SOUTHERN SOUTHEAST INSIDE (CLARENCE STRAIT AND DIXON ENTRANCE)

RELATIVE ABUNDANCE LONGLINE SURVEY

CRUISE REPORT

May 15–May 23, 2001

by

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INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) conducts an annual longline survey in the Southern Southeast Inside (SSEI) subdistrict of Southeast Alaska to assess the health of the sablefish stocks targeted in the limited-entry state fishery. The 2001 survey, which occurred between May 15 and May 23, represents the fourteenth year of these operations.

The survey area included the waters of Clarence Strait and Dixon Entrance from 55°39.49' N. latitude and 132°19.21' W. longitude to 54°27.99' N. latitude and 132° 32.27' W. longitude. These coordinates describe the area of Clarence Strait and Dixon Entrance from the northernmost station (Station 50) near Tolstoi Point to the southernmost station (Station 53) near the Canadian border. The most westerly station (Station 52) sampled was located just east of Cape Muzon at 54°31.50' N. latitude and 132°40.70' W. longitude. Due to their proximity, similar depth, and substrate type, Stations 10 and 11 were once again fished as a single continuous station. This was accomplished by doubling the number of skates fished. These combined results are recorded as, and attributed to, Station 10. (Table 1 and Figure 1).

OBJECTIVES

1. To estimate the relative abundance of sablefish in the SSEI subdistrict (Clarence Strait and Dixon Entrance).
2. To collect 403–415 biological samples including otoliths, length, weight, sex, and stage of gonad maturity from a subsample of sablefish.
3. To collect biological samples including otoliths, length, weight, sex, and stage of gonad maturity from all rockfish (*Sebastes*) caught.
4. To collect length data only from all thornyhead rockfish (*Sebastolobus*) caught and released at sea.

OPERATIONS

The *F/V Jennifer Lee* (Trip #1) and the *F/V Providence* (Trip # 2), accepted the second year of a five-year renewable contract to conduct the annual SSEI sablefish longline survey. The two contractors simultaneously fished 37 stations, with the *F/V Jennifer Lee* fishing 19 stations in northern Clarence Strait and the *F/V Providence* fishing 18 stations in southern Clarence Strait and Dixon Entrance (Figure 1).

A “set” was defined as the deployment and retrieval of 25 skates of baited longline gear. Skates were laid out in a single string connected to an anchor with buoy lines and flags on both ends of the string. Standard gear included #13/0 Mustad circle hooks on medium lay #60 gangions spaced 2 m apart and baited with *Illex* spp. squid, (100–200g) (Table 2).

Both survey vessels set the required amount of gear at all stations except Station 27. Due to a miscount when setting, only 22 skates were deployed at Station 27. The survey was conducted during a time period when the tidal differentials were minimal. With the exception of Station 55, all sets were accomplished within a specified time frame of 3–11 hours, intended to minimize the chance of "gear saturation" (Sigler 1993). It should be noted the 2001 longline survey was characterized by extremely adverse weather conditions including both gales and storms. These conditions delayed the retrieval of all gear set at Station 55. The 25 skates of gear at this station were retrieved after a soak time of 13.63 hours.

On both vessels, only the squid body was used for bait. Consistent with NMFS sablefish surveys in federal waters, the head and tentacles were not used. This was a departure from the 2000 SSEI survey where both the squid body and head were used for bait. It may be appropriate to consider this small change to the survey design when comparing CPUEs for this year with previous years. Each squid was cut into 3–4 pieces, resulting in approximately 12.5 pounds of bait being used per 100 hooks.

A total of 37 stations were surveyed. One set was made at each station. Sets were made in the same direction as the tidal current. A typical pattern was as follows: deploy two sets, wait three hours, pick the first set, deploy the third set (and sometimes a fourth set), and then retrieve the second. This alternating pattern of setting and hauling typically allowed soak times to remain within the established 3–11 hour parameter. Haul-back direction depended upon the tide, wind direction, and current. For each set the skipper recorded latitude, longitude, start and end depths, start time, compass bearing, wind direction and speed, and bottom type. Depths were usually recorded at the deployment of every two skates, as well as when the first and last anchors were thrown overboard. These depths were averaged to obtain a mean depth per station.

