4

THE "OSHORO MARU" CRUISE 228
TO THE NORTHWEST PACIFIC OCEAN

IN MAY 2011

1. Cruise Itinerary

Cruise 228

Departure from Hakodate	May	12,	2011
Start hydrographic research (OS11043)		14	
Start Gillnet research (OSG1101)		16	
Finish Gillnet research (OSG1104)		17	
Finish hydrographic research (OS11054)		20	
Return to Hakodate		24	

Total coverage 1916.8 miles

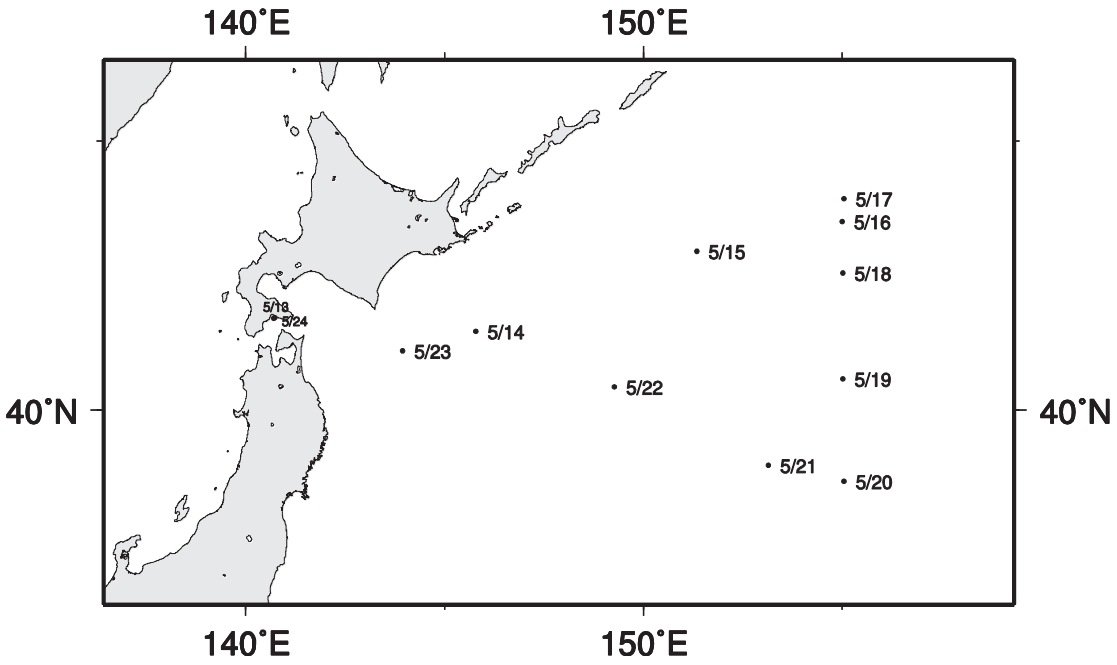

Figure 1. Noon position

2. Vessel Personnel

Captain:		Associate Professor	Shogo Takagi
Crew:	First Officer	Instructor	Keiichiro Sakaoka
	Second Officer	Instructor	Naoki Hoshi
	Second Officer	Technical official	Takuzo Abe
	Chief Engineer	Instructor	Jyunichi Kimura
	And 25 men		

Cruise 228

Research Staff:

	Associate Professor	(Laboratory of Strategic Studies on Marine Bioresource Conservation and Management) Hideaki Kudo
	Research Fellow	(Graduate School of Information and Technology GCOE) Toshiro Iwamori
	Technical assistant	(Field Science Center for Northern Biosphere, Hokkaido University) Yuya Miyazima

Teaching Assistant:	2 person
Graduate Students:	6 person
Under Graduate Students:	37 persons
	Total 48 persons

3. Items of Research

Hydrographic observations:	Fig. 2	Table 1,2
Biological research for fishes caught by non-selective drift gillnets:	Fig. 3	Table 3-8
Salmon hook-and-line research:	Fig. 4	Table 9-11
Plankton Sampling		Table 12, 13

4. Data on Temperature, Salinity and Computed Dynamic Depth Anomaly

Hydrographic work on deck and the data processing were made by the deck officers, crews, research staff and cadets of the *"Oshoromaru"*. Temperature and salinity were measured by CTD (Seabird SBE-9Plus and XCTD2). Dynamic computations were made using a desk-top computer aboard the *"Oshoromaru"*. Water and Plankton sampling were also carried out at almost hydrographic stations.

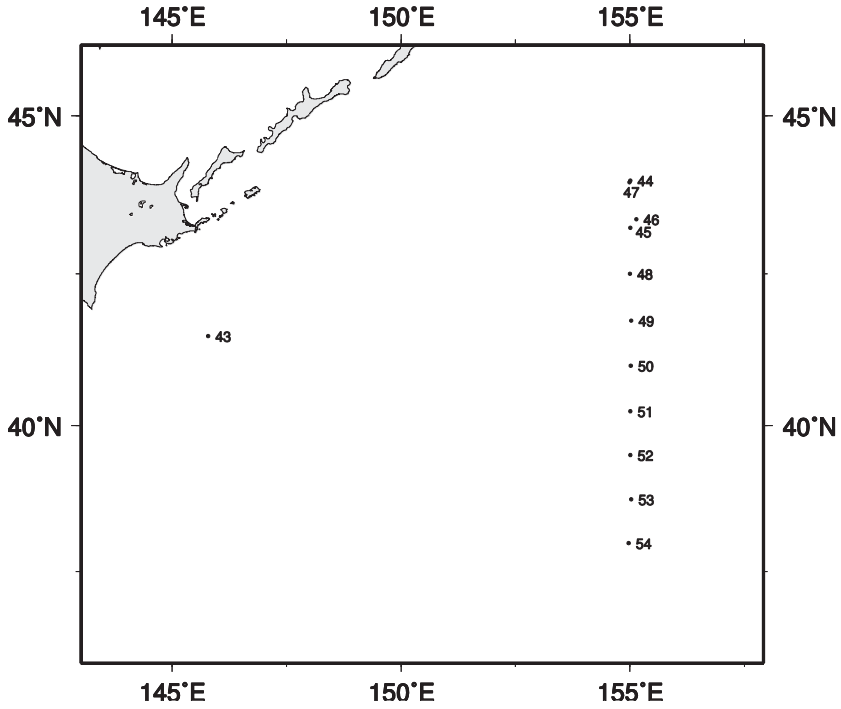

Figure 2. Oceanographic stations

Table 1. List of Oceanographic Station

Station	Lat.(*)	Long.(*)	Date	S.M.T	T.Z.	Depth	COL.	TR.	S.S.T.	WR.	Remark
OS11043	41-29.9N	145-46.3E	5/14	0053	9	6932	4	9	5.7	c	9Plus-0769
OS11044	44-00.1N	155-02.7E	5/15	1951	10	5315	-	-	-	-	9Plus-0769
OS11045	43-15.0N	155-00.1E	5/16	0346	10	5490	-	-	9.5	c	9Plus-0769
OS11046	43-23.2N	155-08.0E	5/16	1108	10	5547	3	14.6	5.6	bc	19Plus-4636
OS11047	43-58.4N	154-58.6E	5/17	0833	10	5330	-	-	4.6	c	19Plus-4636
OS11048	42-30.4N	154-59.7E	5/18	0308	10	5186	-	-	-	c	XCTD
OS11049	41-45.6N	155-01.6E	5/18	1019	10	5516	-	-	9.7	c	9Plus-0769
OS11050	41-00.4N	155-00.3E	5/18	2346	10	5511	-	-	-	bc	XCTD
OS11051	40-15.2N	155-00.1E	5/19	0356	10	5550	-	-	-	bc	XCTD
OS11052	39-31.3N	154-59.2E	5/19	1045	10	5615	-	-	13.8	c	9Plus-0769
OS11053	38-45.7N	155-00.9E	5/20	0004	10	5765	4	9	16.2	c	19Plus-4636
OS11054	38-00.6N	154-57.1E	5/20	0709	10	5860	3	11.8	15	c	9Plus-0769

(*) : Fixed position by Global Positioning System

Table 2. Oceanographic data

Station OS11043
Latitude 41-29.9N
Longitude 145-46.3E
Depth(m) 6932

Press.	Temp.	Sal.	SIG-T
5	5.231	32.948	26.023
10	5.106	32.950	26.039
20	4.969	32.945	26.050
30	4.830	32.958	26.075
40	4.037	32.994	26.187
50	3.649	33.056	26.274
75	2.166	33.121	26.454
100	1.847	33.169	26.516
125	2.033	33.317	26.621
150	2.239	33.447	26.709
175	2.559	33.546	26.762
200	2.614	33.601	26.802
250	2.903	33.724	26.876
300	2.990	33.827	26.950
400	3.222	33.976	27.047
500	3.308	34.119	27.154
600	3.261	34.209	27.230
700	3.053	34.269	27.297
800	2.907	34.324	27.354
900	2.791	34.360	27.393
1000	2.615	34.394	27.435
1200	2.446	34.458	27.501
1500	2.256	34.524	27.570

Station OS11044
Latitude 44-00.1 N
Longitude 155-02.7 E
Depth(m) 5315

Press.	Temp.	Sal.	SIG-T
5	3.727	32.954	26.186
10	3.725	32.954	26.186
20	3.725	32.954	26.186
30	3.723	32.955	26.187
40	3.662	32.956	26.193
50	3.506	32.961	26.212
75	2.538	33.130	26.432
100	1.825	33.124	26.481
125	2.014	33.286	26.598
150	2.330	33.458	26.710
175	2.633	33.581	26.784
200	2.965	33.690	26.842
250	3.134	33.817	26.929
300	3.178	33.898	26.989
400	3.257	34.034	27.091
500	3.209	34.144	27.183
600	3.013	34.223	27.263
700	2.877	34.277	27.319
800	2.755	34.325	27.369
900	2.685	34.371	27.411
1000	2.584	34.413	27.453
1200	2.346	34.470	27.519
1500	2.149	34.529	27.582
2000	1.858	34.597	27.660
2500	1.646	34.636	27.707
3000	1.532	34.657	27.733

Station OS11045
Latitude 43-15.0 N
Longitude 155-00.1 E
Depth(m) 5490

Press.	Temp.	Sal.	SIG-T
5	9.620	34.113	26.323
10	9.616	34.113	26.324
20	9.611	34.114	26.325
30	9.611	34.114	26.325
40	9.610	34.114	26.325
50	9.604	34.113	26.325
75	9.516	34.103	26.332
100	9.389	34.091	26.343
125	8.018	33.958	26.453
150	7.356	33.915	26.515
175	6.844	33.907	26.579
200	6.159	33.841	26.617
250	5.377	33.843	26.715
300	4.626	33.868	26.820
400	4.150	33.976	26.956
500	3.865	34.080	27.068
600	3.765	34.201	27.174
700	3.465	34.261	27.252
800	3.226	34.308	27.312
900	2.999	34.353	27.369
1000	2.837	34.390	27.413
1200	2.570	34.447	27.482
1500	2.261	34.511	27.559
2000	1.931	34.585	27.645
2500	1.703	34.628	27.697
3000	1.565	34.653	27.727

