

Southern Southeast Inside (Clarence Strait) Sablefish Longline Survey

by

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and

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June 2021

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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

REGIONAL OPERATIONAL PLAN NO. ROP.CF.1J.2021.07

**SOUTHERN SOUTHEAST INSIDE (CLARENCE STRAIT) SABLEFISH
LONGLINE SURVEY**

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This document should be cited as follows:

Ebert, E. T., and R. K. Ehresmann. 2021. Southern Southeast Inside (Clarence Strait) sablefish longline survey. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Operational Plan No. ROP.CF.1J.2021.07, Petersburg.

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Signature Page

Project Title: *Southern Southeast Inside (Clarence Strait) Sablefish
Longline Survey*

Project leader(s): *Erica T. Ebert*

Division, Region and Area: *Commercial Fisheries, Region 1, Petersburg*

Project Nomenclature: *TF-187 TF SE Groundfish*

Period Covered: *2021*

Field Dates: *12 May-23 May*

Plan Type: *Category I*

Approval

Title	Name	Signature	Date
Project leader	Erica T. Ebert		06/18/2021
Research Coordinator	Andrew P. Olson		06/18/2021

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PURPOSE

This regional operational plan details the methodology for the annual Southern Southeast Inside (SSEI) Subdistrict sablefish *Anoplopoma fimbria* longline survey. The longline survey's primary objective is to estimate the relative abundance of sablefish through documentation of catch per unit effort (CPUE) at fixed random stations in the SSEI Subdistrict. In addition, department personnel collect fishery independent biological data (age, length, weight, and maturity) of sablefish during the longline survey. The survey results are used in conjunction with fishery CPUE, biological information, and regional trends in sablefish populations to establish the SSEI annual harvest objective (AHO).

BACKGROUND

Sablefish are found in the northeastern Pacific Ocean, ranging from Baja, California to the Aleutian Islands and into the Bering Sea (Mecklenburg et al. 2002). Adult sablefish inhabit the deep waters of the continental shelf, slope, and coastal fjords. While most adults live at depths ranging from 366 m to 914 m [200 to 500 fathoms (fm)], sablefish have been captured at depths over 1,829 m (1,000 fm; Allen and Smith 1988). Sablefish are a long-lived species and have been aged to at least 94 years old in Alaska waters (Munk 2001); however, sablefish captured by the commercial fisheries in Southeast Alaska are often not older than 20 years (Mueter 2010).

The sablefish fishery within the Southern Southeast Inside (SSEI) Subdistrict waters (Figure 1) dates to the early 1900s, with the fishery becoming a regular feature in annual reports by 1935, and regulations governing the fishery passing in 1945 (Barry Bracken, Groundfish Project Leader, ADF&G Commercial Fisheries Management and Development Division, Petersburg, memorandum to Carl Rosier, Commissioner, ADF&G, Juneau, June 17, 1994). While the fishery remained small in comparison to the Northern Southeast Inside (NSEI) Subdistrict sablefish fishery, by 1973 it became a developed fishery that was prosecuted utilizing longline and pot gear (Holum and Coonradt 2005). The original SSEI Subdistrict consisted of Clarence Strait, Sumner Strait, Behm Canal, Ernest Sound, the outer coast of Prince of Wales Island, and a portion of southern Frederick Sound. The waters of Dixon Entrance were not formally recognized by the State of Alaska as part of the SSEI Subdistrict until 1983 (Holum and Coonradt 2005). As fleet effort and efficiency increased and the number of fishery days decreased over the next decade, the equal quota share (EQS) management system was implemented in 1997, with 30 longline permits and 5 pot permits authorized to fish SSEI (Holum and Coonradt 2005). The EQS system with limited entry being used to manage the SSEI sablefish fishery with a maximum of 22 permits allowed to fish since 2019.

Sablefish stock assessment surveys in the SSEI Subdistrict began in 1979; however, these surveys were not standardized (Holum and Coonradt 2005). In 1988, the Alaska Department of Fish and Game (ADF&G) began conducting an annual standardized longline research survey in SSEI to assess the relative abundance of sablefish over time. Fixed sampling stations were randomly assigned within 3 statistical areas in Clarence Strait (325531, 315502, 315432) where most of the fishing effort was focused, with each statistical area considered a separate stratum (Stahl et al. 2014). Survey stations were added to Dixon Entrance in 1996 as commercial fishery effort shifted over time (Figure 2). In 1997, survey methods were standardized to the National Marine Fisheries Service (NMFS) sablefish longline survey, which included switching bait from herring to cut squid and modifying survey soak times from 1 hour to a minimum of 3 hours and maximum of 11 hours (Sigler 2000). Furthermore, in 2000 the department began using standardized skates of conventional longline gear built to similar specifications as NMFS longline survey gear (Table 1; O'Connell et al. 2002). This gear consisted of 2 m (78 in) spacing

of hooks attached to the groundline with 38 cm (15 in) gangions with beackets (Carlile et al. 2002).

