March 16, 2005

F/V *Alaskan Leader*
Cruise Report AL-04-01
Longline Survey of the Gulf of Alaska and Eastern Aleutian Islands
June 3-September 1, 2004

Prepared by

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On September 1, 2004, the, Alaska Fisheries Science Center (AFSC), completed the twenty-fifth annual longline survey of Alaska sablefish (*Anoplopoma fimbria*) resources of the upper continental slope (Figure 1). The present NMFS survey was designed to continue the time series (1979-94) of the discontinued Japan-U.S. cooperative longline survey of the Gulf of Alaska. NMFS has surveyed the Gulf of Alaska annually since 1987, the eastern Aleutian Islands biennially since 1996, and the eastern Bering Sea biennially since 1997. The Gulf of Alaska and eastern Aleutian Islands were sampled in 2004.

OBJECTIVES

1. Determine the relative abundance and size composition of the commercially important species: sablefish, shortspine thornyhead (*Sebastolobus alascanus*), Greenland turbot (*Reinhardtius hippoglossoides*) and rougheye and shortraker rockfishes (*Sebastes aleutianus* and *S. borealis*)

2. Determine the relative abundance and size composition of other groundfish species caught during the survey: Pacific cod (*Gadus macrocephalus*), arrowtooth flounder (*Atheresthes stomias*), and grenadiers (Macrouridae).

3. Tag and release sablefish, shortspine thornyhead, and Greenland turbot to determine migration patterns.

4. Collect sablefish otoliths to study the age composition of the population.

5. Conduct surface-gillnet sampling to examine distribution and abundance of young-of-the-year sablefish.

6. Implant Greenland turbot and shortspine thornyhead with electronic tags that record water temperature, depth, and time.

7. Test the effect of hook spacing on sablefish catch rates.

VESSEL AND GEAR

Survey operations were conducted using the F/V *Alaskan Leader*, a chartered U.S. longline vessel. The 46 m (150 ft) vessel carried standard longline hauling gear and was equipped with radios, radars, GPS receivers, video and paper track plotters, a processing line, three sets of plate freezers, and refrigerated holds. Vessel personnel consisted of a captain, an engineer, a first mate, a cook, a quality-control technician, three fishermen, four baiters and three processors, two contract biologists, and one or two NMFS biologists .

Gear configuration was unchanged from that of the 1988-2003 surveys. Units of gear (skates) were 100 m (55 fm) long and contained 45 size 13/0 Mustad[1] circle hooks. Hooks were attached to 38 cm (15 in) gangions that were secured to beckets tied into the groundline at 2 m (6.5 ft) intervals. Five meters (16 ft) of groundline were left bare at each end. Gangions were constructed of medium lay #60 thread nylon, becket material was medium lay #72 thread nylon, and groundline was medium lay 9.5 mm (3/8 in) diameter nylon.

A set of gear consisted of a flag and buoy array at each end. Each flag was followed sequentially by between 183and 1,281 m (100-700 fm) 9.5 mm diameter nylon buoyline, a 92 m (50 fm) section of 9.5 mm polypropylene floating line, a 16 kg (35 lb) piece of chain (to dampen the effect of wave surge on the buoyline), 92 m of 9.5 mm nylon line, a 27 kg (60 lb) halibut anchor, and 366 m (200 fm) of 9.5 mm nylon line. The groundline was weighted with 3.2 kg (7 lb) lead balls at the end of each skate. Hooks were hand baited with chopped squid (*Illex*) at a rate of about 5.7 kg (12.5 lb) per 100 hooks. Squid heads and tentacles were not used for bait.

Total groundline set each day was 16 km (8.6 nmi) long and contained 160 skates and 7,200 hooks. Two eighty-skate groundlines laid end to end were set at each station along the upper continental slope. A single groundline of eighty skates was set at each station in the gullies. Two stations spaced 3.5-7 km (2-4 nmi) apart usually will be sampled each day in the gullies. Fewer skates are needed to sample a gully compared to a slope station, 80 vs. 160, because of the narrower range of depths covered in gullies. Only Amatuli Gully station 87 consists of 160 skates because it was created during the earlier Japan-U.S. cooperative longline survey; whereas all other gully stations were created during the domestic longline survey.

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[1] Citation of the above brand name does not constitute U.S. government endorsement.

OPERATIONS

The charter began on June 3 at Unalaska, Alaska, and ended on September 1 in Unalaska. The charter period was divided into seven legs of 17, 14, 15, 2, 10, 11 and 11 days. During leg 1, the stations along the upper continental slope of the eastern Aleutian Islands were sampled. During leg 2 the area in the Gulf of Alaska extending from the western end of Umnak Island and eastward of Sand Point was sampled. Leg 3 began near Dixon Entrance and continued north and westward to Yakutat. During leg 4 the hook-spacing experiment was conducted in the Yakutat vicinity. During leg 5, the area between Yakutat and Seward was sampled, and during leg 6 the area from Seward to Kodiak was sampled. During leg 7, the area from Kodiak Island to the Sumagin Islands was sampled.

