

Regional Information Report No. 1J10-12

2009 SSEI (Clarence) Sablefish Longline Survey Field Report

by

Kamala Carroll

June 2010

Alaska Department of Fish and Game

Divisions of Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative Code	AAC	fork length	FL
deciliter	dL			mid-eye-to-fork	MEF
gram	g	all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.	mid-eye-to-tail-fork	METF
hectare	ha			standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.		
liter	L		@		
meter	m	at		Mathematics, statistics	
milliliter	mL	compass directions:		<i>all standard mathematical signs, symbols and abbreviations</i>	
millimeter	mm	east	E	alternate hypothesis	H _A
		north	N	base of natural logarithm	e
Weights and measures (English)		south	S	catch per unit effort	CPUE
cubic feet per second	ft ³ /s	west	W	coefficient of variation	CV
foot	ft	copyright	©	common test statistics	(F, t, χ^2 , etc.)
gallon	gal	corporate suffixes:		confidence interval	CI
inch	in	Company	Co.	correlation coefficient (multiple)	R
mile	mi	Corporation	Corp.	correlation coefficient (simple)	r
nautical mile	nmi	Incorporated	Inc.	covariance	cov
ounce	oz	Limited	Ltd.	degree (angular)	°
pound	lb	District of Columbia	D.C.	degrees of freedom	df
quart	qt	et alii (and others)	et al.	expected value	E
yard	yd	et cetera (and so forth)	etc.	greater than	>
		exempli gratia (for example)	e.g.	greater than or equal to	≥
Time and temperature		Federal Information Code	FIC	harvest per unit effort	HPUE
day	d	id est (that is)	i.e.	less than	<
degrees Celsius	°C	latitude or longitude	lat. or long.	less than or equal to	≤
degrees Fahrenheit	°F	monetary symbols (U.S.)	\$, ¢	logarithm (natural)	ln
degrees kelvin	K	months (tables and figures): first three letters	Jan,...,Dec	logarithm (base 10)	log
hour	h	registered trademark	®	logarithm (specify base)	log ₂ , etc.
hour	h	trademark	™	minute (angular)	'
minute	min	United States (adjective)	U.S.	not significant	NS
second	s	United States of America (noun)	USA	null hypothesis	H ₀
		U.S.C.	United States Code	percent	%
Physics and chemistry		U.S. state	use two-letter abbreviations (e.g., AK, WA)	probability	P
all atomic symbols				probability of a type I error (rejection of the null hypothesis when true)	α
alternating current	AC			probability of a type II error (acceptance of the null hypothesis when false)	β
ampere	A			second (angular)	"
calorie	cal			standard deviation	SD
direct current	DC			standard error	SE
hertz	Hz			variance	
horsepower	hp			population	Var
hydrogen ion activity (negative log of)	pH			sample	var
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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**2009 SSEI (CLARENCE) SABLEFISH LONGLINE SURVEY FIELD
REPORT**

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ABSTRACT

This report presents methods and data from the 2009 sablefish longline survey conducted in the Southern Southeast Inside (SSEI) Subdistrict of Southeast Alaska. Catch rates, bycatch data and biological data including sablefish lengths, sex ratios, and ages are presented. Data from previous annual surveys are also presented. The overall catch per unit of effort (CPUE) for the 2009 survey was 0.15 fish per hook and 0.79 round pounds per hook.

Key words: Sablefish, *Anoplopoma fimbria*, longline survey, SSEI, Clarence Strait, CPUE, Southeast Alaska

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) conducts annual longline surveys in the Southern Southeast Inside Subdistrict of Southeast Alaska to assess the condition of sablefish (*Anoplopoma fimbria*) in this area (Figure 1). Annual surveys have been conducted since 1988, with a major standardization of methods occurring in 1997. No survey was performed in 2005 due to spending constraints. In 2009 the annual SSEI sablefish survey was conducted from May 14 through May 21 and was the 21st ADF&G sablefish survey in Clarence Strait.

The specific objectives of the 2009 survey were:

1. Calculate the catch per unit effort (CPUE) for sablefish at the 37 stations surveyed annually in the Clarence Strait and Dixon Entrance portions of the SSEI Subdistrict.
2. Enumerate, to the lowest possible taxonomic group, all fish captured.
3. Collect a representative sample of biological data (n=550) including otoliths (aging structures), length, weight, sex, and stage of gonad maturity from a subsample of sablefish and an additional representative sample (n=550) of sablefish length measurements.
4. Collect biological data including length, weight, and sex, from all *Sebastes* rockfishes caught.
5. Collect length data from all shortspine thornyheads (*Sebastolobus alascanus*) caught.

METHODS

SURVEY AREA

The survey area included the waters of Clarence Strait and Dixon Entrance from 55° 39.21' N. latitude and 132° 19.13' W. longitude to 54° 28.00' N. latitude and 132° 32.77' W. longitude. There are currently 37 stations within the survey area (Figure 2). The station locations and amount of gear set at the stations has been consistent since 2002. Prior to that time some changes were made involving stations 10 & 11. For an explanation of the changes see Regional Informational Report No. IJ04-09, 2003.

VESSELS

ADF&G awards annual 14-day charter agreements to two commercial longline vessels to fish 18 or 19 stations each. The survey area is split into two distinct sections, allowing all stations to be fished within a single seven day period. The contract length is longer than the anticipated survey length to allow for delays associated with weather, gear, or other problems.

The 2009 Request for Bids specified a maximum bid of \$30,000 for each portion of the survey and that a vessel could not fish more than one section. Annual contracts were awarded to the two vessels with the lowest bids. Vessels were assigned a section at the department's discretion.

The *F/V Providence* was awarded an annual contract (\$26,400) and conducted the longline survey in the northern portion (Trip #1), fishing 19 stations. The *F/V Masonic* was awarded an annual contract (\$26,300) and conducted the longline survey in the southern portion (Trip #2), fishing 18 stations.

Each vessel was required to provide at least three experienced crew members in addition to the skipper (Appendix B). The crew operated the vessel and baited, set, retrieved, and repaired all longline gear. Two ADF&G scientific personnel were assigned to each vessel to collect the set, hook accounting, and biological data.

GEAR

In 2000, ADF&G contracted Lummi Fishery Supplies in Seattle to build skates of conventional longline gear. These skates were built to replicate the gear used in NMFS longline surveys in order to make the ADF&G sablefish catch and effort data from internal state waters comparable with NMFS data from the outside waters of the Gulf of Alaska. New gear may not fish as effectively as gear that has previously been baited and deployed at sea. To eliminate this potential all gear was fished prior to its use as survey gear.

A string of gear consisted of a flag pole, an array of buoys, buoy line of length dependent upon the set depth, a 60 pound (27 kg) longline anchor, 150 fm (274 m) of running line, 25 skates of 45 #13/0 Mustad circle hooks, a second 150 fm of running line, a second 60 pound longline anchor, a second buoy line, a second array of buoys and a second flagpole. Beginning in 2000, a 7 pound (3 kg) lead ball was snapped to the end of each skate. Hooks were front threaded to gangions secured to beackets tied into the groundline at 6.5 foot (2 m) intervals. All hooks were secured at 15 inches (38 cm) from the groundline, which was the length of the gangion and the becket when tied together and attached to groundline. Sixteen feet (5 m) of groundline were left bare at each skate end. Gangions were medium lay #60 nylon round braided twine, beackets were medium lay #72 nylon becket twine, and the groundline was medium lay 3/8 inch (1 cm) nylon American Line SSR 100. Each vessel crew attached new hooks on all skates prior to the start of the survey. Bent, straightened, and missing hooks were replaced after each set, as the gear was baited.

BAIT

Argentine illex (*Illex argentinus*), 100–200 gm squid was used as bait and the rate of use averaged 12.5 pounds (5.7 kg) per 100 hooks. Only the squid body was used as bait; the head and tentacles were discarded. Bait pieces were 1.5 to 2 inches (3.8–5.0 cm) long. Bait was thawed within 24 hours of use. This bait protocol replicates NMFS bait protocol and is consistent with previous ADF&G surveys from 2000 through the present.