At each station, catch and effort (number of hooks) data were tallied as the gear was hauled. During retrieval, the species of each fish brought to the surface was recorded, as was the condition of each fishless hook (i.e. baited, unbaited, or invalid). Each skate was treated as a subsection of a set to allow exclusion of invalid subsections for estimating catch per unit effort (CPUE). Bycatch was identified to species when possible. This included all rockfish landed, as well as spiny dogfish, arrowtooth flounder, Pacific cod, walleye pollock, ratfish, and Dover sole. Other flatfish, thornyheads, sharks, and hagfish were not keyed to species, while skates were identified as either longnose skate or "other" skate.

Biological Sampling

The first three survey stations for each vessel were sampled at the normal rate for the first 14 skates of each set hauled. Beginning with the first sablefish brought on board at each station, every tenth sablefish was sampled for length (nearest cm), weight (nearest 0.1 kg), sex, and stage of gonad maturity. Stage of sexual maturity was coded according to a list of six descriptions of gonad conditions for each sex. Otoliths were extracted and paired with the biological data and eventually forwarded to ADF&G's coded wire tag and otolith processing laboratory in Juneau for age analysis. Due to the noted decline in catch per unit effort for the first three stations sampled by each vessel, the remaining stations for each of the survey vessels were sampled at the normal rate (see above) for the first 18 skates of each set hauled. Normally length (nearest 0.5 cm), weight (nearest 0.1 kg), sex, stage of maturity, and otoliths are collected from all rockfish landed except thornyheads. This year, in addition to keeping and sampling all the rockfish brought on board, thornyheads were also kept and sold to help offset survey expenses and in some cases sampled for complete biological information. Length measurements (nearest 0.5 cm) were taken from all

thornyheads brought on board regardless of whether they were retained or discarded. Other bycatch species were identified and released at the rail.

RESULTS

Set information and CPUE were collected from all 37 stations. Of the 947 skates set for the survey, 930 skates were considered valid during haul-back as defined by standard operating procedures These 930 skates were used to calculate CPUE (fish/hk). The results from Station 55, where gear soaked 2.63 hours beyond the preferred time period due to weather, were included in the CPUE (fish/hk) calculations mainly for comparison to previous year's data. Including the information from Station 55 had a minimal effect upon the average soak time for all gear, the average number of sablefish caught during the survey, and the average number of valid hooks set during the survey. Including Station 55 information did not change the overall CPUE (fish/hk) for the 2001 survey. Adverse weather and sea conditions may have negatively impacted CPUE (fish/hook) for this year's survey.

The average depth fished during the survey was 238 fm, [range: 189 fm (Station 56) to 360 fm (Station 49)]. Soak time ranged from 3.00 hours (Station 4) to 13.63 hours (Station 55) with a mean of 4.72 hours. A total of 6,670 sablefish were caught on 41,291 valid hooks (Table 1). The overall CPUE (fish/hook) was 0.16 sablefish per hook [range: 0.02 fish/hook (Station 15) to 0.33 fish/hook (Station 48)]. The 2001 overall CPUE declined by 24% from 2000 (0.21 sablefish/hook) and by 27% from 1999 (0.22 sablefish/hook) (Table 4). The mean CPUE based on biomass was 0.38 kg/hook, [range: 0.07 kg/hook (Station 33) to 0.99 kg/hook (Station 48)] for stations at which weights were recorded (Table 1).

Bycatch species on the 930 valid subsets included 448 halibut, 613 thornyhead rockfish, 79 shortraker rockfish, 46 rougheye rockfish, 33 redbanded rockfish, 1,296 spiny dogfish, 977 skates, and 170 arrowtooth flounder (Table 3). There were 119 "other" species caught on valid subsets. "Other" species included hake, sole, ratfish, sharks, and hagfish.

A total of 477 sablefish biological samples were collected during the 2001 survey. Mean length was 58.2 cm (range: 41.0 cm to 96.0 cm) for all subsets sampled (biological samples were collected from both valid and invalid subsets). Adverse weather conditions often precluded accurate measurements of weight using the hanging scale. Only 390 sablefish weight samples were collected from 28 stations on this survey. The mean weight was 2.17 kg (range : 0.7 kg to 9.3 kg). Biological samples collected from other species included 22 redbanded rockfish, 38 rougheye rockfish, and 83 shortraker rockfish. Length data were collected from 488 thornyhead rockfish with some additional biological samples taken from a subsample of this group.