Annual survey periods have varied over time. From 1988 to 1990 the survey period was from June 26 to September 12. The survey periods in 1991 through 1994 were 2-1/2 weeks later than in 1988 through 1990. The 1991-1994 surveys were delayed to avoid the commercial sablefish fishery that started 45 days later than in 1988 through 1990. Starting in 1995, the survey period was moved back to near the 1988-1990 time periods because of the extensive increase in length of the fishing season resulting from the implementation of the Individual Fishing Quota (IFQ) system in the sablefish and Pacific halibut longline fisheries. Beginning in 1998 the order in which the stations were sampled was changed to avoid conflicting with an early July rockfish trawl fishery in the central Gulf of Alaska. Instead of continuing to sample in an easterly direction from Sand Point to Dixon Entrance, the survey vessel completed the second leg and transited to Dixon Entrance during early July. Survey operations were resumed sampling in a westerly direction going from Dixon Entrance to Sand Point.

Hook-Spacing Experiment

A longline hook-spacing experiment was conducted near Yakutat during 25-26 July 2004. The purpose of the experiment was to test an assumption on how to interpret longline fishery catch rates. The fishery catch per skate is assumed to be an index of relative abundance, for example, a 10% difference in catch rate reflects a 10% difference in relative abundance. This assumption would be wrong if increasing the hook spacing increased the fishing power of each hook. Most (about 70%) sablefish longline fishermen currently use 1 meter hook spacing, but this spacing differs among vessels and may change with time. In the hook-spacing experiment, circle hooks (size 13/0) baited with squid were used. Four hook spacings were tested, 0.5, 1, 2, and 4 m. Six sets were completed. Each set contained all hook spacings. For both this experiment and earlier hook spacing experiments conducted in 1986, 1999 and 2001-2003, catch rate per hook increased as hook spacing increased to an asymptote at four meter spacing. Catch per hook for one-meter spacing, the most common spacing currently in the fishery, was about half that for the four-meter spacing. These results imply that analysis of fishery catch rates should be standardized by longline set to account for differences in hook spacing.

Survey Operations

A total of 87 stations were sampled during the 2004 survey. Fourteen stations were sampled along the upper continental slope of the eastern Aleutian Islands and 45 stations along the upper continental slope of the Gulf of Alaska at a rate of one station per day (Figure 1). Surveyed depths ranged from approximately 200 to 1,000 m, although at some stations, depths less than 150 m or more than 1,000 m were sampled (Table 1). In addition, twenty-seven stations were sampled in gullies at the rate of one to two stations per day. The sampled gullies were Shelikof Trough, Amatuli Gully, W-grounds, Yakutat Valley, Spencer Gully, Ommaney Trench, and Dixon Entrance. One station (42) was sampled on the continental shelf off Baranof Island.

The gear was set from shallow to deep and was retrieved in the same order, except on occasions when groundlines parted or sea conditions dictated that it be pulled from the opposite direction. Setting began about 0630 h Alaska Daylight Time. Retrieval began about 0930 h and was completed by about 1930 h.

A floating gillnet was fished at night to examine the distribution and abundance of young-of-the-year sablefish. The net was set at stations when weather permitted. The gillnet is 200 m long and 3 m deep with variable mesh sizes from 0.75" (1.91 mm) to 1.5" (3.81 mm). The gillnet was set about midnight and retrieved before the longline gear was set at 0630. All fish caught in the gillnet were counted and measured for length. Juvenile sablefish and salmon are frozen for additional studies back at the laboratory.

Data Collection

Catch data were recorded on a hand-held electronic data logger. During gear retrieval a scientist recorded the species of each hooked fish, the condition of each unoccupied hook (absent, broken, or tangled), and whether bait remained on the hook. Time of day was recorded constantly from an internal clock and depth was entered when the first and last skates came aboard, at the beginning of each fifth skate, and when crossing into a new depth interval (0-100 m, 101-200 m, 201-300 m, 301-400 m, 401-600 m, 601-800 m, 801-1,000 m and 1,001-1,200 m).

Length frequency data were collected electronically with a bar code-based measuring board and a bar code reader/data storage device. Length was measured by depth interval for sablefish, Pacific cod, grenadiers, arrowtooth flounder, rockfish, and thornyheads. Lengths of sablefish and Pacific cod also were recorded by sex. Pacific halibut were counted and released at the rail without measuring. Catch and length frequency data were transferred to a computer and electronically backed up twice a day. As in the previous surveys, the charter vessel was allowed to retain sablefish and rockfish not tagged or retained for biological samples and after the scientific data were recorded.