International Marine Industries, Inc., of Newport, Rhode Island won the bait bid to provide 5,246 pounds of Argentine illex for the SSEI survey. The winning bid was \$.88 per pound (\$1.94/kg), including freight costs.

SCHEDULE

The survey began on May 14 and concluded on May 21. The survey was scheduled to correspond with the timing of previous surveys, occurring during the favorable tide series (Appendix C) just prior to the start of the commercial fishing season. Each vessel made two deliveries to Trident Seafoods during the survey.

SET INFORMATION

Sets were made in the same direction as the tidal current. Haulback direction was dependent on the tide, wind direction, and currents. Sets were allowed to soak for a minimum of three and a maximum of 11 hours, which is consistent with National Marine Fisheries Service (NMFS) survey protocol (*personal communication*, C.R. Lunsford). If it was necessary to set differently from the standard set coordinates due to circumstances such as tidal currents or weather, the set was to pass through the start latitude and longitude and be made as close to the original location points as possible.

Set information collected at each station included the date and time of set and haul, start and end coordinates, the depth of each anchor and skate as they went overboard, haulback order, wind direction and estimated speed, and bottom substrate. Substrate was evaluated based on the skipper's interpretation of sonar information and any substrate that came up on fishing gear. Comments on any problems with the gear or other factors impacting CPUE were noted along with observations regarding the presence of sharks, whales, or any other information of biological interest.

HOOK ACCOUNTING, CATCH, AND CPUE

ADF&G staff classified each hook as it broke the surface of the water. A hook without a fish on it was recorded as "bare," "bait," or "invalid" (bent, broken, missing, snarled). A whole skate was considered invalid if greater than 25% of the hooks were missing, in a snarl, or stripped.

Sablefish that broke the surface on a hook but were not landed were recorded as "lost." Sablefish less than approximately 45 cm (18 inches) long were recorded as "small" and immediately returned to the water unless the fish was determined to be a biological sample. Sablefish that were not marketable were discarded with the discard reason reported if known. All other fish that broke the surface attached to a hook were identified to the lowest possible taxonomic group and tallied. All species other than sablefish, rockfish, and Pacific cod were immediately released.

The CPUE in terms of sablefish per hook for an individual station was calculated using only valid skates. The number of sablefish, including lost and discarded sablefish, was divided by the number of hooks on valid skates retrieved at that station.

The CPUE in terms of round pounds per hook for an individual station was calculated by multiplying the fish per hook CPUE for the station by the average weight of the fish sampled at that station. The overall fish per hook CPUE for the survey was calculated by dividing the total number of sablefish by the total number of hooks retrieved, on valid skates only. The overall round pounds per hook CPUE was calculated by multiplying the overall fish per hook CPUE for the survey by the overall average weight of sablefish sampled during the survey.

BIOLOGICAL SAMPLING

The first sablefish of each set, and every 10th sablefish thereafter from the first 18 skates of each set, were set aside for biological sampling. Length and weight were measured, sex and maturity

were assessed, and otoliths were removed from each biological sample. Additional length measurements were collected from every 11th sablefish from the first 18 skates of each set.

Lengths were measured to the nearest cm from the tip of the snout to the fork of the tail using a measuring board. Weights were measured to the nearest 0.1 kg using a Salter Heavy-Duty Hanging (#235-10S) metric (44 lb/20 kg) scale. If seas were too rough to obtain repeatable weights during a haul, fish were not weighed. Sablefish sex and maturity were assessed from visual observation of the gonads. Fish were classified into six maturity categories: immature, maturing juvenile, mature/developing, spawning, spent/post spawning, and resting (Appendix D). After sampling, fish were cleaned and dressed to industry standards by ADF&G staff.

Otoliths were cleaned on board the vessels using warm water with highly diluted detergent, hand-dried, and stored dry in plastic multi-cell trays. They were aged at the ADF&G Age Determination Unit in Juneau using the break-and-burn technique.

Sebastes rockfish lengths and weights were taken using the same methods and equipment used for sablefish. Sex was determined by examination of the urogenital papillae. All *Sebastes* rockfish were retained on the vessel. The length of every shortspine thornyhead (*Sebastolobus alascanus*) caught was measured. The same measurement methods were used as those for sablefish. Shortspine thornyheads were released immediately after measurement.

TAGGED SABLEFISH

All tagged sablefish encountered during the survey were retained. Tags were collected and the associated recovery information was recorded for each fish. Fish tagged by agencies other than ADF&G were handled according to the protocols specified by the release agency.

BID TO PURCHASE ADF&G FISH

The department solicited bids from area processors to purchase the fish caught during the survey. The 2009 bids were based upon the actual dressed poundage breakdown by size category of catch delivered during the 2008 survey. Trident Seafoods in Ketchikan submitted the winning bid (Appendix E).

RESULTS

SET INFORMATION

All 37 stations were surveyed (Appendix A). A total of 25 skates with approximately 1,125 hooks were set at each station and a total of 925 skates were deployed during the survey. Eight skates were classified as invalid and not included in the calculation of CPUE. Gear snarls accounted for 6 of the invalid skates 2 of the snarls are believed to be due to Pacific sleeper sharks (*Somniosus pacificus*). The gear was also hung up on the bottom at station 52 however the entire set appeared to be fishing properly. The gear parted at station 54 and was retrieved by hauling the opposite end of the set with no gear loss.

CATCH AND CPUE

The CPUE in terms of fish per hook (Table 1) ranged from 0.02 at stations 16, Kendrick Island, 31, Skin island and 33, Grant Cove, to 0.45 at station 54, Cape Muzon. The overall CPUE was 0.15. The CPUE in terms of round pounds per hook ranged from 0.10 (0.05 kg/hook) at station 33 to 2.46 lbs/hook (1.12 kg/hook) at station 52, Cape Muzon. The survey average was 0.79 lbs/hook (0.36 kg/hook).

The overall 2009 survey CPUE was down from the 2008 survey CPUE of 0.19 fish and .94 lbs/hook (0.41 kg/hook) (Table 2), which was similar to both the 2007 CPUE of 0.20 fish and .94 lbs/hook (0.42 kg/hook), and the 2006 CPUE of 0.20 fish with a slightly higher 1.1 lbs/hook (0.5 kg/hook).

A total of 6,278 sablefish were caught during the survey and 5,791 were retained. Valid skates accounted for 6,237 sablefish and 5,754 were retained (Table 3). Of the remaining sablefish on valid skates, 187 were lost at the roller, 66 were discarded due to hagfish damage, 193 were released due to small size, 12 were discarded due to shark damage, and 25 were discarded due to sand flea damage.

BYCATCH

A total of 4,718 fish and 7 other animals were caught as bycatch (Table 4). Valid skates accounted for 4,701 fish and all the other bycatch species. Spiny dogfish sharks (*Squalus acanthias*) were the most abundant bycatch species, comprising 24% of the bycatch count. Skates (*Raja* spp. and *Bathyraja* spp.) were the next most abundant, comprising 18%. Pacific halibut (*Hippoglossus stenolepis*) comprised 16%, and shortspine thornyhead (*Sebastolobus alascanus*) comprised 15%. Pacific hagfish (*Eptatretus stoutii*) comprised 13%. The remaining bycatch was made up of, in descending order of abundance: arrowtooth flounder (*Atheresthes stomias*), shorttraker rockfish (*Sebastes borealis*), spotted ratfish (*Hydrolagus colliei*), Pacific cod (*Gadus macrocephalus*), redbanded rockfish (*Sebastes babcocki*), rougheye rockfish (*Sebastes aleutianus*), Dover sole (*Microstomus pacificus*), coral (various species), Pacific sleeper shark (*Somniosus Pacificus*), Lingcod (*Ophiodon elongatus*) walleye pollock (*Theragra chalcogramma*), common octopus (*Octopus vulgaris*), and unspecified sea anenome .