Station OS11046
Latitude 43-23.2 N
Longitude 155-08.0 E
Depth(m) 5547

Press.	Temp.	Sal.	SIG-T
5	5.436	33.232	26.224
10	5.426	33.233	26.226
20	6.215	33.407	26.273
30	7.514	33.698	26.328
40	7.833	33.746	26.314
50	7.853	33.754	26.317
75	7.896	33.849	26.386
100	6.920	33.828	26.504
125	6.525	33.768	26.509
150	5.943	33.815	26.623
175	4.627	33.744	26.722
200	4.797	33.767	26.719
250	3.951	33.768	26.810
300	3.723	33.791	26.850
400	4.271	34.077	27.026
500	3.949	34.140	27.108
600	3.454	34.174	27.184
700	3.430	34.269	27.261
800	3.141	34.320	27.329
900	2.965	34.369	27.384
1000	2.810	34.405	27.427
1200	2.494	34.458	27.497
1500	2.213	34.517	27.568

Station OS11047
Latitude 43-58.4 N
Longitude 154-58.6 E
Depth(m) 5330

Press.	Temp.	Sal.	SIG-T
5	4.151	32.947	26.138
10	4.136	32.948	26.141
20	3.993	32.940	26.147
30	3.837	32.948	26.170
40	3.783	32.945	26.173
50	3.773	32.945	26.174
75	2.840	32.993	26.296
100	1.860	33.098	26.459
125	1.646	33.170	26.532
150	2.136	33.382	26.666
175	2.578	33.565	26.777
200	2.857	33.676	26.841
250	3.091	33.814	26.930
300	3.265	33.917	26.996
400	3.283	34.066	27.113
500	3.096	34.161	27.206
600	2.952	34.224	27.270
700	2.848	34.286	27.329
800	2.728	34.331	27.375
900	2.650	34.377	27.419
1000	2.581	34.423	27.462
1200	2.364	34.477	27.523
1500	2.143	34.541	27.593

Station OS11048
Latitude 42-30.4 N
Longitude 154-59.7E
Depth(m) 5186

Press.	Temp.	Sal.	SIG-T
5	9.634	-	-
10	9.568	-	-
20	9.344	-	-
30	9.130	-	-
40	8.987	-	-
50	8.968	-	-
75	8.248	-	-
100	7.887	-	-
125	7.829	-	-
150	7.800	-	-
175	7.791	-	-
200	7.752	-	-
250	7.535	-	-
300	6.077	-	-
400	4.453	-	-
500	4.064	-	-
600	4.068	-	-
700	3.715	-	-
800	3.435	-	-
900	3.203	-	-
1000	3.011	-	-
1200	2.657	-	-
1500	2.331	-	-

Station OS11049
Latitude 41-45.6 N
Longitude 155-01.6 E
Depth(m) 5516

Press.	Temp.	Sal.	SIG-T
5	9.690	34.016	26.236
10	9.675	34.018	26.240
20	9.593	34.039	26.270
30	9.570	34.060	26.290
40	9.560	34.061	26.292
50	9.551	34.060	26.293
75	9.436	34.053	26.306
100	8.960	34.007	26.347
125	7.953	33.910	26.425
150	7.755	33.918	26.460
175	7.516	33.907	26.486
200	7.126	33.859	26.503
250	5.506	33.756	26.630
300	4.859	33.781	26.725
400	4.287	33.905	26.886
500	4.073	34.023	27.001
600	3.843	34.119	27.101
700	3.579	34.200	27.192
800	3.410	34.263	27.259
900	3.173	34.313	27.321
1000	3.026	34.365	27.376
1200	2.727	34.420	27.446
1500	2.349	34.498	27.541
2000	2.000	34.576	27.632
2500	1.741	34.624	27.690
3000	1.597	34.649	27.721

Station OS11050
Latitude 41-00.4 N
Longitude 155-00.3E
Depth(m) 5511

Press.	Temp.	Sal.	SIG-T
5	8.843	-	-
10	8.795	-	-
20	8.481	-	-
30	8.010	-	-
40	8.032	-	-
50	8.414	-	-
75	8.462	-	-
100	8.223	-	-
125	7.841	-	-
150	7.783	-	-
175	7.351	-	-
200	6.815	-	-
250	5.565	-	-
300	5.177	-	-
400	4.428	-	-
500	4.161	-	-
600	3.783	-	-
700	3.423	-	-
800	3.190	-	-
900	3.042	-	-
1000	2.881	-	-
1200	2.689	-	-
1500	2.304	-	-

Station OS11051
Latitude 40-15.2 N
Longitude 155-00.1 E
Depth(m) 5550

Press.	Temp.	Sal.	SIG-T
5	12.545	-	-
10	12.437	-	-
20	12.376	-	-
30	11.651	-	-
40	11.182	-	-
50	10.816	-	-
75	10.485	-	-
100	10.031	-	-
125	8.940	-	-
150	8.225	-	-
175	7.485	-	-
200	7.497	-	-
250	6.338	-	-
300	5.847	-	-
400	4.550	-	-
500	4.222	-	-
600	3.976	-	-
700	3.752	-	-
800	3.456	-	-
900	3.192	-	-
1000	2.990	-	-
1200	2.656	-	-
1500	2.300	-	-

Station OS11052
Latitude 39-31.3 N
Longitude 154-59.2 E
Depth(m) 5615

Press.	Temp.	Sal.	SIG-T
5	13.581	34.447	25.847
10	13.579	34.447	25.847
20	13.579	34.447	25.847
30	13.570	34.446	25.848
40	13.487	34.439	25.860
50	13.328	34.429	25.885
75	13.140	34.425	25.919
100	12.613	34.386	25.994
125	12.321	34.369	26.038
150	11.730	34.306	26.101
175	11.015	34.241	26.182
200	10.225	34.170	26.265
250	9.161	34.129	26.410
300	7.775	34.033	26.547
400	5.668	33.974	26.783
500	4.727	34.013	26.924
600	4.509	34.115	27.028
700	4.259	34.187	27.113
800	3.846	34.253	27.207
900	3.523	34.307	27.283
1000	3.156	34.340	27.344
1200	2.839	34.419	27.436
1500	2.413	34.498	27.536
2000	1.987	34.578	27.635
2500	1.723	34.627	27.694
3000	1.587	34.651	27.724

Station OS11053
Latitude 38-45.7 N
Longitude 155-00.9 E
Depth(m) 5765

Press.	Temp.	Sal.	SIG-T
5	16.086	34.595	25.416
10	16.087	34.596	25.417
20	16.070	34.596	25.421
30	16.044	34.592	25.423
40	15.581	34.584	25.522
50	15.401	34.570	25.549
75	14.705	34.517	25.660
100	14.140	34.502	25.772
125	13.474	34.461	25.877
150	12.534	34.384	26.004
175	11.753	34.307	26.094
200	11.287	34.293	26.173
250	10.234	34.183	26.273
300	7.889	33.905	26.426
400	6.747	33.997	26.662
500	5.160	34.008	26.870
600	4.649	34.096	26.998
700	4.231	34.194	27.121
800	3.832	34.255	27.210
900	3.496	34.319	27.295
1000	3.258	34.359	27.349
1200	2.822	34.428	27.444
1500	2.437	34.505	27.539

Station OS11054
Latitude 38-00.6 N
Longitude 154-57.1 E
Depth(m) 5860

Press.	Temp.	Sal.	SIG-T
5	14.814	34.506	25.632
10	14.807	34.506	25.633
20	14.511	34.472	25.671
30	13.857	34.427	25.774
40	13.661	34.418	25.808
50	13.638	34.419	25.814
75	13.461	34.430	25.858
100	13.237	34.430	25.904
125	12.464	34.382	26.020
150	12.035	34.345	26.073
175	11.543	34.305	26.135
200	11.422	34.294	26.149
250	10.287	34.180	26.263
300	8.914	34.088	26.418
400	6.406	33.976	26.692
500	5.109	34.008	26.876
600	4.551	34.103	27.015
700	4.116	34.194	27.133
800	3.767	34.261	27.222
900	3.482	34.312	27.290
1000	3.228	34.356	27.350
1200	2.859	34.419	27.434
1500	2.410	34.498	27.536
2000	1.975	34.581	27.638
2500	1.736	34.625	27.692
3000	1.584	34.652	27.725

5. Data on drift Gillnet Research

Four gillnet researches were performed during this cruise. The operations were supervised by the captain, and were conducted by deck officers, crews and research staff.

Note: The *Oshoro maru* Cruise #229 gillnet research data are also included.

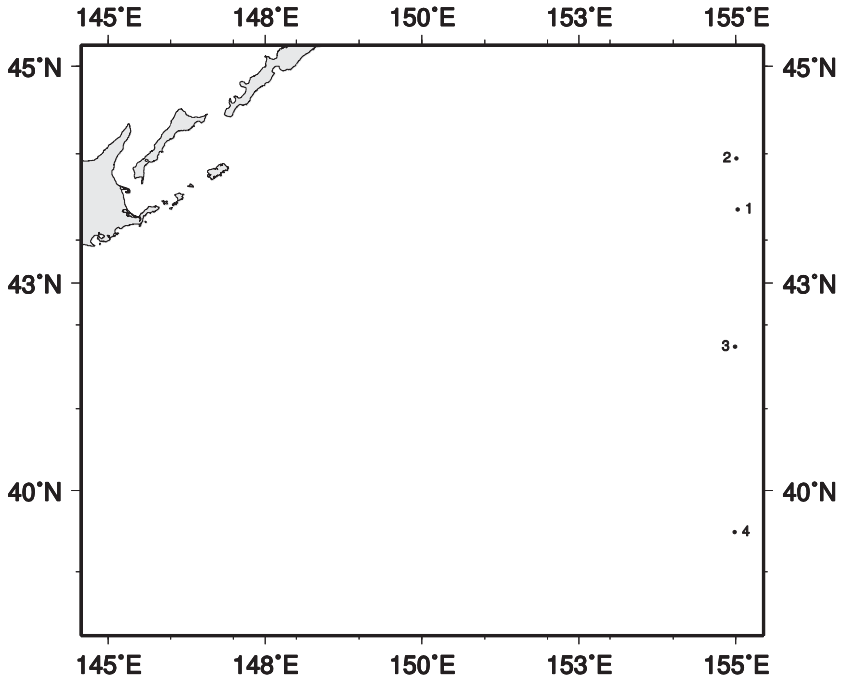

Figure 3. Locations of drift gillnet research

Table 3. Position and research conditions of surface drift gillnet sampling at each station during the *Oshoro maru* Cruise #228 and #229, 2011.

Station	Date and Time (S.M.T.*1)		T.D.*2	Set Position		D.S.*3	Wr*4	Wind
	Net set	Net haul		Lat.	Long.			(Force)
Cruise #228								
OSG 1101	May 16 17:55-18:22	May 17 04:39-05:30	+10h	43-22.1 N	155-01.3 E	070	bc	West-5
OSG 1102	May 17 17:55-18:25	May 18 04:24-05:02	+10h	43-57.3 N	155-00.2 E	310	o	South-5
OSG 1103	May 18 17:50-18:17	May 19 04:25-05:12	+10h	41-45.0 N	154-59.0 E	090	c	West-5
OSG 1104	May 19 18:00-18:25	May 20 04:30-05:38	+10h	39-30.2 N	154-58.4 E	080	bc	West-6
Cruise #229								
OSG 1105	July 28 19:50-20:15	July 29 04:53-05:43	+10h	40-15.0 N	155-02.9 E	150	c	NNW-5
OSG 1106	July 29 18:28-18:51	July 30 04:37-05:25	+10h	41-44.7 N	154-59.8 E	230	o	WSW-3
OSG 1107	July 30 17:52-18:25	July 31 04:34-05:32	+10h	43-14.3 N	155-01.3 E	270	o	NE-3
OSG 1108	July 31 18:24-18:47	August 1 04:30-05:24	+10h	43-43.4 N	154-06.2 E	130	d	NE-4

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of net set.

