

SOUTHERN SOUTHEAST INSIDE (CLARENCE STRAIT AND DIXON ENTRANCE)

RELATIVE ABUNDANCE LONGLINE SURVEY

CRUISE REPORT

May 20-May 26, 2002



by

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## TABLE OF CONTENTS

	<u>Page</u>
AUTHOR .....	2
INTRODUCTION .....	4
Primary Objectives .....	4
Secondary Objectives .....	4
OPERATIONS .....	4
Biological Sampling .....	6
RESULTS .....	6
SCIENTIFIC PERSONNEL .....	8
LITERATURE CITED .....	8

## LIST OF TABLES

	<u>Page</u>
Table 1. Set and catch information for the 37 stations fished in 2002 SSEI sablefish longline survey .....	9
Table 2. Longline gear configuration for the 2002 SSEI longline survey. ....	10
Table 3. 2002 SSEI sablefish survey catch by species and station.....	11
Table 4. CPUEs for 37 stations fished in 1999 - 2002. ....	12

## LIST OF FIGURES

	<u>Page</u>
Figure 1. Clarence Strait survey station locations and groundfish statistical areas .....	13

## 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 2002 survey, which occurred between May 20 and May 26, represents the fifteenth year of these operations.

### *Primary 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 caught.
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.

### *Secondary Objectives*

1. To collect seabird abundance data at each survey station for the Washington Sea Grant Program.
2. To collect heart tissue samples from 50 rougheye rockfish caught in the northernmost stations, for the University of Alaska, Juneau Center, School of Fisheries and Oceans Science.

## OPERATIONS

The survey area included the waters of Clarence Strait and Dixon Entrance from 55° 39.15' N. latitude and 132° 19.20' W. longitude to 54° 27.02' N. latitude and 132° 32.63' W. longitude (Figure 1). 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 lies just east of Cape Muzon at 54° 31.51' N. latitude and 132° 40.43' W. longitude.

The *F/V Jennifer Lee* (Trip #1) and the *F/V Providence* (Trip # 2), accepted the third year of a five-year renewable contract to conduct the annual SSEI sablefish longline survey. The two contractors

simultaneously fished the 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<sup>2</sup> circle hooks on medium lay #60 gangions spaced 2 m apart and baited with *Illex* spp. squid, (100–200g) (Table 2). A single tori line (seabird avoidance device) was deployed at the beginning of each set.

Both survey vessels set the required amount of gear at all stations except Station 10. Due to their proximity, similar depth and substrate type, Stations 10 and 11 were once again fished as a single continuous station. This year concern was expressed for impacting the catch per unit effort (CPUE) at a third station close by (Station 5). A decision was made to set Station 10 as a single station of 25 skates of gear. However, 31 skates of gear had already been baited so those were set instead of the 50 skates normally set here. The results are recorded as, and attributed to, Station 10 (Table 1; Figure 1). It is appropriate to consider this change in survey design when comparing Station 10 and Station 5 CPUEs for this year with previous years.

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). At Station 55, the 25 skates of gear were retrieved after a soak time of 2.9 hours. This slightly early retrieval was due to a miscalculation on haul time. The early retrieval would not be expected to significantly affect CPUE at this station.

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 the same for the 2001 SSEI survey where only the squid body was used for bait. 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 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 CPUE. Bycatch was identified by 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. Immediately after the second anchor was brought on board at the end of a haul, seabird abundance was estimated within a 50-meter radius off the stern of each vessel. Seabirds were also identified by species when possible.

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<sup>2</sup> Product names used in this publication are included for scientific completeness but do not constitute product endorsement.

### *Biological Sampling*

Due to low CPUEs last year, a decision was made to sample the first three survey stations for each vessel at the increased rate of the first 15 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. After noting the first day's CPUEs from the 2002 survey were comparable to the 2001 survey, a decision was made to continue sampling the first 15 skates at each station for the remainder of the survey in order to achieve sampling goals. Length (nearest 0.5 cm), weight (nearest 0.1 kg), sex, stage of maturity, and otoliths were collected from all rockfish landed except thornyheads. Thornyheads were measured for length (nearest 0.5 cm) and then released live. In addition to keeping and sampling all rockfish brought on board, heart tissue samples (1/2 ml in size) from roughey rockfish were collected and individually preserved in a solution of SMSO/EDTA/NaCl. Coloration of each roughey rockfish specimen was noted on the biological sampling form. Other bycatch species were identified and released at the rail.

