Sea Lion                          | 300.00              | -         | 300.00      |
| Unidentified mammal                       | 1.00                | 1.00      | -           |
| Albatross                                 | 5.00                | 5.00      | -           |
| Sooty Shearwater                          | 0.74                | 0.74      | -           |
| Slender-billed<br>Shearwater              | 0.74                | -         | -           |
| Storm Petrels                             | 0.10                | 0.10      | -           |
| Cassin's Auklet                           | 0.20                | 0.20      | -           |
| Rhinoceros Auklet                         | 0.26                | 0.26      | -           |
| Common Murre                              | 0.90                | 0.90      | -           |
| Murres, Murrelets,<br>Auklets and Puffins | 0.40                | -         | -           |
| Terns                                     | 0.20                | 0.20      | -           |

Table 3a. Total catch by species and the proportion of the total catch represented by each species for the 1987 TOMI MARU NO.88 offshore squid cruise (\* = estimated; 0.00 = rounded number <0.01).

| Species                      | Kg        | Percent | Pieces   | Percent |
|------------------------------|-----------|---------|----------|---------|
| Flying Squid                 | 1 180 074 | 71.30   | 507 360* | 79.84   |
| Nail Squid                   | 1*        | 0.00    | 1        | 0.00    |
| Unidentified Squid           | 3*        | 0.00    | 3        | 0.00    |
| Pelagic Octopus              | 5*        | 0.00    | 5        | 0.00    |
| Pink Salmon                  | 11*       | 0.00    | 11       | 0.00    |
| Chum Salmon                  | 201       | 0.01    | 101      | 0.02    |
| Coho Salmon                  | 14        | 0.00    | 7        | 0.00    |
| Sockeye Salmon               | 57*       | 0.00    | 47       | 0.01    |
| Steelhead                    | 520*      | 0.03    | 273      | 0.04    |
| Bonito Shark                 | 100       | 0.01    | 4        | 0.00    |
| Blue Shark                   | 243 363   | 14.70   | 44 300   | 6.97    |
| Salmon Shark                 | 23 429    | 1.42    | 814      | 0.13    |
| Thresher Shark               | 735*      | 0.04    | 6        | 0.00    |
| Pelagic Stingray             | 2         | 0.00    | 1        | 0.00    |
| Pomfret                      | 175 438   | 10.60   | 74 943*  | 11.79   |
| Albacore                     | 5 021     | 0.30    | 1 025*   | 0.16    |
| Jack Mackerel                | 14 558    | 0.88    | 6 048*   | 0.95    |
| Pacific Bonito               | 76        | 0.00    | 2        | 0.00    |
| Yellowtail                   | 55*       | 0.00    | 24       | 0.00    |
| Pelagic Armourhead           | 8*        | 0.00    | 21       | 0.00    |
| Skiffish                     | 3*        | 0.00    | 4        | 0.00    |
| Long Nose Lancetfish         | 17*       | 0.00    | 6        | 0.00    |
| Ocean Sunfish                | 7         | 0.00    | 1        | 0.00    |
| Unidentified Fish            | 1*        | 0.00    | 1        | 0.00    |
| Dall Porpoise                | 4 736*    | 0.29    | 32       | 0.01    |
| Northern Right-Whale Dolphin | 1 274*    | 0.08    | 7        | 0.00    |
| Pacific White-Sided Dolphin  | 408*      | 0.02    | 3        | 0.00    |
| Short-finned Pilot Whale     | 4 566*    | 0.28    | 2        | 0.00    |
| Fur Seal                     | 34*       | 0.00    | 1        | 0.00    |
| Unidentified Mammal          | 1*        | 0.00    | 1        | 0.00    |

Table 3a (cont'd)

| Species                   | Kg        | Percent | Pieces | Percent |
|---------------------------|-----------|---------|--------|---------|
| Albatross                 | 10*       | 0.00    | 2      | 0.00    |
| Sooty Shearwater          | 272*      | 0.02    | 368    | 0.06    |
| Storm Petrels             | 3*        | 0.00    | 32     | 0.01    |
| Cassin's Auklet           | 4*        | 0.00    | 22     | 0.00    |
| Rhinoceros Auklet         | 1*        | 0.00    | 2      | 0.00    |
| Common Murre              | 1*        | 0.00    | 1      | 0.00    |
| Terns                     | 5*        | 0.00    | 23     | 0.00    |
| Total kg                  | 1 655 013 |         |        |         |
| Total pieces              | 635 504   |         |        |         |
| Number of species present | 37        |         |        |         |

Table 3b. Total catch by species and the proportion of the total catch represented by each species for the 1987 OCEAN PEARL offshore squid cruise (\*=estimated; 0.00=rounded number <0.01).

| Species                          | Kg      | Percent | Pieces  | Percent |
|----------------------------------|---------|---------|---------|---------|
| Flying Squid                     | 347 402 | 72.95   | 148 243 | 70.10   |
| Nail Squid                       | 3       | 0.00    | 1       | 0.00    |
| Pelagic Octopus                  | 5*      | 0.00    | 5       | 0.00    |
| Pomfret                          | 50 721  | 10.65   | 46 913  | 22.18   |
| Rough Pomfret                    | 1       | 0.00    | 1       | 0.00    |
| Pink Salmon                      | 37      | 0.01    | 29      | 0.01    |
| Chum Salmon                      | 225     | 0.05    | 63      | 0.03    |
| Coho Salmon                      | 3       | 0.00    | 1       | 0.00    |
| Sockeye Salmon                   | 1 258   | 0.26    | 397     | 0.19    |
| Steelhead                        | 611     | 0.13    | 149     | 0.07    |
| Blue Shark                       | 47 254  | 9.92    | 11 295  | 5.34    |
| Salmon Shark                     | 5 677   | 1.19    | 250     | 0.12    |
| Thresher Shark                   | 590     | 0.12    | 3       | 0.00    |
| Basking Shark                    | 2 500*  | 0.52    | 1       | 0.00    |
| Soupfin Shark                    | 20      | 0.00    | 1       | 0.00    |
| Albacore                         | 1 052   | 0.22    | 159     | 0.08    |
| Jack Mackerel                    | 10 150  | 2.13    | 3 794   | 1.79    |
| Chub Mackerel                    | 8       | 0.00    | 4       | 0.00    |
| Yellowtail                       | 2       | 0.00    | 1       | 0.00    |
| Pelagic Armourhead               | 6       | 0.00    | 7       | 0.00    |
| Skilfish                         | 1       | 0.00    | 1       | 0.00    |
| Pacific Saury                    | 1       | 0.00    | 2       | 0.00    |
| Long Nose<br>Lancetfish          | 10      | 0.00    | 2       | 0.00    |
| Dall Porpoise                    | 3 848*  | 0.81    | 26      | 0.01    |
| Northern Right-<br>Whale Dolphin | 364*    | 0.08    | 2       | 0.00    |
| Pacific White-<br>Sided Dolphin  | 1 768*  | 0.37    | 13      | 0.01    |
| Short-finned<br>Pilot Whale      | 2 283*  | 0.48    | 1       | 0.00    |
| Harbour Porpoise                 | 50*     | 0.01    | 1       | 0.00    |
| Stellar Sea Lion                 | 300*    | 0.06    | 1       | 0.00    |

Table 3b (cont'd)

| Species                       | Kg  | Percent | Pieces | Percent |
|-------------------------------|-----|---------|--------|---------|
| Albatross                     | 20* | 0.00    | 4      | 0.00    |
| Sooty Shearwater              | 71* | 0.01    | 96     | 0.05    |
| Slender-billed<br>Shearwater  | 1*  | 0.00    | 1      | 0.00    |
| Storm Petrels                 | 0*  | 0.00    | 1      | 0.00    |
| Cassin's Auklet               | 1*  | 0.00    | 6      | 0.00    |
| Murre, Auklets and<br>Puffins | 1*  | 0.00    | 2      | 0.00    |
| Terns                         | 0*  | 0.00    | 2      | 0.00    |
| Total kg                      | 476 | 244     |        |         |
| Total pieces                  | 211 | 478     |        |         |
| Number of species present     |     | 36      |        |         |

Table 4a. Bridge log and drift net catch information, in pieces, for each night's fishing by the TOMI MARU NO.88 in 1987. \* = estimated, LST = Local Standard Time.

| SET NO.                       |             | 1           | 2           | 3           | 4           | 5           | 6 |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|---|
| DATE                          | JUNE 15     | JUNE 16     | JUNE 17     | JUNE 18     | JUNE 19     | JUNE 20     |   |
| TIME START (LST)              | 1700        | 1825        | 1700        | 1700        | 1650        | 1745        |   |
| DURATION(HR.MIN)              | 11.00       | 9.35        | 11.00       | 11.00       | 11.10       | 10.45       |   |
| START N. LAT. (DEG)<br>(MIN)  | 42<br>22.0  | 41<br>36.7  | 42<br>57.0  | 43<br>32.0  | 44<br>33.0  | 44<br>59.0  |   |
| W. LONG. (DEG)<br>(MIN)       | 131<br>54.0 | 131<br>1.5  | 132<br>2.0  | 130<br>45.0 | 129<br>51.0 | 129<br>54.0 |   |
| DIRECTION (DEG.TRUE)          | 090         | 090         | 090         | 090         | 290         | 270         |   |
| FINISH N. LAT. (DEG)<br>(MIN) | 42<br>22.0  | 41<br>36.8  | 42<br>58.0  | 43<br>32.0  | 44<br>43.0  | 44<br>59.3  |   |
| W.LONG. (DEG)<br>(MIN)        | 131<br>11.0 | 130<br>39.8 | 131<br>29.0 | 130<br>11.0 | 130<br>22.0 | 130<br>19.3 |   |
| LENGTH OF SET KM.             | 56.0        | 28.0        | 42.0        | 42.0        | 42.0        | 28.0        |   |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |   |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |   |
| START TEMP.(DEG.C)            | 14.0        | 14.4        | 14.2        | 13.8        | 13.5        | 13.2        |   |
| END TEMP.(DEG.C)              | 14.0        | 14.6        | 14.9        | 14.6        | 13.4        | 12.5        |   |
| NO. OF GROUPS.                | 8           | 4           | 6           | 6           | 6           | 4           |   |
| TOTAL SQUID (KG)              | 1409        | 876         | 914         | 1066        | 1447        | 4609        |   |

Table 4a (cont'd)

| SET NO.              | 1       | 2       | 3       | 4       | 5       | 6       |
|----------------------|---------|---------|---------|---------|---------|---------|
| DATE                 | JUNE 15 | JUNE 16 | JUNE 17 | JUNE 18 | JUNE 19 | JUNE 20 |
| TOTAL CATCH PIECES   | 2451*   | 1668*   | 839*    | 1312*   | 1593*   | 2327*   |
| TOTAL CATCH WEIGHT   | 6776    | 4874    | 2881*   | 4299*   | 5303    | 5540    |
| <b>INVERTEBRATES</b> |         |         |         |         |         |         |
| FLYING SQUID         | 730     | 384*    | 400*    | 467*    | 634*    | 2021*   |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..      | ..      | 2       | ..      | ..      | ..      |
| <b>FISH</b>          |         |         |         |         |         |         |
| POMFRET              | 71*     | 63*     | 6*      | 13*     | 45*     | 47*     |
| JACK MACKEREL        | 11*     | 122*    | ..      | 11*     | 7*      | 11*     |
| ALBACORE             | ..      | 1       | 2       | ..      | ..      | ..      |
| STEELHEAD            | ..      | ..      | ..      | ..      | ..      | ..      |
| CHUM SALMON          | 1       | ..      | ..      | ..      | ..      | ..      |
| SOCKEYE SALMON       | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL           | ..      | ..      | ..      | 2       | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..      | ..      | 4       | ..      | ..      | ..      |
| PINK SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH             | ..      | ..      | 1       | ..      | ..      | ..      |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..      | ..      | ..      | 1       | ..      | ..      |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>       |         |         |         |         |         |         |
| BLUE SHARK           | 1620    | 1080    | 420     | 810     | 903     | 243     |
| SALMON SHARK         | 18      | 18      | 3       | 6       | 4       | 5       |
| THRESHER SHARK       | ..      | ..      | ..      | ..      | ..      | ..      |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>       |         |         |         |         |         |         |
| DALL PORPOISE        | ..      | ..      | ..      | 1       | ..      | ..      |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | 1       | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE          | ..      | ..      | ..      | ..      | ..      | ..      |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |         |         |         |         |         |         |
| SOOTY SHEARWATER     | ..      | ..      | ..      | 1       | ..      | ..      |
| STORM PETRELS        | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                | ..      | ..      | ..      | ..      | ..      | ..      |
| CASSIN'S AUKLET      | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBATROSS            | ..      | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..      | ..      |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 7           | 8           | 9           | 10          | 11          | 12          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JUNE 21     | JUNE 22     | JUNE 23     | JUNE 24     | JUNE 25     | JUNE 26     |
| TIME START (LST)              | 1700        | 1655        | 1650        | 1700        | 1655        | 1945        |
| DURATION(HR.MIN)              | 10.00       | 10.35       | 10.40       | 10.45       | 10.35       | 9.15        |
| START N. LAT. (DEG)<br>(MIN)  | 45<br>10.0  | 45<br>14.1  | 45<br>17.0  | 45<br>31.7  | 45<br>15.3  | 46<br>1.7   |
| W. LONG. (DEG)<br>(MIN)       | 130<br>21.0 | 130<br>51.9 | 130<br>38.8 | 130<br>24.0 | 130<br>35.7 | 130<br>31.1 |
| DIRECTION (DEG.TRUE)          | 080         | 090         | 090         | 080         | 090         | 090         |
| FINISH N. LAT. (DEG)<br>(MIN) | 45<br>15.0  | 45<br>14.4  | 45<br>12.2  | 45<br>32.1  | 45<br>14.9  | 46<br>1.2   |
| W.LONG. (DEG)<br>(MIN)        | 129<br>35.0 | 130<br>5.2  | 129<br>51.0 | 129<br>43.9 | 129<br>30.0 | 130<br>0.7  |
| LENGTH OF SET KM.             | 56.0        | 56.0        | 56.0        | 49.0        | 56.0        | 35.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 12.3        | 12.7        | 12.6        | 13.8        | 13.3        | 13.8        |
| END TEMP.(DEG.C)              | 13.1        | 12.9        | 13.2        | 14.0        | 13.5        | 13.3        |
| NO. OF GROUPS.                | 8           | 8           | 8           | 7           | 8           | 5           |
| TOTAL SQUID (KG)              | 13529       | 21561       | 13333       | 7886        | 11314       | 7010        |

Table 4a (cont'd)

| SET NO.              | 7       | 8       | 9       | 10      | 11      | 12      |
|----------------------|---------|---------|---------|---------|---------|---------|
| DATE                 | JUNE 21 | JUNE 22 | JUNE 23 | JUNE 24 | JUNE 25 | JUNE 26 |
| TOTAL CATCH PIECES   | 6262*   | 9689*   | 6109*   | 4039*   | 5741*   | 3500*   |
| TOTAL CATCH WEIGHT   | 14580*  | 22467*  | 16957*  | 9956*   | 14245*  | 8395*   |
| <b>INVERTEBRATES</b> |         |         |         |         |         |         |
| FLYING SQUID         | 5933*   | 9456*   | 5847*   | 3458*   | 4962*   | 3074*   |
| PELAGIC OCTOPUS      | 1       | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>          |         |         |         |         |         |         |
| POMFRET              | 43*     | 29*     | 47*     | 239*    | 258*    | 239*    |
| JACK MACKEREL        | 44*     | 15*     | 15*     | 15*     | ..      | ..      |
| ALBACORE             | 1       | ..      | ..      | ..      | ..      | ..      |
| STEELHEAD            | ..      | ..      | 1       | 1       | ..      | 3       |
| CHUM SALMON          | ..      | ..      | 1       | ..      | 1       | ..      |
| SOCKEYE SALMON       | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL           | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..      | 1       | ..      | ..      | ..      | ..      |
| PINK SALMON          | 1       | ..      | ..      | ..      | 1       | ..      |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | 2       | ..      |
| SKILFISH             | ..      | ..      | ..      | ..      | ..      | ..      |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>       |         |         |         |         |         |         |
| BLUE SHARK           | 236     | 180     | 190     | 320     | 510     | 180     |
| SALMON SHARK         | 2       | 6       | 5       | 2       | 3       | 3       |
| THRESHER SHARK       | ..      | ..      | ..      | ..      | ..      | ..      |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..      | ..      | ..      | 1       | ..      | ..      |
| <b>MAMMALS</b>       |         |         |         |         |         |         |
| DALL PORPOISE        | ..      | 1       | 1       | 1       | ..      | ..      |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | 1       | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | 1       | ..      |
| PILOT WHALE          | ..      | ..      | 1       | ..      | ..      | ..      |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |         |         |         |         |         |         |
| SOOTY SHEARWATER     | ..      | 1       | ..      | 2       | 2       | ..      |
| STORM PETRELS        | ..      | ..      | ..      | ..      | 1       | ..      |
| TERNS                | ..      | ..      | ..      | ..      | ..      | ..      |
| CASSIN'S AUKLET      | ..      | ..      | ..      | ..      | ..      | 1       |
| ALBATROSS            | 1       | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..      | ..      |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 13          | 14          | 15          | 16          | 17          | 18          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JUNE 27     | JUNE 28     | JUNE 29     | JUNE 30     | JULY 1      | JULY 2      |
| TIME START (LST)              | 1640        | 1705        | 1755        | 1755        | 1850        | 1705        |
| DURATION(HR.MIN)              | 11.05       | 11.10       | 10.05       | 10.05       | 9.40        | 10.55       |
| START N. LAT. (DEG)<br>(MIN)  | 46<br>13.5  | 46<br>15.4  | 46<br>27.0  | 46<br>28.0  | 46<br>31.0  | 46<br>32.0  |
| W. LONG. (DEG)<br>(MIN)       | 131<br>50.0 | 132<br>5.0  | 132<br>17.0 | 132<br>16.0 | 130<br>55.9 | 130<br>52.0 |
| DIRECTION (DEG.TRUE)          | 090         | 090         | 100         | 095         | 090         | 095         |
| FINISH N. LAT. (DEG)<br>(MIN) | 46<br>11.0  | 46<br>15.4  | 46<br>19.0  | 46<br>21.0  | 46<br>26.3  | 46<br>27.6  |
| W.LONG. (DEG)<br>(MIN)        | 131<br>2.1  | 131<br>26.5 | 131<br>38.0 | 131<br>28.0 | 130<br>14.4 | 130<br>53.1 |
| LENGTH OF SET KM.             | 56.0        | 49.0        | 49.0        | 56.0        | 49.0        | 56.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 13.0        | 12.9        | 12.8        | 12.7        | 13.2        | 13.5        |
| END TEMP.(DEG.C)              | 13.0        | 12.8        | 12.4        | 12.7        | 12.9        | 13.3        |
| NO. OF GROUPS.                | 8           | 7           | 7           | 8           | 7           | 8           |
| TOTAL SQUID (KG)              | 14247       | 13940       | 14362       | 12076       | 27886       | 34819       |

