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# Results of 2002 Salmon Research Cruise of the *Oshoro maru*

by

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## ABSTRACT

To continue collecting oceanographic and biological data, the *Oshoro maru* conducted three research cruises along 155?E (Cruise #123 and #124) and 145?W (#125) in the North Pacific. Each survey was conducted in late May (Cruise #123), mid June (#124) and from mid-late July (#125), 2002.

In Cruise #123, the Subsurface Temperature Front crossed at 42?-20'N, and the Subarctic Boundary crossed at 38?N. In Cruise #124, the Subsurface Temperature Front crossed at 43?N, and temperature between 0-50db was 2? higher than in Cruise #123 in the Transition Domain. In Cruise #125, Oceanographic conditions corresponded to the oceanographic structure in the central Gulf of Alaska and surface temperature was over 11? .

In Cruise #123, chum salmon and pink salmon were abundant at all three drift gillnet stations. The CPUE value of chum salmon was higher at 41?N than at 42.5?N and 44?N. On the other hand, the CPUE value of pink salmon at 41?N was lower than at 42.5?N and 44?N. In Cruise #124, chum and pink salmon were also abundant, and coho salmon was collected in small numbers. The CPUE value of chum salmon increased from south to north, but those of pink salmon and coho salmon were highest at 42.5?N. Neon flying squid was most abundant species collected at 39.6?N. In Cruise #125, the most dominant salmonid was chum salmon, whose center of distribution was at 54?N. The next dominant salmonid was sockeye salmon, whose center of distribution was at 53?N. Almost all pink salmon were collected at 55?N and 56?N. Almost all steelhead were collected at 54?N and 55?N. Coho salmon was collected in low ratios at all stations. Pacific pomfret was especially dominant species collected at 51?N.

A total of 89% of sockeye salmon collected in Cruise #125 were adult, and their fork lengths ranged 520-680mm F.L. The male ratio was under 50%. Over 95% of chum salmon were adult and between 460-640mm F.L. in Cruise #123 and #124. On the other hand, 94.5% were immature and almost all of them were between 380-540mm F.L. in Cruise #125. The sex ratios were about 50% in the all cruises. For pink salmon, the fork length frequency distributions were different among the three cruises. The proportions of males were 46% in both Cruise #123 and #124, and 42% in Cruise #125. For coho salmon, 75% were over 500mm F.L. in Cruise #124, but 75% were under 500mm F.L. in Cruise #125. The proportion of males was high in Cruise #124 but low in Cruise #125. The maturity ratio of steelhead was 33.3%. Fork lengths ranged widely. Males composed 60.0%.

## INTRODUCTION

The *Oshoro maru* and the *Hokusei maru* have conducted pelagic fishes and squids research and have studied the oceanic structure and marine biology in the North Pacific Ocean, Bering Sea and/or Chukuchi Sea every summer since 1953. Data collected by the *Oshoro maru* and the *Hokusei maru* have been published annually since 1957 (Hokkaido University, 1957-2002).

Since 1978, several transects have been repeatedly sampled to study long-term changes in the North Pacific ecosystem. These transects include 180 ?, 165 ?W, 145 ?W by the *Oshoro maru* and 155 ?E, 170 ?E, 175 ?30'E by the *Hokusei maru*.

The *Hokusei maru* was decommissioned in March 2002, so our salmon research cruises in the North Pacific conducted only two transects along 155 ?E (late May and mid June) and 145 ?W (mid-late July) by three cruises of the *Oshoro Maru* in summer, 2002 (Cruise #123, #124, and #125). The cruises have sampled along 155 ?E from 35 ?N to 44 ?N since 1982, and sampled along 145 ?W from 50 ?N to 56 ?N since 1994. The primary objects of these cruises are to continue collecting oceanographic and biological data along these transects.

This document reports the preliminary results of the 2002 research cruises of the *Oshoro maru* in the North Pacific.

## METHODS

### 1.Survey Area and Cruise Schedule

Hydrographic, gillnet, and surface longline research were conducted along the 155?E and 145?W in the North Pacific during three cruises: #123 (22-28 May), #124 (12-16 June), and #125 (17-24 July). (Fig. 1, Tables 1-3)

### 2.Oceanographic Observation

Oceanographic stations were occupied from 35 ?N to 44?N in Cruise #123 and 39.6?N to 44 ?N in Cruise #124 along 155?E. In Cruise #125, oceanographic stations were occupied from 50 ?N to 56?N along 145?W (Fig. 1, Table 1).

Data collected by CTD and XBT instruments were used to plot the temperature and salinity.

### 3.Drift Gillnet Sampling

A drift gillnet was used to catch salmonids and the other organisms at 13 stations (Fig. 1, Table 2). The gillnet configurations is shown in Table 3. The net comprised of 30 tans of C-Gear gillnet (non-selective varied research mesh, Takagi, 1975), 12 tans (Cruise #123 and #124) or 19 tans (Cruise #125) of A-Gear gillnet (commercial mesh), and 7 tans (Cruise #123 and #124) of F-Gear gillnet (special mesh). Each tan was 50m long.

Gillnet gear was set in the evening, allowed to soak overnight, and retrieved the following morning.

The number of organisms caught was counted by species for each mesh size. Catch per unit effort (CPUE) values were calculated as the number of fish caught by C-gear gillnet per tan.

Fork length (F.L.), body weight, and gonad weight by sex of a maximum 60 fishes for each salmon species of each mesh size were measured, and scale samples were collected from the International North Pacific Fisheries Commission (INPFC) preferred body area and placed on gummed cards for verification of species identification, and for age, growth and stock origin studies.

Sockeye salmon (*Oncorhynchus nerka*), chum salmon (*Oncorhynchus keta*), chinook salmon (*Oncorhynchus tshawytscha*) and Steelhead (*Oncorhynchus mykiss*) were classified as mature or immature based on gonad weight (Takagi, 1961, Ito et al., 1974, Okazaki, 1984).

By prior arrangement with the FAJ, snouts were collected from each salmonid lacking an adipose fin. These snouts were labeled with catch and biological information and frozen. Snout samples were sent to the U.S. National Marine Fisheries Service, Auke Bay Laboratory, where they will be examined for coded-wire tags.

**4. Surface Longline Sampling and Tagging**

Five surface longline samplings were operated to tag and release viable salmonids along 145? W in Cruise #125 (Fig. 1, Table 4). Ten hachi (baskets) were used at each station.

One hachi; mainline: 127m long; 34 branch lines/hachi; 3m between branch lines;

Fishing depth: 2m ; Bait: Cut frozen saury.

To collect salmonids for tagging, hook-and-line gear was used in addition to the longline.

All viable salmonids were double-tagged with FAJ (red and white, 1.6 cm in diameter) and FRI Petersen (red and white, 2.0 cm in diameter) disk tags. Some salmonids were also tagged with data-storage archival tags, which record temperature and depth (Walker et al. 1998).

Data on species, length and tag number of each fish were recorded on data forms. The scale collection method and data recorded on length, species and tag number were the same as those in standard methods.

**5. Additional Biological Sampling**

At gillnet stations, additional research activities by U.S. and Japanese scientists included collection of whole salmon, salmonid stomachs, otoliths, muscle tissue, liver, heart, eye fluid and scales for studies of energetics, food habits, growth, maturity and stock identification.

## RESULTS AND DISCUSSION

Final oceanographic data and biological data collected during the cruises will be published

in the *"DATA RECORDE OF OCEANOGRAPHIC OBSERVATIONS AND EXPLORATORY FISHING* NO. 46" of Hokkaido University no later than March 2003.