*4 Wr : Weather (bc: 25-75% clouded, o: 100% clouded, d: drizzling rain, c: 75-99% clouded).

Table 4. Net information

Drift Gillnet Sampling

One set of drift gillnet was used to collect salmonids and other epipelagic fishes [Figs.1-(1),(2) and Table 1].
Details about each operation are shown in Table 2.The gillnet configuration is as follows:

Stations	net	A-Gear				C-gear										F-Gear							Total
	Mesh size (mm)	112	115	118	121	48	55	63	72	82	93	106	121	138	157	19	22	25	29	33	37	42	
OSG1101-2	Number	3	3	3	3	3	3	3	6	5	5	3	3	3	3	-	-	-	-	-	-	-	49
OSG1103-8	of tan	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	49

The net comprised of total 49 tans of A-Gear gillnet (non-selective varied research mesh, Takagi, 1975), C-Gear gillnet (commercial mesh), and F-Gear gillnet (spetial mesh).Each tan was 50m long. Gillnet gear was set in the evening, allowed to soak overnight, and retrived in the following morning. The number of organisms caught was counted by species for mesh size. Catch per unit effort (CPUE) values were calculated as the number of fish caught by C-gear gillnet per tan.

Table 5. Data on catch number of salmonids by drift gillnet research

Chum (catch number)

No. of	Mesh size (mm)																						
	A-Gear				C-gear										F-Gear								
research	112	115	118	121	48	55	63	72	82	93	106	121	138	157	19	22	25	29	33	37	42	Total
OSG1101	**6**	**3**	**1**	**3**	0	0	**1**	0	0	**5**	**2**	**2**	**1**	0	-	-	-	-	-	-	-	**24**
OSG1102	0	**1**	**3**	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	**4**
OSG1103	**2**	**2**	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	**6**
OSG1104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pink (catch number)

No. of	Mesh size (mm)																						
	A-Gear				C-gear										F-Gear								
research	112	115	118	121	48	55	63	72	82	93	106	121	138	157	19	22	25	29	33	37	42	Total
OSG1101	0	**1**	0	0	0	**3**	**3**	**142**	**289**	**65**	**2**	0	0	0	-	-	-	-	-	-	-	**505**
OSG1102	0	0	0	0	0	0	0	**14**	**46**	**26**	**2**	0	0	0	-	-	-	-	-	-	-	**88**
OSG1103	**1**	0	0	0	0	**1**	**6**	**46**	**49**	**11**	**2**	0	0	0	0	0	0	0	0	0	0	**116**
OSG1104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OSG1108	**1**	**1**	**2**	**1**	0	0	0	0	0	**2**	**1**	**1**	0	0	0	0	0	0	0	0	0	**9**

Note: Sockeye, Coho, Chinook, Cherry and Steelhead salmon did not catch by the drift gillnet research.

Table 6. Biological characteristics of salmonids caught by drift gillnet research

CHUM SALMON

St.	Gear	F. L.	B. W.	Sex	G. W.
	(mm)	(mm)	(gr)		(gr)
G01	A112	510	1630	M	1
G01	A112	556	1775	M	3
G01	A112	546	1638	F	17
G01	A112	558	2370	M	2
G01	A112	542	1976	F	16
G01	A112	496	1543	M	1
G01	A115	–	1178	M	2
G01	A115	482	1315	F	8
G01	A115	531	2054	M	17
G01	A118	494	1367	M	1
G01	A121	521	1615	F	30
G01	A121	532	1897	M	4
G01	A121	603	2633	F	24
G01	C63	620	2418	M	1
G01	C93	496	1462	M	5
G01	C93	514	1612	F	33
G01	C93	538	1784	F	14
G01	C93	484	1514	M	5
G01	C93	506	1507	M	3
G01	C106	510	1765	F	41
G01	C106	550	1785	F	19
G01	C121	566	1765	M	1
G01	C121	524	1468	M	3
G01	C138	578	2364	F	29
G02	A115	503	1483	F	10
G02	A118	534	1598	–	–
G02	A118	530	1571	–	–
G02	A118	576	2183	M	1
G03	A112	488	1586	F	22
G03	A112	498	1619	M	3
G03	A115	545	1894	M	42
G03	A115	520	1950	M	12
G03	C63	332	417	M	1
G03	C93	479	1372	F	12

PINK SALMON

St.	Gear	F. L.	B. W.	Sex	G. W.
	(mm)	(mm)	(gr)		(gr)
G01	A115	480	1328	M	15
G01	C55	372	502	F	7
G01	C55	370	552	M	9
G01	C55	–	245	F	2
G01	C63	328	372	M	1
G01	C63	358	519	M	2
G01	C63	332	454	M	1
G01	C72	400	621	M	1
G01	C72	390	660	F	6
G01	C72	382	563	F	5
G01	C72	376	575	F	5
G01	C72	376	554	M	1
G01	C72	364	530	F	6
G01	C72	350	450	M	2
G01	C72	448	474	F	9
G01	C72	368	518	M	1
G01	C72	342	440	F	5
G01	C72	370	533	F	5
G01	C72	362	540	M	1
G01	C72	372	538	M	2
G01	C72	382	626	F	5
G01	C72	342	421	F	16
G01	C72	360	447	M	2
G01	C72	408	691	F	6
G01	C72	360	451	M	4
G01	C72	376	560	M	3
G01	C72	368	540	F	7
G01	C72	340	453	M	1
G01	C72	394	628	M	2
G01	C72	342	434	F	17
G01	C72	372	543	M	1
G01	C72	380	544	M	3
G01	C72	374	598	F	4
G01	C72	338	419	M	1
G01	C72	390	667	F	4
G01	C72	360	455	F	17
G01	C72	368	534	M	1
G01	C72	398	717	F	16
G01	C72	360	567	F	20
G01	C72	340	460	M	8
G01	C72	380	571	M	3
G01	C72	378	573	M	3
G01	C72	370	551	M	3
G01	C72	390	673	F	7
G01	C72	362	536	F	27
G01	C72	384	645	F	7
G01	C72	376	552	M	2
G01	C72	376	538	F	12
G01	C72	400	622	F	6
G01	C72	390	596	M	4
G01	C72	388	551	F	17
G01	C72	368	513	M	2
G01	C72	400	676	F	5
G01	C72	391	653	F	14
G01	C72	396	577	M	2
G01	C72	388	609	M	2
G01	C72	366	540	F	10
G01	C72	372	520	F	7
G01	C72	342	453	F	7
G01	C72	410	697	M	4
G01	C72	363	504	M	3
G01	C72	406	712	M	2
G01	C72	367	535	F	20
G01	C72	383	560	F	12
G01	C72	353	482	M	2
G01	C72	374	557	F	12
G01	C72	378	541	F	9
G01	C82	352	520	F	9
G01	C82	356	497	F	9
G01	C82	370	559	M	2
G01	C82	424	889	F	9
G01	C82	380	628	F	3
G01	C82	400	734	M	3
G01	C82	366	594	M	2
G01	C82	372	500	F	32
G01	C82	341	490	M	3
G01	C82	390	653	F	15
G01	C82	359	512	F	20
G01	C82	370	580	F	11
G01	C82	392	689	F	12
G01	C82	394	657	M	3
G01	C82	390	650	M	5
G01	C82	370	599	M	5
G01	C82	382	564	M	4
G01	C82	350	522	M	5
G01	C82	402	738	M	4
G01	C82	380	634	F	13
G01	C82	370	591	F	10
G01	C82	390	685	M	5
G01	C82	380	630	M	6
G01	C82	392	617	M	8
G01	C82	358	491	F	12
G01	C82	370	580	F	7
G01	C82	390	649	F	16
G01	C82	370	601	M	5
G01	C82	414	825	M	3
G01	C82	410	708	M	5
G01	C82	422	867	M	6
G01	C82	362	557	M	4
G01	C82	392	658	F	10
G01	C82	371	551	F	13
G01	C82	431	854	M	7
G01	C82	383	625	M	3
G01	C82	374	570	F	9
G01	C82	383	719	M	5
G01	C82	371	591	M	3
G01	C82	363	519	M	3
G01	C82	370	482	M	3
G01	C82	371	572	M	3
G01	C82	380	609	F	9
G01	C82	410	782	M	3
G01	C82	380	558	M	3
G01	C82	359	509	M	5
G01	C82	370	567	M	4
G01	C82	400	722	M	4
G01	C82	342	516	M	6
G01	C82	390	644	F	12
G01	C82	364	557	M	4
G01	C82	384	548	M	5
G01	C82	362	525	M	8
G01	C82	432	795	F	18
G01	C82	396	595	M	2
G01	C82	364	508	M	2
G01	C82	398	611	F	7
G01	C82	344	477	M	2
G01	C82	372	551	M	2
G01	C93	413	866	F	23
G01	C93	410	785	M	3
G01	C93	402	725	M	4