Table 4a (cont'd)

| SET NO.              | 13      | 14      | 15      | 16      | 17     | 18     |
|----------------------|---------|---------|---------|---------|--------|--------|
| DATE                 | JUNE 27 | JUNE 28 | JUNE 29 | JUNE 30 | JULY 1 | JULY 2 |
| TOTAL CATCH PIECES   | 10711*  | 9696*   | 7710*   | 6446*   | 13671* | 16023* |
| TOTAL CATCH WEIGHT   | 25908*  | 22802*  | 18960*  | 15572*  | 32170* | 37179* |
| <b>INVERTEBRATES</b> |         |         |         |         |        |        |
| FLYING SQUID         | 6248*   | 6114*   | 6299*   | 5296*   | 12230* | 15271* |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..      | ..     | 1      |
| UNIDENT. SQUID       | ..      | ..      | ..      | ..      | ..     | ..     |
| <b>FISH</b>          |         |         |         |         |        |        |
| POMFRET              | 3897*   | 3076*   | 897*    | 811*    | 1111*  | 470*   |
| JACK MACKEREL        | ..      | ..      | ..      | ..      | ..     | ..     |
| ALBACORE             | ..      | ..      | ..      | ..      | ..     | ..     |
| STEELHEAD            | ..      | 3       | 3       | 2       | 5      | 6      |
| CHUM SALMON          | ..      | 2       | 5       | 3       | 4      | ..     |
| SOCKEYE SALMON       | ..      | ..      | ..      | ..      | ..     | ..     |
| YELLOWTAIL           | ..      | ..      | ..      | ..      | ..     | ..     |
| PELAGIC ARMOURHEAD   | 1       | 2       | 2       | 3       | ..     | ..     |
| PINK SALMON          | 1       | 1       | 1       | ..      | ..     | ..     |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..     | ..     |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | ..     | 1      |
| SKILFISH             | ..      | ..      | ..      | ..      | ..     | ..     |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..     | ..     |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..      | ..     | ..     |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | ..     | ..     |
| <b>SELACHI</b>       |         |         |         |         |        |        |
| BLUE SHARK           | 560     | 490     | 480     | 320     | 310    | 260    |
| SALMON SHARK         | 3       | 6       | 21      | 6       | 6      | 10     |
| THRESHER SHARK       | ..      | ..      | ..      | ..      | ..     | ..     |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..     | ..     |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..      | ..     | ..     |
| <b>MAMMALS</b>       |         |         |         |         |        |        |
| DALL PORPOISE        | ..      | ..      | ..      | ..      | ..     | ..     |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | ..      | 1       | 1      | ..     |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | ..     | ..     |
| PILOT WHALE          | ..      | ..      | ..      | ..      | ..     | ..     |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..     | ..     |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..     | ..     |
| <b>BIRDS</b>         |         |         |         |         |        |        |
| SOOTY SHEARWATER     | ..      | ..      | 2       | 3       | 3      | 2      |
| STORM PETRELS        | ..      | 1       | ..      | ..      | ..     | ..     |
| TERNS                | ..      | ..      | ..      | ..      | ..     | ..     |
| CASSIN'S AUKLET      | 1       | 1       | ..      | 1       | 1      | 1      |
| ALBATROSS            | ..      | ..      | ..      | ..      | ..     | ..     |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..     | ..     |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..     | 1      |

Table 4a (cont'd)

| SET NO.                       | 19          | 20          | 21          | 22          | 23          | 24          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 3      | JULY 4      | JULY 5      | JULY 6      | JULY 7      | JULY 8      |
| TIME START (LST)              | 1835        | 1755        | 1830        | 1800        | 1915        | 1740        |
| DURATION(HR.MIN)              | 10.15       | 10.35       | 10.00       | 10.00       | 9.45        | 10.50       |
| START N. LAT. (DEG)<br>(MIN)  | 46<br>36.0  | 46<br>34.7  | 46<br>32.6  | 46<br>31.6  | 46<br>46.9  | 46<br>32.0  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>38.0 | 130<br>35.6 | 130<br>22.0 | 130<br>19.5 | 130<br>15.7 | 130<br>33.0 |
| DIRECTION (DEG.TRUE)          | 090         | 090         | 090         | 090         | 285         | 090         |
| FINISH N. LAT. (DEG)<br>(MIN) | 46<br>36.3  | 46<br>34.5  | 46<br>32.6  | 46<br>31.5  | 46<br>53.7  | 46<br>32.0  |
| W.LONG. (DEG)<br>(MIN)        | 129<br>55.9 | 129<br>54.2 | 129<br>40.2 | 129<br>43.4 | 130<br>55.7 | 129<br>49.0 |
| LENGTH OF SET KM.             | 49.0        | 49.0        | 49.0        | 42.0        | 49.0        | 49.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 13.1        | 13.3        | 13.2        | 13.2        | 13.0        | 12.8        |
| END TEMP.(DEG.C)              | 12.9        | 13.1        | 13.3        | 13.2        | 13.3        | 12.8        |
| NO. OF GROUPS.                | 7           | 7           | 7           | 6           | 7           | 7           |
| TOTAL SQUID (KG)              | 32723       | 35276       | 36495       | 5920        | 7542        | 14857       |

Table 4a (cont'd)

| SET NO.              | 19     | 20     | 21     | 22     | 23     | 24     |
|----------------------|--------|--------|--------|--------|--------|--------|
| DATE                 | JULY 3 | JULY 4 | JULY 5 | JULY 6 | JULY 7 | JULY 8 |
| TOTAL CATCH PIECES   | 14839* | 16094* | 16661* | 5507*  | 3978*  | 10786* |
| TOTAL CATCH WEIGHT   | 34597* | 37326* | 38719* | 14017* | 9502*  | 26733* |
| <b>INVERTEBRATES</b> |        |        |        |        |        |        |
| FLYING SQUID         | 14352* | 15471* | 16006* | 2596*  | 3307*  | 6516*  |
| PELAGIC OCTOPUS      | ..     | ..     | 3      | ..     | ..     | ..     |
| UNIDENT. SQUID       | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>FISH</b>          |        |        |        |        |        |        |
| POMFRET              | 307*   | 444*   | 470*   | 880*   | 324*   | 3803*  |
| JACK MACKEREL        | ..     | ..     | ..     | 1677*  | 155*   | 4*     |
| ALBACORE             | ..     | ..     | ..     | ..     | ..     | ..     |
| STEELHEAD            | ..     | 1      | 1      | 1      | ..     | 9      |
| CHUM SALMON          | ..     | 3      | 6      | 4      | 5      | 10     |
| SOCKEYE SALMON       | ..     | ..     | ..     | ..     | ..     | 4      |
| YELLOWTAIL           | ..     | ..     | 3      | 3      | 3      | ..     |
| PELAGIC ARMOURHEAD   | ..     | ..     | ..     | ..     | ..     | 1      |
| PINK SALMON          | 1      | ..     | ..     | ..     | 1      | ..     |
| COHO SALMON          | ..     | ..     | ..     | ..     | ..     | ..     |
| LONG NOSE LANCETFISH | ..     | ..     | ..     | 1      | ..     | ..     |
| SKILFISH             | ..     | ..     | ..     | ..     | ..     | ..     |
| PACIFIC BONITO       | ..     | ..     | ..     | ..     | ..     | ..     |
| OCEAN SUNFISH        | ..     | ..     | ..     | ..     | ..     | ..     |
| UNIDENT. FISH        | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>SELACHI</b>       |        |        |        |        |        |        |
| BLUE SHARK           | 160    | 160    | 140    | 306    | 170    | 420    |
| SALMON SHARK         | 10     | 7      | 8      | 12     | 7      | 6      |
| THRESHER SHARK       | ..     | ..     | ..     | 1      | ..     | ..     |
| BONITO SHARK         | ..     | ..     | ..     | ..     | ..     | ..     |
| PELAGIC STINGRAY     | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>MAMMALS</b>       |        |        |        |        |        |        |
| DALL PORPOISE        | 1      | 1      | 1      | 1      | ..     | 5      |
| N.RT.-WHALE DOLPHIN  | ..     | ..     | ..     | ..     | ..     | 2      |
| P.WH.-SIDED DOLPHIN  | ..     | ..     | 1      | ..     | ..     | 1      |
| PILOT WHALE          | ..     | ..     | ..     | ..     | ..     | ..     |
| FUR SEAL             | ..     | ..     | ..     | ..     | ..     | ..     |
| STENELLA SP          | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>BIRDS</b>         |        |        |        |        |        |        |
| SOOTY SHEARWATER     | 8      | 5      | 14     | 21     | 5      | 5      |
| STORM PETRELS        | ..     | 1      | 8      | 3      | 1      | ..     |
| TERNS                | ..     | ..     | ..     | ..     | ..     | ..     |
| CASSIN'S AUKLET      | ..     | 1      | ..     | 1      | ..     | ..     |
| ALBATROSS            | ..     | ..     | ..     | ..     | ..     | ..     |
| RHINOCEROS AUKLET    | ..     | ..     | ..     | ..     | ..     | ..     |
| COMMON MURRE         | ..     | ..     | ..     | ..     | ..     | ..     |

Table 4a (cont'd)

| SET NO.                       | 25          | 26          | 27          | 28         | 29          | 30          |
|-------------------------------|-------------|-------------|-------------|------------|-------------|-------------|
| DATE                          | JULY 9      | JULY 10     | JULY 11     | JULY 12    | JULY 13     | JULY 14     |
| TIME START (LST)              | 1735        | 2110        | 1725        | 1730       | 2000        | 2030        |
| DURATION(HR.MIN)              | 10.25       | 9.20        | 11.20       | 11.00      | 10.00       | 9.45        |
| START N. LAT. (DEG)<br>(MIN)  | 47<br>21.6  | 47<br>19.1  | 47<br>17.0  | 47<br>27.0 | 47<br>30.8  | 47<br>36.1  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>14.8 | 130<br>35.0 | 129<br>53.0 | 130<br>5.0 | 130<br>0.0  | 130<br>23.6 |
| DIRECTION (DEG.TRUE)          | 090         | 090         | 090         | 090        | 295         | 110         |
| FINISH N. LAT. (DEG)<br>(MIN) | 47<br>20.2  | 47<br>18.5  | 47<br>21.0  | 47<br>31.0 | 47<br>24.9  | 47<br>27.8  |
| W.LONG. (DEG)<br>(MIN)        | 129<br>35.3 | 129<br>36.6 | 129<br>50.0 | 130<br>1.0 | 129<br>51.3 | 129<br>56.7 |
| LENGTH OF SET KM.             | 56.0        | 42.0        | 42.0        | 49.0       | 42.0        | 35.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10      | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1          | 1           | 1           |
| START TEMP.(DEG.C)            | 13.1        | 14.0        | 14.2        | 13.5       | 13.6        | 13.5        |
| END TEMP.(DEG.C)              | 13.3        | 13.7        | 13.7        | 13.4       | 13.5        | 13.3        |
| NO. OF GROUPS.                | 8           | 6           | 6           | 7          | 6           | 5           |
| TOTAL SQUID (KG)              | 36533       | 16685       | 14628       | 26274      | 30133       | 16152       |

Table 4a (cont'd)

| SET NO.              | 25     | 26      | 27      | 28      | 29      | 30      |
|----------------------|--------|---------|---------|---------|---------|---------|
| DATE                 | JULY 9 | JULY 10 | JULY 11 | JULY 12 | JULY 13 | JULY 14 |
| TOTAL CATCH PIECES   | 16558* | 8063*   | 8057*   | 15034*  | 16336*  | 11029*  |
| TOTAL CATCH WEIGHT   | 38588* | 19661*  | 19578*  | 37555*  | 37724*  | 26067*  |
| <b>INVERTEBRATES</b> |        |         |         |         |         |         |
| FLYING SQUID         | 16023* | 7317*   | 6415*   | 11523*  | 13216*  | 7084*   |
| PELAGIC OCTOPUS      | ..     | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..     | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>          |        |         |         |         |         |         |
| POMFRET              | 380*   | 512*    | 1435*   | 3247*   | 2871*   | 2393*   |
| JACK MACKEREL        | ..     | ..      | 88*     | 111*    | 129*    | 1458*   |
| ALBACORE             | ..     | ..      | ..      | ..      | ..      | ..      |
| STEELHEAD            | 8      | 3       | 5       | 10      | 8       | 11      |
| CHUM SALMON          | 2      | 1       | ..      | 2       | 1       | 4       |
| SOCKEYE SALMON       | 2      | ..      | ..      | 1       | 2       | 2       |
| YELLOWTAIL           | ..     | ..      | 6       | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..     | ..      | ..      | 1       | ..      | ..      |
| PINK SALMON          | ..     | ..      | 1       | ..      | ..      | ..      |
| COHO SALMON          | ..     | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH | ..     | ..      | 1       | 1       | ..      | ..      |
| SKILFISH             | ..     | ..      | 2       | ..      | ..      | ..      |
| PACIFIC BONITO       | ..     | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..     | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. FISH        | ..     | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>       |        |         |         |         |         |         |
| BLUE SHARK           | 120    | 210     | 86      | 110     | 96      | 39      |
| SALMON SHARK         | 7      | 10      | 5       | 8       | 3       | 9       |
| THRESHER SHARK       | 1      | ..      | ..      | ..      | ..      | ..      |
| BONITO SHARK         | ..     | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..     | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>       |        |         |         |         |         |         |
| DALL PORPOISE        | 1      | 4       | 5       | 1       | ..      | ..      |
| N.RT.-WHALE DOLPHIN  | ..     | ..      | ..      | 1       | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..     | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE          | ..     | ..      | ..      | 1       | ..      | ..      |
| FUR SEAL             | ..     | 1       | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..     | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |        |         |         |         |         |         |
| SOOTY SHEARWATER     | 13     | 4       | 4       | 15      | 10      | 28      |
| STORM PETRELS        | 1      | 1       | 1       | 1       | ..      | 1       |
| TERNS                | ..     | ..      | ..      | ..      | ..      | ..      |
| CASSIN'S AUKLET      | ..     | ..      | 1       | 1       | ..      | ..      |
| ALBATROSS            | ..     | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..     | ..      | 2       | ..      | ..      | ..      |
| COMMON MURRE         | ..     | ..      | ..      | ..      | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 31          | 32          | 33          | 34          | 35          | 36          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 15     | JULY 18     | JULY 19     | JULY 20     | JULY 21     | JULY 22     |
| TIME START (LST)              | 2030        | 1920        | 1645        | 1750        | 1910        | 1800        |
| DURATION(HR.MIN)              | 9.00        | 9.40        | 11.15       | 11.10       | 9.50        | 11.00       |
| START N. LAT. (DEG)<br>(MIN)  | 48<br>2.0   | 48<br>27.3  | 47<br>37.0  | 47<br>38.5  | 47<br>33.8  | 47<br>33.5  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>21.0 | 132<br>7.2  | 130<br>33.0 | 130<br>18.0 | 129<br>54.8 | 129<br>42.0 |
| DIRECTION (DEG.TRUE)          | 110         | 110         | 110         | 100         | 100         | 100         |
| FINISH N. LAT. (DEG)<br>(MIN) | 47<br>58.0  | 48<br>21.9  | 47<br>29.0  | 47<br>32.4  | 47<br>28.0  | 47<br>31.4  |
| W.LONG. (DEG)<br>(MIN)        | 130<br>10.0 | 131<br>53.1 | 129<br>44.0 | 129<br>35.7 | 129<br>14.8 | 129<br>0.8  |
| LENGTH OF SET KM.             | 14.0        | 21.0        | 56.0        | 49.0        | 49.0        | 49.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 13.5        | 12.8        | 13.3        | 13.6        | 13.6        | 13.6        |
| END TEMP.(DEG.C)              | 13.3        | 12.9        | 13.6        | 13.7        | 14.3        | 14.4        |
| NO. OF GROUPS.                | 2           | 3           | 8           | 7           | 7           | 7           |
| TOTAL SQUID (KG)              | 2991        | 2590        | 27542       | 26209       | 25867       | 13909       |

Table 4a (cont'd)

| SET NO.              | 31      | 32      | 33      | 34      | 35      | 36      |
|----------------------|---------|---------|---------|---------|---------|---------|
| DATE                 | JULY 15 | JULY 18 | JULY 19 | JULY 20 | JULY 21 | JULY 22 |
| TOTAL CATCH PIECES   | 2234*   | 2156*   | 14078*  | 12333*  | 11930*  | 7459*   |
| TOTAL CATCH WEIGHT   | 5412*   | 5110*   | 33037*  | 29565*  | 28214*  | 17091*  |
| <b>INVERTEBRATES</b> |         |         |         |         |         |         |
| FLYING SQUID         | 1311*   | 1135*   | 12079*  | 11495*  | 11345*  | 6100*   |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..      | 1       | ..      | ..      | ..      | ..      |
| <b>FISH</b>          |         |         |         |         |         |         |
| POMFRET              | 470*    | 897*    | 1623*   | 222*    | 205*    | 1196*   |
| JACK MACKEREL        | 420*    | 66*     | 199*    | 170*    | 12*     | 129*    |
| ALBACORE             | ..      | ..      | 80      | 105     | 62      | 9       |
| STEELHEAD            | 7       | 15      | 21      | 13      | 13      | 6       |
| CHUM SALMON          | 3       | ..      | 3       | ..      | 2       | 2       |
| SOCKEYE SALMON       | 3       | 7       | 2       | 1       | ..      | 1       |
| YELLOWTAIL           | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..      | ..      | ..      | 1       | ..      | ..      |
| PINK SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH             | ..      | ..      | ..      | ..      | ..      | ..      |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>       |         |         |         |         |         |         |
| BLUE SHARK           | 16      | 26      | 60      | 310     | 270     | ..      |
| SALMON SHARK         | 2       | 4       | 8       | 9       | 8       | ..      |
| THRESHER SHARK       | ..      | ..      | ..      | 1       | ..      | ..      |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>       |         |         |         |         |         |         |
| DALL PORPOISE        | 1       | ..      | 2       | ..      | ..      | ..      |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE          | ..      | ..      | ..      | ..      | ..      | ..      |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |         |         |         |         |         |         |
| SOOTY SHEARWATER     | ..      | ..      | ..      | 4       | 9       | 13      |
| STORM PETRELS        | 1       | 2       | ..      | 2       | 3       | 2       |
| TERNS                | ..      | 3       | ..      | ..      | ..      | ..      |
| CASSIN'S AUKLET      | ..      | ..      | ..      | ..      | 1       | 1       |
| ALBATROSS            | ..      | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..      | ..      |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 37          | 38          | 39          | 40          | 41          | 42          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 23     | JULY 24     | JULY 25     | JULY 26     | JULY 27     | JULY 28     |
| TIME START (LST)              | 1700        | 1755        | 1655        | 1930        | 1805        | 1730        |
| DURATION(HR.MIN)              | 11.00       | 10.05       | 11.05       | 9.30        | 10.05       | 10.30       |
| START N. LAT. (DEG)<br>(MIN)  | 47<br>42.6  | 48<br>21.7  | 48<br>25.9  | 48<br>32.4  | 48<br>37.9  | 48<br>14.1  |
| W. LONG. (DEG)<br>(MIN)       | 129<br>30.6 | 129<br>35.5 | 130<br>48.6 | 129<br>50.8 | 129<br>25.0 | 130<br>2.9  |
| DIRECTION (DEG.TRUE)          | 095         | 270         | 090         | 090         | 090         | 270         |
| FINISH N. LAT. (DEG)<br>(MIN) | 47<br>39.6  | 48<br>22.9  | 48<br>26.3  | 48<br>33.1  | 48<br>37.9  | 48<br>13.3  |
| W.LONG. (DEG)<br>(MIN)        | 128<br>42.6 | 130<br>23.7 | 130<br>1.7  | 129<br>6.4  | 128<br>54.2 | 130<br>52.6 |
| LENGTH OF SET KM.             | 56.0        | 56.0        | 56.0        | 49.0        | 56.0        | 56.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 14.0        | 13.6        | 14.5        | 14.1        | 14.1        | 14.3        |
| END TEMP.(DEG.C)              | 14.6        | 14.0        | 14.6        | 14.3        | 14.2        | 14.1        |
| NO. OF GROUPS.                | 8           | 8           | 8           | 7           | 8           | 8           |
| TOTAL SQUID (KG)              | 8685        | 15542       | 9638        | 23542       | 12876       | 32266       |