BIOLOGICAL DATA

Sablefish

Length was measured, sex and maturity were assessed, and otoliths were taken from 421 sablefish. Valid weights were obtained for 422 sablefish and valid age estimates were produced for 419 sablefish. An additional 426 sablefish were measured for length only, for a total of 855 length measurements. Lengths ranged from 36 cm (14 in) to 87 cm (34 in) (Figure 3). The mean length of fish sampled in 2009 was 61 cm (24 in). The 2008 mean length was 62 cm (24 in), the 2007 mean was 60 cm (24 in), and the 2006 mean was 61 cm (24 in) (Figure 4).

The sex ratio of the sampled sablefish was 51% female. Females were larger than males with a mean fork length of 63 cm (25 in) compared to the male mean fork length of 59 cm (23 in) (Figure 5). The average weight of all the sablefish sampled was 2.4 kg (5.3 lbs) (Table 1). Females averaged 2.7 kg (6.5.90 lbs) and males averaged 2.2 kg (4.8 lbs).

Age estimates ranged from 3 to 49 years with an average age of 11 years (Figure 6). The mode age was 11 years, and the median was 10 years. Female ages ranged from 3 to 23 years with an average age of 10 years. Male ages ranged from 3 to 49 years with an average age of 12 years.

Visual inspection of the gonads indicated that approximately 52% of the females and 46% of the males sampled had not previously spawned (Table 5). The majority of these fish, 29% of the males and 43% of the females, were classified as “maturing juvenile,” meaning they had not previously spawned but will likely spawn during the following winter (Appendix D).

***Sebastes* Rockfishes**

A total of 37 redbanded rockfish (*Sebastes babcocki*), 22 roughey rockfish (*S. aleutianus*), and 98 shortraker rockfish (*S. borealis*) were sampled for length, weight and sex. The average fork lengths were 45 cm, 46 cm, and 66 cm (18, 18, and 26 in), respectively. Redbanded rockfish averaged 1.6 kg (3.5 lbs), roughey averaged 1.8 kg (4.0 lbs) and shortraker rockfish averaged 4.9 kg (10.8 lbs).

Shortspine Thornyheads

Lengths were taken from 664 shortspine thornyheads. Fork lengths ranged from 28 cm to 65 cm (11 in to 26 in) and the mean length was 40 cm (16 in).

FISH TICKET AND LANDING DATA

A total of 29,532 round pounds of sablefish, 1,298 round pounds of rockfish, and 234 round pounds of Pacific cod were landed for a total value of \$90,124. An estimated 30% of the sablefish catch by weight came from statistical area 325531, 24% from 315432, 17% from 315502, 15% from 325401, 12% from 325431, 2% from 315431, and 1% from 315401. Thirty-seven percent of the fish were graded as 3/4 pounds dressed weight, 26% were 4/5 grade, 18% were 2/3 grade, 13% were 5/7 grade, 3% were -2, and 3% were +7. Four percent of the sablefish catch was graded as #2.

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Table 1.–Hook condition, sablefish average weight and CPUE (valid skates only), by station for the 2009 SSEI sablefish longline survey

Station	Total Hooks	Bare hooks	Baited hooks	Invalid hooks	Sablefish	Fish/total hooks	Avg. weight (kg)	Kg/total hooks	Avg. weight (lbs)	Lbs/total hooks
2	1,046	287	324	6	239	0.23	2.5	0.57	5.5	1.25
3	1,131	737	17	15	136	0.12	1.3	0.15	2.8	0.34
4	1,101	813	0	22	111	0.10	1.1	0.11	2.4	0.24
5	1,122	830	8	64	115	0.10	2.4	0.24	5.2	0.53
6	1,110	888	7	4	66	0.06	1.6	0.10	3.6	0.21
11	1,125	514	20	28	421	0.37	2.5	0.95	5.6	2.10
12	1,115	855	12	35	115	0.10	1.8	0.19	4.0	0.42
14	1,119	467	88	17	381	0.34	2.1	0.72	4.7	1.59
15	1,108	958	6	11	31	0.03	2.8	0.08	6.2	0.17
16	1,064	955	3	13	18	0.02	3.0	0.05	6.6	0.11
17	1,108	973	1	12	46	0.04	2.6	0.11	5.8	0.24
18	1,111	898	4	9	43	0.04	2.5	0.10	5.5	0.21
20	1,122	800	0	29	185	0.16	2.0	0.33	4.3	0.72
21	1,121	946	2	17	77	0.07	2.2	0.15	4.7	0.33
26	1,124	682	109	18	76	0.07	2.7	0.18	6.0	0.40
27	1,025	667	17	24	196	0.19	2.3	0.45	5.2	0.99
30	1,124	988	1	26	59	0.05	2.3	0.12	5.0	0.26
31	1,130	1,067	0	20	20	0.02	3.7	0.07	8.2	0.14
33	1,126	1,051	2	28	28	0.02	1.7	0.04	3.7	0.09
35	1,118	957	0	31	96	0.09	2.0	0.17	4.4	0.38
36	1,129	805	0	28	170	0.15	2.8	0.43	6.3	0.94
37	1,079	780	20	45	139	0.13	3.0	0.39	6.6	0.85
39	1,126	915	4	15	99	0.09	3.0	0.27	6.7	0.59
41	1,129	618	34	32	221	0.20	2.4	0.48	5.4	1.05
43	1,063	432	250	16	115	0.11	3.0	0.32	6.6	0.72
44	1,125	609	7	36	292	0.26	2.3	0.60	5.1	1.33
46	1,128	910	3	14	121	0.11	2.4	0.26	5.3	0.57
47	1,115	830	19	15	158	0.14	2.4	0.33	5.2	0.74
48	1,116	557	72	34	399	0.36	3.0	1.06	6.5	2.33
49	1,068	905	2	12	112	0.10	2.8	0.29	6.2	0.65
50	1,128	979	0	28	62	0.05	3.4	0.19	7.5	0.41
52	1,129	391	190	12	391	0.35	3.2	1.12	7.1	2.46
53	1,110	311	89	12	432	0.39	2.4	0.92	5.2	2.03
54	1,121	279	151	37	501	0.45	2.4	1.07	5.3	2.35
55	1,129	589	34	7	331	0.29	1.5	0.44	3.3	0.97
56	1,112	732	2	16	121	0.11	*****weights discarded*****			
57	1,106	828	28	2	114	0.10	2.5	0.26	5.6	0.58
Overall	41063	27,803	1,526	790	6,237	0.15	2.4	0.37	5.3	0.79

Table 2.—Sablefish fish per hook CPUE and round lbs per hook by each station for the SSEI sablefish long surveys, 2006–2009