### **RESULTS**

Set information and CPUE were collected from all 37 stations. Of the 931 skates set for the survey, 915 skates were considered valid during haul-back as defined by standard operating procedures. These 915 skates were used to calculate CPUE (fish/hk). The average depth fished during the survey was 239 fm, [range: 187 fm (Station 56) to 365 fm (Station 50)]. Soak time ranged from 2.9 hours (Station 55) to 6.6 hours (Station 12) with a mean of 4.05 hours. A total of 8,939 sablefish were caught on 40,853 valid hooks (Table 1). The overall CPUE (fish/hook) was 0.22 sablefish per hook [range: 0.04 fish/hook (Station 26) to 0.49 fish/hook (Station 55)]. The 2002 overall CPUE increased by 37.5% from 2001 (0.16 sablefish/hook) but remained the same as the 2000 overall CPUE and the 1999 overall CPUE (0.22 sablefish/hook) (Table 4). The lower catch rate in the 2001 survey may be at least partially attributable to the severe weather conditions encountered during that year's survey. The mean CPUE by weight was 0.41 kg/hook, [range: 0.06 kg/hook (Station 31) to 0.95 kg/hook (Station 54)] for all stations in 2002. (Table 1).

A total of 543 sablefish biological samples were collected during the 2002 survey. Mean length was 56.8 cm (range: 40.0 cm to 85.0 cm) for all subsets sampled (biological samples were collected from both valid and invalid subsets). Sampled sablefish from the 2001 survey had a mean length of 58.2 cm (range 41.0 cm to 96.0 cm). During the 2002 survey 543 sablefish weight samples were collected from 37 stations. The mean weight was 1.87 kg (range: 0.6 kg to 6.3 kg). Due to adverse weather conditions during the 2001 survey, weight samples were not collected at all stations, however, the mean weight for these samples was 2.17 kg (range: 0.7 kg to 9.3 kg). This disparity represents a 13.8% decline in mean

weight for samples collected on the 2002 survey. Comparison of the 2002 sablefish mean weight to the mean weights for the 2000 and 1999 surveys shows there was a decline of 7.4% and less than 1% respectively. Biological samples collected from other species included 10 redbanded rockfish, 40 rougheye rockfish, and 64 shortraker rockfish. Length data were collected from 383 thornyhead rockfish.

Bycatch species on the 915 valid subsets included 579 halibut, 510 thornyhead rockfish, 57 shortraker rockfish, 36 rougheye rockfish, 25 redbanded rockfish, 1,370 spiny dogfish, 791 skates, and 159 arrowtooth flounder (Table 3). There was 1 Pacific Sleeper shark and 379 “other” species caught on valid subsets. “Other” species included hake, sole, ratfish, and hagfish.

Seabird identification and count: although tori lines (bird avoidance devices) were deployed at the beginning of each set, the relatively low numbers of seabirds present at any of the survey stations made assessment of efficacy questionable. The Washington Sea Grant Program will tabulate seabird counts from this survey. For more information regarding seabird avoidance devices and seabird abundance counts, contact Ed Melvin, Marine Fisheries Specialist, at 206-543-9968.

Rougheye rockfish heart tissue samples: while the University of Alaska, Juneau Center, Fisheries and Oceans Science had requested heart tissue samples from 50 rougheye rockfish caught in the northernmost stations of the survey, low catch rates allowed only 20 such samples to be collected. The preserved samples, along with the biological and station data, were sent to the University of Alaska immediately upon completion of the survey. For more information regarding this project contact Dr. Tony Gharrett at 907-465-6445.