Table 4a (cont'd)

| SET NO.              | 37      | 38      | 39      | 40      | 41      | 42      |
|----------------------|---------|---------|---------|---------|---------|---------|
| DATE                 | JULY 23 | JULY 24 | JULY 25 | JULY 26 | JULY 27 | JULY 28 |
| TOTAL CATCH PIECES   | 7822*   | 8408*   | 5706*   | 11924*  | 6198*   | 16040*  |
| TOTAL CATCH WEIGHT   | 19115*  | 20483*  | 13826*  | 29221*  | 14752*  | 38644*  |
| <b>INVERTEBRATES</b> |         |         |         |         |         |         |
| FLYING SQUID         | 3809*   | 6816*   | 4227*   | 10325*  | 5647*   | 14530   |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>          |         |         |         |         |         |         |
| POMFRET              | 3675*   | 1196*   | 1324*   | 1111*   | 410*    | 470*    |
| JACK MACKEREL        | 83*     | 45*     | 12*     | ..      | ..      | 12*     |
| ALBACORE             | 7*      | 9       | ..      | ..      | 2       | 1       |
| STEELHEAD            | 12      | 16      | 22      | 14      | 8       | ..      |
| CHUM SALMON          | 2       | 3       | 2       | 9       | ..      | 2       |
| SOCKEYE SALMON       | ..      | 4       | 2       | 11      | 4       | ..      |
| YELLOWTAIL           | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..      | ..      | ..      | ..      | ..      | ..      |
| PINK SALMON          | ..      | ..      | ..      | 1       | 1       | ..      |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..      | 4       |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH             | ..      | 1       | ..      | ..      | ..      | ..      |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>       |         |         |         |         |         |         |
| BLUE SHARK           | 210     | 300     | 88      | 410     | 110     | 1010    |
| SALMON SHARK         | 18      | 12      | 16      | 18      | 10      | 6       |
| THRESHER SHARK       | ..      | ..      | ..      | ..      | ..      | ..      |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>       |         |         |         |         |         |         |
| DALL PORPOISE        | 1       | 1       | ..      | ..      | ..      | ..      |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE          | ..      | ..      | ..      | ..      | ..      | ..      |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |         |         |         |         |         |         |
| SOOTY SHEARWATER     | 4       | 4       | 12      | 23      | 6       | 5       |
| STORM PETRELS        | 1       | ..      | ..      | 1       | ..      | ..      |
| TERNS                | ..      | ..      | ..      | ..      | ..      | ..      |
| CASSIN'S AUKLET      | ..      | 1       | 1       | 1       | ..      | ..      |
| ALBATROSS            | ..      | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..      | ..      |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 43          | 44          | 45          | 46          | 47          | 48          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 29     | JULY 30     | JULY 31     | AUG. 1      | AUG. 2      | AUG. 3      |
| TIME START (LST)              | 1800        | 1815        | 1830        | 1840        | 1755        | 2230        |
| DURATION(HR.MIN)              | 10.15       | 10.15       | 10.00       | 10.20       | 10.15       | 8.00        |
| START N. LAT. (DEG)<br>(MIN)  | 48<br>13.0  | 48<br>9.4   | 48<br>31.2  | 48<br>14.5  | 48<br>14.9  | 48<br>16.0  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>36.2 | 130<br>58.7 | 131<br>4.4  | 132<br>10.6 | 133<br>31.5 | 133<br>8.0  |
| DIRECTION (DEG.TRUE)          | 090         | 280         | 090         | 270         | 090         | 090         |
| FINISH N. LAT. (DEG)<br>(MIN) | 48<br>8.5   | 48<br>12.1  | 48<br>31.1  | 48<br>15.1  | 48<br>14.8  | 48<br>16.0  |
| W.LONG. (DEG)<br>(MIN)        | 130<br>34.2 | 131<br>33.9 | 130<br>22.2 | 132<br>52.8 | 132<br>44.0 | 132<br>44.4 |
| LENGTH OF SET KM.             | 56.0        | 49.0        | 49.0        | 49.0        | 49.0        | 28.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 14.4        | 14.4        | 15.1        | 15.0        | 14.8        | 14.6        |
| END TEMP.(DEG.C)              | 14.4        | 14.3        | 14.9        | 14.5        | 15.0        | 14.8        |
| NO. OF GROUPS.                | 8           | 7           | 7           | 7           | 7           | 4           |
| TOTAL SQUID (KG)              | 20000       | 11162       | 14666       | 16762       | 33714       | 19581       |

Table 4a (cont'd)

| SET NO.              | 43      | 44      | 45      | 46     | 47     | 48     |
|----------------------|---------|---------|---------|--------|--------|--------|
| DATE                 | JULY 29 | JULY 30 | JULY 31 | AUG. 1 | AUG. 2 | AUG. 3 |
| TOTAL CATCH PIECES   | 10250*  | 11407*  | 9837*   | 10287* | 18391* | 10048* |
| TOTAL CATCH WEIGHT   | 36741*  | 30662*  | 33264*  | 30365* | 49475* | 27277* |
| <b>INVERTEBRATES</b> |         |         |         |        |        |        |
| FLYING SQUID         | 8688    | 4520    | 5672    | 7650   | 13955  | 8220   |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..     | ..     | ..     |
| UNIDENT. SQUID       | ..      | ..      | ..      | ..     | ..     | ..     |
| <b>FISH</b>          |         |         |         |        |        |        |
| POMFRET              | 512*    | 4923*   | 2393*   | 769*   | 2393*  | 683*   |
| JACK MACKEREL        | 16*     | 8*      | ..      | 24*    | 291*   | 75*    |
| ALBACORE             | ..      | 2       | ..      | 5      | 12     | 18     |
| STEELHEAD            | 3       | 5       | 8       | 2      | 4      | 2      |
| CHUM SALMON          | 2       | ..      | ..      | ..     | ..     | ..     |
| SOCKEYE SALMON       | 1       | ..      | ..      | ..     | ..     | ..     |
| YELLOWTAIL           | ..      | ..      | ..      | ..     | 5      | ..     |
| PELAGIC ARMOURHEAD   | ..      | ..      | 5       | ..     | ..     | ..     |
| PINK SALMON          | 1       | ..      | ..      | ..     | ..     | ..     |
| COHO SALMON          | 1       | 1       | 1       | ..     | ..     | ..     |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..     | ..     | ..     |
| SKILFISH             | ..      | ..      | ..      | ..     | ..     | ..     |
| PACIFIC BONITO       | ..      | ..      | ..      | ..     | ..     | ..     |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..     | ..     | ..     |
| UNIDENT. FISH        | ..      | ..      | ..      | ..     | ..     | ..     |
| <b>SELACHI</b>       |         |         |         |        |        |        |
| BLUE SHARK           | 1000    | 1940    | 1720    | 1800   | 1700   | 1010   |
| SALMON SHARK         | 16      | ..      | 26      | 26     | 21     | 18     |
| THRESHER SHARK       | ..      | 1       | ..      | ..     | ..     | ..     |
| BONITO SHARK         | ..      | ..      | ..      | ..     | ..     | ..     |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..     | ..     | ..     |
| <b>MAMMALS</b>       |         |         |         |        |        |        |
| DALL PORPOISE        | ..      | ..      | 1       | ..     | ..     | ..     |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | ..      | ..     | ..     | ..     |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..     | ..     | ..     |
| PILOT WHALE          | ..      | ..      | ..      | ..     | ..     | ..     |
| FUR SEAL             | ..      | ..      | ..      | ..     | ..     | ..     |
| STENELLA SP          | ..      | ..      | ..      | ..     | ..     | ..     |
| <b>BIRDS</b>         |         |         |         |        |        |        |
| SOOTY SHEARWATER     | 8       | 7       | 8       | 9      | 10     | 20     |
| STORM PETRELS        | ..      | ..      | ..      | ..     | ..     | ..     |
| TERNS                | 1       | ..      | 2       | 2      | ..     | 2      |
| CASSIN'S AUKLET      | 1       | ..      | ..      | ..     | ..     | ..     |
| ALBATROSS            | ..      | ..      | 1       | ..     | ..     | ..     |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..     | ..     | ..     |
| COMMON MURRE         | ..      | ..      | ..      | ..     | ..     | ..     |

Table 4a (cont'd)

| SET NO.                       | 49          | 50          | 51          | 52          | 53          | 54          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | AUG. 4      | AUG. 5      | AUG. 6      | AUG. 7      | AUG. 10     | AUG. 11     |
| TIME START (LST)              | 1700        | 1915        | 2035        | 1730        | 1730        | 1940        |
| DURATION(HR.MIN)              | 11.00       | 10.15       | 7.25        | 10.30       | 10.40       | 9.30        |
| START N. LAT. (DEG)<br>(MIN)  | 48<br>13.5  | 48<br>12.7  | 48<br>40.1  | 49<br>3.9   | 48<br>56.0  | 48<br>55.7  |
| W. LONG. (DEG)<br>(MIN)       | 132<br>46.8 | 133<br>10.9 | 133<br>16.8 | 133<br>31.1 | 131<br>44.3 | 131<br>32.6 |
| DIRECTION (DEG.TRUE)          | 095         | 095         | 110         | 110         | 110         | 100         |
| FINISH N. LAT. (DEG)<br>(MIN) | 48<br>9.7   | 48<br>9.1   | 48<br>37.1  | 48<br>54.6  | 48<br>44.3  | 48<br>49.8  |
| W.LONG. (DEG)<br>(MIN)        | 132<br>51.1 | 133<br>10.3 | 132<br>53.1 | 133<br>0.2  | 131<br>7.0  | 130<br>54.6 |
| LENGTH OF SET KM.             | 49.0        | 42.0        | 28.0        | 42.0        | 56.0        | 49.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 14.8        | 14.7        | 14.0        | 14.0        | 13.9        | 13.8        |
| END TEMP.(DEG.C)              | 14.6        | 14.8        | 14.4        | 14.4        | 14.4        | 14.4        |
| NO. OF GROUPS.                | 7           | 6           | 4           | 6           | 8           | 7           |
| TOTAL SQUID (KG)              | 30781       | 11428       | 8457        | 7886        | 27276       | 45695       |

Table 4a (cont'd)

| SET NO.              | 49     | 50     | 51     | 52     | 53      | 54      |
|----------------------|--------|--------|--------|--------|---------|---------|
| DATE                 | AUG. 4 | AUG. 5 | AUG. 6 | AUG. 7 | AUG. 10 | AUG. 11 |
| TOTAL CATCH PIECES   | 15156* | 17588* | 5147*  | 4176*  | 13515*  | 21079*  |
| TOTAL CATCH WEIGHT   | 39332* | 46569* | 14633* | 13197* | 38286*  | 50110   |
| <b>INVERTEBRATES</b> |        |        |        |        |         |         |
| FLYING SQUID         | 12984  | 4559   | 3472   | 2670   | 10893   | 20000   |
| PELAGIC OCTOPUS      | ..     | ..     | ..     | ..     | ..      | ..      |
| UNIDENT. SQUID       | ..     | ..     | ..     | ..     | ..      | ..      |
| <b>FISH</b>          |        |        |        |        |         |         |
| POMFRET              | 897*   | 10461* | 769*   | 897*   | 380*    | 290*    |
| JACK MACKEREL        | 129*   | 166*   | 158*   | 83*    | 16*     | 45*     |
| ALBACORE             | 17     | 20     | 11     | 11     | 37      | 43      |
| STEELHEAD            | ..     | ..     | ..     | 2      | 3       | ..      |
| CHUM SALMON          | ..     | ..     | ..     | ..     | ..      | ..      |
| SOCKEYE SALMON       | ..     | ..     | ..     | ..     | ..      | ..      |
| YELLOWTAIL           | ..     | ..     | 1      | ..     | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..     | ..     | ..     | ..     | ..      | ..      |
| PINK SALMON          | ..     | ..     | ..     | ..     | ..      | ..      |
| COHO SALMON          | ..     | ..     | ..     | ..     | ..      | ..      |
| LONG NOSE LANCETFISH | ..     | ..     | ..     | ..     | ..      | ..      |
| SKILFISH             | ..     | ..     | ..     | ..     | ..      | ..      |
| PACIFIC BONITO       | ..     | 1      | 1      | ..     | ..      | ..      |
| OCEAN SUNFISH        | ..     | ..     | ..     | ..     | ..      | ..      |
| UNIDENT. FISH        | ..     | ..     | ..     | ..     | ..      | ..      |
| <b>SELACHI</b>       |        |        |        |        |         |         |
| BLUE SHARK           | 1100   | 2340   | 710    | 480    | 2140    | 680     |
| SALMON SHARK         | 26     | 23     | 11     | 18     | 36      | 21      |
| THRESHER SHARK       | ..     | ..     | ..     | ..     | ..      | ..      |
| BONITO SHARK         | ..     | ..     | ..     | ..     | 4       | ..      |
| PELAGIC STINGRAY     | ..     | ..     | ..     | ..     | ..      | ..      |
| <b>MAMMALS</b>       |        |        |        |        |         |         |
| DALL PORPOISE        | ..     | ..     | ..     | ..     | 1       | ..      |
| N.RT.-WHALE DOLPHIN  | ..     | ..     | ..     | ..     | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..     | ..     | ..     | ..     | ..      | ..      |
| PILOT WHALE          | ..     | ..     | ..     | ..     | ..      | ..      |
| FUR SEAL             | ..     | ..     | ..     | ..     | ..      | ..      |
| STENELLA SP          | ..     | ..     | ..     | ..     | 1       | ..      |
| <b>BIRDS</b>         |        |        |        |        |         |         |
| SOOTY SHEARWATER     | 3      | 18     | 14     | 15     | ..      | ..      |
| STORM PETRELS        | ..     | ..     | ..     | ..     | ..      | ..      |
| TERNS                | ..     | ..     | ..     | ..     | 2       | ..      |
| CASSIN'S AUKLET      | ..     | ..     | ..     | ..     | 2       | ..      |
| ALBATROSS            | ..     | ..     | ..     | ..     | ..      | ..      |
| RHINOCEROS AUKLET    | ..     | ..     | ..     | ..     | ..      | ..      |
| COMMON MURRE         | ..     | ..     | ..     | ..     | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 55          | 56          | 57          | 58          | 59          | 60          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | AUG. 13     | AUG. 14     | AUG. 15     | AUG. 16     | AUG. 17     | AUG. 18     |
| TIME START (LST)              | 1830        | 1750        | 1845        | 1810        | 1855        | 1930        |
| DURATION(HR.MIN)              | 10.00       | 10.40       | 10.15       | 10.40       | 10.35       | 10.00       |
| START N. LAT. (DEG)<br>(MIN)  | 49<br>2.3   | 49<br>26.6  | 49<br>30.4  | 49<br>38.4  | 49<br>40.0  | 49<br>48.3  |
| W. LONG. (DEG)<br>(MIN)       | 131<br>21.1 | 131<br>32.8 | 131<br>30.5 | 131<br>42.5 | 131<br>24.4 | 132<br>0.0  |
| DIRECTION (DEG.TRUE)          | 110         | 110         | 115         | 105         | 285         | 100         |
| FINISH N. LAT. (DEG)<br>(MIN) | 48<br>56.0  | 49<br>17.1  | 49<br>21.8  | 49<br>31.7  | 49<br>44.6  | 49<br>44.3  |
| W.LONG. (DEG)<br>(MIN)        | 131<br>0.0  | 130<br>58.0 | 130<br>52.5 | 131<br>2.6  | 131<br>56.8 | 131<br>26.8 |
| LENGTH OF SET KM.             | 35.0        | 49.0        | 49.0        | 49.0        | 42.0        | 42.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 14.3        | 14.4        | 14.3        | 14.6        | 14.3        | 14.4        |
| END TEMP.(DEG.C)              | 14.4        | 14.4        | 13.8        | 13.9        | 14.3        | 14.3        |
| NO. OF GROUPS.                | 5           | 7           | 7           | 7           | 6           | 6           |
| TOTAL SQUID (KG)              | 11238       | 28800       | 17828       | 34019       | 38209       | 36380       |

Table 4a (cont'd)

| SET NO.              | 55      | 56      | 57      | 58      | 59      | 60      |
|----------------------|---------|---------|---------|---------|---------|---------|
| DATE                 | AUG. 13 | AUG. 14 | AUG. 15 | AUG. 16 | AUG. 17 | AUG. 18 |
| TOTAL CATCH PIECES   | 4923*   | 13911*  | 10515*  | 16555*  | 17804*  | 18371*  |
| TOTAL CATCH WEIGHT   | 14175*  | 36171*  | 46211*  | 42587*  | 48736*  | 49636*  |
| <b>INVERTEBRATES</b> |         |         |         |         |         |         |
| FLYING SQUID         | 4126    | 11846   | 7087    | 14427   | 16304   | 15852   |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>          |         |         |         |         |         |         |
| POMFRET              | 470*    | 982*    | 269*    | 431*    | 641*    | 982*    |
| JACK MACKEREL        | 16*     | ..      | ..      | ..      | ..      | ..      |
| ALBACORE             | 17      | 66      | 215     | 54      | 24      | 10      |
| STEELHEAD            | 1       | 3       | 4       | 3       | ..      | ..      |
| CHUM SALMON          | ..      | 3       | 3       | ..      | 3       | 1       |
| SOCKEYE SALMON       | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL           | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..      | ..      | ..      | ..      | ..      | ..      |
| PINK SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH             | ..      | ..      | ..      | ..      | ..      | ..      |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | 1       | ..      |
| <b>SELACHI</b>       |         |         |         |         |         |         |
| BLUE SHARK           | 280     | 980     | 2895    | 1610    | 800     | 1500    |
| SALMON SHARK         | 12      | 23      | 30      | 28      | 30      | 20      |
| THRESHER SHARK       | ..      | ..      | ..      | ..      | ..      | ..      |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>       |         |         |         |         |         |         |
| DALL PORPOISE        | ..      | ..      | ..      | ..      | ..      | ..      |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE          | ..      | ..      | ..      | ..      | ..      | ..      |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |         |         |         |         |         |         |
| SOOTY SHEARWATER     | ..      | 5       | 9       | 1       | ..      | 6       |
| STORM PETRELS        | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                | ..      | 2       | 3       | 1       | ..      | ..      |
| CASSIN'S AUKLET      | 1       | 1       | ..      | ..      | 1       | ..      |
| ALBATROSS            | ..      | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..      | ..      |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4a (cont'd)

| SET NO.                       | 61          | 62          | 63          | 64          | 65          | 66          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | AUG. 19     | AUG. 20     | AUG. 21     | AUG. 22     | AUG. 23     | AUG. 24     |
| TIME START (LST)              | 1825        | 1735        | 1725        | 1725        | 1740        | 1725        |
| DURATION(HR.MIN)              | 10.50       | 10.55       | 11.05       | 11.20       | 11.20       | 11.35       |
| START N. LAT. (DEG)<br>(MIN)  | 49<br>49.3  | 49<br>52.0  | 49<br>54.6  | 50<br>1.9   | 50<br>17.8  | 50<br>20.9  |
| W. LONG. (DEG)<br>(MIN)       | 131<br>32.6 | 132<br>12.9 | 132<br>1.3  | 132<br>31.3 | 132<br>33.4 | 132<br>25.7 |
| DIRECTION (DEG.TRUE)          | 100         | 100         | 280         | 100         | 100         | 280         |
| FINISH N. LAT. (DEG)<br>(MIN) | 49<br>53.8  | 49<br>47.1  | 49<br>59.4  | 49<br>56.6  | 50<br>13.2  | 50<br>24.9  |
| W.LONG. (DEG)<br>(MIN)        | 132<br>4.5  | 131<br>34.4 | 132<br>38.6 | 131<br>53.8 | 131<br>58.2 | 132<br>59.3 |
| LENGTH OF SET KM.             | 42.0        | 49.0        | 49.0        | 49.0        | 49.0        | 49.0        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 1           | 1           | 1           | 1           | 1           | 1           |
| START TEMP.(DEG.C)            | 14.5        | 14.6        | 14.7        | 14.9        | 15.1        | 15.3        |
| END TEMP.(DEG.C)              | 14.3        | 14.5        | 14.6        | 15.2        | 15.0        | 14.4        |
| NO. OF GROUPS.                | 6           | 7           | 7           | 7           | 7           | 7           |
| TOTAL SQUID (KG)              | 17904       | 19314       | 27771       | 5295        | 8388        | 10361       |