RESULTS

One hundred-forty-eight longline hauls (sets) were completed (Table 1). Sablefish was the most frequently caught species, followed by giant grenadiers, Pacific cod, and shortspine thornyhead, (Table 2). A total of 90,226 sablefish, with an estimated total round weight of 272,509 kg (600,882 lb), was taken during the survey (Table 3).

The highest total sablefish catch was observed at station 85 in the central Gulf of Alaska (Table 2). Station 100 in northern southeast Alaska had the largest average length sablefish (Table 3).

A total of 3,983 sablefish, 442 shortspine thornyhead, and 24 Greenland turbot were tagged and released during the survey. Length-weight data and otoliths were collected from 2,454 sablefish. Twenty-four gillnet sets were completed and 144 young-of-the-year sablefish were caught during the survey. Electronic tags were implanted in 23 Greenland turbot and 53 shortspine thornyhead.

Killer whales preying on sablefish coming up on the gear were observed at stations 62, 63, 64, and 66 in the western Gulf of Alaska. Sperm whales preying on sablefish coming up on the gear were observed at stations of the hook spacing experiment off of Yakutat and several stattions in the central Gulf.

SCIENTIFIC PERSONNEL

Leg I (June 1 - June 17)
Larry Haaga, Field Party Chief, RACE
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

Leg II (June 18- June July 3)
Mitch Lorenz, Field Party Chief, ABL
Carl Anderson, Biologist, ABL
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

Leg III (July 8 - July 24)
John Karinen, Field Party Chief, ABL
Dana Hanselman, Biologist ABL
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

Leg IV (July 25 - July 27)
Dean Courtney, Field Party Chief, ABL
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

Leg V (July 28 - August 7)
Nancy Maloney, Field Party Chief, ABL
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

Leg VI (August 8- August 20)
Chris Lunsford, Field Party Chief, ABL
Dave Clausen, Fisheries Biologist, ABL
Cindy Tribuzio, Graduate Student, UAF
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

Leg VII (August 21 - September 1)
Larry Haaga, Field Party Chief, RACE
Jason Wright, Contract Biologist
Ken Orwig, Contract Biologist

ABL - Auke Bay Laboratory
RACE - Resource Assessment and Conservation Engineering Division
UAF- University of Alaska Fairbanks

For further information contact either

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Table 1.--Haul number (set), preassigned station number, and starting and ending positions and depths for the 2004 NMFS longline survey of the Eastern Aleutian Islands and Gulf of Alaska, June 3- September

Haul no.	Station no.	Start latitude (ddmm.m)	Start longitude (dddmm.m)	End latitude (ddmm.m)	End longitude (dddmm.m)	Start depth (m)	End depth (m)
			Eastern Aleutian Islands				
1	35	5305.6	17016.64	5303.5	17011.25	175	574
2	35	5303.2	17010.27	5300.8	17004.18	152	172
3	37	5216.9	17329.70	5220.6	17329.33	148	616
4	37	5221.6	17329.31	5225.0	17330.62	635	771
5	38	5215.1	17450.56	5218.5	17446.98	175	589
6	38	5219.4	17445.35	5221.0	17439.69	477	889
7	39	5210.5	17548.53	5209.4	17542.03	564	813
8	39	5209.1	17541.70	5208.5	17538.40	120	570
9	40	5158.1	17626.12	5201.6	17626.12	108	432
10	40	5201.9	17624.19	5203.9	17618.82	464	830
11	42	5146.6	17857.77	5143.2	17853.58	160	484
12	42	5142.6	17852.68	5139.4	17849.60	512	713
13	53	5124.3	17837.08	5121.0	17833.71	169	551
14	53	5121.1	17833.15	5121.6	17827.11	565	736
15	54	5145.6	17809.85	5144.2	17816.34	91	439
16	54	5144.3	17816.83	5143.7	17822.73	456	572
17	55	5135.3	17736.91	5132.9	17742.48	234	324
18	55	5132.9	17743.09	5131.7	17749.68	422	906
19	57	5143.8	17559.68	5139.3	17559.28	190	422
20	57	5138.9	17600.13	5135.5	17601.05	445	793
21	58	5150.9	17507.84	5146.6	17507.61	177	358
22	58	5145.7	17506.22	5141.6	17506.71	416	987
23	59	5152.9	17420.27	5149.2	17424.51	120	429
24	59	5148.9	17425.25	5146.6	17431.34	408	893
25	60	5155.0	17329.97	5152.8	17336.27	118	205
26	60	5152.7	17337.35	5151.0	17344.04	195	739
27	61	5226.4	17018.78	5223.8	17024.01	245	522
28	61	5223.6	17024.07	5220.9	17028.40	539	867
			Gulf of Alaska				
29	65	5334.9	16541.15	5330.7	16543.56	120	293
30	65	5330.3	16544.35	5326.5	16547.52	291	460
31	62	5239.7	16859.30	5237.0	16905.41	135	503
32	62	5237.1	16906.59	5233.5	16911.26	312	513
33	64	5311.5	16651.43	5307.2	16653.60	216	322
34	64	5306.8	16654.20	5303.4	16657.99	322	890
35	63	5258.0	16808.05	5254.7	16811.60	108	475
36	63	5254.4	16812.58	5251.0	16812.13	276	861