### SCIENTIFIC PERSONNEL

<i>F/V Jennifer Lee</i>	Deidra Holum, crew leader Eric Coonradt, crew
<i>F/V Providence</i>	Kamala Carroll, crew leader Victoria O'Connell, 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 2002 SSEI sablefish longline survey.\*

Area Description	Station	Statistical Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Soak Time (HOURS)	Haul Back	Mean Depth (fm)	Sablefish Total	Valid Hooks	CPUE (fish/hk)	Mean Weight (kg)	CPUE (kg/hk)
Cape Chacon	2	315431	54 41.26	131 54.07 54	39.58 131 54.30	5.1	Opposite	198	500	1138	0.44	1.70	0.75	
W. Devil Rock	3	315432	54 44.81	131 43.81 54	43.53 131 43.93	3.6	Opposite	209	229	1079	0.21	1.64	0.34	
W. Devil Rock	4	315432	54 41.95	131 44.11 54	43.45 131 44.03	4.5	Same	208	216	944	0.23	1.62	0.37	
West Rock	5	315432	54 47.78	131 42.75 54	46.43 131 42.75	3.6	Opposite	224	238	1128	0.21	1.61	0.34	
McLean Point	6	315432	54 47.91	131 50.63 54	46.33 131 50.68	3.1	Same	216	241	1036	0.23	1.85	0.43	
West Rock	10**	315432	54 48.13	131 41.95 54	49.96 131 41.71	3.1	Opposite	257	434	1400	0.31	2.00	0.62	
Island Point	12	315432	54 48.81	131 53.06 54	50.33 131 52.83	6.6	Opposite	220	146	1123	0.13	2.21	0.29	
Hassler Reef	14	315432	54 50.39	131 42.70 54	51.90 131 42.50	4.0	Same	228	387	1130	0.34	1.96	0.67	
Kendrick Island	15	315432	54 52.52	131 56.50 54	51.02 131 56.47	6.0	Same	235	118	1127	0.1	1.99	0.20	
Kendrick Island	16	315432	54 54.45	131 55.70 54	52.97 131 55.89	3.1	Opposite	229	54	1121	0.05	1.30	0.07	
Hidden Bay	17	315432	54 53.99	131 51.51 54	55.43 131 51.63	5.7	Opposite	228	124	1130	0.11	1.33	0.15	
Hidden Bay	18	315432	54 54.48	131 48.19 54	55.99 131 48.20	4.7	Opposite	228	223	1122	0.2	1.56	0.31	
Point Davidson	20	315502	55 0.79	131 43.32 54	59.18 131 42.61	3.3	Same	215	213	1126	0.19	1.62	0.31	
Rip Point	21	315502	55 4.12	131 50.07 55	2.80 131 48.95	4.9	Opposite	225	142	1117	0.13	1.76	0.23	
Wedge Island	26	315502	55 9.59	131 54.72 55	11.07 131 54.07	4.8	Opposite	212	47	1124	0.04	2.28	0.09	
Wedge Island	27	315502	55 13.94	131 56.24 55	15.38 131 55.72	4.3	Same	197	101	1123	0.09	2.36	0.21	
Chasina Pt	30	315502	55 17.56	131 56.10 55	18.95 131 55.82	3.4	Opposite	230	142	1115	0.13	2.19	0.28	
Skin Island	31	315502	55 18.43	131 58.65 55	19.73 131 59.95	3.2	Opposite	240	41	1109	0.04	1.55	0.06	
Grant Cove	33	315502	55 20.69	131 58.93 55	22.25 131 58.96	4.3	Same	217	213	1113	0.19	1.85	0.35	
Vallenar Point	35	315502	55 25.92	131 59.18 55	24.44 131 58.93	3.3	Opposite	250	158	1115	0.14	1.88	0.26	
Vallenar Point	36	315502	55 24.00	131 55.90 55	25.37 131 57.25	4.2	Same	250	211	1088	0.19	2.24	0.43	
Caamano Island	37	315502	55 29.18	132 1.46 55	28.44 131 59.10	4.3	Opposite	240	267	1117	0.24	1.95	0.47	
Street Island	39	325531	55 31.48	132 8.55 55	30.00 132 8.07	3.2	Opposite	270	187	1112	0.17	2.56	0.44	
Niblack Point	41	325531	55 32.09	132 6.83 55	32.86 132 9.02	3.1	Same	257	263	1054	0.25	2.32	0.58	
Niblack Point	43	325531	55 31.12	132 9.64 55	32.52 132 10.39	3.4	Same	220	221	1009	0.22	2.14	0.47	
Ship Island	44	325531	55 34.13	132 13.60 55	35.49 132 15.15	4.3	Opposite	285	347	1111	0.31	1.71	0.53	
Ship Island	46	325531	55 35.04	132 15.29 55	36.38 132 16.55	4.8	Opposite	325	258	1104	0.23	1.94	0.45	
Windfall Harbor	47	325531	55 34.79	132 16.68 55	36.15 132 17.75	3.2	Same	260	187	1016	0.18	1.65	0.30	
Ship Island	48	325531	55 37.68	132 16.56 55	36.08 132 14.36	3.4	Same	340	363	1025	0.35	2.49	0.87	
Windfall Harbor	49	325531	55 37.68	132 16.56 55	39.25 132 17.18	4.7	Same	345	203	1108	0.18	2.06	0.37	
Tolstoi Point	50	325531	55 39.15	132 19.20 55	37.69 132 18.68	3.9	Opposite	365	178	1043	0.17	2.18	0.37	
Cape Muzon	52	325431	54 31.51	132 40.43 54	31.50 132 37.83	5.1	Opposite	201	254	1066	0.24	2.11	0.51	
Cape Muzon	53	325401	54 27.02	132 32.63 54	28.04 132 35.63	4.0	Opposite	205	399	1128	0.35	1.91	0.67	
Cape Muzon	54	325401	54 28.40	132 24.21 54	28.44 132 21.59	3.6	Opposite	196	472	1085	0.44	2.17	0.95	
Celestial Reef	55	315401	54 28.94	131 48.98 54	30.47 131 48.95	2.9	Same	192	552	1122	0.49	1.44	0.71	
Celestial Reef	56	315431	54 30.54	131 48.01 54	32.12 131 47.91	3.9	Same	187	389	1120	0.35	1.17	0.41	
W. Devil Rock	57	315431	54 39.05	131 41.32 54	37.49 131 41.58	3.2	Same	230	221	1125	0.2	1.80	0.36	
Average						4.05		239	242	1104	0.22	1.87	0.41	
Maximum						6.60		365	552	1400	0.49	2.56	0.95	
Minimum						2.90		187	41	944	0.04	1.17	0.06	
Total									8939	40853				