In 2013, the SSEI survey was redesigned to improve the spatial coverage of the survey relative to the fishery as commercial harvest shifted from Clarence Strait into Dixon Entrance (Stahl and Baldwin 2013). Survey stations were proportionally allocated relative to the area of sablefish habitat by strata, with statistical areas included in the redesign that had 3% or more of the commercial fishery harvest on average from 2003 to 2012 (Stahl et al. 2014). The survey redesign also included increasing the minimum distance between stations to 5,400 m based on the average set length of 3,000 m and the distance sablefish can detect bait odor after 1 hour of soaking (1,200 m; Løkkeborg et al. 1995; Sigler 2000). The overall number of survey stations decreased from 37 to 29 stations in 2013, to maintain both the proportional allocation scheme by strata and to accommodate additional survey time needed to survey the more exposed stations in the Dixon Entrance area (Figure 2; Stahl et al. 2014).

OBJECTIVES

1. Collect CPUE data to estimate relative abundance of sablefish in the SSEI Subdistrict.
2. Collect biological data (otoliths, fork length, weight, sex, and maturity) from 550 sablefish during the survey.
3. Measure an additional 550 sablefish (fork length) during the survey.
4. Identify and enumerate, to the lowest possible taxonomic group, all species captured on longline gear during the survey.

METHODS

SURVEY DESIGN

A total of 29 longline survey stations (Table 2) have been fished in the annual survey since 2013; however, in 2016 and 2017, a total of 28 stations were fished, and in 2019, 24 stations were fished due to time constraints with having only 1 chartered vessel conducting the survey. Typically, 2 vessels are chartered to conduct the annual survey; one is assigned to trip 1, fishing the northern portion (15 stations) of the survey, and the other is assigned to trip 2, fishing the southern portion (14 stations). Timing of the survey is based on the most favorable tide series (i.e., smallest difference between low and high tides) occurring between late April and May. In the event of weather or mechanical delays, the duration of the survey may be extended to a maximum of 14 days.

Each vessel is staffed with 2 scientific ADF&G crew members, 1 of whom is assigned as crew leader. ADF&G staff are responsible for data collection and entry, as well as the adherence to survey protocols outlined in this document. The vessel crew consists of a captain (skipper) and 3 experienced crewmen. The skipper is responsible for general navigation, crew supervision, and control of the vessel. The vessel fishing the northern portion of the survey sets gear at 3 stations per day for 5 days, and the vessel fishing the southern portion of the survey sets gear at 3 stations per day for 4 days and has 1 day in which only 2 stations are fished. The skipper on this trip selects the shorter day at their discretion. The ADF&G crew leader on each vessel works with the skipper to adjust the number of sets fished per day to accommodate changes in weather, whale depredation, problems with gear or the vessel, or other issues that arise. If winds exceed

25 knots, fishing operations may be suspended to provide for the safety of crew and to prevent deterioration of data quality due to loss of fish in rough seas.

One longline set occurs at each station, and each set consists of 25 standardized 100 m (approximately 55 fm) skates of medium lay 1 cm (3/8 in) American SSR 100 nylon line. A skate consists of 45 Mustad® 39965D #13/0 circle hooks attached approximately 38 cm (15 in) from the groundline with a becket (#72 medium lay twine) and gangion (#60 medium lay round braid twine), and hooks are spaced 2 m (78 in) apart for a total of 1,125 hooks per set. There are 5 m (16 ft) of bare groundline at each skate end, including a spliced 46 cm (18 in) long loop at either end for connecting skates. Skates are weighted with a 3.2 kg (7 lb) cannonball connected by heavy gangion line to a longline snap, which is then attached to the loop at each skate end for a total of 26 weights per set. The end of each set is connected to 366 meters (200 fathoms) of running line, a 27 kg (60 lb) longline anchor, and buoy line with buoys and a “highflyer” flagpole. New hooks are attached to the gear at the start of each survey. Bent or broken hooks are replaced throughout the survey to allow for equal catchability on all hooks. The vessel crew is responsible for overhauling the gear after each set and ensuring the gear remains in good condition throughout the survey.

Each vessel receives 1,043 kg (2,300 lb) of squid for bait. ADF&G staff calculates the rate of bait used at the first 3 stations to ensure enough bait is available to fish all survey stations. The rate of use is approximately 5.7 kg (12.5 lb) per 100 hooks. Bait must be freshly cut squid, thawed no more than 24 hours prior to use. Squid bait is cut into 3.8 cm to 5 cm (1.5 in to 2 in) pieces. The head and the tentacles of the squid are discarded, using only the mantle and viscera of the squid as bait. Staff records details of the vessel, crew, and bait usage on the Vessel Information Form (Appendix A).