**1.Oceanographic Conditions**

Temperature and salinity sections (0-1000db) are shown in Figure 2.

[Cruise #123]

The Subsurface Temperature Front (Roden, 1991), which is indicated by the vertical 4?C isotherm (Dodimead et al., 1963), occurred near 42 ?-20'N. The Subarctic Boundary, that is indicated by which the vertical 34.0 psu isohaline is shallower than the intermediate salinity minimum layer in the Subtropical Water (Favorite et al., 1976), occurred near 38 ?N.

Based on these data, the survey area was divided as follows:

the Subarctic Gyre, from 44 ?N to 42 ?-20'N;

the Transition Domain, from 42 ?-20'N to 38 ?N;

and Subtropical Water, from 38 ?N to 35 ?N.

[Cruise #124]

The Subarctic Temperature Front occurred near 43 ?N. The Subarctic Boundary wasn't observed in this cruise.

This area was divided as follows:

the Subarctic Gyre, from 44 ?N to 43 ?N;

the Transition Domain, from 39 ?-40'N;

Temperature between 0-50db in the Transition Domain was 2? higher than Cruise #123.

[Cruise #125]

Oceanographic conditions in survey area corresponded to oceanographic structure in the central Gulf of Alaska (Musgrave et al., 1992). Surface temperature was over 11? in this season, and the thermocline occurred between 20-50db.

Data at 56?N was not use for analysis because the accuracy of the CTD data collected was dubious.

**2.Distribution and abundance of organisms caught by drift gillnet**

The number of organisms caught by the drift gillnet and CPUE values at each station are shown in Table 5-(1) (Cruise #123), 5-(2) (Cruise #124), and 5-(3) (Cruise #125).

[Cruise #123]

A total of 145 chum salmon and 394 pink salmon (*Oncorhynchus gorbuscha*) were collected at all stations, and only one chinook salmon was collected at 41?N in this cruise. CPUE value of chum salmon at 41?N was the highest of all stations. On the other hand, CPUE value of pink salmon at 41?N was the lowest of all stations.

As for non-salmonids species, small numbers of boreal clubhook squid (*Onychoteuthis borealijaponika*) and pacific pomfret (*Brama japonica*) were collected at 41?N, and only

boreal clubhook squid (*Onychoteuthis borealijaponika*) was collected at 42.5 ? N. Non-salmonids species were not collected at 44?N.

[Cruise #124]

A total of 208 chum salmon, 697 pink salmon and 19 coho salmon (*Oncorhynchus kisutch*) were collected in this cruise. Only one salmonid (a chum salmon) was collected at 39.6?N. The CPUE value of chum salmon increased from south to north, but those of pink salmon and coho salmon were highest at 42.5?N.

As for non-salmonids species, boreal clubhook squid was dominant at 44 ?N and 42.5?N. Pacific pomfret was collected in high ratios at 41 ?N. Neon flying squid (*Ommastrephes bartramii*) was most abundant of all species at 39.6?N.

[Cruise #125]

A total of 380 sockeye, 507 chum, 95 pink, 15 coho, and 45 steelhead salmon were collected in this cruise. Except at 53?N, most abundant salmonids was chum salmon in this cruise. The CPUE value of sockeye salmon was highest at 53?N, and it was much lower at 50?N and 56?N than those at other stations. The CPUE value of chum salmon was highest at 54?N, and decreased to the north and south. The CPUE value of pink salmon was highest at 55?N and it was under 0.1(N/tan) between 50?N and 54?N. Coho salmon was collected in low ratios, and the CPUE values were under 0.07(N/tan) at all stations. More than fifteen steelhead were collected at 54?N and 55?N, fewer than six were collected under six at the other four stations.

As for non-salmonids species, boreal clubhook squid was dominant at 50?N. Pacific pomfret was especially abundant at 51?N. But in the other four stations, salmonids composed over 79% of the numeric catch by C-gear gillnet.

**3.Biological characteristics of salmonids**

[Sockeye salmon]

A total of 89% of sockeye salmon collected by C-gear gillnet in Cruise #125 were adult. Fork lengths of adult fish ranged between 520-680mm (mean ± STD: 603.5± 19.89mm, mode: 590mm median: 602mm). 90% of immature fish were between 320-460mm F.L. Males composed 42.5%. (Fig. 3)

[Chum salmon]

Over 95% of chum salmon collected by C-gear gillnet in Cruise #123 and #124 were adult, and their fork length ranged between 460-640mm. On the other hand, 94.5% of catch in Cruise #125 were immature fish of which 97.7% were between 380-540mm F.L. The sex ratios were about 50% in the all cruises. (Fig. 4)

[Pink salmon]

Fork length frequency distributions of pink salmon were as follows:

Cruise #123: mean ± STD =421.0± 24.83mm, mode=412mm, median=419mm F.L.

Cruise #124: mean ± STD =447.2± 27.07mm, mode=450mm, median=446mm F.L.

Cruise #125: mean ± STD =509.7±26.87mm, mode=510mm, median=510mm F.L.

It is considered that these differences were caused by differences of sampling season and area. The proportions of males were 46% in both Cruise #123 and #124, and 42% in Cruise #125. (Fig. 4)

[Coho salmon]

Eight coho salmon were collected by C-gear gillnet both in Cruise #124 and in Cruise #125 (Table 5-(1), (2)); 75% were over 500mm F.L. in Cruise #124, and 75% were under 500mm F.L. in Cruise #125. The proportion of males was high in Cruise #124 (87.5%) and low in Cruise #125 (25.0%). (Fig. 4)

[Steelhead]

Steelhead was collected only in Cruise #125; 33.3% of those caught by C-gear gillnet were mature. Fork lengths varied widely for both immature and mature fish, but fish under 360mm F.L. were all immature. Males composed 60.0%. (Fig. 3)

**4. Surface longline sampling and tagging**

Only one chum salmon was caught at all surface longline stations (a 474mm F.L. female at 53?N), but it was not viable for tagging and release.

One viable 515mm F.L. chum salmon was caught at 54?N, and one viable 484mm F.L. pink salmon was caught at 55?N using hook-and-line gear. They were double-tagged with FAJ and FRI Petersen disk tags. They were also tagged with data-storage archival tags, which record temperature and depth.

**5. Scale Sampling**

The original gummed scale cards were sent to the FAJ, Hokkaido National Fisheries Research Institute, Kushiro, for age determination. The results of this analysis will be reported later.

**6. Fish lacking adipose fins**

Snouts were collected from 24 steelhead lacking adipose fins for coded-wire tag detection.

## ACKNOWLEDGMENTS

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Table 1. List of oceanographic stations along the 155°E and 145°W.