\* Invalid skates were excluded in calculating Station information for #Sablefish, #Valid Hooks, and CPUE's.

\*\* Station 10 effort was reduced from 50 to 31 skates in 2002. (See Results).

Table 2. Longline gear configuration for the 2002 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
Gangion (cm)	38, med lay #60 thread
Hook Spacing (m)	2
Hooks Per	45
Running Line (fm)	150
Lead Ball Weights	7 lbs.

Table 3. 2002 SSEI sablefish survey catch by species and station.\*

Station	Sablefish	Halibut	Thornyhead	Shortraker	Rougheye	Redbanded	Spiny Dogfish	Skates	Arrowtooth	Other
2	500	20	7	0	0	0	76	35	0	16
3	229	5	5	0	1	0	21	21	3	10
4	216	4	9	0	0	0	17	13	2	13
5	238	5	8	0	0	0	52	22	3	11
6	241	2	6	1	1	0	2	25	1	6
10	434	10	26	0	0	0	95	79	4	10
12	146	3	14	0	0	0	2	10	1	13
14	387	21	26	0	0	0	83	39	8	5
15	118	1	12	1	0	0	10	25	2	3
16	54	2	28	1	0	0	7	35	1	9
17	124	6	39	1	0	0	23	31	3	10
18	223	5	25	1	0	0	14	18	1	9
20	213	2	17	0	0	0	53	12	0	7
21	142	1	9	1	0	0	17	16	1	20
26	47	36	8	2	15	19	230	15	1	58
27	101	8	6	0	0	0	450	5	1	2
30	142	4	15	0	1	0	21	7	2	6
31	41	0	14	1	0	0	0	10	1	18
33	213	1	6	0	0	0	11	5	0	2
35	158	2	13	0	0	0	2	7	1	6
36	211	8	8	0	0	0	34	8	1	8
37	267	16	16	16	2	0	6	12	6	5
39	187	11	16	2	0	0	4	11	2	3
41	263	26	5	0	1	0	16	15	3	13
43	221	17	19	15	0	3	50	23	4	39
44	347	13	12	0	0	0	8	20	0	7
46	258	10	13	0	0	0	1	12	1	4
47	187	12	10	4	0	0	8	15	2	3
48	363	5	5	0	0	0	3	14	1	1
49	203	2	5	3	0	0	3	8	0	5
50	178	4	2	2	0	0	0	2	0	7
52	254	90	37	2	6	1	10	62	27	14
53	399	117	18	0	5	0	1	64	43	5
54	472	74	15	3	4	2	3	35	23	12
55	552	18	10	0	0	0	4	11	3	3
56	389	13	20	0	0	0	20	13	7	7
57	221	5	6	1	0	0	13	36	0	9
Total	8939	579	510	57	36	25	1370	791	159	379