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

PINK SALMON

St.	Gear	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	Gear	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	Gear	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)
G01	C93	406	735	F	13	G01	C106	450	1017	M	2	G02	C93	393	711	F	8
G01	C93	388	682	M	6	G02	C72	402	685	M	3	G02	C93	404	845	F	21
G01	C93	420	827	M	6	G02	C72	400	793	M	6	G02	C93	404	781	M	3
G01	C93	408	898	F	39	G02	C72	374	592	F	10	G02	C93	400	745	M	2
G01	C93	405	723	F	20	G02	C72	380	697	F	27	G02	C93	408	754	M	4
G01	C93	412	860	M	8	G02	C72	386	700	F	8	G02	C93	395	745	M	4
G01	C93	404	653	M	11	G02	C72	390	655	F	7	G02	C93	400	703	F	14
G01	C93	447	936	F	27	G02	C72	−	652	F	24	G02	C93	410	762	F	8
G01	C93	389	820	M	2	G02	C72	−	602	F	14	G02	C93	394	653	F	9
G01	C93	410	729	M	2	G02	C72	424	904	−	−	G02	C93	400	770	F	23
G01	C93	378	607	M	1	G02	C72	412	734	−	−	G02	C93	426	850	F	36
G01	C93	412	730	F	20	G02	C72	388	712	−	−	G02	C93	404	790	F	15
G01	C93	408	829	F	7	G02	C72	400	768	−	−	G02	C93	420	749	F	28
G01	C93	434	963	M	6	G02	C72	380	985	−	−	G02	C93	466	1252	M	7
G01	C93	402	691	F	13	G02	C72	−	643	−	−	G02	C93	414	836	M	14
G01	C93	388	607	M	1	G02	C82	404	722	F	18	G02	C93	414	818	M	4
G01	C93	400	695	F	11	G02	C82	396	704	M	4	G02	C93	414	863	F	18
G01	C93	395	700	M	4	G02	C82	388	684	M	2	G02	C93	398	776	F	31
G01	C93	403	752	M	1	G02	C82	388	646	F	17	G02	C93	424	1022	F	10
G01	C93	382	619	M	1	G02	C82	408	735	M	2	G02	C93	402	834	M	6
G01	C93	402	723	F	10	G02	C82	396	684	F	24	G02	C93	470	1246	M	7
G01	C93	388	745	F	10	G02	C82	392	714	F	8	G02	C93	434	922	M	3
G01	C93	388	709	M	1	G02	C82	388	660	F	9	G02	C93	402	698	M	4
G01	C93	407	732	F	11	G02	C82	406	786	M	3	G02	C93	390	731	F	11
G01	C93	420	826	F	21	G02	C82	390	697	M	2	G02	C106	430	854	M	6
G01	C93	419	786	F	17	G02	C82	388	641	F	26	G02	C106	400	799	M	6
G01	C93	423	871	M	4	G02	C82	412	803	F	24	G03	A112	462	1188	M	4
G01	C93	384	675	F	19	G02	C82	386	680	F	14	G03	C55	372	510	M	1
G01	C93	394	667	F	16	G02	C82	410	804	M	3	G03	C63	371	522	M	10
G01	C93	406	776	F	13	G02	C82	388	724	M	3	G03	C63	360	546	F	10
G01	C93	393	709	F	19	G02	C82	400	736	M	2	G03	C63	388	674	F	10
G01	C93	403	754	F	15	G02	C82	382	694	M	3	G03	C63	359	585	M	7
G01	C93	407	764	F	7	G02	C82	−	701	F	22	G03	C63	345	451	F	12
G01	C93	396	675	F	13	G02	C82	420	918	F	15	G03	C63	365	505	F	5
G01	C93	400	694	F	9	G02	C82	374	638	M	3	G03	C72	408	709	M	1
G01	C93	432	860	M	1	G02	C82	382	652	F	20	G03	C72	376	594	F	8
G01	C93	406	726	F	7	G02	C82	372	505	M	2	G03	C72	383	626	M	1
G01	C93	412	803	M	3	G02	C82	390	654	F	13	G03	C72	395	668	M	2
G01	C93	391	683	M	2	G02	C82	402	768	M	2	G03	C72	369	616	F	5
G01	C93	412	791	F	17	G02	C82	378	666	M	4	G03	C72	389	585	M	2
G01	C93	417	720	F	24	G02	C82	370	588	F	15	G03	C72	372	633	F	14
G01	C93	378	605	M	1	G02	C82	394	719	F	14	G03	C72	367	557	M	1
G01	C93	392	714	M	4	G02	C82	382	646	F	19	G03	C72	399	562	M	3
G01	C93	384	639	M	4	G02	C82	390	683	F	8	G03	C72	343	468	M	1
G01	C93	440	881	M	5	G02	C82	392	608	F	14	G03	C72	382	631	F	6
G01	C93	444	1080	M	6	G02	C82	420	824	F	15	G03	C72	374	578	M	2
G01	C93	388	657	M	7	G02	C82	380	622	F	6	G03	C72	363	544	F	4
G01	C93	398	665	M	2	G02	C82	386	618	M	1	G03	C72	349	455	F	5
G01	C93	372	717	F	21	G02	C82	410	814	M	4	G03	C72	383	641	M	2
G01	C93	382	637	M	4	G02	C82	376	600	F	18	G03	C72	359	544	M	2
G01	C93	374	656	F	12	G02	C82	412	686	M	1	G03	C72	398	703	M	2
G01	C93	456	1102	M	3	G02	C82	392	727	M	3	G03	C72	354	517	M	1
G01	C93	414	911	F	33	G02	C82	403	821	F	10	G03	C72	396	687	F	10
G01	C93	398	740	F	8	G02	C82	373	613	M	4	G03	C72	406	668	F	6
G01	C93	372	657	F	10	G02	C82	410	834	F	26	G03	C72	342	453	F	7
G01	C93	392	691	M	1	G02	C82	390	714	F	14	G03	C72	348	433	M	1
G01	C93	408	795	F	30	G02	C93	410	757	M	3	G03	C72	365	548	F	3
G01	C106	350	417	M	1	G02	C93	423	893	M	4	G03	C72	333	402	M	1

Table 6. Biological characteristics of salmonids caught by drift gillnet research (continued)

PINK SALMON

St.	Gear (mm)	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	Gear (mm)	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	Gear (mm)	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)
G03	C72	367	546	M	1	G03	C82	408	756	F	10	G03	C82	392	646	F	10
G03	C72	338	400	F	3	G03	C82	378	589	F	5	G03	C82	375	564	F	8
G03	C72	393	679	F	10	G03	C82	375	598	F	7	G03	C82	368	501	M	1
G03	C72	382	575	M	1	G03	C82	362	560	F	7	G03	C82	423	784	F	5
G03	C72	384	636	M	1	G03	C82	405	775	M	3	G03	C82	370	562	M	1
G03	C72	342	415	M	1	G03	C82	388	698	M	2	G03	C82	373	520	F	2
G03	C72	403	668	F	6	G03	C82	389	677	M	4	G03	C93	398	765	F	11
G03	C72	344	459	M	1	G03	C82	403	736	M	1	G03	C93	412	734	F	2
G03	C72	360	490	M	1	G03	C82	382	634	F	4	G03	C93	402	735	F	3
G03	C72	347	528	F	3	G03	C82	403	725	F	10	G03	C93	430	849	M	4
G03	C72	399	671	F	1	G03	C82	399	673	M	1	G03	C93	410	749	M	1
G03	C72	370	568	M	12	G03	C82	388	652	M	1	G03	C93	398	712	M	2
G03	C72	408	773	M	17	G03	C82	365	561	F	12	G03	C93	442	1054	M	2
G03	C72	341	512	M	3	G03	C82	387	621	M	3	G03	C93	408	756	M	1
G03	C72	392	623	F	7	G03	C82	390	610	F	10	G03	C93	403	812	F	13
G03	C72	336	452	F	1	G03	C82	379	613	M	2	G03	C93	403	756	F	13
G03	C82	382	670	M	4	G03	C82	373	625	F	10	G03	C106	423	923	F	47
G03	C82	393	671	F	9	G03	C82	400	715	F	9	G03	C106	453	1029	M	3
G03	C82	406	710	F	18	G03	C82	373	576	F	12	G08	A112	468	1360	M	37
G03	C82	388	607	M	1	G03	C82	410	780	M	2	G08	A118	478	1570	F	99
G03	C82	392	664	M	2	G03	C82	398	748	M	3	G08	A118	492	1539	M	64
G03	C82	406	699	M	1	G03	C82	410	739	F	10	G08	A121	488	1780	F	70
G03	C82	388	640	M	1	G03	C82	350	500	F	6	G08	A115	520	1769	M	89
G03	C82	392	702	F	20	G03	C82	390	701	M	1	G08	C93	433	1128	F	59
G03	C82	393	710	F	13	G03	C82	388	580	F	14	G08	C93	489	1592	F	59
G03	C82	390	610	F	6	G03	C82	387	595	F	7	G08	C106	477	1362	F	94
G03	C82	374	535	F	6	G03	C82	389	614	F	12	G08	C121	485	1587	M	62
G03	C82	428	830	M	5	G03	C82	376	620	F	7						

Table 7-1. The number of organisms caught by drift gillnet during the Oshoro maru Cruise # 228, 2011. CPUE and (%) indicate numerical catch per tan and percentage of total catch by C-gear gillnet at the station, respectively.

Common name	Scientific name	Station	OSG 1101					OSG 1102					OSG 1103					OSG 1104				
		Gear	C					C					C					C				
			CPUE	(%)	A	F	Total	CPUE	(%)	A	F	Total	CPUE	(%)	A	F	Total	CPUE	(%)	A	F	Total
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	0	0.0 (0.0)	0	0	0
Chum salmon	*Oncorhynchus keta*		11	0.3 (2.1)	13	0	24	0	0.0 (0.0)	4	0	4	2	0.1 (1.5)	4	0	6	0	0.0 (0.0)	0	0	0
Pink salmon	*Oncorhynchus gorbuscha*		504	13.6 (95.6)	1	0	505	88	2.4 (95.7)	0	0	88	115	3.8 (87.8)	1	0	116	0	0.0 (0.0)	0	0	0
Coho salmon	*Oncorhynchus kisutch*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Chinook salmon	*Oncorhynchus 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	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	0.0 (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	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	4	4
Boreal clubhook squid	*Onychoteuthis borealijaponicus*		9	0.2 (1.7)	0	0	9	0	0.0 (0.0)	0	0	0	13	0.4 (9.9)	0	0	13	21	0.7 (38.9)	0	2	23
Eight-armed squid	*Gonatopsis borealis*		1	0.0 (0.2)	0	0	1	3	0.1 (3.3)	0	0	3	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Flying squid	*Ommastrephes bartramii*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	1	0	1
									(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	0.0 (0.0)	0	0	0	1	0.0 (1.9)	1	0	2
Spiny dogfish	*Squalus acanthias*		1	0.0 (0.2)	0	0	1	0	0.0 (0.0)	0	0	0	0	0.0 (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	0	1	0.0 (0.8)	0	0	1	0	0.0 (0.0)	0	0	0
Lantern fishes	Myctophidae		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	3	3	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	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	389	389
Pacific pomfret	*Brama japonica*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	26	0.9 (48.1)	6	1	33
Smalleye squaretail	*Tetragonurus atlanticus*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	5	0.2 (9.3)	0	0	5
Short-tailed shearwater	*Puffinus tenuirostris*		0	0.0 (0.0)	0	0	0	1	0.0 (1.1)	0	0	1	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Tufted Puffin	*Fratercula cirrhata*		1	0.0 (0.2)	0	0	1	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	1	0.0 (1.9)	0	0	1

Table 7-2. The number of organisms caught by drift gillnet during the Oshoro maru Cruise #229, 2011. CPUE and (%) indicate numerical catch per tan and percentage of total catch by C-gear gillnet at the station, respectively.