Cruise #123

| Station | Lat.(N)*1 | Long.(E)*1 | S.M.T.*2 | T.D.*3 | COL.*4 | TR.*5 | Remark |
|---|---|---|---|---|---|---|---|
| OS 02138 | 35-00.0 | 155-00.0 | 5/22 13:04 | +10:00 | 3 | 12.4 | CTD |
| OS 02139 | 35-45.8 | 154-59.8 | 5/22 23:14 | +10:00 | - | - | CTD |
| OS 02140 | 36-30.4 | 154-59.8 | 5/23 06:58 | +10:00 | 3 | 11.0 | CTD |
| OS 02141 | 37-14.9 | 155-00.0 | 5/23 13:00 | +10:00 | 4 | 15.0 | CTD |
| OS 02142 | 37-59.7 | 155-00.8 | 5/23 19:07 | +10:00 | - | - | CTD |
| OS 02143 | 38-45.2 | 154-59.5 | 5/24 07:17 | +10:00 | 5 | 11.0 | CTD |
| OS 02144 | 39-30.1 | 154-59.3 | 5/24 12:21 | +10:00 | 4 | 11.0 | CTD |
| OS 02145 | 40-15.0 | 154-59.8 | 5/25 02:19 | +10:00 | - | - | CTD |
| OS 02146 | 41-00.8 | 154-59.4 | 5/25 07:30 | +10:00 | 4 | 15.0 | CTD |
| OS 02147 | 41-45.8 | 155-00.0 | 5/26 09:02 | +10:00 | 4 | 12.0 | CTD |
| OS 02148 | 42-29.7 | 154-59.8 | 5/26 16:16 | +10:00 | 5 | 11.0 | CTD |
| OS 02149 | 43-15.3 | 154-59.8 | 5/27 09:06 | +10:00 | 5 | 15.4 | CTD |
| OS 02150 | 44-00.2 | 154-59.8 | 5/27 13:53 | +10:00 | 4 | 16.2 | CTD |

Cruise #124

| Station | Lat.(N)*1 | Long.(E)*1 | S.M.T.*2 | T.D.*3 | COL.*4 | TR.*5 | Remark |
|---|---|---|---|---|---|---|---|
| OS 02153 | 44-00.0 | 155-00.0 | 6/12 11:05 | +10:00 | - | - | CTD |
| OS 02154 | 43-15.0 | 155-00.0 | 6/13 12:30 | +10:00 | - | - | XBT |
| OS 02155 | 42-19.4 | 155-07.0 | 6/14 00:03 | +10:00 | | | CTD |
| OS 02156 | 41-45.0 | 155-00.0 | 6/14 11:10 | +10:00 | 4 | 9.0 | XBT |
| OS 02157 | 41-01.2 | 154-59.1 | 6/14 16:45 | +10:00 | 6 | 9.0 | CTD |
| OS 02158 | 40-20.0 | 155-00.0 | 6/15 09:20 | +10:00 | - | - | XBT |
| OS 02159 | 39-38.5 | 155-01.5 | 6/15 15:36 | +10:00 | - | - | CTD |

Cruise #125

| Station | Lat.(N)*1 | Long.(E)*1 | S.M.T.*2 | T.D.*3 | COL.*4 | TR.*5 | Remark |
|---|---|---|---|---|---|---|---|
| OS 02250 | 50-00.0 | 144-59.8 | 7/17 09:30 | -10:00 | 4 | 12.0 | CTD |
| OS 02251 | 50-30.0 | 145-00.0 | 7/18 07:50 | -10:00 | 4 | 16.0 | CTD |
| OS 02252 | 51-00.2 | 144-59.7 | 7/18 12:52 | -10:00 | 5 | 13.0 | CTD |
| OS 02253 | 51-30.0 | 145-00.2 | 7/19 09:40 | -10:00 | 4 | 13.0 | CTD |
| OS 02254 | 51-59.8 | 145-00.5 | 7/19 14:40 | -10:00 | 4 | 15.0 | CTD |
| OS 02255 | 52-30.4 | 145-00.0 | 7/19 20:50 | -10:00 | - | - | CTD |
| OS 02256 | 53-00.0 | 145-00.0 | 7/20 08:02 | -10:00 | 5 | 14.0 | CTD |
| OS 02257 | 53-29.8 | 145-00.0 | 7/21 08:30 | -10:00 | 4 | 16.0 | CTD |
| OS 02258 | 53-59.8 | 145-01.5 | 7/21 13:35 | -10:00 | 5 | 16.5 | CTD |
| OS 02259 | 54-30.0 | 145-00.0 | 7/22 09:03 | -10:00 | 5 | 13.0 | CTD |
| OS 02260 | 55-00.6 | 144-59.1 | 7/22 14:20 | -10:00 | 5 | 16.0 | CTD |
| OS 02261 | 55-30.1 | 145-00.1 | 7/23 09:05 | -10:00 | 5 | 17.0 | CTD |
| OS 02262 | 56-00.1 | 145-00.2 | 7/23 14:00 | -10:00 | 5 | 15.0 | CTD |

*1: Fixed position by Global Positioning System

*2: S.M.T. = Ship's Mean Time

*3: T.D. = Time Difference between Greenwich Mean Time and Ship's Mean Time

*4 : COL. = Water color in Forel-Ule scale

*5 : TR.. = Transparency in meters measured with Secchi disk

CTD : CTD cast XBT : XBT cast

Table 2. Position and research conditions of drift gillnet at each station in Cruise #123, #124, and #125.

Cruise #123

| Station | Date and Time (S.M.T.) | | | | T.D. | Set position | | D.S. | Bottom | Wr | Wind | Oceanographic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net set | | Net haul | | | Lat.(N) | Long.(E) | | depth (m) | | (Force) | Station No. |
| OSG 0201 | May 25 | 17:48-18:15 | May 26 | 04:26-05:50 | +10:00 | 40-59.9 | 155-00.8 | 120 | 5540 | bc | West -4 | OS 02146 |
| OSG 0202 | 26 | 17:50-18:20 | 27 | 04:20-05:30 | +10:00 | 42-29.9 | 154-59.5 | 230 | 5180 | o | NE -2 | OS 02148 |
| OSG 0203 | 27 | 17:52-18:15 | 28 | 04:30-05:51 | +10:00 | 44-00.3 | 155-01.2 | 060 | 5290 | b | SW -4 | OS 02150 |

Cruise #124

| Station | Date and Time (S.M.T.) | | | | T.D. | Set position | | D.S. | Bottom | Wr | Wind | Oceanographic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net set | | Net haul | | | Lat.(N) | Long.(E) | | depth (m) | | (Force) | Station No. |
| OSG 0204 | June 12 | 17:54-04:30 | June 13 | 04:30-06:09 | +10:00 | 44-02.3 | 155-03.6 | 200 | 5294 | f | NNW -5 | OS 02153 |
| OSG 0205 | 13 | 17:48-18:14 | 14 | 04:30-05:28 | +10:00 | 42-29.4 | 155-00.2 | 200 | - | bc | NW -4 | OS 02155 |
| OSG 0206 | 14 | 17:48-18:12 | 15 | 04:38-05:47 | +10:00 | 41-01.7 | 154-58.6 | 320 | 5330 | o | ESE -3 | OS 02157 |
| OSG 0207 | 15 | 17:52-18:17 | 16 | 04:30-05:39 | +10:00 | 39-38.4 | 155-00.9 | 250 | 5475 | c | NE -5 | OS 02159 |

Cruise #125

| Station | Date and Time (S.M.T.) | | | | T.D. | Set position | | D.S. | Bottom | Wr | Wind | Oceanographic |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net set | | Net haul | | | Lat.(N) | Long.(W) | | depth (m) | | (Force) | Station No. |
| OSG 0208 | July 17 | 17:50-18:11 | July 18 | 04:25-05:20 | -10:00 | 50-00.2 | 144-58.6 | 100 | 4251 | o | West -2 | OS 02250 |
| OSG 0209 | 18 | 17:50-18:12 | 19 | 05:20-06:25 | -10:00 | 50-59.9 | 144-59.5 | 120 | 4270 | bc | WNW -2 | OS 02252 |
| OSG 0210 | 20 | 17:51-18:10 | 21 | 04:30-05:25 | -10:00 | 53-01.3 | 144-59.7 | 030 | 4107 | f | SSW -6 | OS 02256 |
| OSG 0211 | 21 | 17:51-18:16 | 22 | 04:35-05:35 | -10:00 | 54-00.0 | 145-01.2 | 224 | 3900 | f | South -4 | OS 02258 |
| OSG 0212 | 22 | 17:51-18:13 | 23 | 04:30-05:34 | -10:00 | 55-00.1 | 144-59.4 | 015 | 4053 | o | SSE -4 | OS 02260 |
| OSG 0213 | 23 | 18:13-18:34 | 24 | 03:55-04:50 | -10:00 | 56-00.1 | 144-59.6 | 060 | 3915 | o | SSW -5 | OS 02262 |