Table 4a (cont'd)

| SET NO.              | 61      | 62      | 63      | 64      | 65      | 66      |
|----------------------|---------|---------|---------|---------|---------|---------|
| DATE                 | AUG. 19 | AUG. 20 | AUG. 21 | AUG. 22 | AUG. 23 | AUG. 24 |
| TOTAL CATCH PIECES   | 9449*   | 11058*  | 13724*  | 2901*   | 4706*   | 5689*   |
| TOTAL CATCH WEIGHT   | 28789*  | 32039*  | 40732   | 11015   | 15290*  | 16297*  |
| <b>INVERTEBRATES</b> |         |         |         |         |         |         |
| FLYING SQUID         | 7176    | 8419    | 11581   | 1854    | 3834    | 4102    |
| PELAGIC OCTOPUS      | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. SQUID       | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>          |         |         |         |         |         |         |
| POMFRET              | 811*    | 982*    | 769*    | 346*    | 769*    | 897*    |
| JACK MACKEREL        | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBACORE             | 32      | 27      | 55      | 59      | 10      | 1       |
| STEELHEAD            | 2       | 3       | ..      | ..      | ..      | ..      |
| CHUM SALMON          | 3       | 1       | ..      | ..      | 2       | ..      |
| SOCKEYE SALMON       | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL           | ..      | ..      | 1       | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD   | ..      | ..      | ..      | ..      | ..      | ..      |
| PINK SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON          | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH             | ..      | ..      | ..      | ..      | ..      | ..      |
| PACIFIC BONITO       | ..      | ..      | ..      | ..      | ..      | ..      |
| OCEAN SUNFISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| UNIDENT. FISH        | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>       |         |         |         |         |         |         |
| BLUE SHARK           | 1400    | 1600    | 1300    | 630     | 76      | 670     |
| SALMON SHARK         | 18      | 21      | 18      | 12      | 14      | 16      |
| THRESHER SHARK       | 1       | 1       | ..      | ..      | ..      | ..      |
| BONITO SHARK         | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC STINGRAY     | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>       |         |         |         |         |         |         |
| DALL PORPOISE        | ..      | ..      | ..      | ..      | 1       | ..      |
| N.RT.-WHALE DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN  | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE          | ..      | ..      | ..      | ..      | ..      | ..      |
| FUR SEAL             | ..      | ..      | ..      | ..      | ..      | ..      |
| STENELLA SP          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>         |         |         |         |         |         |         |
| SOOTY SHEARWATER     | 5       | ..      | ..      | ..      | ..      | 2       |
| STORM PETRELS        | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                | 1       | 4       | ..      | ..      | ..      | ..      |
| CASSIN'S AUKLET      | ..      | ..      | ..      | ..      | ..      | 1       |
| ALBATROSS            | ..      | ..      | ..      | ..      | ..      | ..      |
| RHINOCEROS AUKLET    | ..      | ..      | ..      | ..      | ..      | ..      |
| COMMON MURRE         | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4b. Bridge log and jig catch information for each night's fishing by the TOMI MARU NO.88 in 1987.

| SET NO.                                | 1            | 2            | 3            | 4            | 5            | 6            |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| DATE                                   | JUNE 15      | JUNE 16      | JUNE 17      | JUNE 18      | JUNE 20      | JUNE 21      |
| TIME START (LST)                       | 2130         | 2040         | 2220         | 2200         | 2330         | 2130         |
| DURATION(HR.MIN)                       | 4.00         | 3.00         | 3.40         | 3.50         | 1.15         | 4.30         |
| START N. LAT. (DEG)<br>(MIN)           | 42<br>21.6   | 41<br>37.8   | 42<br>57.1   | 43<br>32.0   | 45<br>2.1    | 45<br>12.2   |
| W. LONG. (DEG)<br>(MIN)                | 131<br>7.4   | 130<br>36.3  | 131<br>26.8  | 130<br>10.0  | 129<br>53.8  | 129<br>31.8  |
| FINISH N. LAT. (DEG)<br>(MIN)          | 42<br>22.3   | 41<br>38.7   | 42<br>54.8   | 43<br>32.0   | 45<br>2.1    | 45<br>12.2   |
| W.LONG. (DEG)<br>(MIN)                 | 131<br>6.6   | 130<br>35.4  | 131<br>27.1  | 130<br>10.0  | 129<br>53.8  | 129<br>31.8  |
| DEPTH (M)                              | 100          | 100          | 100          | 100          | 100          | 100          |
| SEE FIGURE NO.                         | 2            | 2            | 2            | 2            | 2            | 2            |
| START TEMP.(DEG.C)<br>END TEMP.(DEG.C) | 14.0<br>14.0 | 14.4<br>14.3 | 14.0<br>14.0 | 14.6<br>14.6 | 13.0<br>13.0 | 13.1<br>13.1 |
| NO. OF JIGS/LINE                       | 26           | 26           | 26           | 26           | 26           | 26           |
| NO. OF LINES                           | 4            | 6            | 4            | 6            | 4            | 4            |
| TOTAL SQUID (KG)                       | 0            | 0            | 2            | 0            | 0            | 55           |

Table 4b (cont'd)

| SET NO.                       | 1       | 2       | 3       | 4       | 5       | 6       |
|-------------------------------|---------|---------|---------|---------|---------|---------|
| DATE                          | JUNE 15 | JUNE 16 | JUNE 17 | JUNE 18 | JUNE 20 | JUNE 21 |
| TOTAL CATCH PIECES            | ..      | ..      | 1       | ..      | ..      | 31      |
| TOTAL CATCH WEIGHT            | ..      | ..      | 2       | ..      | ..      | 55      |
| INVERTEBRATES<br>FLYING SQUID | ..      | ..      | 1       | ..      | ..      | 31      |

Table 4b (cont'd)

| SET NO.                                | 7            | 8            | 9            | 10           | 11           | 12           |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| DATE                                   | JUNE 22      | JUNE 23      | JUNE 24      | JUNE 25      | JUNE 27      | JULY 1       |
| TIME START (LST)                       | 2130         | 2320         | 2330         | 2300         | 2300         | 0000         |
| DURATION(HR.MIN)                       | 4.40         | 2.40         | 2.00         | 2.00         | 2.00         | 1.00         |
| START N. LAT. (DEG)<br>(MIN)           | 45<br>13.3   | 45<br>15.8   | 45<br>35.0   | 45<br>14.0   | 46<br>10.0   | 46<br>18.0   |
| W. LONG. (DEG)<br>(MIN)                | 130<br>1.9   | 129<br>48.2  | 129<br>43.0  | 129<br>49.0  | 131<br>2.0   | 131<br>27.0  |
| FINISH N. LAT. (DEG)<br>(MIN)          | 45<br>13.3   | 45<br>15.8   | 45<br>35.0   | 45<br>14.0   | 46<br>10.0   | 46<br>18.0   |
| W.LONG. (DEG)<br>(MIN)                 | 130<br>1.9   | 129<br>48.2  | 129<br>43.0  | 129<br>49.0  | 131<br>2.0   | 131<br>27.0  |
| DEPTH (M)                              | 100          | 100          | 100          | 100          | 100          | 100          |
| SEE FIGURE NO.                         | 2            | 2            | 2            | 2            | 2            | 2            |
| START TEMP.(DEG.C)<br>END TEMP.(DEG.C) | 12.6<br>12.6 | 13.6<br>13.6 | 14.0<br>14.0 | 13.5<br>13.5 | 13.0<br>13.0 | 12.7<br>12.7 |
| NO. OF JIGS/LINE                       | 26           | 26           | 26           | 26           | 26           | 26           |
| NO. OF LINES                           | 2            | 2            | 4            | 4            | 2            | 2            |
| TOTAL SQUID (KG)                       | 3            | 0            | 0            | 0            | 0            | 0            |

Table 4b (cont'd)

| SET NO.                       | 7       | 8       | 9       | 10      | 11      | 12     |
|-------------------------------|---------|---------|---------|---------|---------|--------|
| DATE                          | JUNE 22 | JUNE 23 | JUNE 24 | JUNE 25 | JUNE 27 | JULY 1 |
| TOTAL CATCH PIECES            | 2       | ..      | ..      | ..      | ..      | ..     |
| TOTAL CATCH WEIGHT            | 3       | ..      | ..      | ..      | ..      | ..     |
| INVERTEBRATES<br>FLYING SQUID | 2       | ..      | ..      | ..      | ..      | ..     |

Table 4b (cont'd)

| SET NO.                                | 13           | 14           | 15           | 16           | 17           | 18           |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| DATE                                   | JULY 1       | JULY 2       | JULY 4       | JULY 4       | JULY 9       | JULY 19      |
| TIME START (LST)                       | 2300         | 2300         | 2300         | 2300         | 2300         | 2230         |
| DURATION(HR.MIN)                       | 2.00         | 2.00         | 2.00         | 2.00         | 2.00         | 2.30         |
| START N. LAT. (DEG)<br>(MIN)           | 46<br>26.0   | 46<br>28.0   | 46<br>34.0   | 46<br>34.0   | 47<br>20.0   | 47<br>29.0   |
| W. LONG. (DEG)<br>(MIN)                | 130<br>14.0  | 130<br>0.2   | 129<br>53.0  | 129<br>53.0  | 129<br>24.0  | 129<br>42.0  |
| FINISH N. LAT. (DEG)<br>(MIN)          | 46<br>26.0   | 46<br>28.0   | 46<br>34.0   | 46<br>34.0   | 47<br>20.0   | 47<br>29.0   |
| W.LONG. (DEG)<br>(MIN)                 | 130<br>14.0  | 130<br>0.2   | 129<br>53.0  | 129<br>53.0  | 129<br>24.0  | 129<br>42.0  |
| DEPTH (M)                              | 100          | 100          | 100          | 100          | 100          | 100          |
| SEE FIGURE NO.                         | 2            | 2            | 2            | 2            | 2            | 2            |
| START TEMP.(DEG.C)<br>END TEMP.(DEG.C) | 12.9<br>12.9 | 12.7<br>12.7 | 13.1<br>13.1 | 13.1<br>13.1 | 13.3<br>13.3 | 13.6<br>13.6 |
| NO. OF JIGS/LINE                       | 26           | 26           | 26           | 26           | 26           | 26           |
| NO. OF LINES                           | 3            | 3            | 3            | 2            | 3            | 2            |
| TOTAL SQUID (KG)                       | 0            | 10           | 0            | 0            | 0            | 0            |

Table 4b (cont'd)

| SET NO.                       | 13     | 14     | 15     | 16     | 17     | 18      |
|-------------------------------|--------|--------|--------|--------|--------|---------|
| DATE                          | JULY 1 | JULY 2 | JULY 4 | JULY 4 | JULY 9 | JULY 19 |
| TOTAL CATCH PIECES            | ..     | 5      | ..     | ..     | ..     | ..      |
| TOTAL CATCH WEIGHT            | ..     | 10     | ..     | ..     | ..     | ..      |
| INVERTEBRATES<br>FLYING SQUID | ..     | 5      | ..     | ..     | ..     | ..      |

Table 4b (cont'd)

|                               |             |
|-------------------------------|-------------|
| SET NO.                       | 19          |
| DATE                          | JULY 23     |
| TIME START (LST)              | 2200        |
| DURATION(HR.MIN)              | 3.00        |
| START N. LAT. (DEG)<br>(MIN)  | 47<br>39.0  |
| W. LONG. (DEG)<br>(MIN)       | 128<br>41.0 |
| FINISH N. LAT. (DEG)<br>(MIN) | 47<br>39.0  |
| W.LONG. (DEG)<br>(MIN)        | 128<br>41.0 |
| DEPTH (M)                     | 100         |
| SEE FIGURE NO.                | 2           |
| START TEMP.(DEG.C)            | 14.6        |
| END TEMP.(DEG.C)              | 14.6        |
| NO. OF JIGS/LINE              | 26          |
| NO. OF LINES                  | 2           |
| TOTAL SQUID (KG)              | 1           |

Table 4b (cont'd)

|                               |         |
|-------------------------------|---------|
| SET NO.                       | 19      |
| DATE                          | JULY 23 |
| TOTAL CATCH PIECES            | 1       |
| TOTAL CATCH WEIGHT            | 1       |
| INVERTEBRATES<br>FLYING SQUID | 1       |

Table 4c. Bridge log and drift net catch information, in pieces, for each night's fishing by the OCEAN PEARL in 1987. \* = estimate, LST = Local Standard Time.

| SET NO.                       | 1           | 2           | 3           | 4           | 5          | 6           |
|-------------------------------|-------------|-------------|-------------|-------------|------------|-------------|
| DATE                          | JUNE 13     | JUNE 14     | JUNE 15     | JUNE 16     | JUNE 17    | JUNE 18     |
| TIME START (LST)              | 2125        | 2030        | 1805        | 1910        | 1835       | 1820        |
| DURATION(HR.MIN)              | 6.35        | 6.20        | 8.55        | 7.50        | 8.25       | 8.40        |
| START N. LAT. (DEG)<br>(MIN)  | 43<br>48.5  | 41<br>57.1  | 41<br>3.9   | 41<br>6.7   | 41<br>45.5 | 41<br>51.8  |
| W. LONG. (DEG)<br>(MIN)       | 129<br>25.5 | 129<br>29.1 | 130<br>27.6 | 130<br>9.2  | 130<br>6.7 | 129<br>15.7 |
| DIRECTION (DEG.TRUE)          | 270         | 270         | 285         | 090         | 270        | 270         |
| FINISH N. LAT. (DEG)<br>(MIN) | 43<br>47.5  | 41<br>58.7  | 41<br>4.5   | 41<br>6.2   | 41<br>53.6 | 41<br>54.1  |
| W.LONG. (DEG)<br>(MIN)        | 129<br>37.1 | 129<br>44.4 | 130<br>50.4 | 129<br>45.7 | 130<br>6.7 | 129<br>39.4 |
| LENGTH OF SET KM.             | 16.0        | 21.5        | 32.5        | 32.5        | 27.0       | 32.5        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10      | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3          | 3           |
| START TEMP.(DEG.C)            | 14.0        | 14.3        | 14.8        | 15.4        | 15.4       | 15.5        |
| END TEMP.(DEG.C)              | 13.7        | 14.6        | 15.1        | 15.4        | 15.0       | 15.7        |
| NO. OF GROUPS.                | 3           | 4           | 6           | 6           | 5          | 6           |
| TOTAL SQUID (KG)              | 680         | 820         | 980         | 420         | 40         | 620         |

Table 4c (cont'd)

| SET NO.                  | 1       | 2       | 3       | 4       | 5       | 6       |
|--------------------------|---------|---------|---------|---------|---------|---------|
| DATE                     | JUNE 13 | JUNE 14 | JUNE 15 | JUNE 16 | JUNE 17 | JUNE 18 |
| TOTAL CATCH PIECES       | 453     | 882     | 1112    | 905     | 473     | 1027    |
| TOTAL CATCH WEIGHT       | 892     | 1600    | 2132    | 1427    | 1030*   |         |
| 2057*                    |         |         |         |         |         |         |
| <b>INVERTEBRATES</b>     |         |         |         |         |         |         |
| FLYING SQUID             | 295     | 355     | 425     | 180     | 20      | 265     |
| PELAGIC OCTOPUS          | ..      | ..      | ..      | ..      | 3       | 1       |
| NAIL SQUID               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>              |         |         |         |         |         |         |
| POMFRET                  | 65      | 208     | 120     | 68      | 10      | 6       |
| JACK MACKEREL            | 3       | 19      | 167     | 56      | 16      | 31      |
| SOCKEYE SALMON           | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBACORE                 | ..      | ..      | ..      | ..      | ..      | ..      |
| STEELHEAD                | ..      | ..      | ..      | ..      | ..      | ..      |
| CHUM SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| PINK SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD       | ..      | ..      | ..      | ..      | ..      | ..      |
| CHUB MACKEREL            | 4       | ..      | ..      | ..      | ..      | ..      |
| SAURY                    | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH     | ..      | ..      | ..      | ..      | ..      | ..      |
| ROUGH POMFRET            | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH                 | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>           |         |         |         |         |         |         |
| BLUE SHARK               | 84      | 300     | 400     | 600     | 420     | 720     |
| SALMON SHARK             | 2       | ..      | ..      | 1       | 3       | 2       |
| THRESHER SHARK           | ..      | ..      | ..      | ..      | ..      | ..      |
| BASKING SHARK            | ..      | ..      | ..      | ..      | ..      | ..      |
| SOUPFIN SHARK            | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>           |         |         |         |         |         |         |
| DALL PORPOISE            | ..      | ..      | ..      | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN      | ..      | ..      | ..      | ..      | 1       | ..      |
| N.RT.-WHALE DOLPHIN      | ..      | ..      | ..      | ..      | ..      | ..      |
| STELLAR SEA LION         | ..      | ..      | ..      | ..      | ..      | ..      |
| HARBOUR PORPOISE         | ..      | ..      | ..      | ..      | ..      | 1       |
| PILOT WHALE              | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>             |         |         |         |         |         |         |
| SOOTY SHEARWATER         | ..      | ..      | ..      | ..      | ..      | 1       |
| CASSIN'S AUKLET          | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBATROSS                | ..      | ..      | ..      | ..      | ..      | ..      |
| MURRES, AUKLETS, PUFFINS | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                    | ..      | ..      | ..      | ..      | ..      | ..      |
| SL.-BILL. SHEARWATER     | ..      | ..      | ..      | ..      | ..      | ..      |
| STORM PETRELS            | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4c (cont'd)

| SET NO.                       | 7           | 8           | 9           | 10          | 11          | 12          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JUNE 19     | JUNE 20     | JUNE 22     | JUNE 22     | JUNE 23     | JUNE 24     |
| TIME START (LST)              | 1805        | 1830        | 0005        | 1755        | 1805        | 1705        |
| DURATION(HR.MIN)              | 7.55        | 8.20        | 2.55        | 9.05        | 8.50        | 10.50       |
| START N. LAT. (DEG)<br>(MIN)  | 42<br>9.0   | 41<br>47.1  | 43<br>43.2  | 45<br>9.3   | 45<br>22.0  | 45<br>25.1  |
| W. LONG. (DEG)<br>(MIN)       | 129<br>14.9 | 129<br>9.4  | 129<br>59.2 | 130<br>22.5 | 130<br>40.6 | 130<br>27.0 |
| DIRECTION (DEG.TRUE)          | 270         | 345         | 090         | 270         | 090         | 090         |
| FINISH N. LAT. (DEG)<br>(MIN) | 42<br>15.0  | 42<br>4.1   | 43<br>42.9  | 45<br>9.5   | 45<br>22.7  | 45<br>25.6  |
| W.LONG. (DEG)<br>(MIN)        | 129<br>29.9 | 129<br>12.3 | 130<br>3.1  | 130<br>46.0 | 130<br>16.0 | 130<br>1.6  |
| LENGTH OF SET KM.             | 27.5        | 32.5        | 5.2         | 32.5        | 32.4        | 32.3        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           |
| START TEMP.(DEG.C)            | 14.6        | 14.7        | 13.6        | 13.7        | 13.2        | 15.4        |
| END TEMP.(DEG.C)              | 14.9        | 14.6        | 13.6        | 13.7        | 14.6        | 15.0        |
| NO. OF GROUPS.                | 5           | 6           | 1           | 6           | 6           | 6           |
| TOTAL SQUID (KG)              | 880         | 1400        | 15          | 8950        | 7530        | 7740        |