Common name	Scientific name	Station	OSG 1105					OSG 1106					OSG 1107					OSG 1108				
		Gear	C					C					C					C				
			CPUE	(%)	A	F	Total	CPUE	(%)	A	F	Total	CPUE	(%)	A	F	Total	CPUE	(%)	A	F	Total
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	0	0.0 (0.0)	0	0	0
Chum salmon	*Oncorhynchus keta*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Pink salmon	*Oncorhynchus gorbuscha*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	4	0.1 (1.3)	5	0	9
Coho salmon	*Oncorhynchus kisutch*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Chinook salmon	*Oncorhynchus 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	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	0.0 (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	14	14	130	4.3 (36.4)	0	30	160	142	4.7 (47.8)	0	32	174
Boreal clubhook squid	*Onychoteuthis borealijaponicus*		0	0.0 (0.0)	0	1	1	6	0.2 (10.5)	0	35	41	90	3.0 (25.2)	0	82	172	43	1.4 (14.5)	0	15	58
Eight-armed squid	*Gonatopsis borealis*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Flying squid	*Ommastrephes bartramii*		416	13.9 (91.4)	2	6	424	44	1.5 (77.2)	10	0	54	2	0.1 (0.6)	0	0	2	0	0.0 (0.0)	0	0	0
Football octopus	*Ocythoe tuberculata*		1	0.0 (0.2)	0	0	1	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Shortfin mako shark	*Isurus oxyrinchus*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	2	0.1 (0.6)	0	0	2	0	0.0 (0.0)	0	0	0
Blue shark	*Prionace glauca*		4	0.1 (0.9)	2	0	6	1	0.0 (1.8)	0	0	1	1	0.0 (0.3)	1	0	2	0	0.0 (0.0)	1	0	1
Salmon shark	*Lamna ditropis*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	1	0.0 (0.3)	2	0	3	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	0.0 (0.0)	0	1	1	0	0.0 (0.0)	0	0	0
Lantern fishes	Myctophidae		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	5	5	0	0.0 (0.0)	0	16	16	0	0.0 (0.0)	0	3	3
Pacific saury	*Cololabis saira*		4	0.1 (0.9)	0	44	48	0	0.0 (0.0)	0	13	13	0	0.0 (0.0)	0	35	35	0	0.0 (0.0)	0	0	0
Japanese amberjack	*Seriola quinqueradiata*		8	0.3 (1.8)	0	0	8	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Pilotfish	*Naucrates ductor*		1	0.0 (0.2)	0	0	1	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Pacific pomfret	*Brama japonica*		7	0.2 (1.5)	0	0	7	2	0.1 (3.5)	1	0	3	131	4.4 (36.7)	44	5	180	106	3.5 (35.7)	29	6	141
Chub mackerel	*Scomber japonicus*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	1	1	1	0.0 (0.3)	0	0	1
Smalleye squaretail	*Tetragonurus atlanticus*		0	0.0 (0.0)	0	0	0	2	0.1 (3.5)	0	0	2	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Medusa fish	*Icichthys lockingtoni*		0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	1	0.0 (0.3)	0	0	1
Pacific barrelfish	*Hyperoglyphe japonica*		14	0.5 (3.1)	1	0	15	2	0.1 (3.5)	0	0	2	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0
Bluefin driftfish	*Psenes pellucidus*		0	0.0 (0.0)	1	0	1	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0	0	0.0 (0.0)	0	0	0

Table 8. Biological characteristics of fishes caught by drift gillnet

NEON FLYING SQUID

St.	Gear (mm)	M. L. (mm)	B. W. (gr)	St.	Gear (mm)	M. L. (mm)	B. W. (gr)	St.	Gear (mm)	M. L. (mm)	B. W. (gr)
G04	A115	360	−	G05	C72	220	264	G05	F42	196	226
G05	A112	498	4700	G05	C72	206	224	G05	F42	194	150
G05	C55	188	330	G05	C72	203	254	G05	C106	201	236
G05	C55	205	278	G05	C72	200	219	G05	A115	437	2500
G05	C55	208	240	G05	C72	194	186	G06	A121	415	2419
G05	C55	220	289	G05	C72	241	388	G06	A115	412	2360
G05	C55	222	337	G05	C72	212	264	G06	C93	432	2655
G05	C55	211	290	G05	C72	219	266	G06	C63	201	255
G05	C55	209	252	G05	C72	188	210	G06	C63	228	380
G05	C55	202	224	G05	C72	204	230	G06	C63	242	426
G05	C55	215	271	G05	C72	215	268	G06	C63	250	433
G05	C55	192	211	G05	C72	220	266	G06	C63	251	486
G05	C55	219	308	G05	C72	169	218	G06	C63	238	372
G05	C55	214	246	G05	C72	207	241	G06	C63	240	407
G05	C55	201	214	G05	C48	194	199	G06	C63	247	394
G05	C55	210	252	G05	C48	202	222	G06	C63	238	404
G05	C55	204	215	G05	C48	198	266	G06	C63	246	443
G05	C55	203	204	G05	C48	205	241	G06	C63	256	448
G05	C55	206	236	G05	C48	196	191	G06	C63	243	406
G05	C55	202	241	G05	C48	198	225	G06	C63	239	313
G05	C55	222	317	G05	C48	213	300	G06	C63	252	452
G05	C55	219	247	G05	C48	202	204	G06	C63	221	411
G05	C55	206	236	G05	C48	218	288	G06	C63	217	277
G05	C55	211	282	G05	C48	220	316	G06	C72	239	414
G05	C55	198	213	G05	C48	214	277	G06	C72	250	414
G05	C55	236	351	G05	C48	202	259	G06	C72	243	443
G05	C55	205	230	G05	C48	222	288	G06	C72	227	299
G05	C55	219	290	G05	C48	195	215	G06	C72	256	518
G05	C55	202	231	G05	C48	208	266	G06	C138	462	3274
G05	C55	216	282	G05	C48	201	245	G06	C82	301	832
G05	C55	200	222	G05	C48	202	233	G06	C82	261	525
G05	C55	204	200	G05	C48	198	230	G06	C82	255	485
G05	C72	224	327	G05	C48	198	225	G06	C82	258	464
G05	C72	215	270	G05	C48	210	241	G06	C82	227	323
G05	C72	210	264	G05	C48	203	252	G06	C55	221	268
G05	C72	213	307	G05	C48	218	274	G06	C55	207	277
G05	C72	209	234	G05	C48	201	240	G06	C55	249	291
G05	C72	235	415	G05	C48	209	250	G06	C55	229	334
G05	C72	210	254	G05	C48	214	266	G06	C55	214	292
G05	C72	275	687	G05	C48	209	210	G06	A112	433	2606
G05	C72	251	453	G05	C48	200	247	G06	A118	458	2574
G05	C72	211	278	G05	C48	204	247	G06	A118	455	2655
G05	C72	199	430	G05	C48	203	251	G06	A118	423	2588
G05	C72	198	215	G05	C48	205	257	G06	A118	486	3626
G05	C72	222	307	G05	F42	194	225	G06	A118	425	2294
G05	C72	208	260	G05	F42	202	269	G06	A118	424	2192
G05	C72	218	320	G05	F42	203	243	G07	C106	406	2052
G05	C72	197	221	G05	F42	197	181	G07	C106	404	2269

Table 8. Biological characteristics of fishes caught by drift gillnet (continued)

BOREAL CLUBHOOK SQUID

St.	Gear	M. L.	B. W.	St.	Gear	M. L.	B. W.	St.	Gear	M. L.	B. W.
	(mm)	(mm)	(gr)		(mm)	(mm)	(gr)		(mm)	(mm)	(gr)
G01	C72	296	520	G06	F22	74	12	G07	F42	142	66
G01	C72	276	470	G06	F22	72	12	G07	F42	184	111
G01	C72	296	500	G06	F22	86	19	G07	F42	148	69
G01	C72	270	450	G06	F22	84	18	G07	F42	161	94
G01	C72	265	440	G06	F19	72	12	G07	F42	165	33
G01	C82	391	555	G06	F19	87	21	G07	F42	177	100
G01	C82	380	610	G06	F19	72	14	G07	F42	180	101
G03	C63	288	449	G06	F19	87	20	G07	F42	184	134
G03	C72	254	393	G06	F19	83	19	G07	F42	115	31
G03	C72	256	376	G06	F19	84	19	G07	F42	180	116
G03	C72	268	442	G06	F19	111	33	G07	F42	140	61
G03	C72	276	488	G06	C48	187	136	G07	F42	113	116
G03	C72	262	444	G06	C48	180	116	G07	F42	165	89
G03	C72	282	472	G06	C48	178	119	G07	F33	182	125
G03	C82	293	573	G06	C48	167	104	G07	F33	148	61
G03	C82	283	527	G06	C48	180	121	G07	F33	127	46
G03	C82	296	535	G06	C48	204	172	G07	F33	112	31
G03	C82	288	553	G06	F25	96	26	G07	F33	119	45
G03	C82	288	576	G06	F25	91	23	G07	F33	97	18
G03	C82	303	562	G06	F25	76	16	G07	F33	92	22
G04	C48	211	201	G06	F25	89	21	G07	F33	122	39
G04	C48	184	137	G06	F25	77	17	G07	F33	141	67
G04	C48	182	122	G06	F25	97	27	G07	F33	87	18
G04	C48	178	128	G06	F29	104	31	G07	F22	119	46
G04	C48	221	223	G06	F29	125	45	G07	F22	73	16
G04	C48	198	175	G06	F29	96	23	G07	F22	76	19
G04	C48	184	136	G06	F37	162	91	G07	F22	107	35
G04	C48	184	152	G06	F37	148	70	G07	F22	86	23
G04	C48	192	143	G06	F37	174	102	G07	F22	92	25
G04	C48	186	150	G06	F37	94	23	G07	F22	81	18
G04	C48	184	137	G06	F37	129	57	G07	C48	168	83
G04	C48	181	126	G07	F42	166	110	G07	C48	175	110
G04	C48	188	130	G07	F42	172	131	G07	C48	200	137
G04	C48	164	112	G07	F42	166	99	G07	C48	181	120
G04	C48	180	123	G07	F42	172	108	G07	C48	182	131
G04	C48	162	128	G07	F42	171	114	G07	C48	203	185
G04	C48	170	116	G07	F42	163	86	G07	C48	201	135
G04	C48	185	152	G07	F42	165	80	G07	C48	184	134
G04	C48	178	143	G07	F42	145	76	G07	C48	176	111
G04	F42	188	142	G07	F42	184	141	G07	C48	175	111
G04	F42	184	135	G07	F42	167	98	G07	C48	183	126
G05	F22	73	17	G07	F42	155	84	G07	C48	169	117
G06	F42	171	114	G07	F42	194	150	G07	C48	204	186
G06	F22	67	42	G07	F42	168	118	G07	C48	175	123
G06	F22	91	20	G07	F42	175	102	G07	C48	188	141
G06	F22	89	16	G07	F42	163	91	G07	C48	193	146
G06	F22	92	16	G07	F42	155	79	G07	C48	195	167
G06	F22	94	15	G07	F42	162	92	G07	C48	189	135

Table 8. Biological characteristics of fishes caught by drift gillnet (continued)