Table 1. -- continued

37	66	5344.1	16427.92	5341.0	16432.46	138	293
38	66	5340.5	16433.60	5337.8	16439.10	322	625
39	68	5408.0	16138.26	5405.3	16143.75	121	403
40	68	5405.4	16145.03	5403.6	16150.86	303	835
41	67	5358.2	16315.91	5354.2	16320.07	120	416
42	67	5354.0	16321.09	5351.6	16327.45	336	738
43	69	5418.8	16103.56	5415.5	16108.46	174	408
44	69	5415.5	16109.11	5412.5	16113.55	409	861
45	70	5421.9	16014.38	5417.9	16017.9.0	141	308
46	70	5417.7	16018.60	5413.5	16020.24	312	605
47	71	5430.6	15915.55	5426.5	15919.19	143	272
48	71	5426.3	15920.07	5422.6	15924.11	274	767
49	72	5437.9	15835.12	5433.9	15839.02	129	360
50	72	5433.9	15839.67	5429.9	15843.03	324	796
51	73	5451.0	15744.56	5447.3	15748.99	184	374
52	73	5447.1	15750.27	5442.8	15752.45	348	625
53	74	5514.6	15638.41	5510.9	15642.84	177	383
54	74	5508.6	15646.74	5504.1	15648.35	284	638
55	75	5538.2	15550.99	5533.9	15551.85	153	212
56	75	5533.5	15552.21	5529.4	15549.72	212	227
57	148	5439.8	13250.32	5436.0	13256.00	145	380
58	149	5435.8	13301.35	5435.7	13309.09	410	391
59	108	5427.7	13355.31	5429.6	13401.29	250	603
60	108	5429.7	13401.20	5433.6	13403.73	546	634
61	107	5454.0	13417.24	5457.9	13421.18	222	413
62	107	5457.9	13422.16	5501.2	13426.09	475	800
63	106	5520.8	13444.25	5523.8	13449.96	354	480
64	106	5523.8	13450.57	5523.4	13458.24	532	835
65	105	5533.4	13453.04	5534.5	13502.99	246	520
66	105	5535.0	13503.25	5535.8	13507.85	486	845
67	144	5555.8	13454.10	5600.4	13455.13	193	369
68	145	5602.0	13455.01	5605.3	13501.27	341	369
69	104	5559.0	13526.38	5601.5	13532.47	346	642
70	104	5601.9	13532.76	5605.2	13538.37	638	919
71	103	5623.0	13521.09	5622.9	13529.2	154	189
72	103	5622.9	13529.83	5621.9	13521.95	189	283
73	102	5651.0	13559.84	5654.1	13605.63	215	634
74	102	5654.7	13606.07	5658.5	13607.16	684	777
75	101	5711.3	13614.27	5712.8	13620.96	220	790
76	101	5713.2	13620.87	5712.8	13620.96	795	896
77	100	5737.3	13632.66	5736.8	13640.44	223	803
78	100	5736.9	13640.80	5740.0	13646.73	677	950
79	142	5754.8	13700.67	5755.2	13709.44	386	443
80	143	5757.9	13704.65	5758.0	13713.58	201	417
81	99	5752.6	13722.99	5753.2	13730.08	196	716
82	99	5751.5	13724.43	5748.5	13719.24	700	771
83	98	5808.4	13844.00	5809.2	13851.62	222	825