Station	2009		2008		2007		2006	
	Fish/hook	lbs/hook	Fish/hook	lbs/hook	Fish/hook	lbs/hook	Fish/hook	lbs/hook
2	0.23	1.25	0.32	—	0.29	1.60	0.36	2.03
3	0.12	0.34	0.19	—	0.17	0.58	0.25	0.99
4	0.10	0.24	0.17	—	0.30	1.25	0.28	1.07
5	0.11	0.55	0.16	—	0.18	0.66	0.28	1.41
6	0.06	0.21	0.13	—	0.15	0.62	0.22	0.93
11	0.37	2.10	0.44	—	0.40	2.01	0.24	1.20
12	0.10	0.42	0.12	—	0.11	0.43	0.15	0.76
14	0.34	1.59	0.45	—	0.35	1.59	0.40	1.95
15	0.03	0.17	0.12	—	0.10	0.42	0.15	0.89
16	0.02	0.11	0.06	—	0.08	0.37	0.19	0.98
17	0.04	0.24	0.08	—	0.09	0.47	0.15	0.76
18	0.04	0.21	0.08	—	0.21	0.87	0.19	0.91
20	0.16	0.72	0.22	1.04	0.22	0.93	0.26	1.49
21	0.07	0.33	0.10	0.46	0.16	0.70	0.12	0.61
26	0.07	0.40	0.21	1.34	0.10	0.59	0.15	1.02
27	0.19	0.99	0.22	1.52	0.30	1.77	0.20	1.49
30	0.05	0.26	0.07	0.50	0.09	0.37	0.11	0.65
31	0.02	0.14	0.10	0.64	0.05	0.27	0.06	0.32
33	0.03	0.10	0.03	0.22	0.03	0.18	0.06	0.24
35	0.09	0.38	0.12	0.65	0.09	0.52	0.12	0.75
36	0.15	0.94	0.17	1.09	0.14	0.87	0.18	1.03
37	0.13	0.85	0.18	1.35	0.13	0.87	0.16	0.79
39	0.09	0.59	0.15	0.96	0.14	0.82	0.14	0.91
41	0.20	1.05	0.13	0.86	0.16	0.96	0.20	1.34
43	0.11	0.72	0.21	1.12	0.23	1.31	0.17	1.02
44	0.26	1.33	0.26	1.38	0.31	1.83	0.17	0.93
46	0.11	0.57	0.13	0.91	0.21	1.18	0.08	0.39
47	0.14	0.74	0.14	0.65	0.20	0.80	0.14	0.84
48	0.36	2.33	0.21	1.61	0.27	1.80	0.22	1.44
49	0.10	0.65	0.14	0.88	0.13	0.99	0.08	0.58
50	0.05	0.41	0.10	0.65	0.09	0.61	0.08	0.61
52	0.35	2.46	0.25	—	0.31	0.00	0.30	2.10
53	0.39	2.03	0.38	—	0.28	1.55	0.28	2.00
54	0.45	2.35	0.53	—	0.34	2.18	0.37	2.53
55	0.29	0.97	0.21	—	0.36	1.24	0.44	2.00
56	0.11	—	0.25	—	0.24	0.86	0.32	1.27
57	0.10	0.58	0.14	—	0.24	0.82	0.28	1.03
Overall	0.15	0.79	0.19	0.94	0.20	0.94	0.20	1.12

— indicates that weights were not taken due to rough seas or problems with the scale

Table 3.—Sablefish retention and discard status in numbers of fish (valid skates only), during the 2009 SSEI sablefish longline survey

Station	Discarded due to predation			Released Alive			Total
	Sand fleas	Sharks	Hagfish	Small Size	Lost at Roller	Retained	
2	—	—	—	4	7	228	239
3	3	3	4	59	2	65	136
4	—	—	7	30	5	69	111
5	—	—	—	5	6	104	115
6	—	—	—	16	1	49	66
11	—	—	—	5	12	404	421
12	—	—	1	4	3	107	115
14	1	3	—	2	11	364	381
15	1	—	2	1	4	23	31
16	—	—	—	—	2	16	18
17	2	—	2	3	6	33	46
18	—	—	2	3	—	38	43
20	—	—	8	5	3	169	185
21	—	—	2	2	6	67	77
26	1	—	—	1	2	72	76
27	—	—	1	1	7	187	196
30	—	—	1	—	1	57	59
31	—	—	2	—	1	17	20
33	—	—	—	1	1	26	28
35	—	—	2	—	5	89	96
36	4	2	3	—	5	156	170
37	1	—	3	1	3	131	139
39	—	—	—	—	4	95	99
41	—	2	2	—	7	210	221
43	—	—	—	—	1	114	115
44	—	2	4	1	8	277	292
46	—	—	2	1	2	116	121
47	3	—	5	—	1	149	158
48	—	—	3	—	19	377	399
49	1	—	8	1	5	97	112
50	3	—	2	—	1	56	62
52	—	—	—	—	15	376	391
53	2	—	—	3	11	416	432
54	—	—	—	—	8	493	501
55	—	—	—	10	3	318	331
56	1	—	—	29	3	88	121
57	2	—	—	5	6	101	114
Total	25	12	66	193	187	5,754	6,237

Table 4.—Overall catch in numbers by species (valid and invalid skates), in the 2009 SSEI sablefish longline survey

Station	Sablefish	Spiny Dogfish	Pacific Halibut	Thornyhead	Longnose Skate	Hagfish	Arrowtooth Flounder	Unidentified Skate	Shortraker Rockfish	Ratfish	Pacific Cod	Redbanded Rockfish	Rougheye Rockfish	Dover Sole	Coral	Pacific Sleeper Shark	Other
2	261	105	20	14	46		14	3	1	1	1				4		
3	136	121	15	19	33	26	19	4									
4	111	49	9	31	13	34	31	8		2							
5	118	38	2	33	10	14	33			1							
6	66	47	4	21	20	36	21	9		1							
11	421	18	44	13	18	15	13	7	3	1							
12	115	29	1	24	6	27	24	4		2							
14	381	22	19	46	41	1	46	2	4								
15	31	22	5	16	12	41	16	3	1								
16	19	8	3	16	11	32	16	1		1							
17	46	15	2	20	9	19	20	4		2							
18	43	23	3	33	20	64	33	6	2								1
20	185	15	8	5	35	14	5	19	3			1					
21	77	15	5	11	23	12	11	7		3							
26	76	20	68	13	27	3	13	18	1	24	36	16	2				
27	201	15	28	29	25	4	29	1		9	2	3		1			
30	59	5	2	23	6	6	23	1					1				
31	20			6	4	9	6		1								
33	29	1		3	9		3	1									
35	96	6	1	6	9	7	6	2	1								
36	170	45	12	13	16	2	13	24	10	1	1						
37	141	7	25	26	12	8	26	6	4	4			1				1
39	99	3	18	29	15	1	29	19	3	2							
41	221	67	47	7	30	3	7	27	24	5	2	2	2	2		2	
43	117	89	66	16	11		16	3	14	23	10	11	3				1
44	292	109	17	7	22	2	7	13	1		1			1		1	1
46	121	10	5	3	7	50	3	3	2								
47	158	3	6	7	35	16	7	12	8	2		1		2			
48	399	2	13	5	19	5	5	9		1							
49	117		1	3	5	27	3	2									
50	62	1		6	4	45	6	3									
52	391	13	45	24	16	2	24	14	14		3	3	5				
53	432	27	97	57	26		57	5	2	1	1			2			
54	501	25	64	20	13		20	8	8	1	1	2	2	1	1		1
55	331	42	47	34	6	7	34	1									
56	121	89	40	64	9	5	64	1			1			1			
57	114	20	6	18	8	65	18	3									
Su	6,278	1,126	748	721	631	602	313	253	107	87	59	39	16	10	5	3	5

Table 5.–Sablefish maturity stages from observation of gonad gross morphology, found in samples taken during the 2009 SSEI sablefish longline survey

Maturity Stage	Number of Males	Number of Females	Sex indiscernible	Total
Immature	37	18	9	64
Maturing Juvenile	62	89	0	151
Mature/developing	25	7	0	32
Spawning	1	1	0	2
Spent/post spawning	24	53	0	77
Resting	56	46	0	102
Not observed	0	0	1	1
Total	214	205	10	429