T.D. : Time Difference between G.M.T. and S.M.T. D.S. : Direction in which net was set Wr. : Weather

Wr. : Weather (b: 0-25% clouded, bc: 25-75% clouded, c: over 75%-99% clouded, o:100% clouded, f: fog)

Table 3. Gillnet configurations used in Cruise #123, #124, and #125.

| Cruise No. | Station | Number of tan for each mesh size (mm) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A-Gear | | | | C-Gear | | | | | | | | | | F-Gear | | | | | | | Total |
| | | 112 | 115 | 118 | 121 | 48 | 55 | 63 | 72 | 82 | 93 | 106 | 121 | 138 | 157 | 19 | 22 | 25 | 29 | 33 | 37 | 42 | |
| #123 | OSG 0201 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| | OSG 0202 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| | OSG 0203 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| #124 | OSG 0204 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| | OSG 0205 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| | OSG 0206 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| | OSG 0207 | 6 | - | 6 | - | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 49 |
| #125 | OSG 0208 | - | 10 | - | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 49 |
| | OSG 0209 | - | 10 | - | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 49 |
| | OSG 0210 | - | 10 | - | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 49 |
| | OSG 0211 | - | 10 | - | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 49 |
| | OSG 0212 | - | 10 | - | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 49 |
| | OSG 0213 | - | 10 | - | 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 49 |

Table 4. List of surface longline station along 145°W in Cruise #125.

| Station | Date and Time (S.M.T.) | | | | Set Position | | D.S. | No. of | Wr | Wind | Oceanographic | Gillnet |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Line set | | Line haul | | Lat.(N) | Long.(W) | | hooks | | (Force) | Station No. | Station No. |
| OSSL 0201 | July 17 | 04:24-04:38 | July 17 | 06:33-07:07 | 50-00.2 | 144-57.7 | 110 | 340 | o | West -4 | OS 02250 | OSG 0208 |
| OSSL 0202 | 19 | 04:20-04:37 | 19 | 06:46-07:20 | 51-00.8 | 144-55.9 | 210 | 340 | c | SSE -2 | OS 02252 | OSG 0209 |
| OSSL 0203 | 21 | 03:52-04:08 | 21 | 05:55-06:25 | 53-04.8 | 144-55.1 | 238 | 340 | f | SW -5 | OS 02256 | OSG 0210 |
| OSSL 0204 | 22 | 03:54-04:10 | 22 | 06:10-06:27 | 53-59.7 | 145-00.8 | 210 | 340 | m | SSW -4 | OS 02258 | OSG 0211 |
| OSSL 0205 | 23 | 03:48-04:13 | 23 | 06:05-06:35 | 55-03.5 | 144-52.8 | 190 | 340 | o | SSE -4 | OS 02260 | OSG 0212 |

D.S. : Direction of Set toward Wr. : Weather (c: over 75%-99% clouded, o:100% clouded, f: fog, m: mist)

Table 5-(1). Data on number of organisms caught by drift gillnet during the *OSHORO MARU* cruise #123.

| Cruise No. | | Cruise #123 (late May, 155°E line) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station No. | | OSG 0201 (41°N) | | | | | | OSG 0202 (42.5°N) | | | | | | OSG 0203 (44°N) | | | | | |
| Common name | Scientific name | Gear | | | Total | C-Gear | | Gear | | | Total | C-Gear | | Gear | | | Total | C-Gear | |
| | | A | C | F | | CPUE | N% | A | C | F | | CPUE | N% | A | C | F | | CPUE | N% |
| Sockeye salmon | *Oncorhynchus nerka* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chum salmon | *Oncorhynchus keta* | 45 | 44 | 0 | 89 | 1.47 | 35.2 | 12 | 13 | 0 | 25 | 0.43 | 5.88 | 19 | 12 | 0 | 31 | 0.4 | 7.84 |
| Pink salmon | *Oncorhynchus gorbuscha* | 3 | 74 | 0 | 77 | 2.47 | 59.2 | 4 | 156 | 0 | 160 | 5.2 | 70.6 | 18 | 139 | 0 | 157 | 4.63 | 90.8 |
| Coho salmon | *Oncorhynchus kisutch* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chinook salmon | *Oncorhynchus tshawytscha* | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Steelhead | *Oncorhynchus mykiss* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Boreal clubhook squid | *Onychoteuthis borealijaponicus* | 0 | 3 | 0 | 3 | 0.1 | 2.4 | 0 | 52 | 0 | 52 | 1.73 | 23.5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Robust clubhook squid | *Moroteuthis robusta* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eight-armed squid | *Gonatopsis borealis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese common squid | *Todarodes pacificus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Neon flying squid | *Ommastrephes bartramii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue shark | *Prionace glauca* | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salmon shark | *Lamna ditropis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spiny dogfish | *Squalus acanthias* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese anchovy | *Engraulis japonicus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lanternfishes | Myctophidae | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Longnose lancetfish | *Alepisaurus ferox* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific saury | *Cololabis saira* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific pomfret | *Brama japonica* | 0 | 4 | 1 | 5 | 0.13 | 3.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Albacore | *Thunnus alalunga* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Smalleye squaretail | *Tetragonurus cuvieri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medusafish | *Icichthys lockingtoni* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Skilfish | *Erilepis zonifer* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ocean sunfish | *Mola mola* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sooty shearwater | *Puffinus griseus* | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Short-tailed shearwater | *Puffinus tenuirostris* | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0.07 | 1.31 |

CPUE values were calculated as the number of fish caught by C-gear gillnet per one tan.

N% indicates % of total numeric catch.

Table 5-(2). Data on number of organisms caught by drift gillnet during the *OSHORO MARU* cruise #124.