BOREAL CLUBHOOK SQUID

St.	Gear (mm)	M. L. (mm)	B. W. (gr)	St.	Gear (mm)	M. L. (mm)	B. W. (gr)	St.	Gear (mm)	M. L. (mm)	B. W. (gr)
G07	C48	177	127	G07	F29	95	25	G08	C82	285	475
G07	C48	167	198	G07	F29	100	34	G08	C82	310	591
G07	C48	178	116	G07	F29	106	42	G08	C72	285	473
G07	C48	187	155	G07	F29	102	33	G08	C72	316	596
G07	C48	194	159	G07	F29	116	39	G08	C72	298	478
G07	C48	182	118	G07	F37	160	81	G08	C63	250	297
G07	C48	212	170	G07	F37	168	108	G08	C63	248	305
G07	C48	181	128	G07	F37	160	81	G08	C63	240	240
G07	C48	182	123	G07	F37	168	108	G08	C63	239	245
G07	C48	191	136	G07	F37	170	106	G08	C63	234	236
G07	C48	176	112	G07	F37	150	83	G08	C63	244	292
G07	C48	183	123	G07	F37	166	92	G08	C48	203	155
G07	F19	87	17	G07	F37	126	61	G08	C48	187	133
G07	F19	81	18	G07	F37	170	101	G08	C48	195	149
G07	C55	194	167	G07	F37	166	92	G08	C48	170	115
G07	C55	190	150	G07	F37	152	90	G08	C48	174	116
G07	C55	219	185	G07	F37	142	83	G08	C48	175	239
G07	C55	202	176	G07	F37	164	102	G08	C48	174	118
G07	C55	200	189	G07	F37	176	121	G08	C48	165	107
G07	C55	188	139	G07	F37	142	78	G08	C48	215	172
G07	C55	204	176	G08	F37	148	87	G08	C48	209	181
G07	C55	208	178	G08	F37	178	105	G08	C48	174	110
G07	C55	201	173	G08	F37	150	83	G08	C48	202	165
G07	C55	201	177	G08	F29	149	72	G08	C48	191	149
G07	C55	199	178	G08	F29	164	96	G08	C48	178	117
G07	C55	230	228	G08	F25	120	46	G08	C48	186	134
G07	C55	205	182	G08	C55	89	21	G08	C48	180	125
G07	C55	196	183	G08	C55	159	87	G08	C48	192	129
G07	C55	210	165	G08	C55	189	127	G08	C48	173	112
G07	C63	237	252	G08	C55	219	196	G08	C48	178	117
G07	C63	239	287	G08	C55	248	280	G08	C48	171	114
G07	F25	82	21	G08	C55	203	176	G08	C48	183	129
G07	F25	80	18	G08	C55	205	192	G08	F42	160	80
G07	F25	76	21	G08	C82	303	552	G08	F42	187	128
G07	F25	70	16	G08	C82	302	564	G08	F42	165	104
G07	F25	90	27	G08	C82	303	616	G08	F42	193	138
G07	F25	88	22	G08	C82	281	473	G08	F42	176	114
G07	F29	90	24	G08	C82	304	566	G08	F33	102	28

Table 8. Biological characteristics of fishes caught by drift gillnet (continued)

PACIFIC SAURY

St.	Gear	F. L.	B. W.	St.	Gear	F. L.	B. W.	St.	Gear	F. L.	B. W.
	(mm)	(mm)	(gr)		(mm)	(mm)	(gr)		(mm)	(mm)	(gr)
G04	F29	284	99	G04	F33	280	95	G05	F37	328	142
G04	F29	296	115	G04	F37	290	108	G05	F37	348	120
G04	F29	285	102	G04	F37	290	106	G05	F37	332	103
G04	F29	306	120	G04	F37	300	113	G05	F37	318	152
G04	F29	288	83	G04	F37	308	124	G05	F37	305	122
G04	F29	308	115	G04	F37	284	104	G05	F37	308	144
G04	F29	284	86	G04	F37	274	95	G05	F37	316	166
G04	F29	283	98	G04	F37	282	103	G05	F37	304	158
G04	F29	301	120	G04	F37	281	101	G05	F37	311	175
G04	F29	297	104	G04	F37	293	128	G05	F37	298	144
G04	F29	290	107	G04	F37	278	98	G05	F37	321	170
G04	F29	282	77	G04	F37	296	115	G05	F37	286	127
G04	F29	286	95	G04	F37	290	105	G06	F42	305	154
G04	F29	282	114	G04	F37	274	103	G06	F33	243	66
G04	F29	321	144	G04	F37	300	121	G06	F22	150	16
G04	F29	287	119	G04	F37	304	136	G06	F22	161	21
G04	F29	291	97	G04	F37	324	155	G06	F19	145	14
G04	F29	276	95	G04	F37	300	149	G06	F19	139	12
G04	F29	286	90	G04	F37	196	149	G06	F29	248	75
G04	F29	289	82	G04	F37	286	101	G06	F29	237	78
G04	F29	289	109	G04	F37	286	117	G06	F37	296	141
G04	F29	300	145	G04	F37	310	120	G06	F37	249	83
G04	F29	280	100	G04	F37	300	113	G06	F37	249	91
G04	F29	300	107	G04	F37	313	108	G06	F37	279	113
G04	F29	292	94	G04	F37	280	85	G07	F19	165	18
G04	F29	288	108	G04	F37	280	115	G07	F19	162	22
G04	F29	306	132	G04	F37	294	103	G07	F19	160	23
G04	F29	300	84	G04	F37	276	85	G07	F19	148	20
G04	F29	280	88	G04	F37	293	109	G07	F19	163	22
G04	F29	290	66	G04	F37	303	109	G07	F19	178	22
G04	F33	332	142	G04	F37	283	106	G07	F19	160	11
G04	F33	283	100	G05	F29	300	118	G07	F19	162	20
G04	F33	315	165	G05	F29	309	148	G07	F19	152	19
G04	F33	278	124	G05	F29	311	157	G07	F19	157	18
G04	F33	286	111	G05	F29	299	128	G07	F19	167	21
G04	F33	308	121	G05	F29	293	129	G07	F19	156	20
G04	F33	292	101	G05	F42	324	148	G07	F19	159	20
G04	F33	280	127	G05	F42	305	152	G07	F19	160	19
G04	F33	276	89	G05	F42	306	138	G07	F19	157	18
G04	F33	292	109	G05	F42	322	157	G07	F19	165	10
G04	F33	296	76	G05	F42	315	183	G07	F19	156	19
G04	F33	290	112	G05	F42	307	137	G07	F19	155	10
G04	F33	310	120	G05	F33	305	142	G07	F19	166	19
G04	F33	292	82	G05	F33	307	131	G07	F19	158	18
G04	F33	284	126	G05	F33	297	130	G07	F19	154	14
G04	F33	298	94	G05	F33	296	130	G07	F19	150	12
G04	F33	304	94	G05	F33	302	129	G07	F19	169	20
G04	F33	276	80	G05	F33	301	120	G07	F19	165	18
G04	F33	272	123	G05	F33	298	127	G07	F19	167	21
G04	F33	304	103	G05	F33	301	120	G07	F19	171	18
G04	F33	290	82	G05	F33	299	115	G07	F19	164	23
G04	F33	266	92	G05	F33	179	81	G07	F19	159	11
G04	F33	276	82	G05	F33	305	130	G07	F19	159	19
G04	F33	272	87	G05	F33	295	108	G07	F19	155	11
G04	F33	276	87	G05	F33	311	117	G07	F29	242	75
G04	F33	272	115	G05	F33	306	120	G07	F29	246	79
G04	F33	282	81	G05	F33	289	105	G07	F29	254	74
G04	F33	280	92	G05	F37	334	160				

Table 8. Biological characteristics of fishes caught by drift gillnet (continued)

PACIFIC POMFRET

St.	Gear (mm)	F. L. (mm)	B. W. (gr)	St.	Gear (mm)	F. L. (mm)	B. W. (gr)	St.	Gear (mm)	F. L. (mm)	B. W. (gr)
G04	F29	468	1530	G07	A115	383	1099	G07	C157	426	1653
G04	F33	434	1460	G07	A115	452	1923	G07	C157	435	1468
G04	C82	451	1533	G07	A115	412	1275	G07	C157	449	1548
G04	C93	452	1518	G07	A115	440	1312	G07	C82	464	1750
G04	C106	470	1562	G07	A115	448	1656	G07	C82	487	1804
G04	C138	464	1863	G07	A115	409	1253	G07	C82	449	1485
G04	C138	426	1360	G07	A115	414	1322	G07	C82	474	1920
G04	C138	460	1801	G07	A115	454	1617	G07	C82	463	1890
G04	C138	412	1367	G07	A115	471	2011	G07	C82	438	1520
G04	C138	450	1610	G07	A115	414	1310	G07	C82	475	2177
G04	C138	434	1600	G07	A115	460	1729	G07	C82	444	1615
G04	C138	426	1394	G07	A115	480	1881	G07	C82	449	1669
G04	C138	474	1773	G07	A115	438	1482	G07	C82	454	1880
G04	C157	481	1910	G07	F42	433	1418	G07	C138	436	1643
G04	C157	440	1565	G07	C48	468	1773	G07	C138	450	1729
G04	C157	420	1345	G07	C48	425	1498	G07	C138	458	1825
G04	C157	452	1603	G07	C48	426	1287	G07	C138	466	1806
G04	C157	464	1725	G07	C93	462	1715	G07	C138	424	1258
G04	C157	442	1290	G07	C93	455	1719	G07	C138	436	1650
G04	C157	388	1101	G07	C93	481	1721	G07	C138	464	1923
G04	C157	430	1423	G07	C93	453	1797	G07	C138	441	1590
G04	C157	383	951	G07	C93	438	1590	G07	C138	472	1675
G04	C157	440	1333	G07	C93	463	1610	G07	C138	458	1982
G04	C157	442	1561	G07	C93	450	1666	G07	C138	414	1240
G04	C157	406	1160	G07	C93	452	1578	G07	C138	440	1563
G04	C157	434	1360	G07	C93	449	1574	G07	C138	462	1853
G04	C157	456	1756	G07	C93	451	1484	G07	C138	470	1692
G04	C157	433	1326	G07	C157	461	1635	G07	C138	450	1690
G04	A112	391	1020	G07	C157	353	1593	G07	C138	486	1847
G04	A112	414	1256	G07	C157	425	1587	G07	C138	420	1471
G04	A112	418	1180	G07	C157	451	1874	G07	C138	447	1507
G04	A115	452	1587	G07	C157	411	1330	G07	C138	470	1647
G04	A115	419	1203	G07	C157	453	1623	G07	C138	446	1463
G04	A115	424	1075	G07	C157	454	1777	G07	C138	442	1663
G05	C55	181	68	G07	C157	435	1370	G07	C138	465	1875
G05	C72	173	88	G07	C157	455	1832	G07	C138	429	1290
G05	C72	169	86	G07	C157	488	1794	G07	C138	460	1534
G05	C72	168	74	G07	C157	437	1547	G07	C138	493	1427
G05	C157	419	1070	G07	C157	421	1244	G07	C138	443	1693
G05	C157	448	1430	G07	C157	465	1865	G07	C138	465	1600
G05	C157	422	1106	G07	C157	452	1750	G07	C138	440	1483
G06	C138	456	1823	G07	C157	449	1490	G07	C138	433	1437
G06	C138	471	2083	G07	C157	447	1650	G07	C138	450	1663
G06	A121	444	1308	G07	C157	472	1871	G07	C121	468	1588
G07	A121	475	1918	G07	C157	449	1610	G07	C121	462	1812
G07	A121	466	1690	G07	C157	464	1884	G07	C121	453	1879
G07	A121	470	1648	G07	C157	456	2102	G07	C121	415	1359
G07	A121	429	1303	G07	C157	469	1944	G07	C121	438	1601
G07	A121	442	1614	G07	C157	455	1660	G07	C121	446	1379
G07	A121	468	1659	G07	C157	462	1765	G07	C121	445	1556
G07	A121	485	1988	G07	C157	442	1480	G07	C121	421	1249
G07	A121	424	1363	G07	C157	466	1735	G07	C121	431	1811
G07	A121	452	1575	G07	C157	462	1802	G07	C121	418	1278
G07	A121	412	1130	G07	C157	443	1788	G07	C121	456	1670

Table 8. Biological characteristics of fishes caught by drift gillnet (continued)