SCIENTIFIC PERSONNEL

F/V Jennifer Lee	Deidra Holum, crewleader Gordon Kruse, crew
F/V Providence	Beverly Richardson, crewleader Kamala Carroll, crew

LITERATURE CITED

Sigler, M. F. 1993. Stock assessment and management of sablefish *Anoplopoma fimbria* in the Gulf of Alaska. Doctoral dissertation. University of Washington. 188pp.

Table 1. Set and Catch information for the 37 stations fished in the 2001 SSEI sablefish longline survey.*

Area Description	Station	Statistical Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Soak Time (hrs)	Haul Back	Mean Depth (fm)	Sablefish Total	Valid Hooks	CPUE (fish/hk)	Mean Weight (kg)	CPUE (kg/hk)
Cape Chacon	2	315431	54 41.48	131 54.07	54 40.07	131 54.26	3.07	Same	199	162	1043	0.16	2.03	0.32
W Devil Rock	3	315432	54 45.00	131 43.81	54 43.73	131 43.87	3.07	Same	210	222	1075	0.21	1.15	0.24
W Devil Rock	4	315432	54 41.83	131 44.11	54 43.48	131 44.00	3.00	Opposite	208	196	1110	0.18	1.58	0.28
West Rock	5	315432	54 46.20	131 42.80	54 47.75	131 42.76	9.97	Opposite	225	166	1075	0.15	**	
McLean Point	6	315432	54 46.23	131 50.66	54 47.54	131 50.63	3.08	Opposite	216	177	1117	0.16	1.55	0.25
West Rock	10	315432	54 47.36	131 41.86	54 50.14	131 41.71	3.08	Same	260	493	2127	0.23	1.89	0.44
Island Point	12	315432	54 48.60	131 53.00	54 49.86	131 52.89	3.65	Opposite	218	116	1085	0.11	1.98	0.21
Hassler Reef	14	315432	54 50.35	131 42.72	54 51.97	131 42.56	3.02	Same	227	247	1141	0.22	1.38	0.30
Kendrick Island	15	315432	54 50.92	131 56.46	54 52.48	131 56.49	6.67	Opposite	235	26	1107	0.02	**	
Kendrick Island	16	315432	54 53.25	131 55.85	54 54.73	131 55.65	4.73	Opposite	230	43	1115	0.04	2.07	0.08
Hidden Bay	17	315432	54 53.95	131 51.55	54 55.47	131 51.65	5.02	Opposite	227	62	1077	0.06	**	
Hidden Bay	18	315432	54 54.34	131 48.26	54 55.95	131 48.16	4.17	Opposite	225	80	1097	0.07	**	
Point Davidson	20	315502	54 59.35	131 42.77	55 0.98	131 43.36	3.78	Opposite	218	182	1120	0.16	1.83	0.30
Rip Point	21	315502	55 2.69	131 48.99	55 4.12	131 50.02	3.10	Same	225	116	1119	0.10	1.55	0.16
Wedge Island	26	315502	55 9.59	131 54.57	55 11.17	131 54.04	3.15	Opposite	230	125	1048	0.12	3.09	0.37
Wedge Island	27	315502	55 13.92	131 56.24	55 15.40	131 55.69	5.82	Opposite	195	227	967	0.23	2.01	0.47