| Cruise No. | | Cruise #124 (mid June, 155°E line) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station No. | | OSG 0204 (44°N) | | | | | | OSG 0205 (42.5°N) | | | | | | OSG 0206 (41°N) | | | | | | OSG 0207 (39.6°N) | | | | | |
| Common name | Scientific name | Gear | | | To-tal | C-Gear | | Gear | | | To-tal | C-Gear | | Gear | | | To-tal | C-Gear | | Gear | | | To-tal | C-Gear | |
| | | A | C | F | | CPUE | N% | A | C | F | | CPUE | N% | A | C | F | | CPUE | N% | A | C | F | | CPUE | N% |
| Sockeye salmon | *Oncorhynchus nerka* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chum salmon | *O. keta* | 61 | 60 | 0 | 121 | 2 | 22.1 | 46 | 26 | 0 | 72 | 0.87 | 5.94 | 4 | 10 | 0 | 14 | 0.33 | 8 | 1 | 0 | 0 | 1 | 0 | 0 |
| Pink salmon | *O. gorbuscha* | 83 | 170 | 0 | 253 | 5.67 | 62.7 | 53 | 327 | 0 | 380 | 10.9 | 74.7 | 19 | 45 | 0 | 64 | 1.5 | 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coho salmon | *O. kisutch* | 4 | 2 | 0 | 6 | 0.07 | 0.74 | 5 | 4 | 0 | 9 | 0.13 | 0.91 | 2 | 2 | 0 | 4 | 0.07 | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chinook salmon | *O. tshawytscha* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Steelhead | *O. mykiss* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Boreal clubhook squid | *Onychoteuthis borealijaponicus* | 0 | 21 | 0 | 21 | 0.7 | 7.75 | 1 | 72 | 0 | 73 | 2.4 | 16.4 | 0 | 19 | 1 | 20 | 0.63 | 15.2 | 0 | 12 | 2 | 14 | 0.4 | 6.12 |
| Robust clubhook squid | *Moroteuthis robusta* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eight-armed squid | *Gonatopsis borealis* | 0 | 1 | 0 | 1 | 0.03 | 0.37 | 0 | 2 | 0 | 2 | 0.07 | 0.46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese common squid | *Todarodes pacificus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 2 | 5 | 7 | 0.07 | 1.6 | 0 | 0 | 2 | 2 | 0 | 0 |
| Neon flying squid | *Ommastrephes bartramii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 9 | 0 | 21 | 0.3 | 7.2 | 18 | 105 | 5 | 128 | 3.5 | 53.6 |
| Blue shark | *Prionace glauca* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 7 | 0.2 | 3.06 |
| Salmon shark | *Lamna ditropis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spiny dogfish | *Squalus acanthias* | 0 | 1 | 0 | 1 | 0.03 | 0.37 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese anchovy | *Engraulis japonicus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Lanternfishes | Myctophidae | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 22 | 0.03 | 0.8 | 0 | 0 | 1 | 1 | 0 | 0 |
| Longnose lancetfish | *Alepisaurus ferox* | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific saury | *Cololabis saira* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific pomfret | *Brama japonica* | 4 | 12 | 0 | 16 | 0.4 | 4.43 | 0 | 6 | 0 | 6 | 0.2 | 1.37 | 22 | 34 | 1 | 57 | 1.13 | 27.2 | 14 | 56 | 0 | 70 | 1.87 | 28.6 |
| Albacore | *Thunnus alalunga* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 14 | 0 | 17 | 0.47 | 7.14 |
| Smalleye squaretail | *Tetragonurus cuvieri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.03 | 0.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medusafish | *Icichthys lockingtoni* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.03 | 0.23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Skilfish | *Erilepis zonifer* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ocean sunfish | *Mola mola* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0.1 | 1.53 |
| Sooty shearwater | *Puffinus griseus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.03 | 0.8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Short-tailed shearwater | *Puffinus tenuirostris* | 1 | 4 | 0 | 5 | 0.13 | 1.48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.03 | 0.8 | 0 | 0 | 0 | 0 | 0 | 0 |

CPUE values were calculated as the number of fish caught by C-gear gillnet per one tan.

N% indicates % of total numeric catch.

Table 5-(3). Data on number of organisms caught by drift gillnet during the *OSHORO MARU* cruise #125.

| Cruise No. | | Cruise #125 (mid July, 165?W line) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station No. | | OSG 0208 (50?N) | | | | | OSG 0209 (51?N) | | | | | OSG 0210 (53?N) | | | | |
| Common name | Scientific name | Gear | | Total | C-Gear | | Gear | | Total | C-Gear | | Gear | | Total | C-Gear | |
| | | A | C | | CPUE | N% | A | C | | CPUE | N% | A | C | | CPUE | N% |
| Sockeye salmon | *Oncorhynchus nerka* | 10 | 13 | 23 | 0.43 | 19.4 | 30 | 25 | 55 | 0.83 | 5.88 | 80 | 69 | 149 | 2.3 | 50.4 |
| Chum salmon | *Oncorhynchus keta* | 6 | 27 | 33 | 0.9 | 40.3 | 25 | 48 | 73 | 1.6 | 11.3 | 14 | 59 | 73 | 1.97 | 43.1 |
| Pink salmon | *Oncorhynchus gorbuscha* | 1 | 1 | 2 | 0.03 | 1.49 | 0 | 2 | 2 | 0.07 | 0.47 | 4 | 1 | 5 | 0.03 | 0.73 |
| Coho salmon | *Oncorhynchus kisutch* | 0 | 1 | 1 | 0.03 | 1.49 | 1 | 0 | 1 | 0 | 0 | 2 | 2 | 4 | 0.07 | 1.46 |
| Chinook salmon | *Oncorhynchus tshawytscha* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Steelhead | *Oncorhynchus mykiss* | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 3 | 0.03 | 0.24 | 3 | 3 | 6 | 0.1 | 2.19 |
| Boreal clubhook squid | *Onychoteuthis borealijaponicus* | 2 | 18 | 20 | 0.6 | 26.9 | 0 | 5 | 5 | 0.17 | 1.18 | 0 | 2 | 2 | 0.07 | 1.46 |
| Robust clubhook squid | *Moroteuthis robusta* | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eight-armed squid | *Gonatopsis borealis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese common squid | *Todarodes pacificus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Neon flying squid | *Ommastrephes bartramii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue shark | *Prionace glauca* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salmon shark | *Lamna ditropis* | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spiny dogfish | *Squalus acanthias* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese anchovy | *Engraulis japonicus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lanternfishes | Myctophidae | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Longnose lancetfish | *Alepisaurus ferox* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific saury | *Cololabis saira* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific pomfret | *Brama japonica* | 11 | 6 | 17 | 0.2 | 8.96 | 363 | 342 | 705 | 11.4 | 80.5 | 0 | 0 | 0 | 0 | 0 |
| Albacore | *Thunnus alalunga* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Smalleye squaretail | *Tetragonurus cuvieri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medusafish | *Icichthys lockingtoni* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Skilfish | *Erilepis zonifer* | 0 | 1 | 1 | 0.03 | 1.49 | 0 | 2 | 2 | 0.07 | 0.47 | 0 | 1 | 1 | 0.03 | 0.73 |
| Ocean sunfish | *Mola mola* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sooty shearwater | *Puffinus griseus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Short-tailed shearwater | *Puffinus tenuirostris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CPUE values were calculated as the number of fish caught by C-gear gillnet per one tan.

N% indicates % of total numeric catch.

Table 5-(3). Continued.