Table 1 Continued

Haul no.	Station no.	Start latitude (ddmm.m)	Start longitude (dddmm.m)	End latitude (ddmm.m)	End longtude (dddmm.m)	Start depth (m)	End depth (m)
84	98	5809.5	13852.05	5810.7	13858.65	509	822
85	97	5828.1	13928.28	5827.4	13936.43	196	525
86	97	5827.6	13936.82	5825.1	13942.84	442	1,070
87	138	5924.9	14056.54	5925.5	14105.46	212	296
88	139	5924.7	14110.33	5921.0	14115.47	319	325
89	96	5841.0	14038.53	5841.2	14046.92	250	631
90	96	5841.3	14047.55	5843.9	14054.69	622	775
91	95	5902.7	14120.91	5902.7	14129.25	300	532
92	95	5902.9	14129.86	5902.9	14138.37	538	900
93	94	5923.2	14209.89	5925.7	14217.11	232	409
94	94	5925.9	14217.63	5929.0	14223.77	345	900
95	93	5933.0	14233.66	5935.1	14241.14	125	587
96	93	5935.3	14240.58	5934.7	14247.08	571	635
97	137	5940.2	14324.26	5943.2	14330.81	293	309
98	136	5944.5	14334.46	5945.9	14343.23	154	300
99	92	5933.2	14340.20	5933.9	14349.20	170	526
100	92	5934.1	14349.86	5935.5	14358.20	532	900
101	91	5931.0	14442.95	5928.7	14450.57	183	513
102	91	5929.1	14450.26	5927.3	14458.45	467	828
103	90	5930.0	14532.62	5931.1	14541.27	158	829
104	90	5931.4	14540.94	5931.2	14549.56	503	767
105	89	5914.8	14648.73	5913.1	14656.86	220	625
106	89	5913.3	14656.50	5910.5	14704.18	577	805
107	134	5936.6	14659.10	5932.9	14703.57	210	215
108	135	5930.9	14709.13	5926.6	14708.92	208	216
109	88	5908.8	14736.54	5904.1	14704.19	245	555
110	88	5904.1	14737.48	5859.5	14738.00	539	1,038
111	87	5907.2	14838.48	5902.7	14838.44	160	220
112	87	5902.4	14838.75	5857.8	14839.13	226	251
113	132	5904.7	14924.30	5902.1	14931.42	184	224
114	133	5856.8	14930.98	5854.9	14938.58	236	242
115	131	5851.1	14859.93	5848.3	14901.96	231	258
116	130	5846.8	14902.13	5844.3	14910.86	186	224
117	86	5841.0	14819.98	5836.8	14820.00	279	470
118	86	5837.1	14820.44	5832.3	14820.55	431	948
119	85	5817.6	14836.97	5813.1	14839.63	225	529
120	85	5813.1	14839.08	5808.5	14842.08	525	838
121	84	5758.3	14910.00	5754.8	14915.42	168	490
122	84	5754.8	14916.11	5750.9	14920.98	488	911
123	128	5800.0	14950.18	5758.8	14957.82	220	265
124	129	5804.9	14954.55	5803.9	15002.44	292	306
125	83	5738.3	14956.86	5733.9	14956.84	372	550
126	83	5734.0	14957.64	5729.5	14959.22	543	864

Table 1. -- continued

127	82	5724.0	15034.22	5719.8	15035.28	216	503
128	82	5719.4	15035.95	5715.1	15035.79	509	735
129	81	5707.0	15113.26	5702.5	15116.42	245	570
130	81	5702.4	15116.96	5657.8	15117.04	581	858
131	80	5629.0	15212.89	5625.2	15217.87	138	525
132	80	5625.2	15218.35	5620.8	15221.15	365	835
133	79	5618.1	15304.59	5615.9	15311.38	255	540
134	79	5616.9	15312.00	5612.7	15317.64	524	748
135	78	5559.0	15401.82	5554.3	15401.89	256	575
136	78	5554.4	15402.42	5550.1	15404.33	569	922
137	77	5602.7	15433.77	5558.1	15434.00	232	548
138	77	5558.2	15434.55	5553.6	15434.55	542	883
139	76	5546.1	15508.26	5541.6	15510.79	153	331
140	76	5541.4	15511.00	5537.9	15516.00	346	605
141	124	5659.5	15504.28	5659.9	15512.63	176	235
142	125	5659.9	15518.15	5703.0	15524.76	250	262
143	126	5720.9	15502.30	5720.9	15510.77	238	239
144	126	5720.9	15515.00	5719.5	15522.90	242	255
145	122	5611.1	15557.83	5610.9	15605.94	192	239
146	123	5613.9	15607.90	5615.1	15615.34	244	263
147	120	5547.3	15604.73	5545.0	15612.00	203	240
148	121	5544.8	15612.58	5543.6	15620.40	241	248

Table 2.–Catch in number by species for the 2004 NMFS longline survey of the Eastern Aleutian Islands and the Gulf of Alaska June 3 - September 1. SF = sablefish, PC = Pacific cod, GR = giant grenadiers, PH = Pacific halibut, ATF = arrowtooth flounder, GT = Greenland Turbot, RF = rougheye and shortraker rockfish, ST = thornyheads, SK = skate, OS = other species.