Chasina Point	30	315502	55 17.58	131 56.09	55 19.03	131 55.70	3.42	Same	231	107	1030	0.10	2.26	0.24
Skin Island	31	315502	55 19.89	132 0.12	55 18.50	131 58.68	3.15	Opposite	240	64	1120	0.06	2.08	0.12
Grant Cove	33	315502	55 20.73	131 58.91	55 22.33	131 58.96	4.20	Opposite	218	50	1117	0.04	1.50	0.07
Vallenar Point	35	315502	55 24.36	131 58.92	55 25.99	131 59.24	5.01	Opposite	250	120	1114	0.11	**	
Vallenar Point	36	315502	55 24.04	131 56.05	55 25.48	131 57.26	3.15	Opposite	250	191	1105	0.17	2.76	0.48
Caamano Island	37	315502	55 28.43	131 59.08	55 29.11	132 1.29	4.45	Opposite	240	97	923	0.11	**	
Street Island	39	325531	55 30.14	132 8.15	55 31.72	132 8.69	4.58	Opposite	271	139	1109	0.13	2.44	0.31
Niblack Point	41	325531	55 32.91	132 9.27	55 32.12	132 7.20	5.05	Same	240	249	1098	0.23	2.65	0.60
Niblack Point	43	325531	55 30.98	132 9.56	55 32.43	132 10.38	5.85	Opposite	210	198	1105	0.18	2.24	0.40
Ship Island	44	325531	55 34.16	132 13.60	55 35.51	132 15.16	3.98	Opposite	285	316	1102	0.29	1.75	0.50
Ship Island	46	325531	55 36.46	132 16.57	55 35.14	132 15.26	5.09	Same	310	207	1096	0.19	2.30	0.43
Windfall Harbor	47	325531	55 34.77	132 16.62	55 36.10	132 17.74	3.90	Opposite	260	184	1029	0.18	1.82	0.32
Ship Island	48	325531	55 36.27	132 14.50	55 37.64	132 15.89	6.78	Opposite	340	330	997	0.33	3.00	0.99
Windfall Harbor	49	325531	55 37.76	132 16.57	55 39.29	132 17.22	4.26	Opposite	360	213	1090	0.20	2.21	0.43
Tolstoi Point	50	325531	55 37.98	132 18.74	55 39.49	132 19.21	3.96	Opposite	350	162	1113	0.15	2.39	0.35
Cape Muzon	52	325431	54 31.50	132 40.70	54 31.51	132 37.74	5.28	Same	200	291	1116	0.26	3.13	0.82
Cape Muzon	53	325401	54 27.99	132 32.27	54 28.06	132 35.00	3.88	Opposite	203	233	1127	0.21	1.98	0.41
Cape Muzon	54	325401	54 28.42	132 24.44	54 28.43	132 21.59	3.63	Opposite	197	346	1126	0.31	2.60	0.80
Celestial Reef	55	315401	54 30.62	131 48.97	54 29.10	131 48.98	13.63	Same	194	107	1094	0.10	**	
Celestial Reef	56	315431	54 32.18	131 47.91	54 30.61	131 48.07	5.95	Same	189	110	1143	0.10	**	
W Devil Rock	57	315431	54 37.54	131 41.57	54 39.05	131 41.28	7.17	Same	230	316	1114	0.28		
Average							4.72		238	180	1116	0.16	2.17	0.38
Maximum							13.63		360	493	2127	0.33	3.13	0.99
Minimum							3.00		189	26	923	0.02	1.15	0.07
Total										6670	41291			