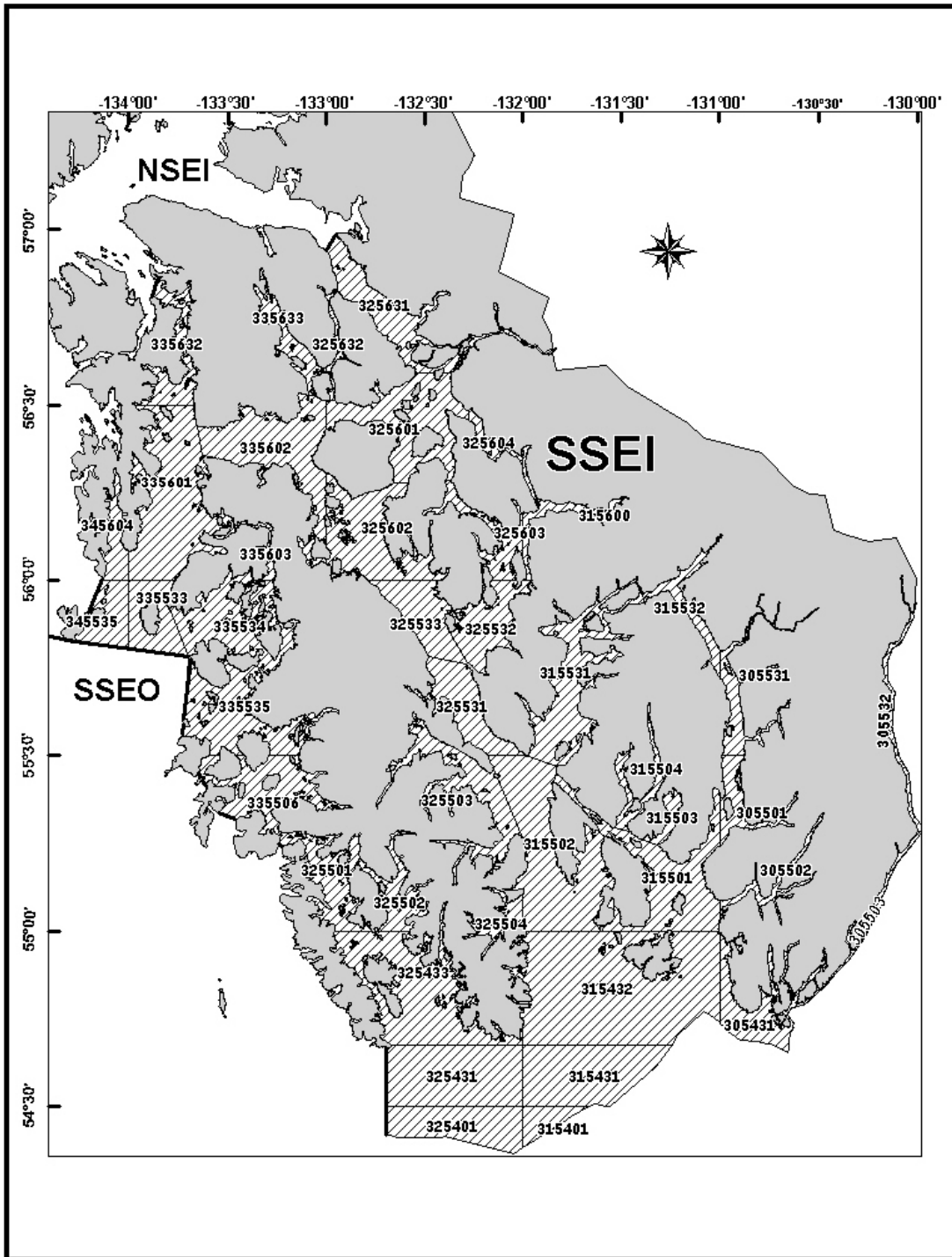


Figure 1.— The marine waters included in the Southern Southeast Inside (SSEI) Subdistrict. Adjacent Groundfish Management areas include Northern Southeast Inside (NSEI) and Southern Southeast Outside (SSEO).

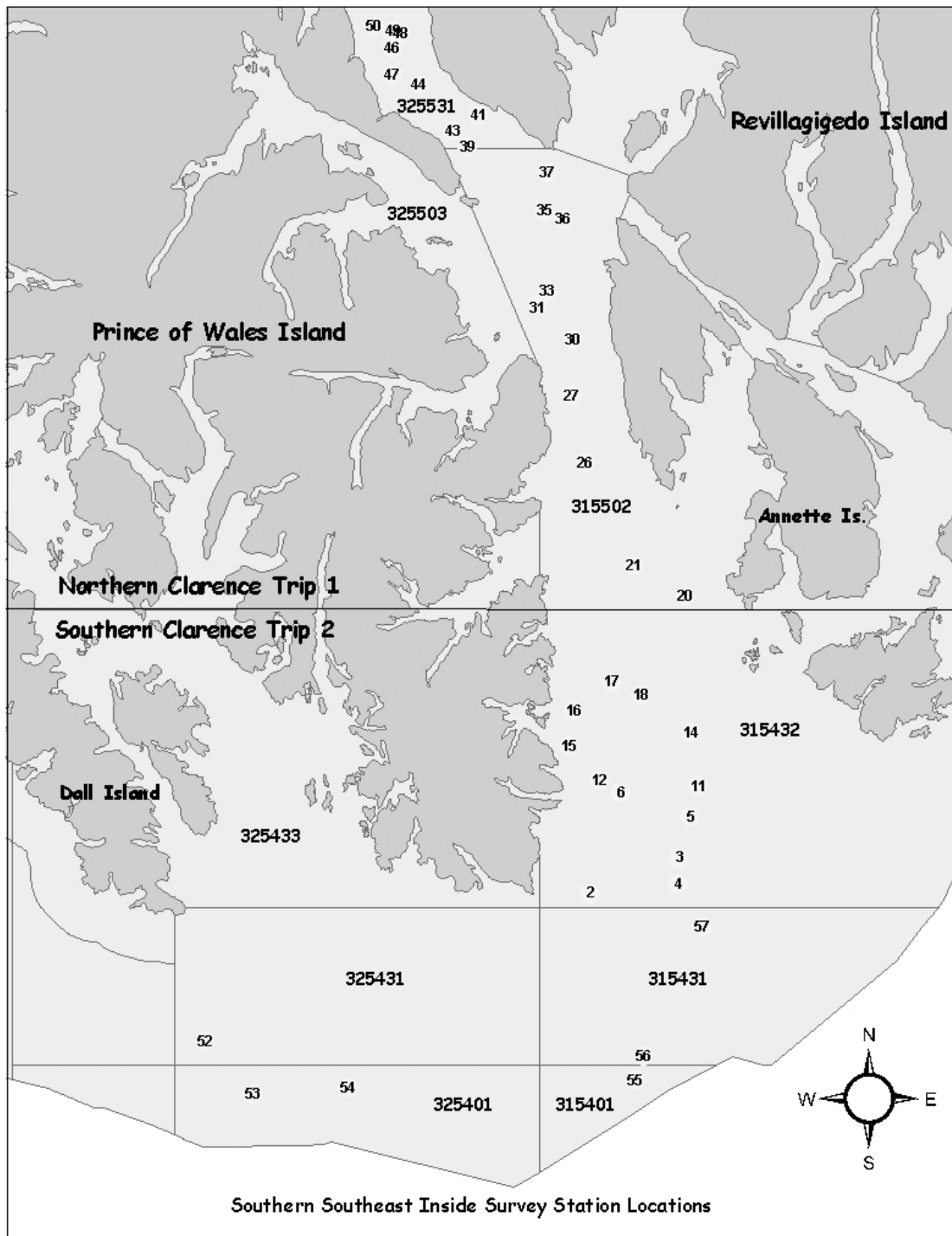


Figure 2.– The marine waters included in the Southern Southeast Inside (SSEI) Subdistrict including survey station locations, statistical areas, and trip station assignments.