Station	SF	PC	GR	PH	ATF	GT	RF	ST	SK	OS
Eastern Aleutian Islands										
35	0	773	19	873	0	3	8	0	233	167
37	653	40	1,717	12	251	349	3	34	186	53
38	620	261	938	22	230	128	41	305	23	41
39	437	73	2,273	39	158	21	79	60	7	88
40	324	76	1,780	26	93	27	45	75	49	59
42	247	96	1,587	39	101	5	162	48	232	340
53	653	26	1,773	11	68	39	75	153	54	256
54	157	658	1,596	81	122	16	485	52	49	752
55	410	328	1,548	55	70	1	168	109	40	213
57	128	144	1,666	51	80	9	49	79	112	102
58	127	254	1,874	81	97	5	344	107	76	123
59	333	332	1,654	144	41	5	406	118	49	265
60	165	900	1,773	82	19	1	368	35	23	277
61	286	282	97	81	27	21	29	70	224	162
Gulf of Alaska										
62	3	91	0	21	1	0	231	0	0	7
63	967	490	1,164	92	103	0	361	147	51	88
64	578	8	0	17	13	0	0	8	9	1
65	558	261	86	129	97	0	16	41	51	34
66	604	191	0	13	6	0	0	8	17	23
67	1,135	623	1,731	186	97	0	179	67	41	143
68	1,119	947	607	153	205	0	336	277	32	70
69	1,337	8	2,600	31	41	0	36	166	1	37
70	1,874	556	1,457	55	46	0	18	125	3	77
71	1,902	632	1,237	97	137	0	49	179	15	77
72	2,135	199	1,497	93	60	0	36	114	8	79
73	2,315	33	860	52	185	0	40	123	20	47
74	2,396	11	1,197	65	71	0	23	127	2	112
75	1,278	1,177	0	508	441	0	6	0	94	81
76	1,545	263	513	190	288	0	152	141	76	564
77	1,924	62	754	35	88	0	60	234	20	230
78	1,214	2	816	140	207	0	45	317	4	872
79	2,627	0	428	28	82	0	23	174	0	31
80	1,029	62	634	240	46	0	50	228	7	116
81	2,051	0	1,025	43	140	0	41	131	1	622
82	1,988	50	321	142	164	0	15	107	3	176
83	2,100	0	1,284	12	4	0	7	220	1	141
84	2,034	181	600	374	39	0	23	131	24	331
85	2,630	0	672	29	80	0	13	227	2	112
86	1,469	1	367	55	55	0	168	220	5	90
87	1,232	56	0	139	82	0	3	79	84	49
88	2,047	1	722	23	31	0	161	133	5	583
89	1,848	18	241	20	11	0	14	271	19	81
90	1,108	20	330	61	4	0	250	160	24	51
91	1,918	6	228	49	26	0	98	232	15	65
92	1,461	0	457	0	2	0	72	96	1	188

Table 2.- Continued

Station	SF	PC	GR	PH	ATF	GT	RF	ST	SK	OS
93	1,997	0	324	118	6	0	20	279	7	61
94	1,031	0	162	54	69	0	147	257	57	101
95	1,707	0	460	61	13	0	469	290	69	142
96	1,571	0	446	19	60	0	553	217	24	95
97	1,059	0	265	37	20	0	82	137	12	268
98	933	0	302	1	5	0	194	114	3	65
99	541	0	187	6	2	0	166	136	2	75
100	1,153	0	245	0	4	0	101	146	0	130
101	950	1	370	7	15	0	85	105	4	136
102	972	0	193	3	7	0	49	127	3	136
103	121	92	0	239	44	0	0	4	21	518
104	1,790	0	314	13	7	0	226	233	6	262
105	1,345	69	140	29	13	0	150	132	5	278
106	1,495	0	142	5	10	0	785	110	3	88
107	1,135	7	196	11	10	1	835	99	11	99
108	1,073	0	110	9	10	0	638	93	17	149
120	338	722	0	350	340	0	0	0	114	10
121	506	213	0	117	477	0	2	1	225	18
122	667	399	0	104	543	0	0	1	181	8
123	786	357	0	46	212	0	0	0	168	11
124	375	252	0	108	242	0	0	0	218	16
125	425	169	0	148	174	0	0	0	261	28
126	365	160	0	74	143	0	0	0	140	17
127	587	232	0	106	105	0	0	0	158	31
128	952	505	0	248	101	0	0	6	23	14
129	1,319	7	0	78	151	0	0	14	32	6
130	844	7	0	25	14	0	1	15	25	9
131	1,276	1	0	23	34	0	4	80	43	18
132	716	15	0	19	11	0	0	6	46	30
133	1,099	1	0	14	94	0	7	28	65	34
134	246	2	0	10	21	0	10	23	165	553
135	330	2	0	26	57	0	79	26	156	359
136	271	0	0	18	10	0	5	98	42	102
137	333	0	0	5	1	0	3	52	28	57
138	329	0	0	69	50	0	114	96	101	115
139	972	0	0	41	6	0	37	42	76	19
142	969	0	33	4	1	0	23	132	5	8
143	1,258	0	9	85	9	0	29	44	12	34
144	262	29	0	54	52	0	117	162	34	48
145	1,005	0	0	19	42	0	30	149	22	167
148	901	149	0	63	33	0	35	80	118	439
149	1,256	1	0	29	17	0	20	165	101	53
Total	90,226	13,584	46,021	7,184	7,444	631	9,804	9,427	4,795	12,883

Table 3.- -Mean length, round weight, mean dressed weight, number and estimated total round weight of sablefish by station, for the 2004 NMFS longline survey of the Eastern Aleutian Islands and the Gulf of Alaska, June 3 - September 1.