* Invalid skates were excluded in calculating Station information for #Sablefish, #Valid Hooks, and CPUE (fish/hk) except for Station 55. Extreme weather conditions delayed the retrieval of gear at Station 55 beyond the normal soak time of 3–11 hours. Inclusion of Station 55 data provides annual comparisons without compromising CPUE (fish/hk) and with only minimal effect on the overall Averages for Soak Time, #Sablefish and #Valid Hooks for the 2001 survey.

** Rough seas prevented collection of sample weights at these stations.

Table 2. Longline gear configuration for 2001 SSEI longline survey.

line type	American line SSR 100, soft med. lay, 99.5mm
anchor wt. (lbs)	40–60 lbs.
skate length (fm)	55
becket (cm)	46, med lay #72 thread
gangion (cm)	38, med lay # 60 thread
hook spacing (m)	2
hooks per skate	45
running line (fm)	200
lead ball weights	7 lbs.

Table 3. 2001 SSEI sablefish survey catch by species and station.*

Station	Sablefish	Halibut	Thornyhead Rockfish	Shortraker Rockfish	Rougheye Rockfish	Redbanded Rockfish	Spiny Dogfish	Skates	Arrowtooth Flounder	Other
2	162	8	13	0	1	0	141	47	2	2
3	222	8	17	0	0	0	5	28	2	3
4	196	5	11	0	0	0	8	19	9	2
5	166	6	17	0	0	0	8	25	2	3
6	177	8	12	0	0	0	28	14	0	6
10	493	9	15	2	0	0	5	79	6	3
12	116	1	9	1	0	0	64	28	1	1
14	247	9	31	0	0	0	29	55	7	5
15	26	1	17	0	0	0	64	7	0	0
16	43	1	23	0	0	0	16	20	1	9
17	62	0	22	2	0	0	33	15	2	3
18	80	5	10	1	1	0	41	34	3	15
20	182	5	11	0	0	0	28	16	2	0
21	116	1	9	0	0	0	13	17	2	4
26	125	26	14	4	15	19	40	43	3	15
27	227	12	13	0	0	1	8	33	3	3
30	107	3	5	0	0	0	2	11	0	1
31	64	0	11	0	0	0	3	6	0	0
33	50	0	3	0	0	0	3	3	0	3
35	120	2	9	0	0	0	2	9	3	0
36	191	10	16	3	0	1	4	21	4	0
37	97	4	22	0	2	0	1	9	2	2
39	139	7	20	5	1	1	5	12	5	1
41	249	24	41	6	2	3	4	25	27	2
43	198	31	30	13	12	7	29	26	6	5
44	316	10	12	0	0	0	2	37	1	0
46	207	3	5	0	0	0	3	10	0	2
47	184	8	6	0	0	0	3	28	2	3
48	330	7	1	2	0	0	3	27	0	2
49	213	2	3	0	0	0	2	11	0	0
50	162	0	5	4	0	0	0	6	1	4
52	291	41	35	3	5	1	56	47	10	6
53	233	121	49	5	4	0	41	95	38	4
54	346	48	41	28	3	0	49	80	19	6
55	107	12	23	0	0	0	283	18	6	0
56	110	5	30	0	0	0	197	4	1	3
57	316	5	2	0	0	0	42	12	0	1
Total	6,670	448	613	79	46	33	1,265	977	170	119

*Invalid skates excluded. Station 55 included for comparison to past year's data.

Table 4. Sablefish CPUEs for the 37 stations fished in 1999 – 2001 SSEI longline surveys. *

	2001		2000		1999	
Station	CPUE (fish/hk)	CPUE (kg/hook)	CPUE (fish/hk)	CPUE (kg/hook)	CPUE (fish/hk)	CPUE (kg/hook)
2	0.16	0.32	0.26	0.66	0.40	1.28
3	0.21	0.24	0.23	0.30	0.37	0.43
4	0.18	0.28	0.15	0.21	0.20	0.24
5	0.15	0.00	0.20	0.31	0.16	0.24
6	0.16	0.25	0.26	0.59	0.31	0.53
10	0.23	0.44	0.14	0.32	0.27	0.50
12	0.11	0.21	0.26	0.46	0.25	0.47
14	0.22	0.30	0.27	0.37	0.35	0.57
15	0.02	0.00	0.10	0.19	0.07	0.10
16	0.04	0.08	0.10	0.22	0.11	0.27
17	0.06	0.00	0.13	0.23	0.11	0.15
18	0.07	0.00	0.20	0.36	0.13	0.22
20	0.16	0.30	0.12	0.16	0.22	0.34
21	0.10	0.16	0.11	0.15	0.12	0.16
26	0.12	0.37	0.16	0.31	0.14	0.25
27	0.23	0.47	0.24	0.64	0.15	0.21
30	0.10	0.24	0.10	0.22	0.10	0.20
31	0.06	0.12	0.10	0.14	0.10	0.16
33	0.04	0.07	0.16	0.22	0.07	0.08
35	0.11	0.00	0.11	0.23	0.11	0.26
36	0.17	0.48	0.28	0.50	0.28	0.63
37	0.11	0.00	0.25	0.55	0.21	0.49
39	0.13	0.31	0.19	0.46	0.26	0.50
41	0.23	0.60	0.23	0.53	0.32	0.74
43	0.18	0.40	0.32	0.00	0.23	0.50
44	0.29	0.50	0.44	0.75	0.41	0.84
46	0.19	0.43	0.25	0.46	0.17	0.30
47	0.18	0.32	0.30	0.56	0.35	0.60
48	0.33	0.99	0.34	0.81	0.19	0.44
49	0.20	0.43	0.18	0.51	0.16	0.32
50	0.15	0.35	0.26	0.50	0.16	0.32
52	0.26	0.82	0.28	0.85	0.24	0.65
53	0.21	0.41	0.32	0.78	0.22	0.57
54	0.31	0.80	0.36	0.90	0.25	0.72
55	0.10	0.00	0.24	0.48	0.50	0.61
56	0.10	0.00	0.24	0.32	0.38	0.41
57	0.28	0.00	0.13	0.24	0.20	0.32
Average	0.16	0.39	0.22	0.42	0.22	0.42

*Invalid skates were excluded in CPUE calculations.