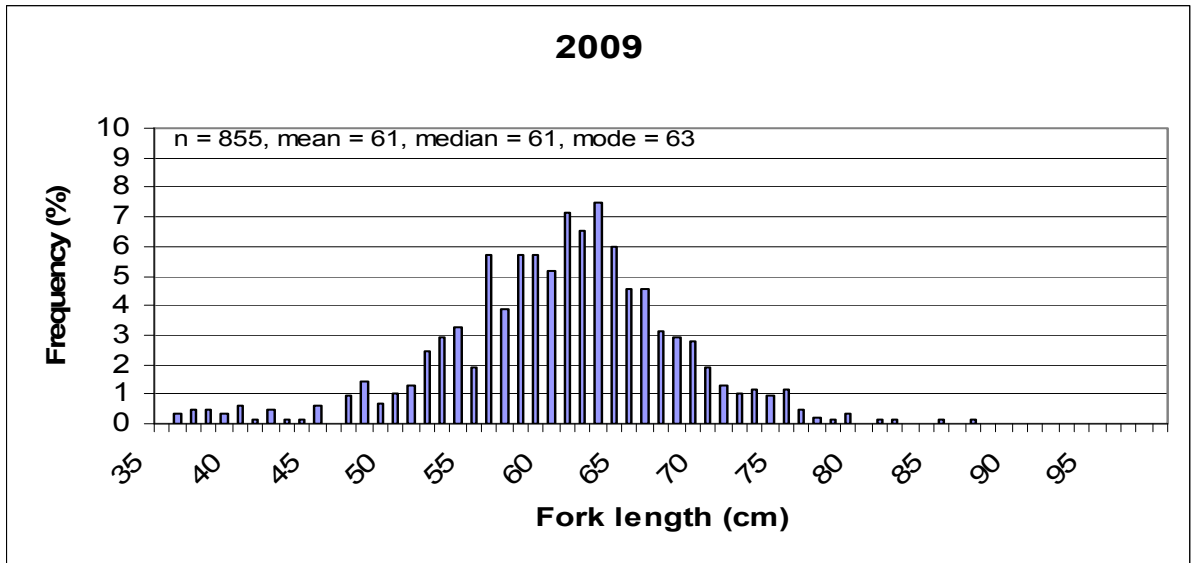


Figure 3.—Sablefish length frequency distribution, from the 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey.

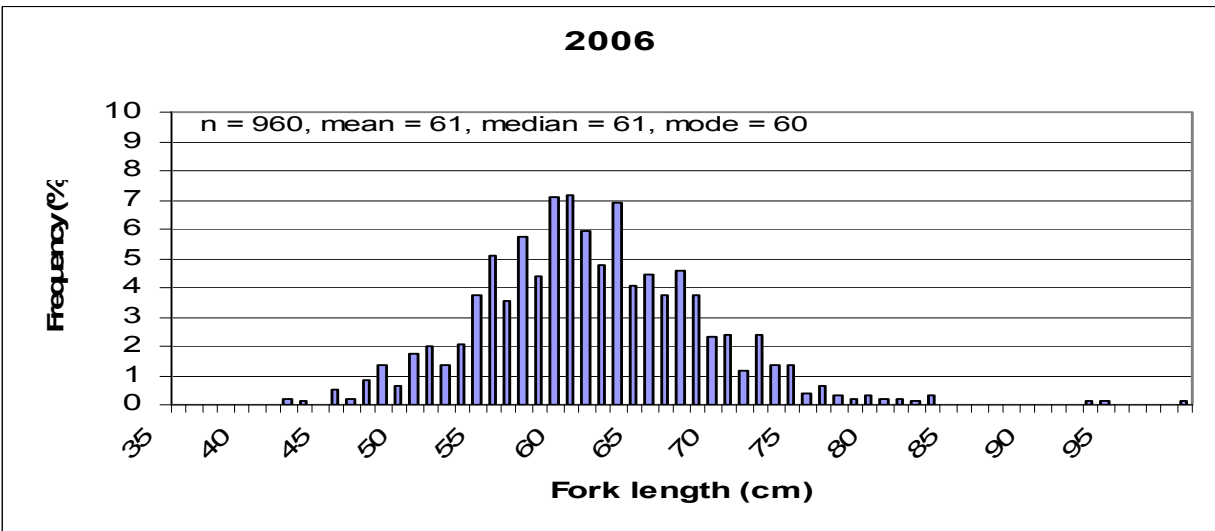
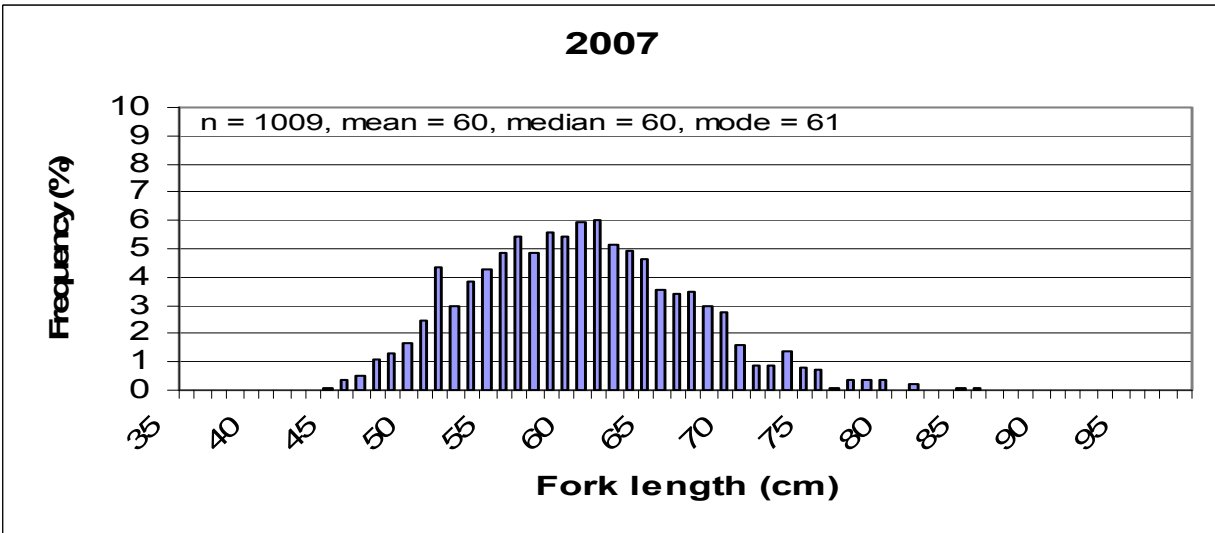
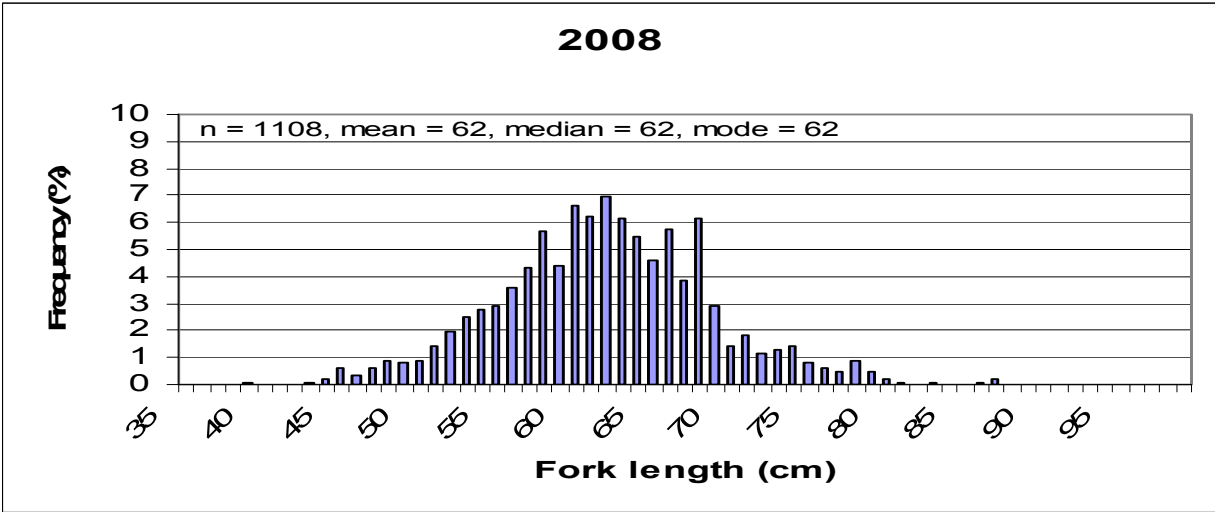


Figure 4.–Sablefish length frequency distributions from the 2006 to 2008 Southern Southeast Inside (SSEI) Subdistrict sablefish longline surveys