Station Number	Mean length (cm)	Mean round weight (kg)[2]	Mean dressed weight (lb)[3]	Number of sablefish	Estimated total round weight (kg) [4]
		Eastern Aleutian Islands			
37	61.05	2.43	3.37	653	1,585.37
38	62.08	2.6	3.62	620	1,614.03
39	58.62	2.14	2.98	427	914.95
40	63.18	2.78	3.86	324	899.58
42	64.52	3.01	4.18	247	742.60
53	59.76	2.28	3.16	653	1,487.48
54	68.93	3.68	5.11	157	577.24
55	57.31	1.98	2.75	410	811.76
57	64.04	2.89	4.01	128	369.33
58	63.41	2.85	3.96	127	362.18
59	64.68	3.03	4.2	333	1,007.83
60	66.4	3.31	4.6	165	546.75
61	60.1	2.35	3.27	286	673.17
		Gulf of Alaska			
62	57.89	2	2.78	3	6.00
63	57.24	1.94	2.7	967	1,876.61
64	55.07	1.69	2.34	578	974.22
65	59.31	2.18	3.03	558	1,218.15
66	56.5	1.83	2.55	604	1,108.10
67	60.5	2.38	3.3	1,135	2,697.69
68	63.15	2.78	3.86	1,119	3,112.42
69	61.84	2.63	3.65	1,337	3,512.03
70	59.08	2.21	3.07	1,874	4,146.82
71	60.38	2.36	3.28	1,902	4,487.72
72	64.36	2.9	4.03	2,135	6,194.01
73	62.67	2.68	3.73	2,315	6,210.91
74	64.77	2.97	4.13	2,396	7,127.43
75	57.97	2.05	2.85	1,278	2,626.17

[2] Mean weight was estimated by applying a length-weight relationship to the length frequency distribution from each station.

[3] Mean dressed weight was estimated using a recovery rate of 0.6 of round weight in pounds.

[4] Estimated total round weight is the product of mean round weight and the number of hooked sablefish that came to the surface, including a small percentage that was lost during landing.

Table 3 - Continued

Station Number	Mean length (cm)	Mean round weight (kg)	Mean dressed weight (lb)	Number of sablefish	Estimated total round weight (kg)
76	62.74	2.67	3.71	1,545	4,124.74
77	65.49	3.1	4.31	1,924	5,966.86
78	66.1	3.17	4.4	1,214	3,849.08
79	66.65	3.24	4.5	2,627	8,503.02
80	65.91	3.16	4.39	1,029	3,250.23
81	67.08	3.33	4.63	2,051	6,837.85
82	65.01	2.97	4.12	1,988	5,903.09
83	67.1	3.32	4.61	2,100	6,968.81
84	65.54	3.04	4.23	2,034	6,192.76
85	66.44	3.19	4.43	2,630	8,379.61
86	65.71	3.09	4.3	1,469	4,544.52
87	63.34	2.74	3.8	1,232	3,370.09
88	68.27	3.52	4.88	2,047	7,199.44
89	66.53	3.2	4.44	1,848	5,911.80
90	66.75	3.27	4.54	1,108	3,622.16
91	68.08	3.52	4.88	1,918	6,744.63
92	65.93	3.16	4.39	1,461	4,618.51
93	69.31	3.72	5.16	1,997	7,423.56
94	67.62	3.5	4.87	1,031	3,612.57
95	69.75	3.83	5.32	1,707	6,544.09
96	69.45	3.76	5.22	1,571	5,901.34
97	67.02	3.4	4.72	1,059	3,598.45
98	67.96	3.62	5.02	933	3,374.91
99	70.73	4.07	5.65	541	2,200.51
100	70.87	4.03	5.59	1,153	4,642.53
101	68.71	3.67	5.09	950	3,483.30
102	69.53	3.81	5.3	972	3,707.61
103	58.83	2.24	3.11	121	271.25
104	66.85	3.36	4.67	1,790	6,018.25
105	68.33	3.61	5.02	1,345	4,860.92
106	68.07	3.54	4.91	1,495	5,288.29
107	68.29	3.54	4.92	1,135	4,023.21
108	68.13	3.55	4.93	1,073	3,805.80
120	61.59	2.48	3.44	338	836.97
121	60.85	2.39	3.32	506	1,210.40
122	60.96	2.37	3.29	667	1,581.15
123	62.44	2.57	3.57	786	2,019.24
124	61.34	2.42	3.36	375	906.05
125	62.21	2.53	3.51	425	1,074.59
126	61.21	2.4	3.34	365	876.82
127	63.68	2.74	3.81	587	1,608.75
128	64.55	2.88	4	952	2,742.11
129	66.12	3.11	4.33	1,319	4,107.78
130	64.92	2.99	4.15	844	2,523.09