| Cruise No. | | Cruise #125 (late July, 165°W line) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station No. | | OSG 0211 (54°N) | | | | | OSG 0212 (55°N) | | | | | OSG 0213 (56°N) | | | | |
| Common name | Scientific name | Gear | | Total | C-Gear | | Gear | | Total | C-Gear | | Gear | | Total | C-Gear | |
| | | A | C | | CPUE | N% | A | C | | CPUE | N% | A | C | | CPUE | N% |
| Sockeye salmon | *Oncorhynchus nerka* | 28 | 27 | 55 | 0.9 | 18 | 40 | 35 | 75 | 1.17 | 19.1 | 9 | 14 | 23 | 0.47 | 14.4 |
| Chum salmon | *Oncorhynchus keta* | 30 | 103 | 133 | 3.43 | 68.7 | 28 | 78 | 106 | 2.6 | 42.6 | 27 | 62 | 89 | 2.07 | 63.9 |
| Pink salmon | *Oncorhynchus gorbuscha* | 8 | 3 | 11 | 0.1 | 2 | 28 | 17 | 45 | 0.57 | 9.29 | 22 | 8 | 30 | 0.27 | 8.25 |
| Coho salmon | *Oncorhynchus kisutch* | 1 | 1 | 2 | 0.03 | 0.67 | 0 | 2 | 2 | 0.07 | 1.09 | 3 | 2 | 5 | 0.07 | 2.06 |
| Chinook salmon | *Oncorhynchus tshawytscha* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Steelhead | *Oncorhynchus mykiss* | 6 | 9 | 15 | 0.3 | 6 | 3 | 13 | 16 | 0.43 | 7.1 | 0 | 4 | 4 | 0.13 | 4.12 |
| Boreal clubhook squid | *Onychoteuthis borealijaponicus* | 0 | 2 | 2 | 0.07 | 1.33 | 0 | 30 | 30 | 1 | 16.4 | 0 | 3 | 3 | 0.1 | 3.09 |
| Robust clubhook squid | *Moroteuthis robusta* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eight-armed squid | *Gonatopsis borealis* | 0 | 2 | 2 | 0.07 | 1.33 | 0 | 2 | 2 | 0.07 | 1.09 | 0 | 2 | 2 | 0.07 | 2.06 |
| Japanese common squid | *Todarodes pacificus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Neon flying squid | *Ommastrephes bartramii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blue shark | *Prionace glauca* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Salmon shark | *Lamna ditropis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spiny dogfish | *Squalus acanthias* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Japanese anchovy | *Engraulis japonicus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lanternfishes | Myctophidae | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Longnose lancetfish | *Alepisaurus ferox* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific saury | *Cololabis saira* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pacific pomfret | *Brama japonica* | 0 | 3 | 3 | 0.1 | 2 | 4 | 6 | 10 | 0.2 | 3.28 | 2 | 2 | 4 | 0.07 | 2.06 |
| Albacore | *Thunnus alalunga* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Smalleye squaretail | *Tetragonurus cuvieri* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medusafish | *Icichthys lockingtoni* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Skilfish | *Erilepis zonifer* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ocean sunfish | *Mola mola* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sooty shearwater | *Puffinus griseus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Short-tailed shearwater | *Puffinus tenuirostris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CPUE values were calculated as the number of fish caught by C-gear gillnet per one tan.

N% indicates % of total numeric catch.

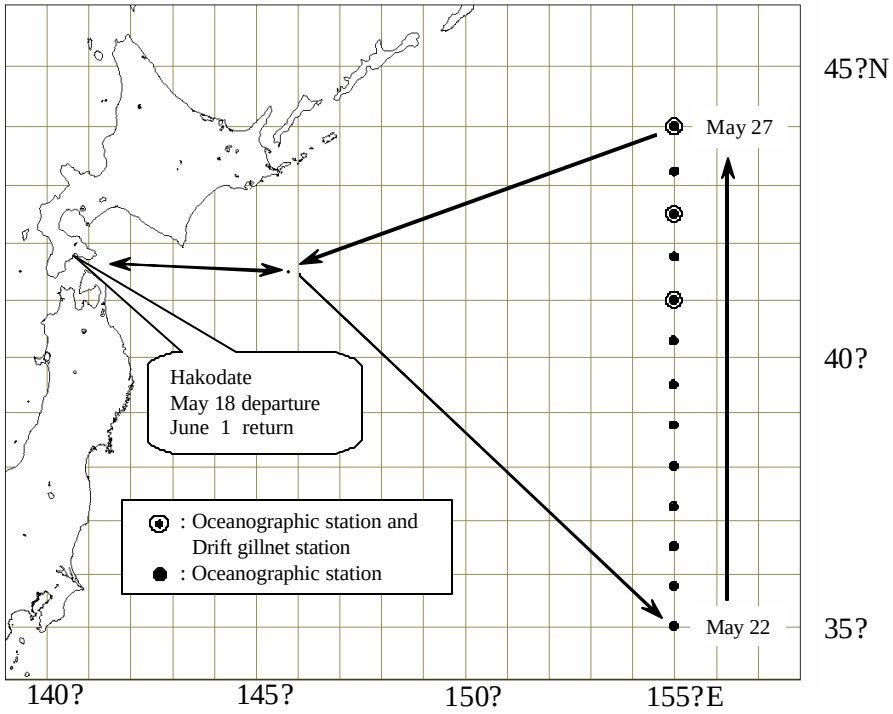


Fig. 1-1 Cruise #123 (May 18 ~ June 1)

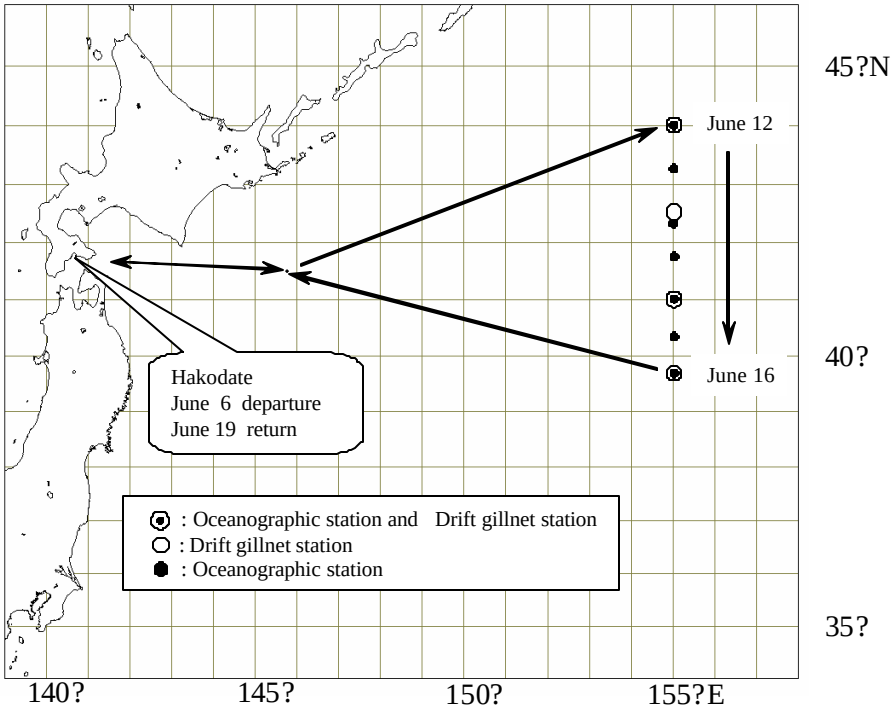


Fig. 1-2 Cruise #124 (June 6 ~ June 19)