Table 4c (cont'd)

| SET NO.                  | 7       | 8       | 9       | 10      | 11      | 12      |
|--------------------------|---------|---------|---------|---------|---------|---------|
| DATE                     | JUNE 19 | JUNE 20 | JUNE 22 | JUNE 22 | JUNE 23 | JUNE 24 |
| TOTAL CATCH PIECES       | 826     | 1228    | 26      | 4388    | 3531    | 4440    |
| TOTAL CATCH WEIGHT       | 1710*   | 3407*   | 86      | 10628*  | 10857*  | 11421*  |
| <b>INVERTEBRATES</b>     |         |         |         |         |         |         |
| FLYING SQUID             | 380     | 605     | 8       | 3890    | 3270    | 3360    |
| PELAGIC OCTOPUS          | ..      | ..      | ..      | ..      | ..      | ..      |
| NAIL SQUID               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>              |         |         |         |         |         |         |
| POMFRET                  | 12      | 14      | 1       | 4       | 11      | 300     |
| JACK MACKEREL            | 121     | 272     | ..      | 4       | 4       | 2       |
| SOCKEYE SALMON           | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBACORE                 | ..      | ..      | ..      | ..      | ..      | ..      |
| STEELHEAD                | ..      | 1       | ..      | 1       | 1       | ..      |
| CHUM SALMON              | ..      | ..      | ..      | ..      | ..      | 1       |
| PINK SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD       | ..      | ..      | ..      | 1       | ..      | ..      |
| CHUB MACKEREL            | ..      | ..      | ..      | ..      | ..      | ..      |
| SAURY                    | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH     | ..      | ..      | ..      | ..      | ..      | ..      |
| ROUGH POMFRET            | ..      | ..      | ..      | ..      | ..      | 1       |
| SKILFISH                 | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>           |         |         |         |         |         |         |
| BLUE SHARK               | 310     | 330     | 17      | 486     | 240     | 770     |
| SALMON SHARK             | 2       | 4       | ..      | 1       | 4       | 2       |
| THRESHER SHARK           | ..      | 1       | ..      | ..      | ..      | ..      |
| BASKING SHARK            | ..      | ..      | ..      | ..      | ..      | ..      |
| SOUPFIN SHARK            | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>           |         |         |         |         |         |         |
| DALL PORPOISE            | ..      | ..      | ..      | ..      | ..      | ..      |
| P.WH.-SIDED DOLPHIN      | ..      | ..      | ..      | ..      | ..      | 2       |
| N.RT.-WHALE DOLPHIN      | ..      | ..      | ..      | ..      | ..      | ..      |
| STELLAR SEA LION         | ..      | ..      | ..      | ..      | ..      | ..      |
| HARBOUR PORPOISE         | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE              | ..      | ..      | ..      | ..      | 1       | ..      |
| <b>BIRDS</b>             |         |         |         |         |         |         |
| SOOTY SHEARWATER         | ..      | 1       | ..      | 1       | ..      | 2       |
| CASSIN'S AUKLET          | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBATROSS                | 1       | ..      | ..      | ..      | ..      | ..      |
| MURRES, AUKLETS, PUFFINS | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                    | ..      | ..      | ..      | ..      | ..      | ..      |
| SL.-BILL. SHEARWATER     | ..      | ..      | ..      | ..      | ..      | ..      |
| STORM PETRELS            | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4c (cont'd)

| SET NO.                       |             | 13          | 14          | 15          | 16          | 17          | 18    |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| DATE                          | JUNE 25     | JUNE 26     | JUNE 27     | JUNE 28     | JUNE 29     | JUNE 30     |       |
| TIME START (LST)              | 1820        | 1900        | 1810        | 1850        | 1755        | 1730        |       |
| DURATION(HR.MIN)              | 8.45        | 8.00        | 8.45        | 8.15        | 9.10        | 9.25        |       |
| START N. LAT. (DEG)<br>(MIN)  | 45<br>40.4  | 46<br>41.8  | 46<br>51.1  | 46<br>49.4  | 46<br>42.6  | 46<br>34.7  |       |
| W. LONG. (DEG)<br>(MIN)       | 130<br>30.3 | 130<br>58.8 | 130<br>57.8 | 130<br>35.5 | 130<br>54.5 | 130<br>57.7 |       |
| DIRECTION (DEG.TRUE)          | 270         | 270         | 090         | 090         | 090         | 080         |       |
| FINISH N. LAT. (DEG)<br>(MIN) | 45<br>40.1  | 46<br>41.9  | 46<br>51.1  | 46<br>50.4  | 46<br>44.2  | 46<br>37.6  |       |
| W.LONG. (DEG)<br>(MIN)        | 130<br>55.6 | 131<br>10.4 | 130<br>33.6 | 130<br>13.2 | 130<br>35.9 | 130<br>35.4 |       |
| LENGTH OF SET KM.             | 32.1        | 15.6        | 32.1        | 29.1        | 24.2        | 30.9        |       |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10 |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           | 3     |
| START TEMP.(DEG.C)            | 14.0        | 13.5        | 13.1        | 13.2        | 13.4        | 13.6        |       |
| END TEMP.(DEG.C)              | 13.8        | 13.4        | 13.6        | 13.0        | 13.2        | 13.3        |       |
| NO. OF GROUPS.                | 6           | 3           | 6           | 6           | 5           | 6           |       |
| TOTAL SQUID (KG)              | 5320        | 3060        | 3810        | 6590        | 7490        | 9410        |       |

Table 4c (cont'd)

| SET NO.                  | 13      | 14      | 15      | 16      | 17      | 18      |
|--------------------------|---------|---------|---------|---------|---------|---------|
| DATE                     | JUNE 25 | JUNE 26 | JUNE 27 | JUNE 28 | JUNE 29 | JUNE 30 |
| TOTAL CATCH PIECES       | 2704    | 1883    | 2421    | 4312    | 4103    | 5339    |
| TOTAL CATCH WEIGHT       | 6739*   | 3891    | 5353*   | 9560*   | 9086*   | 13690*  |
| <b>INVERTEBRATES</b>     |         |         |         |         |         |         |
| FLYING SQUID             | 2310    | 1325    | 1655    | 2860    | 3250    | 4090    |
| PELAGIC OCTOPUS          | ..      | ..      | ..      | ..      | ..      | ..      |
| NAIL SQUID               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>              |         |         |         |         |         |         |
| POMFRET                  | 175     | 510     | 550     | 1150    | 680     | 1150    |
| JACK MACKEREL            | 1       | ..      | 1       | ..      | ..      | ..      |
| SOCKEYE SALMON           | ..      | 1       | 3       | 2       | 2       | ..      |
| ALBACORE                 | ..      | ..      | ..      | ..      | ..      | ..      |
| STEELHEAD                | ..      | 2       | 4       | 2       | 1       | 1       |
| CHUM SALMON              | 1       | 1       | 4       | 2       | 2       | ..      |
| PINK SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD       | ..      | ..      | ..      | ..      | ..      | ..      |
| CHUB MACKEREL            | ..      | ..      | ..      | ..      | ..      | ..      |
| SAURY                    | ..      | ..      | 2       | ..      | ..      | ..      |
| LONG NOSE LANCETFISH     | ..      | ..      | ..      | ..      | ..      | ..      |
| ROUGH POMFRET            | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH                 | 1       | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>           |         |         |         |         |         |         |
| BLUE SHARK               | 205     | 42      | 190     | 285     | 160     | 90      |
| SALMON SHARK             | 9       | 2       | 5       | 9       | 6       | 4       |
| THRESHER SHARK           | ..      | ..      | ..      | ..      | ..      | ..      |
| BASKING SHARK            | ..      | ..      | ..      | ..      | ..      | 1       |
| SOUPFIN SHARK            | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>           |         |         |         |         |         |         |
| DALL PORPOISE            | 1       | ..      | ..      | 1       | ..      | ..      |
| P.WH.-SIDED DOLPHIN      | ..      | ..      | ..      | ..      | ..      | ..      |
| N.RT.-WHALE DOLPHIN      | ..      | ..      | ..      | ..      | ..      | ..      |
| STELLAR SEA LION         | ..      | ..      | ..      | ..      | ..      | ..      |
| HARBOUR PORPOISE         | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE              | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>             |         |         |         |         |         |         |
| SOOTY SHEARWATER         | ..      | ..      | 6       | 1       | 1       | ..      |
| CASSIN'S AUKLET          | 1       | ..      | 1       | ..      | ..      | 2       |
| ALBATROSS                | ..      | ..      | ..      | ..      | ..      | ..      |
| MURRES, AUKLETS, PUFFINS | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                    | ..      | ..      | ..      | ..      | ..      | ..      |
| SL.-BILL. SHEARWATER     | ..      | ..      | ..      | ..      | ..      | 1       |
| STORM PETRELS            | ..      | ..      | ..      | ..      | 1       | ..      |

Table 4c (cont'd)

| SET NO.                       | 19          | 20          | 21          | 22          | 23          | 24          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 1      | JULY 2      | JULY 3      | JULY 4      | JULY 5      | JULY 6      |
| TIME START (LST)              | 1810        | 1935        | 1800        | 1625        | 1905        | 2015        |
| DURATION(HR.MIN)              | 8.50        | 6.30        | 7.30        | 10.35       | 7.55        | 6.45        |
| START N. LAT. (DEG)<br>(MIN)  | 46<br>36.8  | 46<br>40.3  | 46<br>47.1  | 46<br>39.1  | 46<br>37.2  | 46<br>36.5  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>43.3 | 130<br>38.3 | 130<br>30.2 | 130<br>36.2 | 130<br>26.2 | 130<br>21.1 |
| DIRECTION (DEG.TRUE)          | 090         | 090         | 090         | 090         | 090         | 090         |
| FINISH N. LAT. (DEG)<br>(MIN) | 46<br>38.2  | 46<br>40.9  | 46<br>47.1  | 46<br>39.2  | 46<br>37.7  | 46<br>36.8  |
| W.LONG. (DEG)<br>(MIN)        | 130<br>19.2 | 130<br>19.1 | 130<br>15.3 | 130<br>11.7 | 130<br>0.8  | 129<br>56.9 |
| LENGTH OF SET KM.             | 29.0        | 23.8        | 20.0        | 29.3        | 29.3        | 29.2        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           |
| START TEMP.(DEG.C)            | 13.3        | 13.7        | 13.3        | 13.5        | 13.7        | 13.6        |
| END TEMP.(DEG.C)              | 13.2        | 13.6        | 13.2        | 13.4        | 13.7        | 13.6        |
| NO. OF GROUPS.                | 6           | 5           | 4           | 6           | 6           | 6           |
| TOTAL SQUID (KG)              | 20660       | 14610       | 15730       | 11145       | 14240       | 4015        |

Table 4c (cont'd)

| SET NO.                | 19     | 20     | 21     | 22     | 23     | 24     |
|------------------------|--------|--------|--------|--------|--------|--------|
| DATE                   | JULY 1 | JULY 2 | JULY 3 | JULY 4 | JULY 5 | JULY 6 |
| TOTAL CATCH PIECES     | 9816   | 6466   | 7336   | 5214   | 6464   | 2149   |
| TOTAL CATCH WEIGHT     | 21976  | 14988* | 16925* | 12590* | 15192* | 5362*  |
| <b>INVERTEBRATES</b>   |        |        |        |        |        |        |
| FLYING SQUID           | 8980   | 6350   | 6835   | 4845   | 6190   | 1745   |
| PELAGIC OCTOPUS        | ..     | ..     | ..     | ..     | ..     | ..     |
| NAIL SQUID             | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>FISH</b>            |        |        |        |        |        |        |
| POMFRET                | 740    | 47     | 430    | 270    | 195    | 185    |
| JACK MACKEREL          | 2      | 3      | ..     | 2      | 3      | 163    |
| SOCKEYE SALMON         | ..     | ..     | 1      | 2      | ..     | ..     |
| ALBACORE               | ..     | ..     | ..     | ..     | ..     | ..     |
| STEELHEAD              | 1      | ..     | 3      | 1      | 1      | 1      |
| CHUM SALMON            | ..     | 1      | ..     | 5      | 3      | 1      |
| PINK SALMON            | ..     | ..     | ..     | ..     | 1      | ..     |
| PELAGIC ARMOURHEAD     | ..     | ..     | ..     | 1      | ..     | ..     |
| CHUB MACKEREL          | ..     | ..     | ..     | ..     | ..     | ..     |
| SAURY                  | ..     | ..     | ..     | ..     | ..     | ..     |
| LONG NOSE LANCETFISH   | ..     | 2      | ..     | ..     | ..     | ..     |
| ROUGH POMFRET          | ..     | ..     | ..     | ..     | ..     | ..     |
| SKILFISH               | ..     | ..     | ..     | ..     | ..     | ..     |
| COHO SALMON            | ..     | ..     | ..     | ..     | ..     | ..     |
| YELLOWTAIL             | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>SELACHI</b>         |        |        |        |        |        |        |
| BLUE SHARK             | 90     | 57     | 48     | 73     | 62     | 48     |
| SALMON SHARK           | 3      | 5      | 5      | 4      | 1      | 1      |
| THRESHER SHARK         | ..     | ..     | ..     | ..     | ..     | ..     |
| BASKING SHARK          | ..     | ..     | ..     | ..     | ..     | ..     |
| SOUPFIN SHARK          | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>MAMMALS</b>         |        |        |        |        |        |        |
| DALL PORPOISE          | ..     | ..     | 2      | 2      | 2      | 1      |
| P.WH.-SIDED DOLPHIN    | ..     | ..     | ..     | ..     | 1      | 1      |
| N.RT.-WHALE DOLPHIN    | ..     | ..     | ..     | ..     | ..     | ..     |
| STELLAR SEA LION       | ..     | ..     | ..     | 1      | ..     | ..     |
| HARBOUR PORPOISE       | ..     | ..     | ..     | ..     | ..     | ..     |
| PILOT WHALE            | ..     | ..     | ..     | ..     | ..     | ..     |
| <b>BIRDS</b>           |        |        |        |        |        |        |
| SOOTY SHEARWATER       | ..     | 1      | 11     | 8      | 4      | 3      |
| CASSIN'S AUKLET        | ..     | ..     | 1      | ..     | ..     | ..     |
| ALBATROSS              | ..     | ..     | ..     | ..     | 1      | ..     |
| MURRES,AUKLETS,PUFFINS | ..     | ..     | ..     | ..     | ..     | ..     |
| TERNS                  | ..     | ..     | ..     | ..     | ..     | ..     |
| SL.-BILL. SHEARWATER   | ..     | ..     | ..     | ..     | ..     | ..     |
| STORM PETRELS          | ..     | ..     | ..     | ..     | ..     | ..     |

Table 4c (cont'd)

| SET NO.                       | 25          | 26          | 27          | 28          | 29          | 30          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 7      | JULY 8      | JULY 9      | JULY 11     | JULY 14     | JULY 15     |
| TIME START (LST)              | 1840        | 1830        | 1805        | 1930        | 1710        | 2030        |
| DURATION(HR.MIN)              | 8.20        | 8.30        | 8.55        | 7.30        | 9.50        | 6.30        |
| START N. LAT. (DEG)<br>(MIN)  | 47<br>0.1   | 47<br>16.2  | 47<br>22.4  | 47<br>11.0  | 47<br>36.7  | 48<br>8.5   |
| W. LONG. (DEG)<br>(MIN)       | 130<br>7.0  | 131<br>19.7 | 131<br>29.4 | 131<br>18.6 | 130<br>9.0  | 130<br>21.5 |
| DIRECTION (DEG.TRUE)          | 270         | 090         | 090         | 270         | 090         | 270         |
| FINISH N. LAT. (DEG)<br>(MIN) | 46<br>58.5  | 47<br>17.0  | 47<br>18.7  | 47<br>10.5  | 47<br>36.2  | 48<br>8.2   |
| W.LONG. (DEG)<br>(MIN)        | 130<br>32.1 | 130<br>53.1 | 131<br>3.3  | 131<br>34.1 | 129<br>44.7 | 130<br>6.5  |
| LENGTH OF SET KM.             | 29.3        | 29.2        | 29.0        | 19.6        | 29.2        | 19.2        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           |
| START TEMP.(DEG.C)            | 13.6        | 13.4        | 13.6        | 14.2        | 13.9        | 13.8        |
| END TEMP.(DEG.C)              | 13.7        | 13.4        | 13.4        | 13.9        | 13.9        | 13.9        |
| NO. OF GROUPS.                | 6           | 6           | 6           | 4           | 6           | 4           |
| TOTAL SQUID (KG)              | 1820        | 7365        | 4350        | 5455        | 10020       | 2610        |

Table 4c (cont'd)

| SET NO.                | 25     | 26     | 27     | 28      | 29      | 30      |
|------------------------|--------|--------|--------|---------|---------|---------|
| DATE                   | JULY 7 | JULY 8 | JULY 9 | JULY 11 | JULY 14 | JULY 15 |
| TOTAL CATCH PIECES     | 1281   | 4300   | 2165   | 2483    | 6696    | 2301    |
| TOTAL CATCH WEIGHT     | 2929*  | 9322*  | 4956*  | 5961*   | 14478*  | 4108    |
| <b>INVERTEBRATES</b>   |        |        |        |         |         |         |
| FLYING SQUID           | 790    | 3195   | 1905   | 2380    | 4360    | 1140    |
| PELAGIC OCTOPUS        | ..     | 1      | ..     | ..      | ..      | ..      |
| NAIL SQUID             | ..     | ..     | ..     | ..      | ..      | ..      |
| <b>FISH</b>            |        |        |        |         |         |         |
| POMFRET                | 365    | 1020   | 190    | 68      | 1540    | 1020    |
| JACK MACKEREL          | 24     | 4      | ..     | ..      | 750     | 85      |
| SOCKEYE SALMON         | ..     | 1      | ..     | ..      | 2       | 5       |
| ALBACORE               | ..     | ..     | ..     | ..      | ..      | ..      |
| STEELHEAD              | ..     | 4      | 1      | ..      | 7       | 11      |
| CHUM SALMON            | 5      | 1      | 1      | ..      | 4       | 1       |
| PINK SALMON            | ..     | ..     | ..     | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD     | ..     | 2      | ..     | 1       | ..      | ..      |
| CHUB MACKEREL          | ..     | ..     | ..     | ..      | ..      | ..      |
| SAURY                  | ..     | ..     | ..     | ..      | ..      | ..      |
| LONG NOSE LANCETFISH   | ..     | ..     | ..     | ..      | ..      | ..      |
| ROUGH POMFRET          | ..     | ..     | ..     | ..      | ..      | ..      |
| SKILFISH               | ..     | ..     | ..     | ..      | ..      | ..      |
| COHO SALMON            | ..     | ..     | ..     | ..      | ..      | ..      |
| YELLOWTAIL             | ..     | ..     | ..     | ..      | ..      | ..      |
| <b>SELACHI</b>         |        |        |        |         |         |         |
| BLUE SHARK             | 90     | 64     | 63     | 27      | 24      | 36      |
| SALMON SHARK           | 1      | 3      | 4      | 6       | 7       | 3       |
| THRESHER SHARK         | ..     | ..     | ..     | ..      | ..      | ..      |
| BASKING SHARK          | ..     | ..     | ..     | ..      | ..      | ..      |
| SOUPFIN SHARK          | ..     | ..     | ..     | ..      | ..      | ..      |
| <b>MAMMALS</b>         |        |        |        |         |         |         |
| DALL PORPOISE          | 2      | 2      | ..     | 1       | 1       | ..      |
| P.WH.-SIDED DOLPHIN    | ..     | 2      | ..     | ..      | ..      | ..      |
| N.RT.-WHALE DOLPHIN    | ..     | ..     | ..     | ..      | ..      | ..      |
| STELLAR SEA LION       | ..     | ..     | ..     | ..      | ..      | ..      |
| HARBOUR PORPOISE       | ..     | ..     | ..     | ..      | ..      | ..      |
| PILOT WHALE            | ..     | ..     | ..     | ..      | ..      | ..      |
| <b>BIRDS</b>           |        |        |        |         |         |         |
| SOOTY SHEARWATER       | 4      | 1      | 1      | ..      | 1       | ..      |
| CASSIN'S AUKLET        | ..     | ..     | ..     | ..      | ..      | ..      |
| ALBATROSS              | ..     | ..     | ..     | ..      | ..      | ..      |
| MURRES,AUKLETS,PUFFINS | ..     | ..     | ..     | ..      | ..      | ..      |
| TERNS                  | ..     | ..     | ..     | ..      | ..      | ..      |
| SL.-BILL. SHEARWATER   | ..     | ..     | ..     | ..      | ..      | ..      |
| STORM PETRELS          | ..     | ..     | ..     | ..      | ..      | ..      |