\* Invalid skates excluded.

Table 4. CPUEs for 37 stations fished in 1999 - 2002.\*

Station	2002		2001		2000		1999	
	CPUE (fish/hk)	CPUE (kg/hook)	CPUE (fish/hk)	CPUE (kg/hook)	CPUE (fish/hk)	CPUE (kg/hook)	CPUE (fish/hk)	CPUE (kg/hook)
2	0.44	0.75	0.16	0.32	0.26	0.66	0.40	1.28
3	0.21	0.34	0.21	0.24	0.23	0.30	0.37	0.43
4	0.23	0.37	0.18	0.28	0.15	0.21	0.20	0.24
5	0.21	0.34	0.15		0.20	0.31	0.16	0.24
6	0.23	0.43	0.16	0.25	0.26	0.59	0.31	0.53
10	0.31	0.62	0.23	0.44	0.14	0.32	0.27	0.50
12	0.13	0.29	0.11	0.21	0.26	0.46	0.25	0.47
14	0.34	0.67	0.22	0.30	0.27	0.37	0.35	0.57
15	0.1	0.20	0.02		0.10	0.19	0.07	0.10
16	0.05	0.07	0.04	0.08	0.10	0.22	0.11	0.27
17	0.11	0.15	0.06		0.13	0.23	0.11	0.15
18	0.2	0.31	0.07		0.20	0.36	0.13	0.22
20	0.19	0.31	0.16	0.30	0.12	0.16	0.22	0.34
21	0.13	0.23	0.10	0.16	0.11	0.15	0.12	0.16
26	0.04	0.09	0.12	0.37	0.16	0.31	0.14	0.25
27	0.09	0.21	0.23	0.47	0.24	0.64	0.15	0.21
30	0.13	0.28	0.10	0.24	0.10	0.22	0.10	0.20
31	0.04	0.06	0.06	0.12	0.10	0.14	0.10	0.16
33	0.19	0.35	0.04	0.07	0.16	0.22	0.07	0.08
35	0.14	0.26	0.11		0.11	0.23	0.11	0.26
36	0.19	0.43	0.17	0.48	0.28	0.50	0.28	0.63
37	0.24	0.47	0.11		0.25	0.55	0.21	0.49
39	0.17	0.44	0.13	0.31	0.19	0.46	0.26	0.50
41	0.25	0.58	0.23	0.60	0.23	0.53	0.32	0.74
43	0.22	0.47	0.18	0.40	0.32		0.23	0.50
44	0.31	0.53	0.29	0.50	0.44	0.75	0.41	0.84
46	0.23	0.45	0.19	0.43	0.25	0.46	0.17	0.30
47	0.18	0.30	0.18	0.32	0.30	0.56	0.35	0.60
48	0.35	0.87	0.33	0.99	0.34	0.81	0.19	0.44
49	0.18	0.37	0.20	0.43	0.18	0.51	0.16	0.32
50	0.17	0.37	0.15	0.35	0.26	0.50	0.16	0.32
52	0.24	0.51	0.26	0.82	0.28	0.85	0.24	0.65
53	0.35	0.67	0.21	0.41	0.32	0.78	0.22	0.57
54	0.44	0.95	0.31	0.80	0.36	0.90	0.25	0.72
55	0.49	0.71	0.10		0.24	0.48	0.50	0.61
56	0.35	0.41	0.10		0.24	0.32	0.38	0.41
57	0.2	0.36	0.28		0.13	0.24	0.20	0.32
Average	0.22	0.41	0.16	0.39	0.22	0.42	0.22	0.42

\*Invalid skates were excluded in CPUE calculations.