Table 3. Continued

Station Number	Mean length (cm)	Mean round weight (kg)	Mean dressed weight (lb)	Number of sablefish	Estimated total round weight (kg)
131	65.96	3.14	4.36	1,276	4,003.75
132	64.33	2.86	3.97	716	2,048.25
133	64.4	2.92	4.06	1,099	3,212.17
134	58.45	2.14	2.98	246	527.14
135	58.01	2.08	2.89	330	685.61
136	61.4	2.74	3.81	271	742.92
137	58.76	2.17	3.02	333	724.07
138	62.55	2.82	3.92	329	928.64
139	64.41	2.96	4.11	972	2,876.61
142	64.6	2.93	4.07	969	2,836.17
143	63.25	2.73	3.79	1,258	3,435.74
144	66.91	3.3	4.59	262	865.54
145	64.13	2.96	4.11	1,005	2,973.56
148	63.4	2.76	3.84	901	2,490.48
149	61	2.42	3.36	1,256	3,037.14
Total				90,216	272,509.08

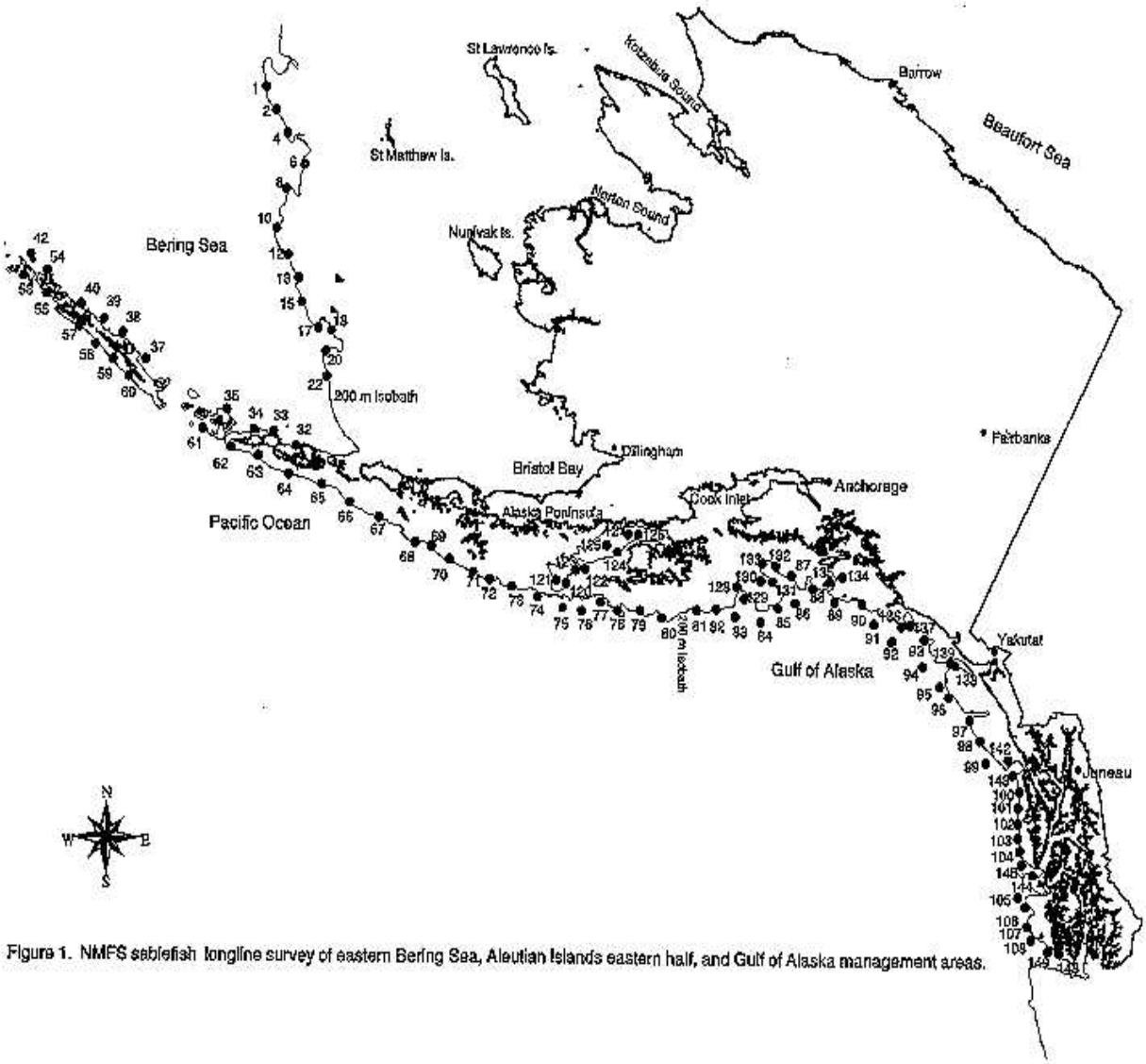

Figure 1. NMFS sablefish longline survey of eastern Bering Sea, Aleutian Islands eastern half, and Gulf of Alaska management areas.