Table 4c (cont'd)

| SET NO.                       | 31          | 32          | 33          | 34          | 35          | 36          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 18     | JULY 19     | JULY 20     | JULY 21     | JULY 22     | JULY 23     |
| TIME START (LST)              | 1820        | 1905        | 1910        | 1850        | 1705        | 1935        |
| DURATION(HR.MIN)              | 8.45        | 7.55        | 7.50        | 8.05        | 9.55        | 8.25        |
| START N. LAT. (DEG)<br>(MIN)  | 49<br>7.2   | 48<br>44.1  | 48<br>28.9  | 47<br>26.3  | 47<br>28.6  | 47<br>25.5  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>45.8 | 131<br>26.1 | 130<br>16.9 | 130<br>14.4 | 129<br>33.2 | 129<br>44.2 |
| DIRECTION (DEG.TRUE)          | 110         | 100         | 100         | 100         | 100         | 100         |
| FINISH N. LAT. (DEG)<br>(MIN) | 49<br>6.7   | 48<br>43.1  | 48<br>26.0  | 47<br>24.7  | 47<br>27.0  | 47<br>19.3  |
| W.LONG. (DEG)<br>(MIN)        | 130<br>26.8 | 131<br>2.6  | 129<br>53.6 | 129<br>49.6 | 129<br>9.9  | 129<br>23.7 |
| LENGTH OF SET KM.             | 24.2        | 29.0        | 28.7        | 28.7        | 28.6        | 28.3        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           |
| START TEMP.(DEG.C)            | 13.2        | 13.7        | 14.4        | 14.0        | 14.4        | 14.5        |
| END TEMP.(DEG.C)              | 13.5        | 13.8        | 14.6        | 14.1        | 14.7        | 14.8        |
| NO. OF GROUPS.                | 5           | 6           | 6           | 6           | 6           | 6           |
| TOTAL SQUID (KG)              | 105         | 450         | 2070        | 6810        | 8280        | 2525        |

Table 4c (cont'd)

| SET NO.                | 31      | 32      | 33      | 34      | 35      | 36      |
|------------------------|---------|---------|---------|---------|---------|---------|
| DATE                   | JULY 18 | JULY 19 | JULY 20 | JULY 21 | JULY 22 | JULY 23 |
| TOTAL CATCH PIECES     | 873     | 2059    | 2891    | 4507    | 4014    | 1554    |
| TOTAL CATCH WEIGHT     | 2507*   | 3885*   | 4645*   | 9487*   | 9057*   | 3398*   |
| <b>INVERTEBRATES</b>   |         |         |         |         |         |         |
| FLYING SQUID           | 45      | 195     | 900     | 2965    | 3615    | 1105    |
| PELAGIC OCTOPUS        | ..      | ..      | ..      | ..      | ..      | ..      |
| NAIL SQUID             | ..      | ..      | 1       | ..      | ..      | ..      |
| <b>FISH</b>            |         |         |         |         |         |         |
| POMFRET                | 340     | 1750    | 1890    | 1240    | 280     | 276     |
| JACK MACKEREL          | ..      | ..      | 19      | 165     | 64      | 115     |
| SOCKEYE SALMON         | 355     | ..      | 3       | 1       | 1       | 3       |
| ALBACORE               | ..      | ..      | 17      | 57      | 6       | 13      |
| STEELHEAD              | 18      | 5       | 8       | 6       | 6       | 1       |
| CHUM SALMON            | 17      | ..      | 1       | 1       | ..      | ..      |
| PINK SALMON            | 18      | ..      | ..      | ..      | ..      | ..      |
| PELAGIC ARMOURHEAD     | 1       | ..      | ..      | ..      | ..      | ..      |
| CHUB MACKEREL          | ..      | ..      | ..      | ..      | ..      | ..      |
| SAURY                  | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH   | ..      | ..      | ..      | ..      | ..      | ..      |
| ROUGH POMFRET          | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH               | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON            | 1       | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL             | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>         |         |         |         |         |         |         |
| BLUE SHARK             | 65      | 94      | 48      | 65      | 34      | 37      |
| SALMON SHARK           | 11      | 9       | 3       | 4       | 6       | 1       |
| THRESHER SHARK         | ..      | 1       | ..      | ..      | ..      | ..      |
| BASKING SHARK          | ..      | ..      | ..      | ..      | ..      | ..      |
| SOUPFIN SHARK          | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>         |         |         |         |         |         |         |
| DALL PORPOISE          | ..      | 5       | 1       | 1       | ..      | ..      |
| P.WH.-SIDED DOLPHIN    | 2       | ..      | ..      | ..      | ..      | ..      |
| N.RT.-WHALE DOLPHIN    | ..      | ..      | ..      | ..      | ..      | ..      |
| STELLAR SEA LION       | ..      | ..      | ..      | ..      | ..      | ..      |
| HARBOUR PORPOISE       | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE            | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>           |         |         |         |         |         |         |
| SOOTY SHEARWATER       | ..      | ..      | ..      | 2       | 2       | 3       |
| CASSIN'S AUKLET        | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBATROSS              | ..      | ..      | ..      | ..      | ..      | ..      |
| MURRES,AUKLETS,PUFFINS | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                  | ..      | ..      | ..      | ..      | ..      | ..      |
| SL.-BILL. SHEARWATER   | ..      | ..      | ..      | ..      | ..      | ..      |
| STORM PETRELS          | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4c (cont'd)

| SET NO.                       | 37          | 38          | 39          | 40          | 41          | 42          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 24     | JULY 25     | JULY 26     | JULY 27     | JULY 28     | JULY 29     |
| TIME START (LST)              | 1815        | 1705        | 1900        | 1800        | 1750        | 1750        |
| DURATION(HR.MIN)              | 8.50        | 10.05       | 8.00        | 9.00        | 9.10        | 9.10        |
| START N. LAT. (DEG)<br>(MIN)  | 48<br>27.3  | 48<br>29.3  | 48<br>28.3  | 48<br>32.8  | 48<br>29.0  | 49<br>9.6   |
| W. LONG. (DEG)<br>(MIN)       | 129<br>39.3 | 129<br>40.7 | 129<br>40.0 | 129<br>36.6 | 129<br>38.7 | 131<br>4.0  |
| DIRECTION (DEG.TRUE)          | 100         | 095         | 090         | 090         | 090         | 110         |
| FINISH N. LAT. (DEG)<br>(MIN) | 48<br>26.0  | 48<br>29.1  | 48<br>28.2  | 48<br>32.6  | 48<br>29.8  | 49<br>6.8   |
| W.LONG. (DEG)<br>(MIN)        | 129<br>15.0 | 129<br>18.7 | 129<br>16.4 | 129<br>13.2 | 139<br>15.9 | 130<br>39.8 |
| LENGTH OF SET KM.             | 28.5        | 28.5        | 28.5        | 28.3        | 28.0        | 28.2        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           |
| START TEMP.(DEG.C)            | 14.4        | 14.8        | 14.6        | 14.4        | 14.9        | 14.8        |
| END TEMP.(DEG.C)              | 14.4        | 14.6        | 14.4        | 14.4        | 14.8        | 14.8        |
| NO. OF GROUPS.                | 6           | 6           | 6           | 6           | 6           | 6           |
| TOTAL SQUID (KG)              | 16190       | 9980        | 13820       | 4370        | 2855        | 3358        |

Table 4c (cont'd)

| SET NO.                  | 37      | 38      | 39      | 40      | 41      | 42      |
|--------------------------|---------|---------|---------|---------|---------|---------|
| DATE                     | JULY 24 | JULY 25 | JULY 26 | JULY 27 | JULY 28 | JULY 29 |
| TOTAL CATCH PIECES       | 7949    | 5250    | 6827    | 3619    | 1895    | 2161    |
| TOTAL CATCH WEIGHT       | 17383   | 12229*  | 16362*  | 7834*   | 5489*   | 5447*   |
| <b>INVERTEBRATES</b>     |         |         |         |         |         |         |
| FLYING SQUID             | 7050    | 4340    | 5990    | 1750    | 1230    | 1450    |
| PELAGIC OCTOPUS          | ..      | ..      | ..      | ..      | ..      | ..      |
| NAIL SQUID               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>FISH</b>              |         |         |         |         |         |         |
| POMFRET                  | 825     | 610     | 440     | 1440    | 275     | 263     |
| JACK MACKEREL            | 21      | 26      | 26      | 12      | 3       | ..      |
| SOCKEYE SALMON           | 2       | 3       | 4       | 4       | ..      | 1       |
| ALBACORE                 | 1       | 1       | ..      | ..      | ..      | ..      |
| STEELHEAD                | 13      | 13      | 5       | 8       | 5       | 9       |
| CHUM SALMON              | 1       | ..      | 4       | ..      | 1       | ..      |
| PINK SALMON              | ..      | ..      | 4       | 1       | 4       | 1       |
| PELAGIC ARMOURHEAD       | ..      | ..      | ..      | ..      | ..      | ..      |
| CHUB MACKEREL            | ..      | ..      | ..      | ..      | ..      | ..      |
| SAURY                    | ..      | ..      | ..      | ..      | ..      | ..      |
| LONG NOSE LANCETFISH     | ..      | ..      | ..      | ..      | ..      | ..      |
| ROUGH POMFRET            | ..      | ..      | ..      | ..      | ..      | ..      |
| SKILFISH                 | ..      | ..      | ..      | ..      | ..      | ..      |
| COHO SALMON              | ..      | ..      | ..      | ..      | ..      | ..      |
| YELLOWTAIL               | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>SELACHI</b>           |         |         |         |         |         |         |
| BLUE SHARK               | 32      | 245     | 340     | 387     | 360     | 410     |
| SALMON SHARK             | 4       | 3       | 4       | 10      | 12      | 25      |
| THRESHER SHARK           | ..      | ..      | 1       | ..      | ..      | ..      |
| BASKING SHARK            | ..      | ..      | ..      | ..      | ..      | ..      |
| SOUPFIN SHARK            | ..      | 1       | ..      | ..      | ..      | ..      |
| <b>MAMMALS</b>           |         |         |         |         |         |         |
| DALL PORPOISE            | ..      | ..      | 2       | ..      | 1       | ..      |
| P.WH.-SIDED DOLPHIN      | ..      | 2       | 1       | ..      | 1       | ..      |
| N.RT.-WHALE DOLPHIN      | ..      | ..      | 1       | 1       | ..      | ..      |
| STELLAR SEA LION         | ..      | ..      | ..      | ..      | ..      | ..      |
| HARBOUR PORPOISE         | ..      | ..      | ..      | ..      | ..      | ..      |
| PILOT WHALE              | ..      | ..      | ..      | ..      | ..      | ..      |
| <b>BIRDS</b>             |         |         |         |         |         |         |
| SOOTY SHEARWATER         | ..      | 6       | 5       | 6       | 3       | 1       |
| CASSIN'S AUKLET          | ..      | ..      | ..      | ..      | ..      | ..      |
| ALBATROSS                | ..      | ..      | ..      | ..      | ..      | 1       |
| MURRES, AUKLETS, PUFFINS | ..      | ..      | ..      | ..      | ..      | ..      |
| TERNS                    | ..      | ..      | ..      | ..      | ..      | ..      |
| SL.-BILL. SHEARWATER     | ..      | ..      | ..      | ..      | ..      | ..      |
| STORM PETRELS            | ..      | ..      | ..      | ..      | ..      | ..      |

Table 4c (cont'd)

| SET NO.                       | 43          | 44          | 45          | 46          | 47          | 48          |
|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| DATE                          | JULY 30     | JULY 31     | AUG. 1      | AUG. 2      | AUG. 3      | AUG. 4      |
| TIME START (LST)              | 1915        | 1900        | 1815        | 1805        | 1805        | 1905        |
| DURATION(HR.MIN)              | 7.45        | 8.00        | 9.45        | 8.55        | 8.55        | 9.00        |
| START N. LAT. (DEG)<br>(MIN)  | 48<br>19.8  | 48<br>19.7  | 48<br>22.0  | 48<br>23.8  | 48<br>20.4  | 48<br>19.8  |
| W. LONG. (DEG)<br>(MIN)       | 130<br>34.5 | 132<br>50.0 | 132<br>45.8 | 132<br>46.3 | 132<br>44.3 | 132<br>43.2 |
| DIRECTION (DEG.TRUE)          | 285         | 280         | 270         | 275         | 270         | 270         |
| FINISH N. LAT. (DEG)<br>(MIN) | 48<br>23.7  | 48<br>20.5  | 48<br>21.8  | 48<br>24.9  | 48<br>20.7  | 48<br>19.3  |
| W.LONG. (DEG)<br>(MIN)        | 130<br>55.7 | 133<br>12.5 | 133<br>7.2  | 133<br>8.3  | 133<br>5.4  | 133<br>3.2  |
| LENGTH OF SET KM.             | 28.0        | 27.9        | 27.5        | 28.6        | 28.2        | 27.5        |
| DEPTH (M)                     | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       | 0- 10       |
| SEE FIGURE NO.                | 3           | 3           | 3           | 3           | 3           | 3           |
| START TEMP.(DEG.C)            | 15.0        | 15.2        | 15.2        | 15.4        | 15.4        | 15.4        |
| END TEMP.(DEG.C)              | 15.0        | 15.6        | 15.2        | 15.4        | 15.2        | 15.2        |
| NO. OF GROUPS.                | 6           | 6           | 6           | 6           | 6           | 6           |
| TOTAL SQUID (KG)              | 5934        | 22265       | 21805       | 13365       | 22005       | 9570        |

Table 4c (cont'd)

| SET NO.                  | 43      | 44      | 45     | 46     | 47     | 48     |
|--------------------------|---------|---------|--------|--------|--------|--------|
| DATE                     | JULY 30 | JULY 31 | AUG. 1 | AUG. 2 | AUG. 3 | AUG. 4 |
| TOTAL CATCH PIECES       | 4232    | 14385   | 12094  | 9413   | 12090  | 8339   |
| TOTAL CATCH WEIGHT       | 9032*   | 29630*  | 26891* | 21825* | 32388* | 16929* |
| <b>INVERTEBRATES</b>     |         |         |        |        |        |        |
| FLYING SQUID             | 2575    | 8905    | 8875   | 5570   | 8795   | 4105   |
| PELAGIC OCTOPUS          | ..      | ..      | ..     | ..     | ..     | ..     |
| NAIL SQUID               | ..      | ..      | ..     | ..     | ..     | ..     |
| <b>FISH</b>              |         |         |        |        |        |        |
| POMFRET                  | 1270    | 4800    | 2850   | 3210   | 1950   | 3600   |
| JACK MACKEREL            | ..      | 570     | 145    | 235    | 265    | 145    |
| SOCKEYE SALMON           | ..      | ..      | ..     | ..     | ..     | ..     |
| ALBACORE                 | ..      | 28      | 8      | ..     | 20     | 4      |
| STEELHEAD                | 5       | 1       | 1      | 2      | ..     | ..     |
| CHUM SALMON              | 2       | ..      | ..     | 1      | ..     | 2      |
| PINK SALMON              | ..      | ..      | ..     | ..     | ..     | ..     |
| PELAGIC ARMOURHEAD       | ..      | ..      | 1      | ..     | ..     | ..     |
| CHUB MACKEREL            | ..      | ..      | ..     | ..     | ..     | ..     |
| SAURY                    | ..      | ..      | ..     | ..     | ..     | ..     |
| LONG NOSE LANCETFISH     | ..      | ..      | ..     | ..     | ..     | ..     |
| ROUGH POMFRET            | ..      | ..      | ..     | ..     | ..     | ..     |
| SKILFISH                 | ..      | ..      | ..     | ..     | ..     | ..     |
| COHO SALMON              | ..      | ..      | ..     | ..     | ..     | ..     |
| YELLOWTAIL               | ..      | ..      | ..     | 1      | ..     | ..     |
| <b>SELACHI</b>           |         |         |        |        |        |        |
| BLUE SHARK               | 375     | 68      | 204    | 365    | 1050   | 475    |
| SALMON SHARK             | 4       | 9       | 9      | 19     | 5      | 5      |
| THRESHER SHARK           | ..      | ..      | ..     | ..     | ..     | ..     |
| BASKING SHARK            | ..      | ..      | ..     | ..     | ..     | ..     |
| SOUPFIN SHARK            | ..      | ..      | ..     | ..     | ..     | ..     |
| <b>MAMMALS</b>           |         |         |        |        |        |        |
| DALL PORPOISE            | 1       | ..      | ..     | ..     | ..     | ..     |
| P.WH.-SIDED DOLPHIN      | ..      | ..      | ..     | ..     | ..     | ..     |
| N.RT.-WHALE DOLPHIN      | ..      | ..      | ..     | ..     | ..     | ..     |
| STELLAR SEA LION         | ..      | ..      | ..     | ..     | ..     | ..     |
| HARBOUR PORPOISE         | ..      | ..      | ..     | ..     | ..     | ..     |
| PILOT WHALE              | ..      | ..      | ..     | ..     | ..     | ..     |
| <b>BIRDS</b>             |         |         |        |        |        |        |
| SOOTY SHEARWATER         | ..      | 1       | 1      | 7      | 5      | 3      |
| CASSIN'S AUKLET          | ..      | ..      | ..     | 1      | ..     | ..     |
| ALBATROSS                | ..      | 1       | ..     | ..     | ..     | ..     |
| MURRES, AUKLETS, PUFFINS | ..      | 2       | ..     | ..     | ..     | ..     |
| TERNS                    | ..      | ..      | ..     | 2      | ..     | ..     |
| SL.-BILL. SHEARWATER     | ..      | ..      | ..     | ..     | ..     | ..     |
| STORM PETRELS            | ..      | ..      | ..     | ..     | ..     | ..     |

Table 4c (cont'd)

|                      |        |
|----------------------|--------|
| SET NO.              | 49     |
| DATE                 | AUG. 5 |
| TIME START (LST)     | 1835   |
| DURATION(HR.MIN)     | 8.55   |
| START N. LAT. (DEG)  | 48     |
| (MIN)                | 16.4   |
| W. LONG. (DEG)       | 133    |
| (MIN)                | 18.0   |
| DIRECTION (DEG.TRUE) | 090    |
| FINISH N. LAT. (DEG) | 48     |
| (MIN)                | 16.3   |
| W.LONG. (DEG)        | 132    |
| (MIN)                | 57.9   |
| LENGTH OF SET KM.    | 27.0   |
| DEPTH (M)            | 0- 10  |
| SEE FIGURE NO.       | 3      |
| START TEMP.(DEG.C)   | 15.0   |
| END TEMP.(DEG.C)     | 15.1   |
| NO. OF GROUPS.       | 3      |
| TOTAL SQUID (KG)     | 3495   |