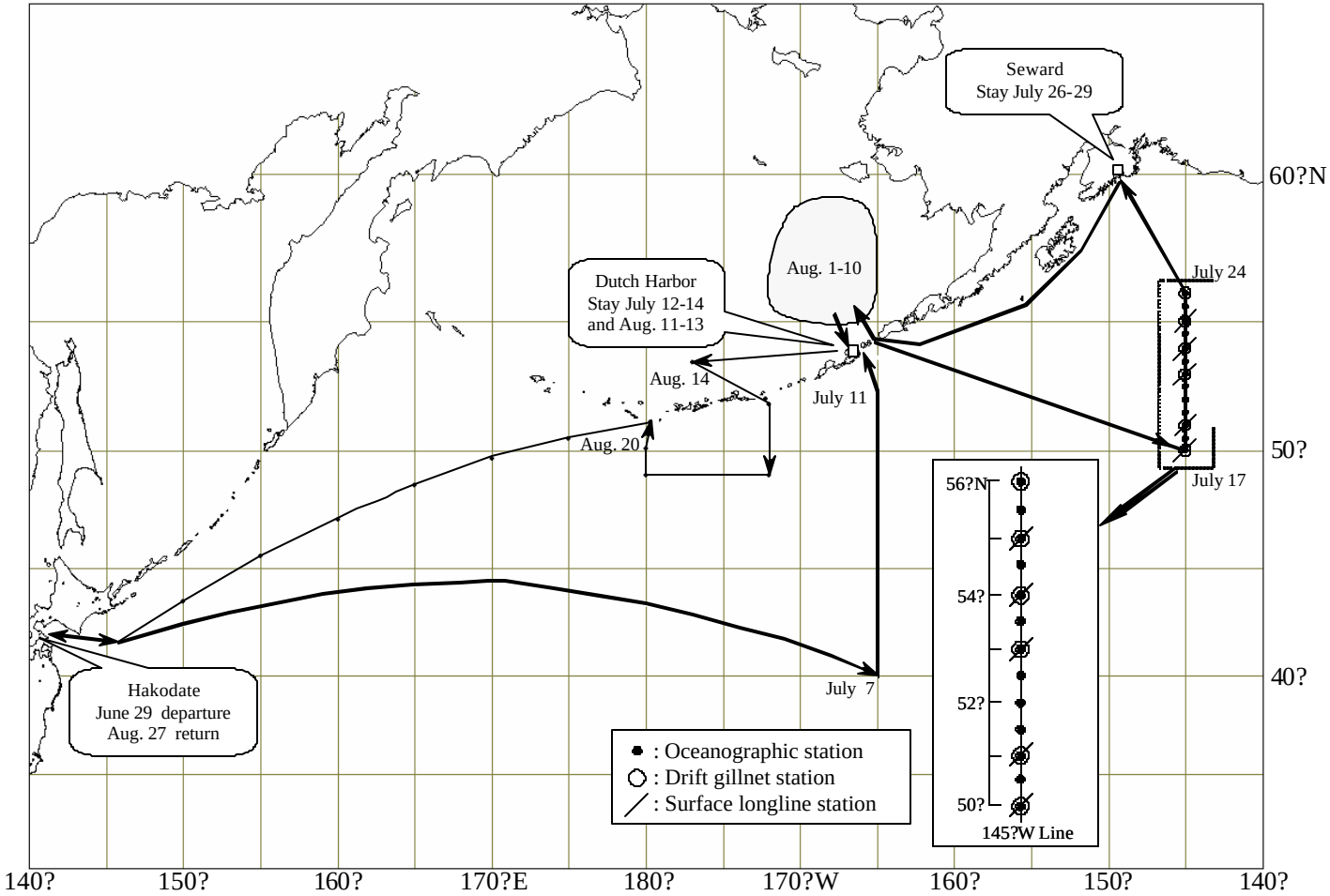


Fig. 1-3 Cruise #125 (June 29 ~ Aug. 27)

Fig. 1 Cruise track and location of oceanographic, drift gillnet and surface longline stations during each cruise

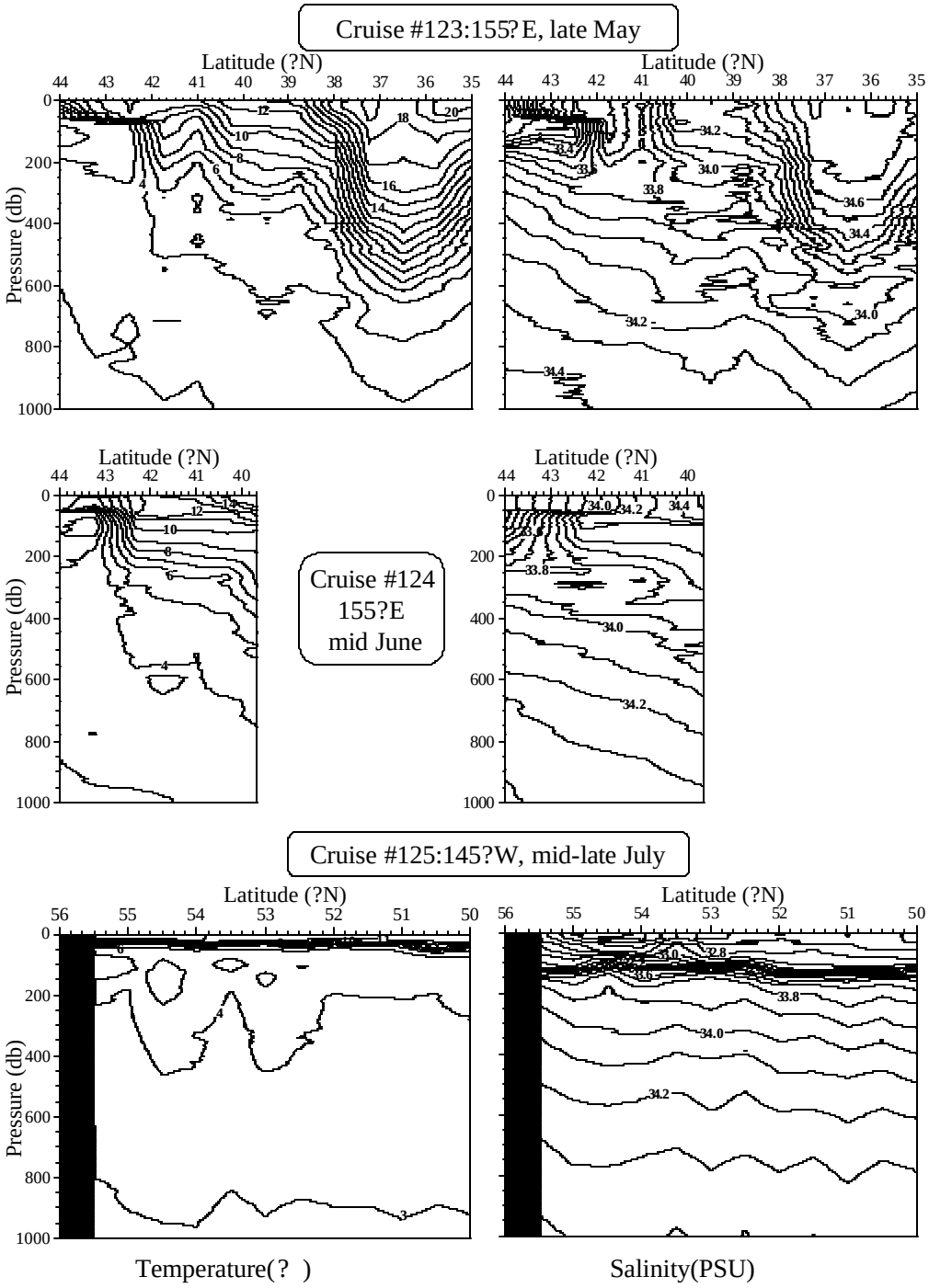


Fig. 2 Temperature and salinity from surface to 1000db pressure along the 155?E and 145?W transect in the Oshoro-Maru Cruise #123,#124 and #125, 2002.