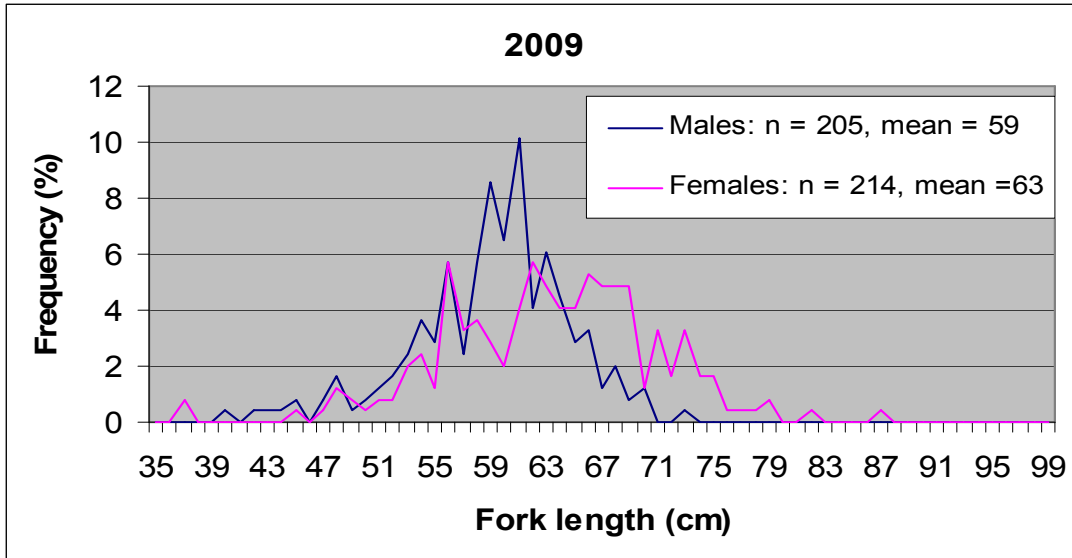


Figure 5.–Sablefish length frequency distribution by sex from the 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey

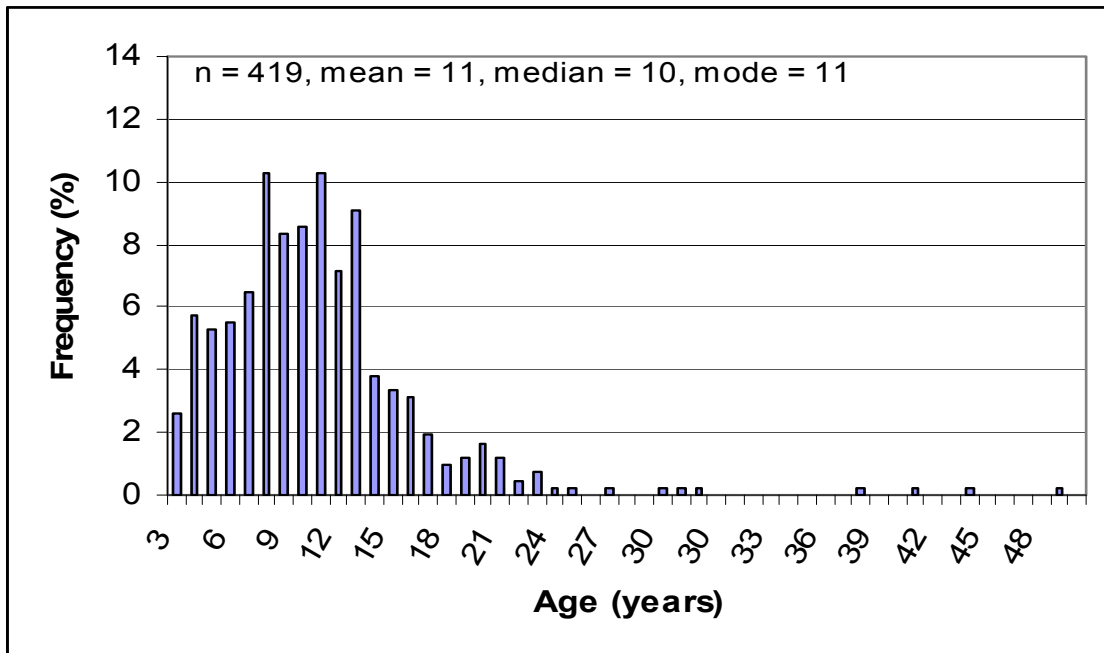


Figure 6.–Sablefish age frequency distribution, from the 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey

APPENDICES

Appendix A.–Set location information for the 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey.

Station	Area description	Start Position				End Position			
		Lat. deg.	Lat. min.	Long. deg.	Long. min.	Lat. deg.	Lat. min.	Long. deg.	Long. min.
2	Cape Chacon	54	39.76	131	54.25	54	41.23	131	54.05
3	W.Devil Rock	54	43.60	131	43.80	54	44.11	131	43.79
4	W.Devil Rock	54	41.94	131	44.08	54	43.44	131	43.97
5	West Rock	54	46.38	131	42.69	54	47.77	131	42.80
6	McLean Point	54	46.54	131	50.72	54	48.11	131	50.64
11	West Rock	54	49.95	131	41.73	54	48.54	131	41.74
12	Island Point	54	50.27	131	52.82	54	48.73	131	53.02
14	Hassler Reef	54	50.57	131	42.66	54	51.90	131	42.60
15	Kendrick Island	54	50.96	131	56.44	54	52.50	131	56.51
16	Kendrick Island	54	54.44	131	55.66	54	52.96	131	55.92
17	Hidden Bay	54	55.21	131	51.62	54	53.63	131	51.45
18	Hidden Bay	54	55.24	131	48.18	54	53.75	131	48.20
20	Point Davidson	54	59.29	131	42.74	55	0.68	131	43.27
21	Rip Point	55	2.87	131	49.06	55	4.39	131	49.52
26	Wedge Island	55	10.99	131	54.08	55	9.38	131	54.66
27	Wedge Island	55	15.28	131	55.77	55	13.75	131	56.26
30	Chasina Point	55	19.07	131	55.74	55	17.50	131	55.48
31	Skin Island	55	19.81	132	0.04	55	18.36	131	58.54
33	Grant Cove	55	22.04	131	58.97	55	20.48	131	58.90
35	Vallenar Point	55	24.38	131	58.92	55	25.92	131	59.22
36	Vallenar Point	55	24.08	131	56.04	55	25.51	131	57.28
37	Caamano Point	55	28.42	131	59.03	55	29.13	132	1.33
39	Street Island	55	30.09	132	8.11	55	31.62	132	8.67
41	Niblack Point	55	32.11	132	6.85	55	32.91	132	9.28
43	Niblack Point	55	32.66	132	10.51	55	31.35	132	9.76
44	Ship Island	55	34.16	132	13.61	55	35.47	132	15.12
46	Ship Island	55	35.00	132	15.19	55	36.43	132	16.53
47	Windfall Harbor	55	36.10	132	17.74	55	34.71	132	16.60
48	Ship Island	55	36.12	132	14.41	55	37.40	132	15.66
49	Windfall Harbor	55	38.87	132	17.04	55	37.43	132	16.40
50	Tolstoi Point	55	39.17	132	19.07	55	37.67	132	18.64
52	Cape Muzon	54	31.49	132	40.57	54	31.51	132	37.93
53	Cape Muzon	54	27.98	132	35.14	54	28.04	132	32.36
54	Cape Muzon	54	28.46	132	21.73	54	28.40	132	24.43
55	Celestial Reef	54	28.95	131	48.98	54	30.49	131	48.94
56	Celestial Reef	54	30.54	131	47.97	54	32.08	131	47.89
57	W.Devil Rock	54	37.70	131	41.57	54	39.21	131	41.33

Appendix B.—Vessels, vessel crew, and scientific survey staff for the 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey.