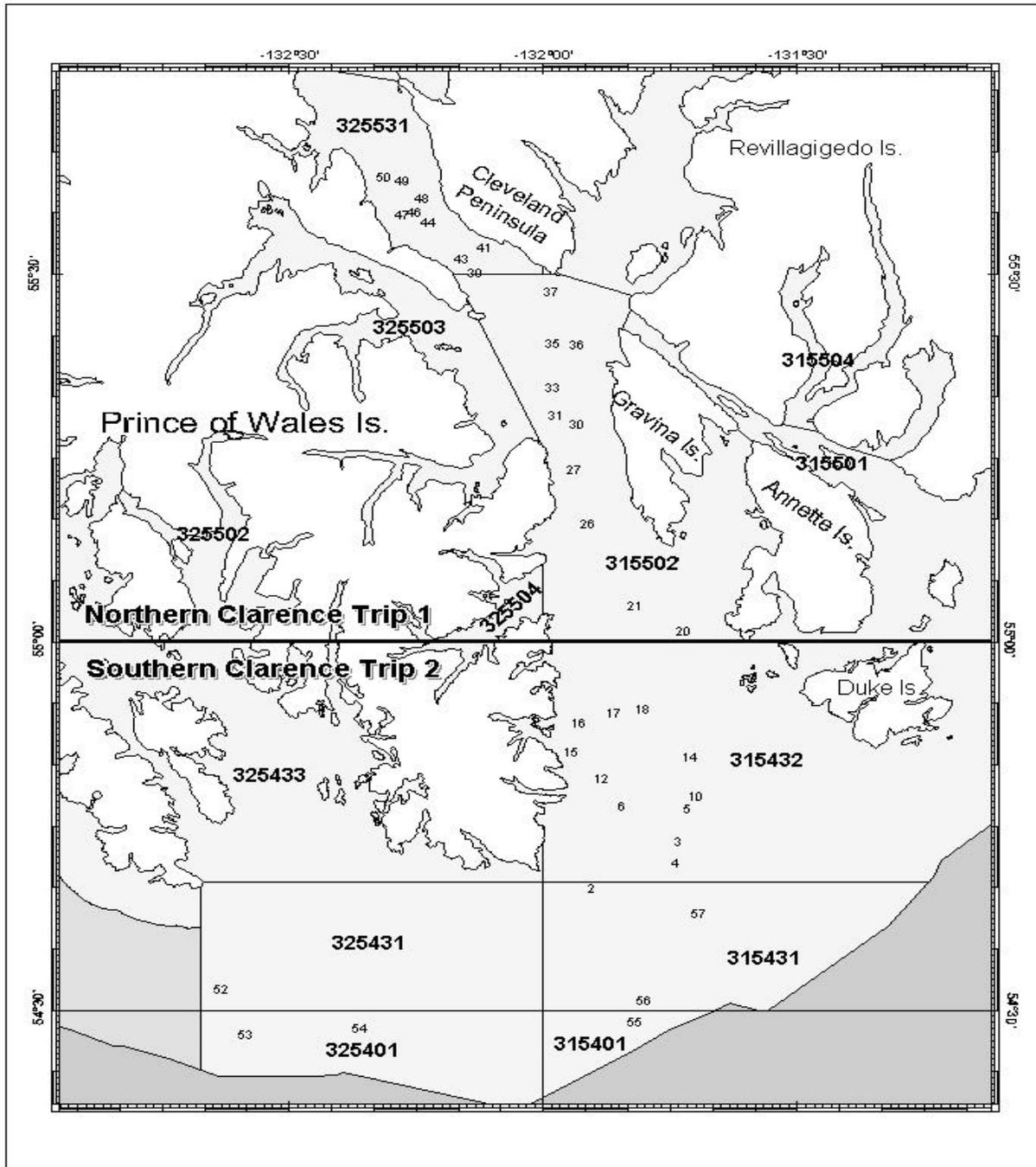


Figure 1. Clarence Strait survey station locations and groundfish statistical areas. The six-digit numbers refer to statistical areas, station local is indicated by numbers 2–57.

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