PACIFIC POMFRET

St.	Gear	F. L.	B. W.	St.	Gear	F. L.	B. W.	St.	Gear	F. L.	B. W.
	(mm)	(mm)	(gr)		(mm)	(mm)	(gr)		(mm)	(mm)	(gr)
G07	C121	439	1387	G08	C55	442	1704	G08	C157	442	1522
G07	C121	447	1408	G08	C82	437	1581	G08	C157	434	1338
G07	C121	449	1040	G08	C82	420	1386	G08	C157	436	1720
G07	C121	450	1460	G08	C82	468	1607	G08	C157	459	1690
G07	C121	448	1458	G08	C138	464	1960	G08	C157	481	1830
G07	C55	464	1735	G08	C138	479	1927	G08	C157	469	2082
G07	C55	476	1738	G08	C138	459	1635	G08	C157	431	1347
G07	C55	468	1846	G08	C138	468	1744	G08	C157	452	1687
G07	C55	455	1765	G08	C138	446	1433	G08	C157	462	1653
G07	C55	440	1674	G08	C138	453	1672	G08	C157	448	1537
G07	A118	423	1167	G08	C138	445	1612	G08	C157	467	1594
G07	A118	472	1833	G08	C138	463	1866	G08	C157	445	1542
G07	A118	464	1740	G08	C138	432	1402	G08	C157	449	1700
G07	A118	474	1648	G08	C138	441	1454	G08	C157	470	1700
G07	A118	412	1194	G08	C138	470	1899	G08	C157	459	1663
G07	A118	458	1855	G08	C138	449	2005	G08	C157	451	1756
G07	A118	469	1721	G08	C138	470	1910	G08	C157	453	1733
G07	A118	431	1410	G08	C138	455	1576	G08	C157	438	1392
G07	A118	412	1277	G08	C138	441	1586	G08	C157	495	1567
G07	A118	473	192	G08	C138	428	1380	G08	C157	462	1739
G07	A118	444	1539	G08	C138	430	1513	G08	C157	448	1613
G07	A118	424	1436	G08	C138	411	1404	G08	C157	425	1534
G07	A112	429	1231	G08	C138	461	1429	G08	C157	432	1652
G07	A112	437	1523	G08	C138	468	2052	G08	C157	467	1635
G07	A112	462	1703	G08	C138	465	1589	G08	C157	443	1420
G07	A112	459	1669	G08	C138	434	1505	G08	C157	467	1881
G07	A112	461	1630	G08	C138	451	1868	G08	C157	466	1860
G07	A112	417	1420	G08	C138	469	1900	G08	C157	443	1536
G07	A112	476	1561	G08	C138	460	1831	G08	C93	461	1653
G07	A112	448	1762	G08	C138	466	1893	G08	C93	449	1586
G07	A112	418	1562	G08	C138	466	1872	G08	C93	438	1463
G07	C72	469	1906	G08	C138	439	1733	G08	C48	450	1696
G07	C72	463	1634	G08	C138	461	1721	G08	C48	453	1472
G07	C106	458	2031	G08	C138	452	1517	G08	F42	459	1736
G07	C106	480	1776	G08	C72	443	1412	G08	A115	434	1855
G07	C106	449	1711	G08	C72	460	1499	G08	A115	462	1811
G07	C106	470	1822	G08	C72	455	1655	G08	A115	428	1292
G07	C106	419	1310	G08	C121	458	1611	G08	A115	444	1582
G07	C106	480	1961	G08	C121	468	1800	G08	A115	459	1750
G07	C63	473	1847	G08	C121	446	1636	G08	A115	462	1980
G07	C63	451	1679	G08	C121	448	1630	G08	F33	465	1709
G07	C63	455	1737	G08	C121	421	1519	G08	F33	485	2149
G07	C63	434	1470	G08	C121	440	1431	G08	F33	469	2138
G07	F37	455	1760	G08	C121	441	1753	G08	F22	471	1720
G07	F37	469	1860	G08	C121	453	1648	G08	F22	432	1422
G07	F37	470	1800	G08	C121	429	1362	G08	A121	430	1280
G07	F37	449	1740	G08	C121	425	1397	G08	A121	430	1500
G08	A118	480	2120	G08	C121	425	1269	G08	A121	429	1430
G08	A118	444	1545	G08	C121	410	1420	G08	A121	432	1480
G08	A118	455	1781	G08	C121	438	1348	G08	A121	450	1640
G08	A118	467	1764	G08	C121	478	1947	G08	A121	440	1720
G08	A118	457	1764	G08	C121	461	1702	G08	A121	438	1700
G08	A112	399	1252	G08	C63	465	1720	G08	A121	420	1530
G08	A112	474	1870	G08	C63	488	1835	G08	A121	435	1510
G08	A112	483	1900	G08	C63	465	1751	G08	A121	450	1620
G08	A112	485	2286	G08	C63	415	1222	G08	A121	462	1700
G08	A112	460	1674	G08	C63	477	1824	G08	A121	428	1500
G08	C55	419	1437	G08	C106	453	1581	G08	A121	408	1120
G08	C55	466	1675	G08	C157	461	1731				
G08	C55	443	1419	G08	C157	440	1435				

ALBACORE

St.	Gear	F. L.	B. W.	St.	Gear	F. L.	B. W.	St.	Gear	F. L.	B. W.
	(mm)	(mm)	(gr)		(mm)	(mm)	(gr)		(mm)	(mm)	(gr)
G03	A112	630	5482	G03	C106	610	4760	G03	C63	500	2612
G03	A121	485	2394	G03	C121	630	5590	G03	C72	618	5342
G03	C106	625	5544	G03	C138	495	2511	G03	C72	512	2900
G03	C106	618	4824	G03	C138	636	5250	G03	C72	500	2619
								G03	C72	698	6315

6. Salmon Hook-and-Line and surface longline Research

[Hook-and-Line and surface longline Sampling]

To collect salmons, hook-and-line gears and surface longline were used along 155° E line in the Central North Pacific during Cruise #228. Five to ten anglers were engaged in the work. These samplings were mainly conducted with observations when ship was under drifting.

Note: Table 10, 11 includes the *Oshoro maru* Cruise #229 hook-and-line research data.

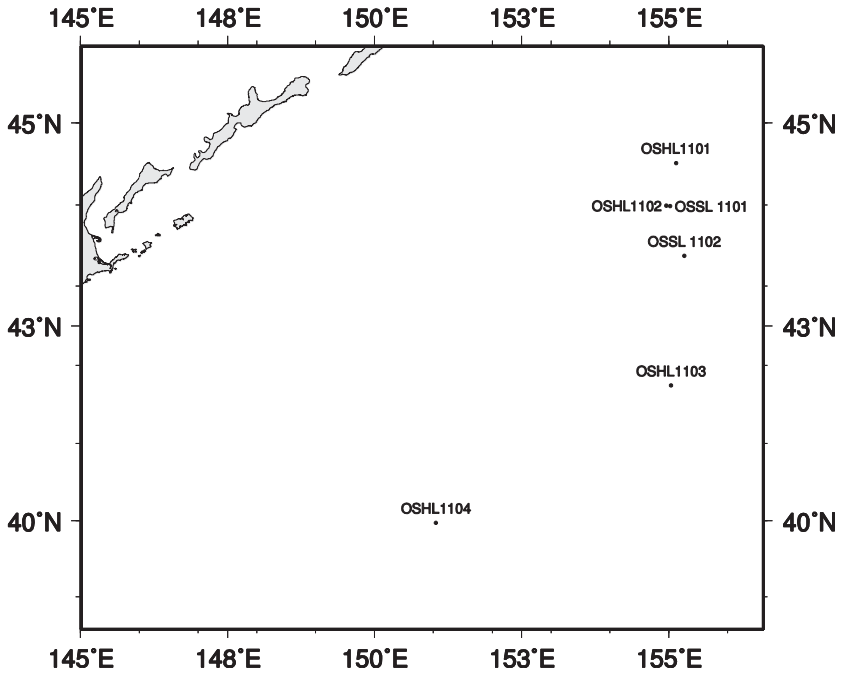

Figure 4. Locations of salmon hook-and-line and surface longline research

Table 9. Position and research conditions of surface longline sampling at each station during the *Oshoro maru* Cruise #228, 2011.

Station	Date and Time (S.M.T.*1)		T.D.*2	Set Position		D.S.*3	Number of baskets	Wr*4	Wind (Force)
	Line set	Line haul		Lat.	Long.				
Cruise #228									
OSSL 1101	May 16 04:55-05:40	May 16 08:39-09:46	+10h	43-59.8N	155-01.0E	080	20	o	West-5
OSHL1101	May 16 21:00	May 17 02:00	+10h	04-31.2N	155-07.0E	-	-	bc	WSW-5
OSSL 1102	May 17 03:55-04:20	May 17 06:25-06:54	+10h	43-22.8N	155-15.3E	253	20	b	WSW-4
OSHL1102	May 17 21:00	May 18 03:15	+10h	44-00.0N	154-57.0E	-	-	o	SSE-4
OSHL1103	May 18 21:00	May 19 03:00	+10h	41-45.2N	155-02.0E	-	-	c	West-5
OSHL1104	May 21 23:00	May 22 03:30	+9h	39-59.0N	151-02.0E	-	-	f	SW-6

*1 S.M.T. : Ship's Mean Time.

*2 T.D. : Time Difference between Greenwich Mean Time (G.M.T.) and Ship's Mean Time (S.M.T.).

*3 D.S. : Direction of line set.

*4 Wr. : Weather (b: 1-25% clouded, bc: 25-75% clouded, c: over 75-99% clouded, o: 100% clouded, f: fog).

Table 10. The catch number of each salmonid at each station where salmonids were collected by hook-and-line gear, surface longline in the Oshoro maru Cruise # 228 and #229, 2011.