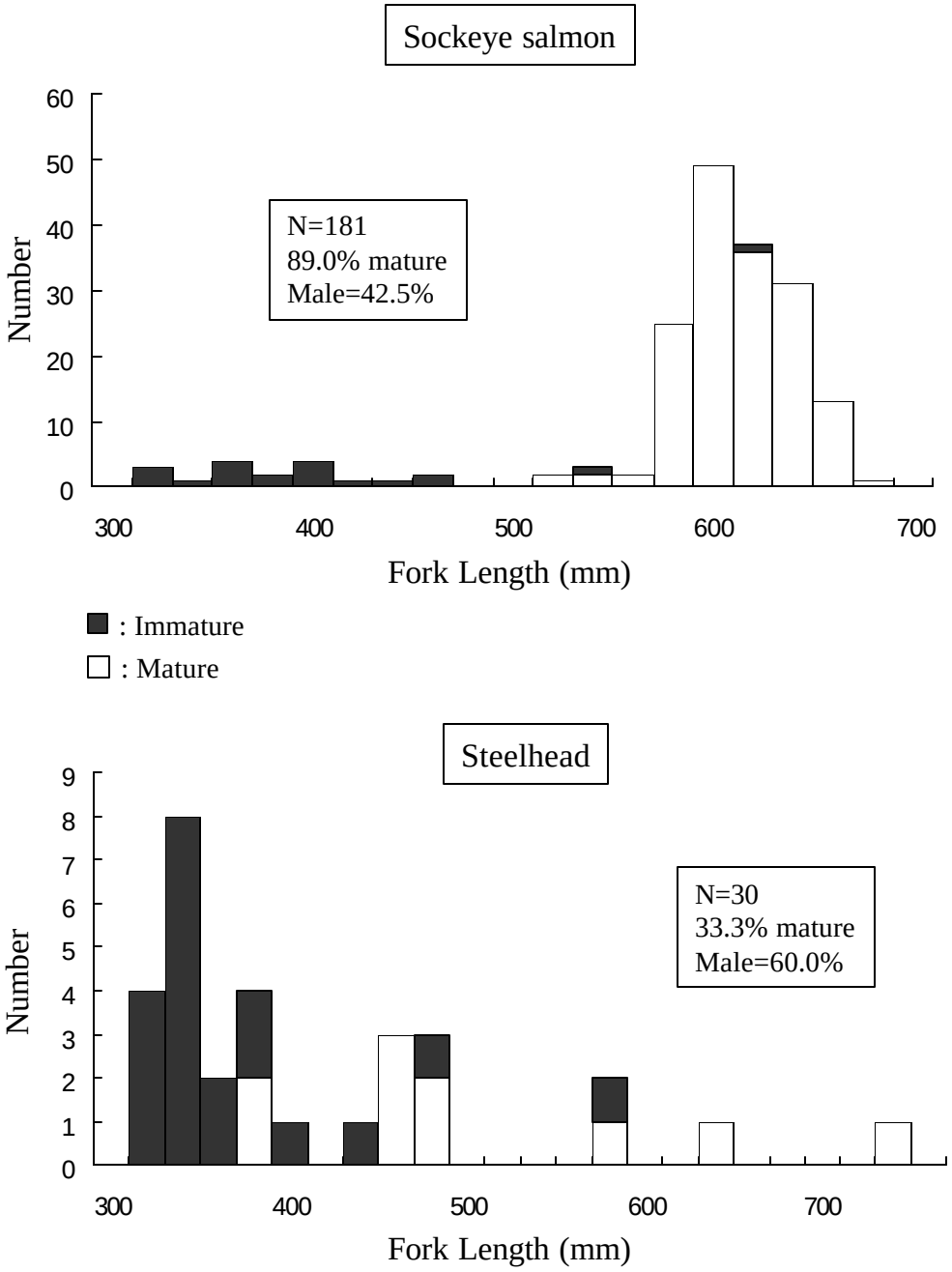


Fig. 3 Fork length frequency distribution, male ratio, and maturity ratio of sockeye salmon and steelhead caught by C-gear drift gillnet along 145?W in mid-late July, 2002.

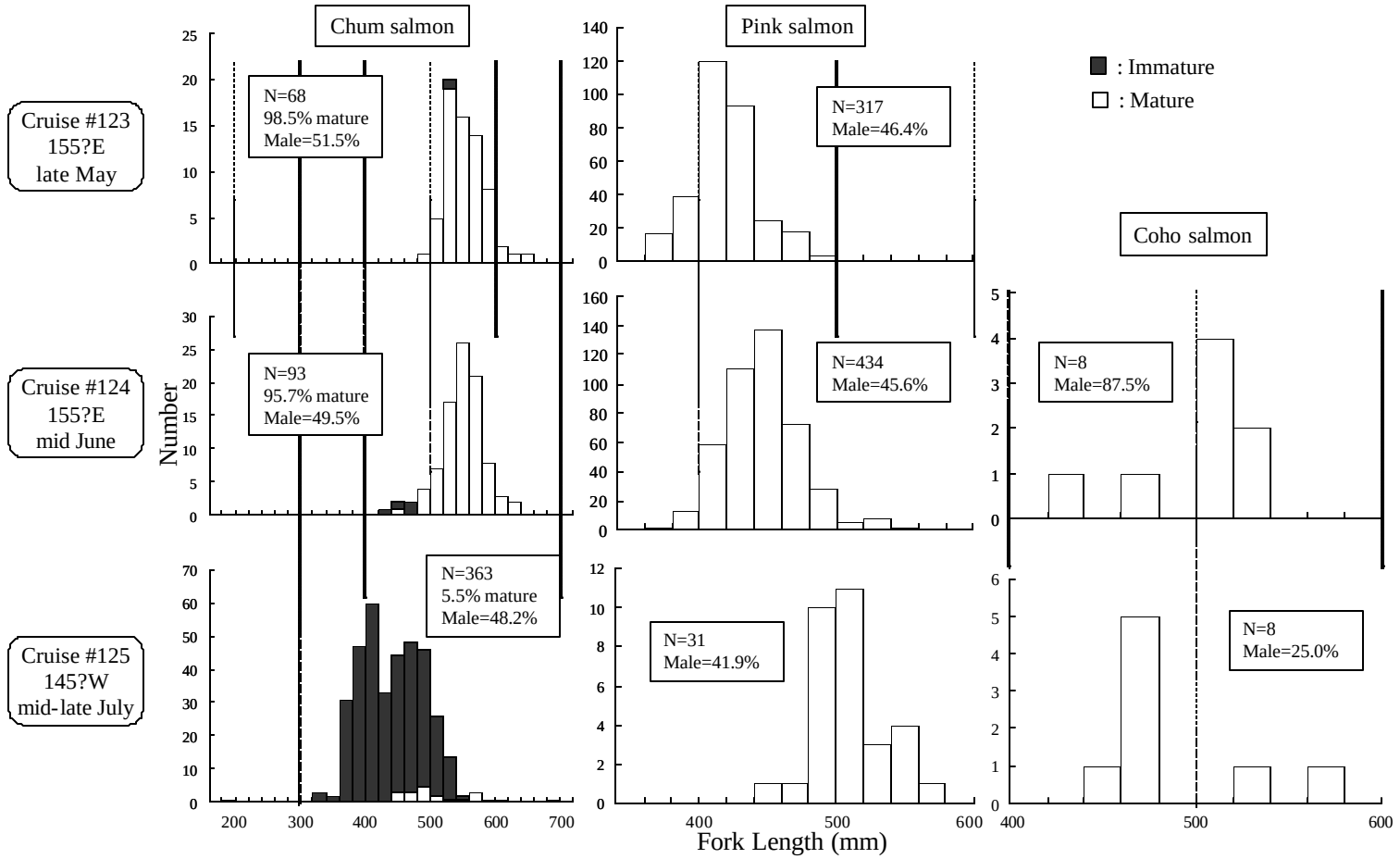


Fig. 4 Fork length frequency distribution, male ratio, and maturity ratio of chum, pink, and coho salmon caught by C-gear drift gillnet at each three cruise in 2002.