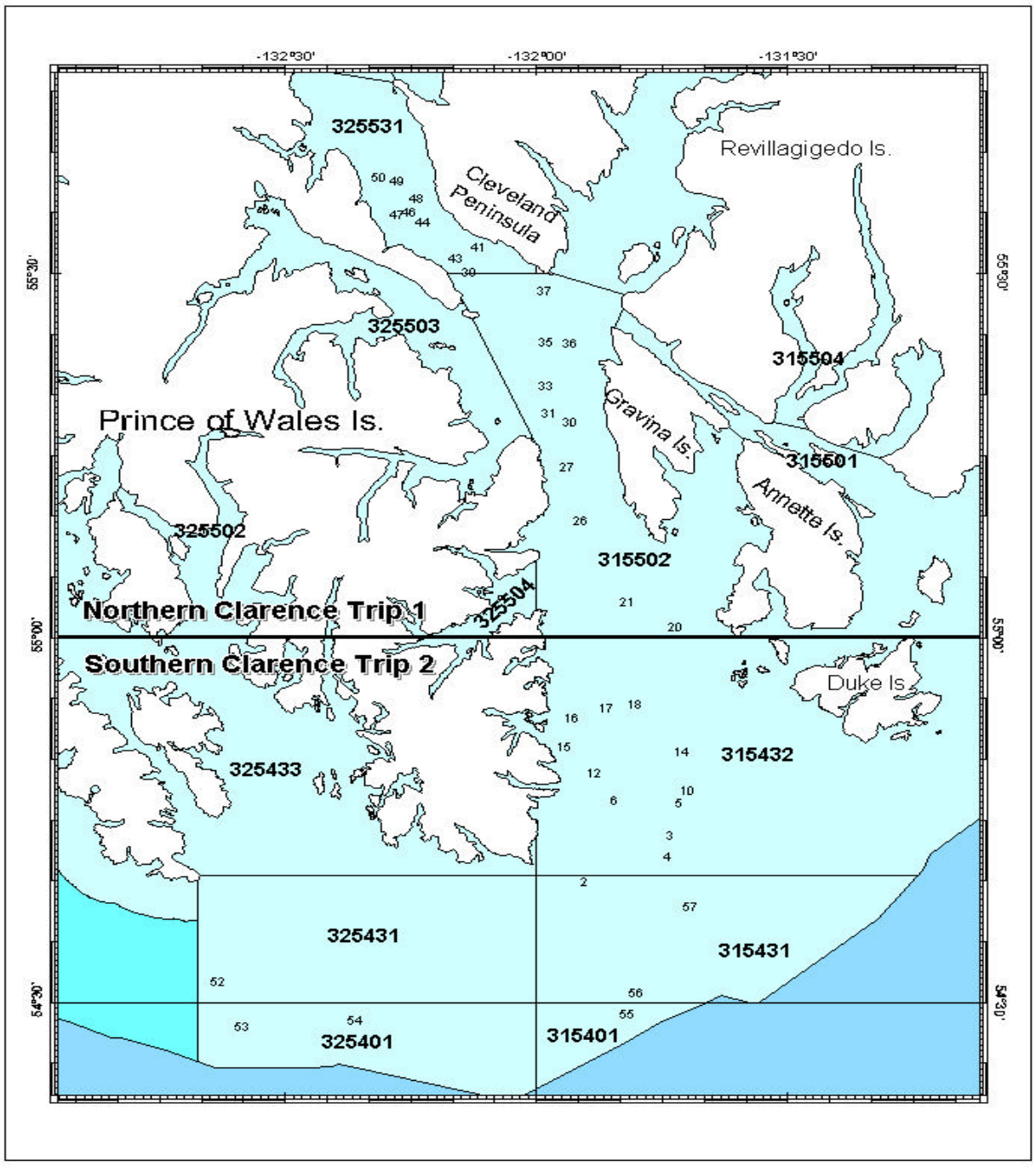

Figure 1. Clarence Strait survey station locations. The numbered marks represent the location of stations within each groundfish statistical area.

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