Table 4c (cont'd)

|                          |        |
|--------------------------|--------|
| SET NO.                  | 49     |
| DATE                     | AUG. 5 |
| TOTAL CATCH PIECES       | 10602  |
| TOTAL CATCH WEIGHT       | 17454* |
| INVERTEBRATES            |        |
| FLYING SQUID             | 1525   |
| PELAGIC OCTOPUS          | ..     |
| NAIL SQUID               | ..     |
| FISH                     |        |
| POMFRET                  | 8500   |
| JACK MACKEREL            | 250    |
| SOCKEYE SALMON           | 1      |
| ALBACORE                 | 4      |
| STEELHEAD                | ..     |
| CHUM SALMON              | ..     |
| PINK SALMON              | ..     |
| PELAGIC ARMOURHEAD       | ..     |
| CHUB MACKEREL            | ..     |
| SAURY                    | ..     |
| LONG NOSE LANCETFISH     | ..     |
| ROUGH POMFRET            | ..     |
| SKILFISH                 | ..     |
| COHO SALMON              | ..     |
| YELLOWTAIL               | ..     |
| SELACHI                  |        |
| BLUE SHARK               | 310    |
| SALMON SHARK             | 8      |
| THRESHER SHARK           | ..     |
| BASKING SHARK            | ..     |
| SOUPFIN SHARK            | ..     |
| MAMMALS                  |        |
| DALL PORPOISE            | ..     |
| P.WH.-SIDED DOLPHIN      | ..     |
| N.RT.-WHALE DOLPHIN      | ..     |
| STELLAR SEA LION         | ..     |
| HARBOUR PORPOISE         | ..     |
| PILOT WHALE              | ..     |
| BIRDS                    |        |
| SOOTY SHEARWATER         | 4      |
| CASSIN'S AUKLET          | ..     |
| ALBATROSS                | ..     |
| MURRES,AUKLETS,PUFFINS.. | ..     |
| TERNS                    | ..     |
| SL.-BILL. SHEARWATER     | ..     |
| STORM PETRELS            | ..     |

Table 5. Percentage of total catch (in pieces) by species for each vessel in 1987.

| Species              | Vessel           |             |
|----------------------|------------------|-------------|
|                      | TOMI MARU No. 88 | OCEAN PEARL |
| Flying Squid         | 79.84            | 70.10       |
| Nail Squid           | 0.00             | 0.00        |
| Pink Salmon          | 0.00             | 0.01        |
| Chum Salmon          | 0.02             | 0.03        |
| Coho Salmon          | 0.00             | 0.00        |
| Sockeye Salmon       | 0.01             | 0.19        |
| Steelhead            | 0.04             | 0.07        |
| Bonito Shark         | 0.00             | -           |
| Blue Shark           | 6.97             | 5.34        |
| Salmon Shark         | 0.13             | 0.12        |
| Thresher Shark       | 0.00             | 0.00        |
| Basking Shark        | -                | 0.00        |
| Soupfin Shark        | -                | 0.00        |
| Pelagic Stingray     | 0.00             | -           |
| Pomfret              | 11.79            | 22.18       |
| Rough Pomfret        | -                | 0.00        |
| Albacore             | 0.16             | 0.08        |
| Jack Mackerel        | 0.95             | 1.79        |
| Chub Mackerel        | -                | 0.00        |
| Pacific Bonito       | 0.00             | -           |
| Yellowtail           | 0.00             | 0.00        |
| Pelagic Armourhead   | 0.00             | 0.00        |
| Skilfish             | 0.00             | 0.00        |
| Pacific Saury        | -                | 0.00        |
| Longnose Lancetfish  | -                | 0.00        |
| Ocean Sunfish        | 0.00             | -           |
| Dall Porpoise        | 0.01             | 0.01        |
| Northern Right-whale | 0.00             | 0.00        |
| Dolphin              |                  |             |
| Pacific White-Sided  | 0.00             | 0.01        |
| Dolphin              |                  |             |
| Short-finned         | 0.00             | 0.00        |
| Pilot Whale          |                  |             |
| Harbour Porpoise     | 0.00             | 0.00        |
| Fur Seal             | 0.00             | -           |
| Stellar Sea Lion     | -                | 0.00        |

Table 5 (cont'd)

| Species                          | Vessel           |             |
|----------------------------------|------------------|-------------|
|                                  | TOMI MARU No. 88 | OCEAN PEARL |
| Albatross                        | 0.00             | 0.00        |
| Sooty Shearwater                 | 0.06             | 0.05        |
| Slender-billed<br>Shearwater     | -                | 0.00        |
| Family Alcidae<br>(unidentified) | -                | 0.00        |
| Common Murre                     | 0.00             | -           |
| Cassin's Auklette                | 0.00             | 0.00        |
| Rhinoceros Auklette              | 0.00             | -           |
| Terns                            | 0.00             | 0.00        |

Table 6. Marine mammal bycatch in the offshore squid fishery during the years 1983, 1985, 1986 and 1987. T.M. = TOMI MARU #88, Sim. = SIMSTAR, O.P. = OCEAN PEARL, L.P. = LA PORSCHE

| Species   | Number of marine mammals |          |          |           |           |          |           |           |    |
|---|--------------------------|----------|----------|-----------|-----------|----------|-----------|-----------|----|
|   | 1983                     |          | 1985     |           | 1986      |          |           | 1987      |    |
|   | T.M.                     | Sim.     | T.M.     | T.M.      | O.P.      | L.P.     | T.M.      | O.P.      |    |
| Dall porpoise                                   | 2                        | 1        |          | 1         | 19        | 9        | 5         | 32        | 26 |
| Short-finned<br>Pilot whale                     | 1                        | -        |          | -         | 5         | -        | 2         | 1         |    |
| Pacific white-sided<br>dolphin                  | -                        | -        | 1        | -         | 3         | -        | 3         | 13        |    |
| Harbour porpoise                                | 2                        | -        |          | -         | -         | -        | -         | 1         |    |
| Northern right-whale<br>dolphin                 | -                        | -        |          | 2         | 1         | 1        | 7         | 2         |    |
| Killer whale                                    | -                        | -        |          | -         | 2         | -        | -         | -         |    |
| Cuvier's beaked whale                           | -                        | -        |          | 1         | -         | -        | -         | -         |    |
| Fur seal  | -                        | -        | 1        | -         | -         | -        | 1         | -         |    |
| Stellar sea lion                                | -                        | -        |          | -         | -         | -        | -         | 1         |    |
| Unidentified                                    | -                        | -        |          | -         | 2         | -        | 1         | -         |    |
| <b>TOTALS</b>                                   | <b>5</b>                 | <b>1</b> | <b>3</b> | <b>22</b> | <b>22</b> | <b>6</b> | <b>46</b> | <b>44</b> |    |
| Total net<br>fished (km)                        | 1376.4                   | 97.3     | 2475.1   | 3204.5    | 750.5     | 352.5    | 3080.0    | 1337.0    |    |
| Average net length<br>(km) to catch 1<br>mammal | 275.3                    | 97.3     | 825.0    | 145.7     | 34.1      | 58.7     | 67.0      | 30.4      |    |
| Average time (days)<br>to catch 1 mammal =      | 9.0                      | 25.0     | 18.7     | 3.2       | 1.6       | 4.7      | 1.4       | 1.1       |    |

Table 7a. CPUE (pieces  $10\text{km}^{-1}$ ) by species for the TOMI MARU NO.88 and the OCEAN PEARL in 1987. (- = no catch, 0.00 = rounded number <0.01).

| Common name                     | CPUE (pieces $10\text{km}^{-1}$ ) |             |
|---------------------------------|-----------------------------------|-------------|
|                                 | TOMI MARU NO.88                   | OCEAN PEARL |
| Flying Squid                    | 1647.97                           | 1108.77     |
| Pelagic Octopus                 | 0.02                              | 0.04        |
| Unidentified Squid              | 0.01                              | -           |
| Nail Squid                      | 0.00                              | 0.01        |
| Pink Salmon                     | 0.04                              | 0.22        |
| Chum Salmon                     | 0.33                              | 0.47        |
| Coho Salmon                     | 0.02                              | 0.01        |
| Sockeye Salmon                  | 0.15                              | 2.97        |
| Steelhead                       | 0.89                              | 1.11        |
| Bonito Shark                    | 0.01                              | -           |
| Blue Shark                      | 143.83                            | 84.48       |
| Salmon Shark                    | 2.64                              | 1.87        |
| Thresher Shark                  | 0.02                              | 0.02        |
| Basking Shark                   | -                                 | 0.01        |
| Soupfin Shark                   | -                                 | 0.01        |
| Pelagic Stingray                | 0.00                              | -           |
| Pomfret                         | 243.32                            | 350.88      |
| Rough Pomfret                   | -                                 | 0.01        |
| Albacore                        | 3.33                              | 1.19        |
| Jack Mackerel                   | 19.64                             | 28.38       |
| Chub Mackerel                   | -                                 | 0.03        |
| Pacific Bonito                  | 0.01                              | -           |
| Yellowtail                      | 0.08                              | 0.01        |
| Pelagic Armourhead              | 0.07                              | 0.05        |
| Skilfish                        | 0.01                              | 0.01        |
| Pacific Saury                   | -                                 | 0.02        |
| Long Nose Lancetfish            | 0.02                              | 0.02        |
| Ocean Sunfish                   | 0.00                              | -           |
| Unidentified Fish               | 0.00                              | -           |
| Dall Porpoise                   | 0.10                              | 0.19        |
| Northern Right<br>Whale Dolphin | 0.02                              | 0.02        |
| Pacific White-<br>Sided Dolphin | 0.01                              | 0.10        |
| Short-finned<br>Pilot Whale     | 0.01                              | 0.01        |

Table 7a (cont'd)

| Common name                               | CPUE (pieces 10km <sup>-1</sup> ) |             |
|---|-----------------------------------|-------------|
|   | TOMI MARU NO.88                   | OCEAN PEARL |
| Harbour Porpoise                          | -                                 | 0.01        |
| Fur Seal                                  | 0.00                              | -           |
| Stellar Sea Lion                          | -                                 | 0.01        |
| Unidentified mammal                       | 0.00                              | -           |
| Albatross                                 | 0.01                              | 0.03        |
| Sooty Shearwater                          | 1.19                              | 0.72        |
| Slender-billed<br>Shearwater              | -                                 | 0.01        |
| Storm Petrels                             | 0.10                              | 0.01        |
| Cassin's Auklet                           | 0.07                              | 0.04        |
| Rhinoceros Auklet                         | 0.01                              | -           |
| Common Murre                              | 0.00                              | -           |
| Murres, Murrelets,<br>Auklets and Puffins | -                                 | 0.02        |
| Terns                                     | 0.07                              | 0.02        |

Table 7b. CPUE (pieces  $10\text{km}^{-1} \text{hr}^{-1}$ ) by species for the TOMI MARU NO.88 and the OCEAN PEARL in 1987. (- = no catch, 0.00 = rounded number <0.01). Includes only net caught species.

| Common name                     | CPUE (pieces $10\text{km}^{-1} \text{hr}^{-1}$ ) |             |
|---------------------------------|--|-------------|
|                                 | TOMI MARU NO.88                                  | OCEAN PEARL |
| Flying Squid                    | 156.29   | 135.71      |
| Pelagic Octopus                 | 0.00   | 0.00        |
| Unidentified Squid              | 0.00   | -           |
| Nail Squid                      | 0.00   | 0.00        |
| Pink Salmon                     | 0.00   | 0.03        |
| Chum Salmon                     | 0.03   | 0.06        |
| Coho Salmon                     | 0.00   | 0.00        |
| Sockeye Salmon                  | 0.01   | 0.36        |
| Steelhead                       | 0.08   | 0.14        |
| Bonito Shark                    | 0.00   | -           |
| Blue Shark                      | 13.65  | 10.34       |
| Salmon Shark                    | 0.25   | 0.23        |
| Thresher Shark                  | 0.00   | 0.00        |
| Basking Shark                   | -  | 0.00        |
| Soupfin Shark                   | -  | 0.00        |
| Pelagic Stingray                | 0.00   | -           |
| Pomfret                         | 23.27  | 42.95       |
| Rough Pomfret                   | -  | 0.00        |
| Albacore                        | 0.32   | 0.15        |
| Jack Mackerel                   | 1.86   | 3.47        |
| Chub Mackerel                   | -  | 0.00        |
| Pacific Bonito                  | 0.00   | -           |
| Yellowtail                      | 0.01   | 0.00        |
| Pelagic Armourhead              | 0.01   | 0.01        |
| Skiffish                        | 0.00   | 0.00        |
| Pacific Saury                   | -  | 0.00        |
| Long Nose Lancetfish            | 0.00   | 0.00        |
| Ocean Sunfish                   | 0.00   | -           |
| Unidentified Fish               | 0.00   | -           |
| Dall Porpoise                   | 0.01   | 0.02        |
| Northern Right<br>Whale Dolphin | 0.00   | 0.00        |
| Pacific White-<br>Sided Dolphin | 0.00   | 0.01        |
| Short-finned<br>Pilot Whale     | 0.00   | 0.00        |

Table 7b (cont'd)

| Common name                               | CPUE (pieces 10km <sup>-1</sup> hr <sup>-1</sup> ) |             |
|---|--|-------------|
|   | TOMI MARU NO.88                                    | OCEAN PEARL |
| Harbour Porpoise                          | -  | 0.00        |
| Fur Seal                                  | 0.00   | -           |
| Stellar Sea Lion                          | -  | 0.00        |
| Unidentified mammal                       | 0.00   | -           |
| Albatross                                 | 0.00   | 0.00        |
| Sooty Shearwater                          | 0.11   | 0.09        |
| Slender-billed<br>Shearwater              | -  | 0.00        |
| Storm Petrels                             | 0.00   | 0.00        |
| Cassin's Auklet                           | 0.01   | 0.00        |
| Rhinoceros Auklet                         | 0.00   | -           |
| Common Murre                              | 0.00   | -           |
| Murres, Murrelets,<br>Auklets and Puffins | -  | 0.00        |
| Terns                                     | 0.01   | 0.00        |

Table 8a. CPUE ( $\text{kg } 10\text{km}^{-1}$ ) by species for the TOMI MARU NO.88 and the OCEAN PEARL in 1987. (- = no catch, 0.00 = rounded number <0.01).

| Common name                     | CPUE ( $\text{kg } 10\text{km}^{-1}$ ) |             |
|---------------------------------|--|-------------|
|                                 | TOMI MARU NO.88                        | OCEAN PEARL |
| Flying Squid                    | 3831.41                                | 2598.37     |
| Pelagic Octopus                 | 0.02                                   | 0.04        |
| Unidentified Squid              | 0.01                                   | -           |
| Nail Squid                      | 0.00                                   | 0.02        |
| Pink Salmon                     | 0.04                                   | 0.28        |
| Chum Salmon                     | 0.65                                   | 1.68        |
| Coho Salmon                     | 0.04                                   | 0.02        |
| Sockeye Salmon                  | 0.18                                   | 9.41        |
| Steelhead                       | 1.69                                   | 4.57        |
| Bonito Shark                    | 0.32                                   | -           |
| Blue Shark                      | 790.14                                 | 353.43      |
| Salmon Shark                    | 76.07                                  | 42.46       |
| Thresher Shark                  | 2.39                                   | 4.41        |
| Basking Shark                   | -                                      | 18.70       |
| Soupfin Shark                   | -                                      | 0.15        |
| Pelagic Stingray                | 0.01                                   | -           |
| Pomfret                         | 569.60                                 | 379.36      |
| Rough Pomfret                   | -                                      | 0.01        |
| Albacore                        | 16.30                                  | 7.87        |
| Jack Mackerel                   | 47.27                                  | 75.92       |
| Chub Mackerel                   | -                                      | 0.06        |
| Pacific Bonito                  | 0.25                                   | -           |
| Yellowtail                      | 0.18                                   | 0.01        |
| Pelagic Armourhead              | 0.03                                   | 0.04        |
| Skilfish                        | 0.01                                   | 0.01        |
| Pacific Saury                   | -                                      | 0.01        |
| Long Nose Lancetfish            | 0.06                                   | 0.07        |
| Ocean Sunfish                   | 0.02                                   | -           |
| Unidentified Fish               | 0.00                                   | -           |
| Dall Porpoise                   | 15.38                                  | 28.78       |
| Northern Right<br>Whale Dolphin | 4.14                                   | 2.72        |
| Pacific White-<br>Sided Dolphin | 1.32                                   | 13.22       |
| Short-finned<br>Pilot Whale     | 14.82                                  | 17.07       |
| Harbour Porpoise                | -                                      | 0.37        |

Table 8a (cont'd)

| Common name                               | CPUE (kg 10km <sup>-1</sup> ) |             |
|---|-------------------------------|-------------|
|   | TOMI MARU NO.88               | OCEAN PEARL |
| Fur Seal                                  | 0.11                          | -           |
| Stellar Sea Lion                          | -                             | 2.24        |
| Unidentified mammal                       | 0.00                          | -           |
| Albatross                                 | 0.03                          | 0.15        |
| Sooty Shearwater                          | 0.88                          | 0.53        |
| Slender-billed<br>Shearwater              | -                             | 0.00        |
| Storm Petrels                             | 0.01                          | 0.00        |
| Cassin's Auklet                           | 0.01                          | 0.00        |
| Rhinoceros Auklet                         | 0.00                          | -           |
| Common Murre                              | 0.00                          | -           |
| Murres, Murrelets,<br>Auklets and Puffins | -                             | 0.00        |
| Terns                                     | 0.02                          | 0.00        |

Table 8b. CPUE ( $\text{kg } 10\text{km}^{-1}\text{hr}^{-1}$ ) by species for the TOMI MARU NO.88 and the OCEAN PEARL in 1987. (- = no catch, 0.00 = rounded number <0.01).

| Common name                     | CPUE ( $\text{kg } 10\text{km}^{-1}\text{hr}^{-1}$ ) |             |
|---------------------------------|--|-------------|
|                                 | TOMI MARU NO.88                                      | OCEAN PEARL |
| Flying Squid                    | 363.51   | 318.04      |
| Pelagic Octopus                 | 0.00   | 0.00        |
| Unidentified Squid              | 0.00   | -           |
| Nail Squid                      | 0.00   | 0.00        |
| Pink Salmon                     | 0.00   | 0.03        |
| Chum Salmon                     | 0.06   | 0.21        |
| Coho Salmon                     | 0.00   | 0.00        |
| Sockeye Salmon                  | 0.00   | 1.15        |
| Steelhead                       | 0.16   | 0.56        |
| Bonito Shark                    | 0.03   | -           |
| Blue Shark                      | 74.97  | 43.26       |
| Salmon Shark                    | 7.22   | 5.20        |
| Thresher Shark                  | 0.23   | 0.54        |
| Basking Shark                   | -  | 2.30        |
| Soupfin Shark                   | -  | 0.02        |
| Pelagic Stingray                | 0.00   | -           |
| Pomfret                         | 54.04  | 46.43       |
| Rough Pomfret                   | -  | 0.00        |
| Albacore                        | 1.55   | 0.96        |
| Jack Mackerel                   | 4.48   | 9.29        |
| Chub Mackerel                   | -  | 0.01        |
| Pacific Bonito                  | 0.00   | -           |
| Yellowtail                      | 0.02   | 0.00        |
| Pelagic Armourhead              | 0.00   | 0.00        |
| Skilfish                        | 0.00   | 0.00        |
| Pacific Saury                   | -  | 0.00        |
| Long Nose Lancetfish            | 0.01   | 0.01        |
| Ocean Sunfish                   | 0.00   | -           |
| Unidentified Fish               | 0.00   | -           |
| Dall Porpoise                   | 1.46   | 3.52        |
| Northern Right<br>Whale Dolphin | 0.39   | 0.33        |
| Pacific White-<br>Sided Dolphin | 0.13   | 1.62        |
| Short-finned<br>Pilot Whale     | 1.41   | 2.09        |