Station Name	Sampling gear	Species name						Total
		Sockeye	Chum	Pink	Coho	Chinook	Stellhead	
Cruise #228								
OSSL1101	Surface longline	0	16	8	0	0	0	24
OSSL 1102	Surface longline	0	2	32	0	0	0	34
OSHL 1101	Hook-and-line	0	1	119	0	0	0	120
OSHL 1102	Hook-and-line	0	1	30	0	0	0	31
OSHL 1103	Hook-and-line	0	1	56	0	0	0	57
OSHL 1104	Hook-and-line	0	61	3	0	0	0	64
	Subtotal	0	82	248	0	0	0	330
Cruise #229								
OSHL 1105	Hook-and-line	0	0	5	0	0	0	5
	Subtotal	0	0	5	0	0	0	5
	Total	0	82	253	0	0	0	335

Table 11. Biological characteristics of salmonids caught by hook-and-line research

CHUM SALMON

St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)
SL01	550	2040	F	56	SL01	556	2060	F	32	SL02	534	1800	M	4
SL01	530	1770	M	4	SL01	524	1680	M	1	SL02	496	1313	M	1
SL01	610	1619	M	3	SL01	520	1970	M	8	HL02	542	1840	F	24
SL01	522	1650	M	2	SL01	554	1910	M	7	HL03	482	1920	M	9
SL01	503	1753	M	10	SL01	530	1850	M	5	HL04	529	2150	F	62
SL01	594	2400	M	3	SL01	558	2230	M	2	HL04	592	2550	M	12
SL01	533	1950	F	42	SL01	590	2440	M	2	HL04	520	2020	F	46
SL01	554	2300	M	12	SL01	523	1680	F	14					

PINK SALMON

St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)
SL01	400	756	M	3	SL02	392	563	F	5	HL01	329	500	M	4
SL01	410	800	M	2	SL02	396	633	F	9	HL01	396	700	F	10
SL01	450	960	M	4	SL02	414	702	M	2	HL01	388	660	F	11
SL01	380	630	F	8	SL02	392	660	M	2	HL01	381	610	M	4
SL01	493	1450	M	9	SL02	378	572	M	2	HL01	384	700	M	6
SL01	423	910	M	2	SL02	394	610	M	3	HL01	382	650	F	15
SL01	390	730	M	1	SL02	360	500	F	5	HL01	393	700	F	10
SL01	364	585	F	3	SL02	376	521	M	3	HL01	388	660	F	9
SL02	360	459	M	1	HL01	482	1325	F	34	HL01	392	710	F	6
SL02	397	474	M	1	HL01	378	530	M	4	HL01	458	1210	M	7
SL02	390	563	M	2	HL01	378	600	F	10	HL01	393	770	M	1
SL02	305	753	M	2	HL01	362	510	M	3	HL01	384	510	M	2
SL02	395	581	F	3	HL01	401	730	F	12	HL01	386	650	M	2
SL02	367	545	M	1	HL01	380	509	M	4	HL01	371	510	M	2
SL02	395	663	F	6	HL01	356	560	M	7	HL01	392	690	F	9
SL02	373	538	M	1	HL01	363	530	M	3	HL01	396	715	M	3
SL02	389	655	F	8	HL01	381	700	F	9	HL01	374	610	F	13
SL02	393	666	F	19	HL01	373	700	M	12	HL01	384	710	M	2
SL02	382	631	M	2	HL01	372	570	M	15	HL01	400	690	M	3
SL02	374	540	M	1	HL01	399	760	M	5	HL01	370	560	M	3
SL02	406	660	M	3	HL01	368	590	F	12	HL01	410	810	F	20
SL02	386	567	F	6	HL01	392	790	F	17	HL01	373	560	F	8
SL02	378	604	F	8	HL01	361	630	F	12	HL01	395	660	F	16
SL02	386	576	M	2	HL01	389	700	M	2	HL01	393	640	M	1
SL02	370	501	M	1	HL01	361	600	M	5	HL01	392	650	M	3
SL02	370	520	M	1	HL01	402	800	M	4	HL01	392	710	M	3
SL02	386	607	F	6	HL01	382	680	F	12	HL01	381	640	M	2
SL02	392	627	F	10	HL01	370	680	M	5	HL01	376	590	M	1
SL02	376	554	M	1	HL01	381	650	F	9	HL01	358	540	F	6
SL02	422	882	M	2	HL01	370	620	M	4	HL01	373	540	F	6
SL02	374	482	F	8	HL01	394	690	F	15	HL01	374	615	F	8
SL02	390	626	F	10	HL01	388	630	F	11	HL01	370	590	F	9

Table 11. Biological characteristics of salmonids caught by hook-and-line research (continued)

PINK SALMON

St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)	St.	F. L. (mm)	B. W. (gr)	Sex	G. W. (gr)
HL01	392	720	M	3	HL03	376	590	−	−	HL04	431	880	M	6
HL01	383	665	F	8	HL03	400	710	−	−	HL04	408	860	F	24
HL01	380	630	M	4	HL03	430	920	−	−	HL04	414	840	F	14
HL01	380	660	F	5	HL03	382	830	−	−	HL04	392	780	F	16
HL01	392	665	F	11	HL03	370	495	−	−	HL04	390	780	F	12
HL02	388	730	F	35	HL03	388	720	−	−	HL04	400	860	F	22
HL02	384	680	M	10	HL03	360	670	−	−	HL04	440	1030	M	3
HL02	398	800	F	15	HL03	365	560	−	−	HL04	445	1250	F	88
HL02	364	600	M	8	HL03	380	710	−	−	HL04	396	880	M	5
HL02	432	960	M	10	HL03	364	670	−	−	HL04	388	770	F	21
HL02	390	750	M	7	HL03	380	510	−	−	HL04	370	730	F	10
HL02	398	700	M	7	HL03	404	640	−	−	HL04	378	730	F	13
HL02	418	940	F	20	HL03	378	640	−	−	HL04	400	820	F	23
HL02	418	840	M	15	HL03	404	910	M	12	HL04	398	800	F	20
HL02	416	760	M	10	HL03	378	700	F	31	HL04	434	860	M	14
HL02	394	740	M	4	HL03	357	560	F	19	HL04	382	810	M	6
HL02	382	600	F	10	HL03	386	640	F	40	HL04	396	850	F	14
HL02	396	720	F	28	HL03	366	640	M	10	HL04	432	980	M	10
HL02	381	640	M	4	HL03	380	630	M	9	HL04	413	940	M	3
HL02	372	580	M	4	HL03	389	640	F	19	HL04	400	880	F	20
HL02	390	580	M	5	HL03	381	700	F	28	HL04	432	930	F	23
HL02	382	700	F	11	HL03	348	500	F	34	HL04	420	820	F	18
HL02	390	640	F	12	HL03	376	580	F	32	HL04	418	870	M	3
HL02	390	680	F	11	HL03	372	640	F	12	HL04	395	720	F	18
HL02	396	720	F	23	HL03	386	540	F	16	HL04	430	750	F	24
HL02	421	860	M	8	HL03	358	580	F	13	HL04	420	800	F	17
HL02	419	840	M	7	HL03	390	620	M	6	HL04	402	920	F	20
HL02	442	840	M	8	HL03	364	550	M	5	HL04	405	850	F	22
HL02	400	660	F	18	HL03	414	740	M	6	HL04	406	850	M	3
HL02	441	660	M	12	HL03	386	720	F	16	HL04	432	960	F	22
HL02	433	780	F	39	HL03	392	670	M	7	HL04	442	920	M	3
HL02	411	780	M	7	HL03	386	660	M	6	HL04	410	900	M	2
HL02	381	560	F	22	HL03	400	670	F	15	HL04	432	940	F	23
HL02	390	620	F	15	HL03	356	560	M	10	HL04	376	740	F	12
HL03	392	700	−	−	HL03	407	640	M	7	HL04	420	980	M	5
HL03	378	560	−	−	HL03	392	750	F	13	HL04	410	920	F	17
HL03	384	640	−	−	HL03	398	750	F	16	HL04	430	1180	F	23
HL03	386	650	−	−	HL03	398	640	M	6	HL04	402	780	F	17
HL03	368	630	−	−	HL04	436	1200	M	7	HL04	448	1020	M	5
HL03	402	680	−	−	HL04	419	940	F	16	HL04	470	1100	F	22
HL03	396	680	−	−	HL04	434	960	M	2	HL04	420	940	M	3
HL03	398	680	−	−	HL04	456	1100	F	18	HL04	400	840	F	12
HL03	384	660	−	−	HL04	417	980	F	11	HL04	402	800	F	22
HL03	374	640	−	−	HL04	395	840	M	5	HL04	432	940	F	20
HL03	370	680	−	−	HL04	424	940	F	15	HL04	412	860	M	3
HL03	421	800	−	−	HL04	389	730	F	8	HL04	440	920	M	4
HL03	375	680	−	−	HL04	437	930	M	7	HL05	556	2200	M	54
HL03	370	620	−	−	HL04	406	800	F	16	HL05	568	2400	M	36
HL03	330	395	−	−	HL04	566	1350	M	14	HL05	466	1350	M	18
HL03	382	640	−	−	HL04	394	830	F	18	HL05	510	1620	M	54
HL03	374	610	−	−	HL04	408	890	F	15	HL05	450	1200	M	48

7. Data on Plankton Collected by Vertical Hauls with a single or twin NORPAC Net.

Vertical hauls with a twin-NORPAC net were made at hydrographic stations. This net was composed of 45 cm mouth diameter and 180 cm long conical one which was made of GG54 and XX13 having 0.33 mm and 0.10 mm mesh, respectively. The net was lowered to the estimated depth of 150 m, 500 m or near the bottom when the bottom depth was shallower than 150 m, and immediately hauled to the surface at a speed about 1 m s^{-1}. A flowmeter was mounted at the center of mouth of the net to estimate the volume water filtered. Sampling was conducted by research staffs and measurement of wet weight of the samples were made by A. Yamaguchi, K. Matsuno, R. Saito, R. Ohashi, Y. Abe, T. Shiota, K. Chikugo (Laboratory of Marine Biology).

Table 12. Data on plankton collected by vertical hauls with a single or twin NORPAC net.

Station	Position		S.M.T.		Length of	Angle of	Depth estimated	Kind of	Flowmeter		Estimated volume of	Wet weight (g)		Sample
no.	Lat. (N)	Lon. (E)	Date	Hour	wire (m)	wire (°)	by wire angle (m)	cloth	No.	Reading	water filtered (m^3)	per haul	per 1000 m^3	no.
OS11043	41-30	145-47	14 May	11:27	530	19	501	GG54	1479	5472	88.51	107.0	1208 1)	11001
(Site H)								XX13	1630	5188	87.78			11002
				11:58	155	14	150	GG54	1479	1678	27.14	76.0	2801 1)	11003
								XX13	1630	1682	28.46			11004
OS11044	44-00	155-00	16 May	4:28	155	15	150	GG54	1479	1542	24.94	8.4	336	11005
(St. KNOT)								XX13	1630	1442	24.40			11006
OS11045	43-15	155-00	16 May	15:56	150	4	150	GG54	1479	1380	22.32	4.8	214	11007
								XX13	1630	1535	25.97			11008
OS11048	42-30	155-00	18 May	12:35	150	5	149	GG54	1479	1462	23.65	5.9	247	11009
								XX13	1630	1462	24.74			11010
OS11049	41-45	155-00	18 May	19:13	152	10	150	GG54	1479	1355	21.92	15.7	718	11011
								XX13	1630	1415	23.94			11012
OS11052	39-30	155-00	19 May	19:46	152	10	150	GG54	1479	1411	22.82	2.0	86	11013
								XX13	1630	1323	22.38			11014
OS11053	38-45	155-00	20 May	9:37	155	14	150	GG54	1479	1412	22.84	6.2	270	11015
								XX13	1630	1162	19.66			11016
OS11054	38-00	155-00	20 May	15:50	150	4	150	GG54	1479	1342	21.71	7.5	343	11017
								XX13	1630	1148	19.42			11018

1) Phytoplankton abundant
2) Including some fragments of medusae
3) *Neocalanus* abundant
4) Gelatinous zooplankton abundant
5) Doliolids abundant

8. Data on Calibration of Flowmeters

Flowmeters used for plankton nets were calibrated once in the cruise.

Table 13. Calibration data on flowmeters used for a twin NORPAC net and other kind of nets.
100-m wire out at off Aomori in 23 May 2011.

Flowmeter	Wire length	Revolution								
No.	(m)	1	2	3	4	5	6	7	8	Mean
RG1479	100	990	1005	968	950*	1045*	947*	1079*	970	983
RG1630	100	910*	1000	930	915	1245*	915	1130*	912*	940
RG3556	100	1128*	1082	1100	1098	1005*	1119	910*	1152*	1100

*: omitted from calculation