Trip No.	Vessel	Name	Affiliation
Trip 1	Providence	Brian Kandoll	Skipper
		Matt Kandoll	Crew
		Scott Kandoll	Crew
		Jim Edgars	Crew
		Rebecca Knight	ADF&G vessel lead
		Jodi Neil	ADF&G
Trip 2	Masonic	Bill Lewis	Skipper
		Kyle Underwood	Crew
		Dane Lewis	Crew
		Casper Harvey	Crew
		Kamala Carroll	ADF&G survey leader
		James Shewmake	ADF&G

Appendix C.–Tide table for Morse Cove, Duke Island, May 13–22, 2009

Date	AM High tide	Ft.	PM High tide	Ft.	AM Low tide	Ft.	PM Low tide	Ft.
May 13	03:25	14.7	16:40	12.4	10:05	0.1	22:06	4.9
May 14	04:05	13.9	17:26	11.8	10:47	0.9	22:54	5.4
May 15	04:50	12.9	18:18	11.5	11:34	1.7	23:53	5.7
May 16	05:44	12.0	19:15	11.5	--	--	12:27	2.4
May 17	06:52	11.3	20:13	11.9	01:05	5.6	13:25	2.9
May 18	08:07	11.0	21:04	12.6	02:19	4.9	14:24	3.1
May 19	09:19	11.2	21:50	13.6	03:24	3.7	15:19	3.2
May 20	10:21	11.9	22:32	14.7	04:17	2.2	16:10	3.1
May 21	11:17	12.7	23:14	15.8	05:05	0.6	16:58	3.0
May 22	12:07	13.5	23::59	16.8	05:50	-1.0	17:44	2.8

Appendix D.–Sablefish maturity stages and criteria used by the Alaska Department of Fish and Game

Maturity stage	Description of males at stage	Description of females at stage
Immature	Testes very narrow, parallel, flat and ribbon-like, almost clear in color. Longitudinal creases are easily discernable.	Ovaries appear as two narrow (slender) ovoids. May be veined. It may be easiest to determine immature from maturing juvenile ovaries while ovaries are intact in fish.
Maturing juvenile	Testes enlarging, not ribbon-like, with four discernable creases running full length. Light pink in color. Has not spawned before.	Ovaries enlarging, translucent and pinkish to clear: eggs not yet discernable. Has not spawned before. Will spawn in the coming year. More veined. Cloudy, but not necessarily throughout.
Mature/developing	Testes large and white, each with four distinct lobes. No milt present.	Ovaries large and becoming white to yellowish white with developing eggs discernable and firmly attached.
Spawning	Testes very large and white, extruding milt freely under slight pressure or when cut.	Ovaries very large with large translucent eggs loose within ovary or extruding from the oviduct.
Spent/post spawning	Testes large, shriveled, often with wrinkles, and bloodshot. No milt present.	Ovaries shriveled and opaque, soft and flaccid, often reddish in color.
Resting	Testes large and firm, light brown to off-white in color. No milt present. Has spawned previously. May have wrinkles.	Ovaries large, firm and opaque, not shriveled. No eggs discernable. Has spawned previously. Noticeable follicle structure.

Appendix E.—Winning fish buyer bid for the 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey, Trident Seafoods—Ketchikan.

Species	Cut	Size	Dressed lbs.	Price per lb (\$)	Extended price (\$)
Sablefish	Eastern cut	under 2	550	3.00	1,650.00
Sablefish	Eastern cut	2–3	3346	3.50	11,711.00
Sablefish	Eastern cut	3–4	7147	4.60	32,876.20
Sablefish	Eastern cut	4–5	5064	4.85	24,560.40
Sablefish	Eastern cut	5–7	2585	5.25	13,571.25
Sablefish	Eastern cut	over 7	494	5.25	2,593.50
Sablefish-#2	Eastern cut	under 2	9	2.40	21.60
Sablefish-#2	Eastern cut	2–3	154	2.80	431.20
Sablefish-#2	Eastern cut	3–4	304	3.68	1,118.72
Sablefish-#2	Eastern cut	4–5	207	3.88	803.16
Sablefish-#2	Eastern cut	5–7	104	4.20	436.80
Sablefish-#2	Eastern cut	over 7	17	4.20	71.40
Shortraker rockfish	Head-on, split belly	n/a	993	.20	198.60
Redbanded rockfish	Head-on, split belly	n/a	137	.20	27.40
Rougheye rockfish	Head-on, split belly	n/a	148	.20	29.60
Misc. rockfish	Eastern cut	n/a	0	.20	0.00
Thornyhead	Round	n/a	0	1.25	0.00
Pacific Cod	Round	n/a	229	.10	22.90
Total					90,123.73

Appendix F.–Set dates, times, soak and haul durations, haul order, and depths, 2009 Southern Southeast Inside (SSEI) Subdistrict sablefish longline survey..

Trip	Effort	Station	Date	Set Time	Time (hr:min)		Haul order	Depth (fm)		
					Soak duration	Haul duration		Start	End	Avg.
1	1	50	05/15	4:30	3:25	1:25	Same	338	369	360
1	2	49	05/15	5:15	4:45	1:23	Same	344	338	341
1	3	47	05/15	6:50	5:55	1:38	Same	263	268	252
1	4	48	05/15	12:30	3:00	1:34	Same	327	343	338
1	5	46	05/16	4:20	3:10	1:27	Opposite	266	337	312
1	6	44	05/16	5:10	4:30	1:42	Opposite	269	324	286
1	7	41	05/16	6:45	5:45	1:43	Same	227	209	244
1	8	43	05/16	12:10	3:15	1:39	Opposite	217	222	212
1	9	39	05/17	4:20	3:40	1:31	Opposite	251	269	273
1	10	37	05/17	5:35	4:55	1:20	Opposite	232	243	241
1	11	36	05/17	6:55	7:00	1:28	Same	242	230	255
1	12	35	05/17	13:15	3:05	1:06	Same	239	262	249
1	13	20	05/19	4:20	3:05	1:35	Same	224	219	219
1	14	21	05/19	5:15	4:30	1:18	Same	227	232	229
1	15	26	05/19	12:45	3:00	1:35	Opposite	235	211	212
1	16	27	05/19	14:10	3:50	1:20	Opposite	196	199	197
1	17	30	05/20	2:10	3:12	1:20	Opposite	240	218	234
1	18	31	05/20	3:12	4:03	1:10	Opposite	237	234	241
1	19	33	05/20	4:22	4:33	1:11	Opposite	220	222	220
2	1	18	05/15	6:32	3:38	1:59	Same	225	225	225
2	2	17	05/15	7:27	6:43	1:47	Opposite	227	227	227
2	3	16	05/15	13:43	3:01	1:34	Same	233	232	232
2	4	15	05/16	5:00	3:00	1:20	Opposite	233	233	239
2	5	14	05/16	6:40	4:36	1:50	Opposite	225	235	230
2	6	12	05/16	10:20	4:25	1:45	Opposite	222	115	220
2	7	6	05/16	14:29	3:04	1:35	Same	214	217	215
2	8	5	05/17	6:13	3:42	1:31	Opposite	227	227	227
2	9	11	05/17	8:59	4:39	1:51	Opposite	261	248	261
2	10	4	05/17	12:56	4:35	1:49	Same	209	209	208
2	11	3	05/17	16:57	3:21	2:05	Same	210	210	210
2	12	2	05/19	5:48	3:03	1:55	Same	198	201	199
2	13	57	05/19	7:08	4:52	1:35	Opposite	226	235	230
2	14	55	05/19	15:35	3:06	2:00	Same	194	192	193
2	15	56	05/19	16:58	4:14	2:13	Same	188	187	187
2	16	52	05/20	6:06	3:03	1:56	Same	197	200	200
2	17	53	05/20	7:57	5:41	1:58	Opposite	207	202	205
2	18	54	05/20	12:53	3:47	1:43	Opposite	195	199	197

Set time is when the second anchor went overboard. Soak duration is between the set time and when the first anchor came aboard. Haul duration is between when the first and second anchors came aboard.