Table 8b (cont'd)

| Common name                               | CPUE (kg 10km <sup>-1</sup> hr <sup>-1</sup> ) |             |
|---|--|-------------|
|   | TOMI MARU NO.88                                | OCEAN PEARL |
| Harbour Porpoise                          | -  | 0.05        |
| Fur Seal                                  | 0.01   | -           |
| Stellar Sea Lion                          | -  | 0.27        |
| Unidentified mammal                       | 0.00   | -           |
| Albatross                                 | 0.00   | 0.02        |
| Sooty Shearwater                          | 0.08   | 0.10        |
| Slender-billed<br>Shearwater              | -  | 0.00        |
| Storm Petrels                             | 0.00   | 0.00        |
| Cassin's Auklet                           | 0.00   | 0.00        |
| Rhinoceros Auklet                         | 0.00   | -           |
| Common Murre                              | 0.00   | -           |
| Murres, Murrelets,<br>Auklets and Puffins | -  | 0.00        |
| Terns                                     | 0.00   | 0.00        |

Table 9. Comparison of CPUE (kg squid km<sup>-1</sup>) between all vessels that have participated in the offshore squid fishery in recent years.

| Vessel              | Date           | CPUE<br>(kg squid km <sup>-1</sup> ) | Source                       |
|---------------------|----------------|--------------------------------------|------------------------------|
| TOMI MARU<br>NO.88  | June-Aug 1987  | 383.1                                | This study                   |
| OCEAN PEARL         | June-Aug 1987  | 259.8                                | This study                   |
| TOMI MARU<br>NO.88  | June-Sept 1986 | 266.3                                | Jamieson and Heritage (1987) |
| OCEAN PEARL         | July-Sept 1986 | 270.5                                | Jamieson and Heritage (1987) |
| LA PORSCHE          | Aug-Sept 1986  | 153.8                                | Jamieson and Heritage (1987) |
| TOMI MARU<br>NO.88  | July-Sept 1985 | 311.5                                | Jamieson and Heritage (1987) |
| SIMSTAR             | July-Aug 1983  | 339.2                                | Robinson and Jamieson (1984) |
| TOMI MARU<br>NO.88  | July-Aug 1983  | 232.3                                | Sloan (1984)                 |
| TENYU MARU<br>NO.37 | July-Aug 1980  | 332.0                                | Bernard (1981)               |
| TOMI MARU<br>NO.88  | August 1980    | 165.8                                | Bernard (1981)               |

Table 10. Mean daily CPUE (pieces  $10\text{km}^{-1}$ ) of the most commonly caught species ( $>1$  piece  $10\text{km}^{-1}$ ) caught with driftnets by the two vessels fishing flying squid in 1987. Data provided are averaged for sets made before and after July 24, with surface water temperatures before and after this date generally  $<14^\circ\text{C}$ , and  $>14^\circ\text{C}$ , respectively.  $p < 0.5$  = significant difference between the two average catch rates.

|                      | TOMI MARU #88             |                             |      | OCEAN PEARL               |                            |      |
|----------------------|---------------------------|-----------------------------|------|---------------------------|----------------------------|------|
|                      | June 15-July 24<br>(n=38) | July 25-August 24<br>(n=28) | p    | June 13-July 24<br>(n=37) | July 25-August 5<br>(n=12) | p    |
| Flying squid         | 1434.1                    | 1875.4                      | .08  | 929.0                     | 1638.2                     | .03  |
| Pomfret              | 219.3                     | 293.2                       | .41  | 177.7                     | 879.2                      | <.01 |
| Jack mackerel        | 34.2                      | 8.3                         | .14  | 19.8                      | 50.2                       | .07  |
| Albacore             | 1.4                       | 5.7                         | .01  | 0.9                       | 1.9                        | .36  |
| Salmon (all species) | 0.7                       | 0.4                         | .21  | 5.0                       | 1.0                        | .60  |
| Steelhead            | 1.2                       | 0.6                         | .10  | 1.0                       | 1.4                        | .47  |
| Blue shark           | 71.8                      | 247.3                       | <.01 | 62.7                      | 136.3                      | <.01 |
| Salmon shark         | 1.7                       | 4.1                         | <.01 | 1.4                       | 3.4                        | <.01 |
| Sooty shearwater     | 1.1                       | 1.6                         | .23  | 0.5                       | 1.2                        | .04  |
| Dall porpoise        | 0.2                       | 0.02                        | .01  | 0.2                       | 0.1                        | .40  |



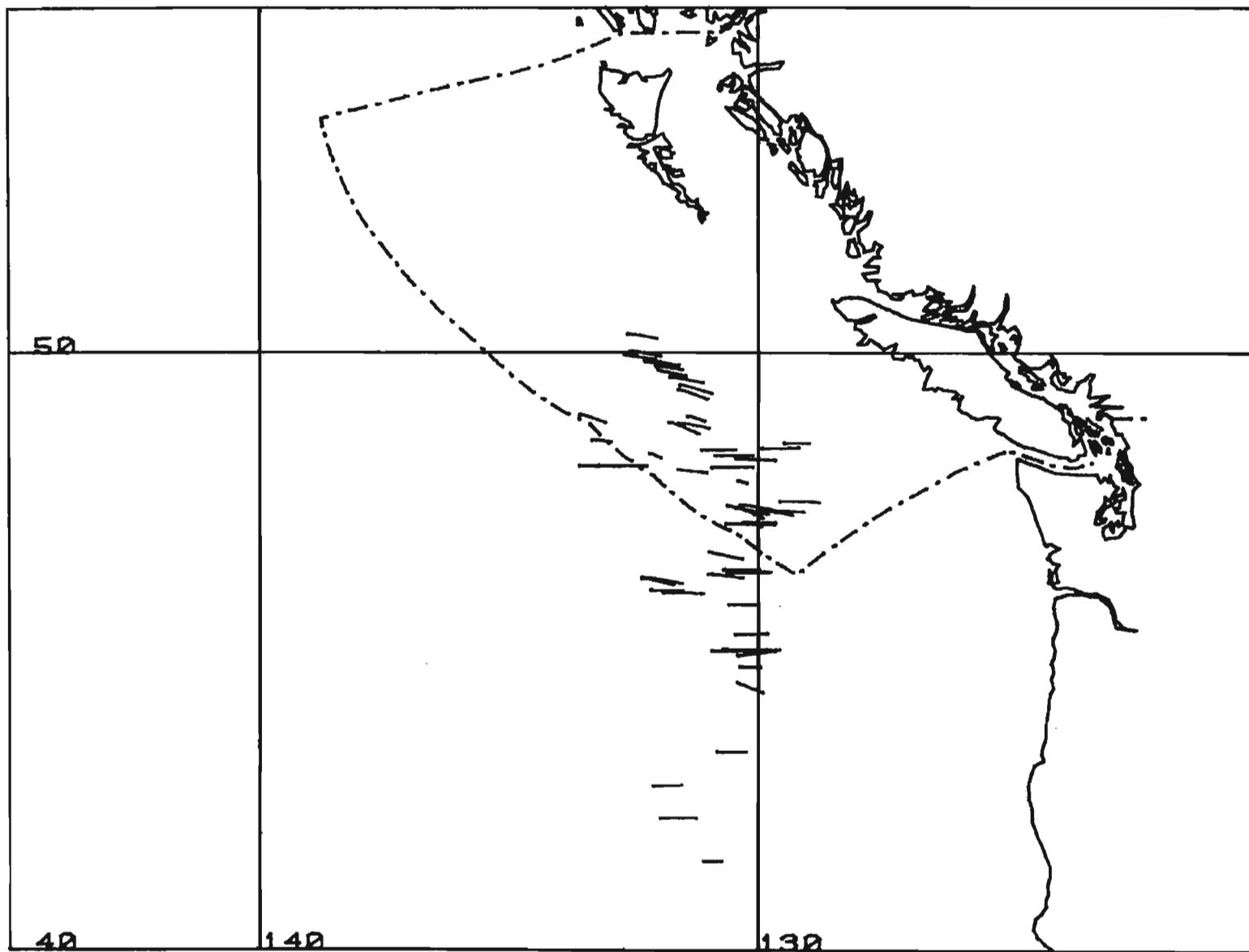


Fig. 1. 1987 driftnet set locations for TOMI MARU NO. 88.



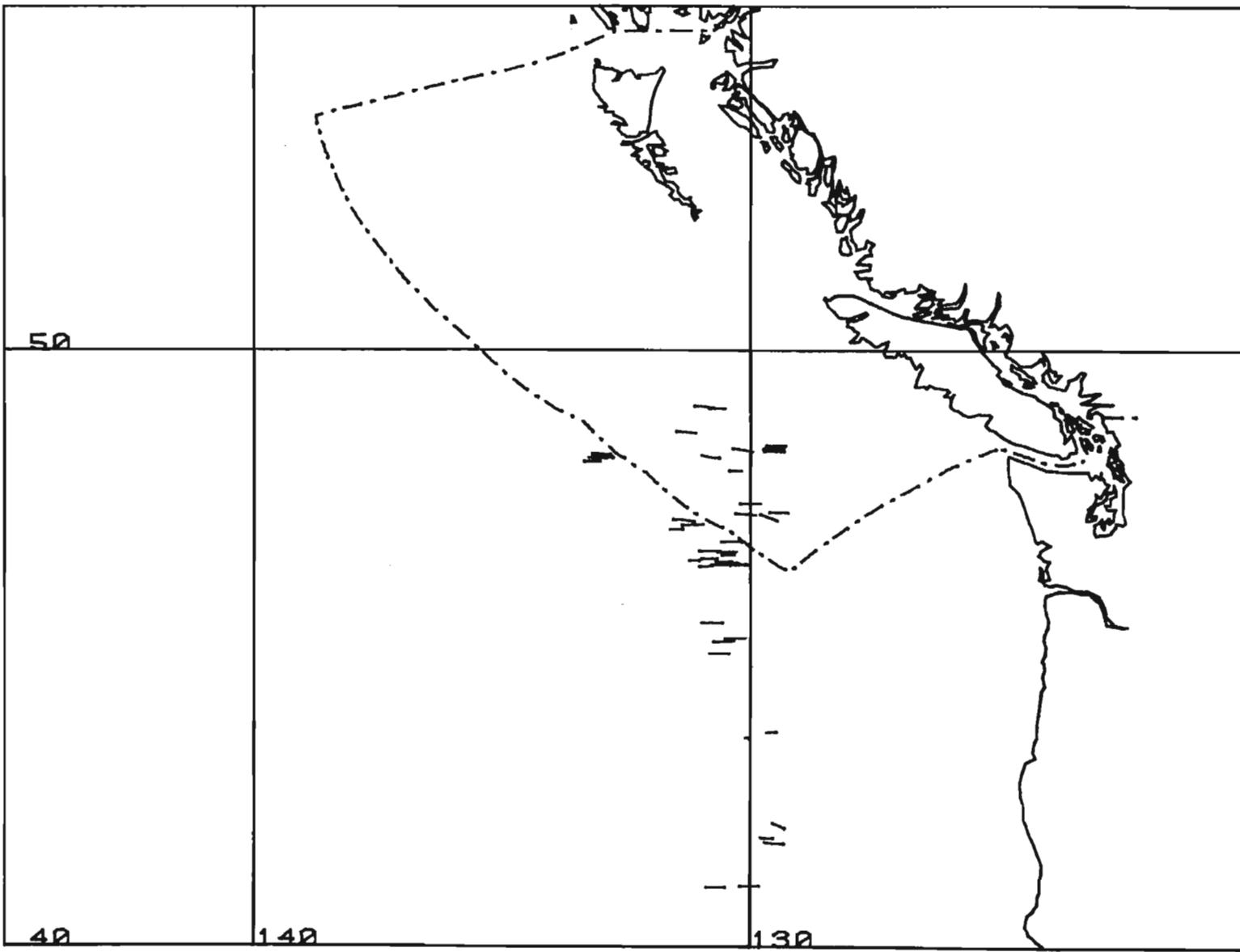
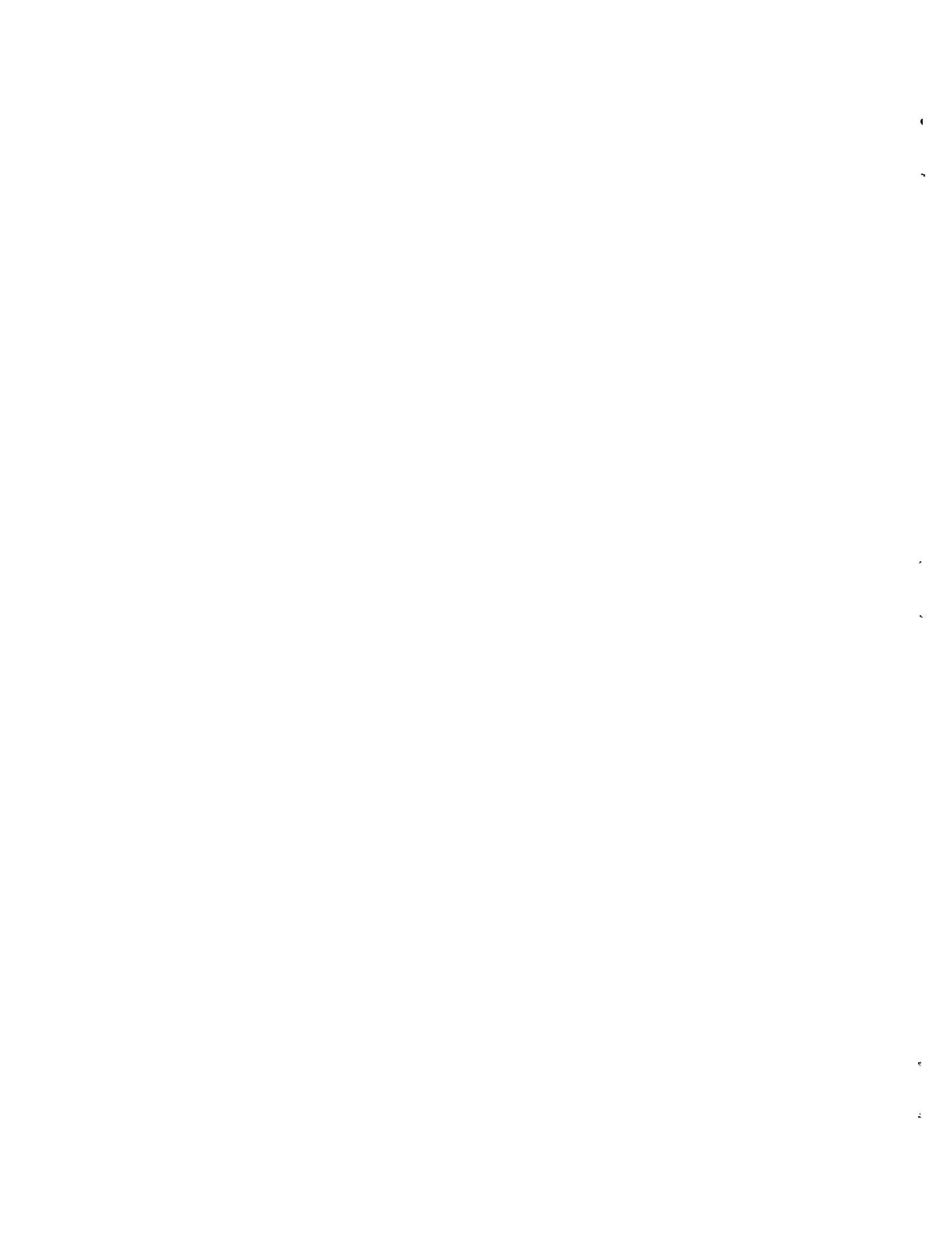


Fig. 2. 1987 driftnet set locations for OCEAN PEARL.



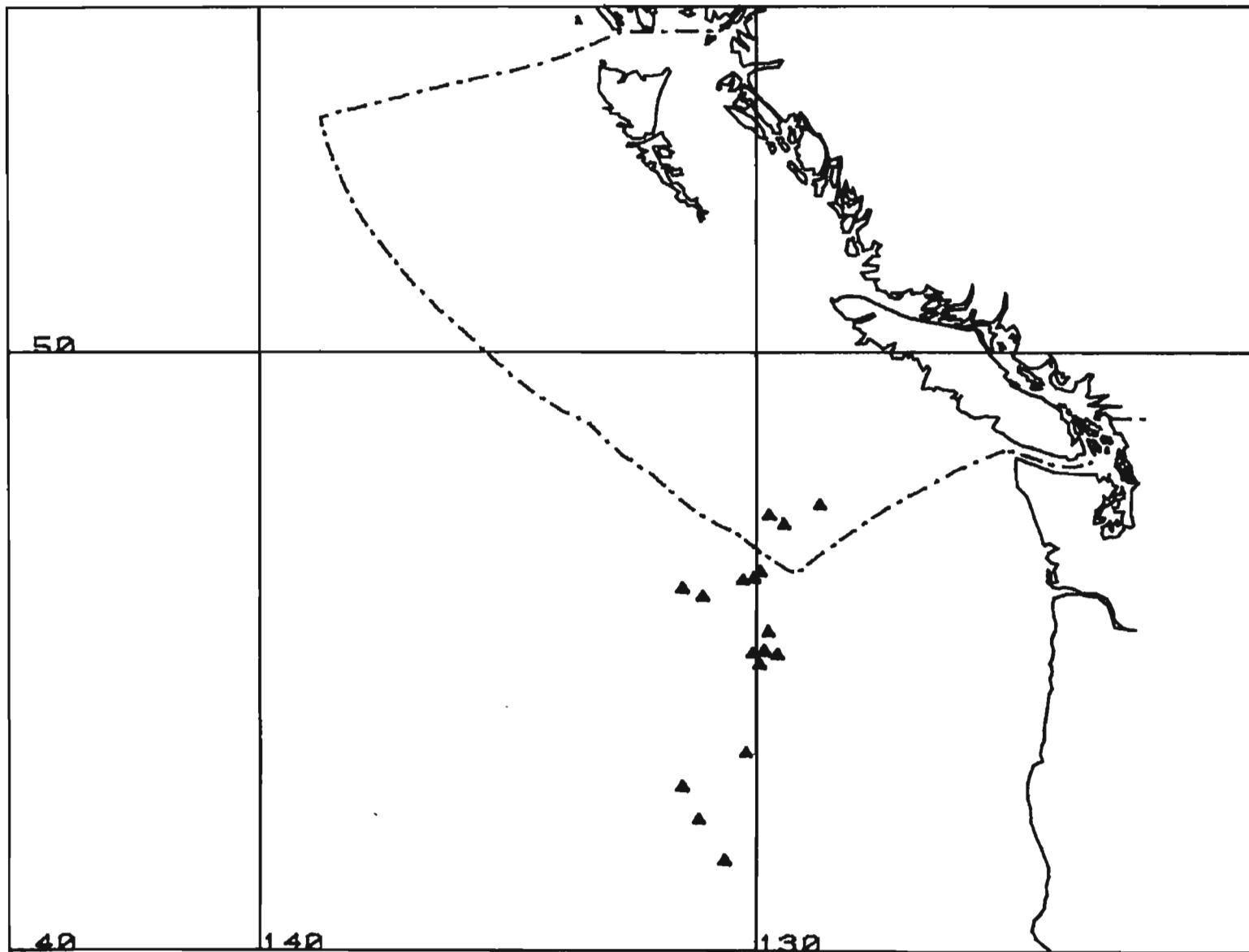


Fig. 3. 1987 jig sites for TOMI MARU NO. 88.