Pre-printed Survey Set Forms (Appendix B) for each station are provided and completed with trip number, station number, statistical area, and start and end coordinates for each set. It is at the skipper’s discretion which end is set first based on ocean and tide conditions. All attempts are made to set between the 2 locations; however, the current or weather may force a deviation from course to fish the gear appropriately. If it is necessary to set differently, the set should be made as close to the original location points as possible. The start and end positions for each set are the locations where the anchors are deployed overboard. Any problems, unforeseen events, skipper comments, and start and end of the workday should be documented on the Daily Log Form (Appendix C).

Sets soak between 3 to 11 hours, as measured from second anchor overboard to first anchor on board. The length of soak is at the skipper’s discretion and depends on weather, killer whale *Orcinus orca* or sperm whale *Physeter macrocephalus* depredation, presence of hagfish Myxinidae or sand fleas Lysianassoidea, or other boat traffic in the area. No more than 2 sets should be in the water at any time to reduce loss of fish to sand fleas. Seabird avoidance devices are required when setting gear in statistical areas 325431 and 325401. This includes trip 1 station 123 and trip 2 stations 124, 125, 126, 127, 128, and 129 located in the Dixon Entrance area (Table 2).

The vessel provides a crewman who operates the roller to haul each set. Prior to hauling gear, a 46 cm (18 in) mark is placed on the railing next to the roller so the operator can measure undersized fish. Sablefish less than the 46 cm (18 in) mark may be gently released at the roller due to low market value and to allow for future spawning potential. All other sablefish, rockfish

(*Sebastes* sp.), and Pacific cod (*Gadus macrocephalus*) are to be retained for sale. Thornyhead rockfish (*Sebastolobus* sp.) that appear healthy are released, while dead or mortally injured thornyhead rockfish are retained for sale. All other catch is carefully released with minimum damage. Fish returned to the water are not to be gaffed or allowed to go through the brushes or a crucifier. Vessels with unfilled Pacific halibut (*Hippoglossus stenolepis*) individual fishing quota (IFQ) on board may retain legal halibut up to their IFQ amount; however, vessels without halibut IFQ must immediately release all Pacific halibut. A reasonable effort should be made to untangle live Pacific sleeper sharks (*Somniosus pacificus*) prior to moving on to other methods of separating the shark from the gear.

DATA COLLECTION

Hook Accounting

One ADF&G staff member records detailed set information during deployment and retrieval (haulback) of each set on the Survey Set Form (Appendix B) and on the tablet using the At-Sea Electronic Sampling (ACES) application (Appendix D). These forms capture the weather condition while setting, time of deployment and retrieval for anchors and buoys, and depths of each anchor and skate (Appendices E and F). The staff member who completes these forms while setting and hauling gear is also responsible for the hook accounting component of that set. This staff member must position themselves in a location where they have an unrestricted view of the intersection of the longline gear and the ocean surface to begin tallying the hooks of the set using the ACES hook accounting application (Appendix G). The staff member keeps a set of paper Hook Accounting Forms (Appendix H) nearby in a clipboard in case the tablet fails, or if weather (rain) does not allow for using the tablet for hook accounting. It is the responsibility of the person conducting the hook accounting to identify and enumerate, to the lowest possible taxonomic group, all species captured on longline gear during the survey. The other ADF&G staff, who is collecting biological samples on deck, should document any irregularities or issues that the other staff person encounters on all-weather paper. This procedure allows the hauling of gear to remain uninterrupted throughout the set.

The roller should be operated at a speed and in a manner to allow accurate tallies. Staff should request that the gear be slowed or stopped if additional time is needed to document the disposition of hooks. Hooks are assigned a code based on their status as the hook breaks the surface of the water. See Appendix I for hook categories and disposition combinations utilized during the SSEI longline survey. If a fish becomes separated from the hook below the water surface, the hook is tallied as either a bare or baited hook. A hook returning with 2 fish attached as the hook breaks the surface is considered a “re-bite” and only the original fish is counted in the hook count tally, while the second fish is noted by species in the skate comment section as a “re-bite.” Thornyhead rockfish are released on the SSEI survey if alive and healthy; however, if a thornyhead cannot be released alive and is retained onboard, there is not an option in the ACES application to document that disposition. Instead, staff should select discard thornyhead and flag the note box on the ACES hook accounting screen, noting the number of thornyhead rockfish retained on that skate. While finalizing sets at the end of the day, staff must change those discard thornyhead tallies with flagged notes to retained thornyhead rockfish tallies.

As hooks are being tallied, every 10th sablefish is set aside for biological sampling. The sample rate calls for the collection of the first sablefish of the set and every 10th sablefish thereafter for the first 20 skates of each set. This systematic sampling design helps reduce bias regarding which

fish are sampled. The sample rate can be adjusted depending on the harvest of the first 2 days of the survey to ensure that the goal of 550 samples is reached. Staff conducting hook accounting alerts the crew member at the roller which specimens should be set aside. If a 10th fish is missed as a sample, the next sablefish is set aside for sampling, and so on. The ACES application emits an audible tone that notifies staff when a sample should be collected based on the number of sablefish tallied. There is also a visual display that provides a countdown to the next sample (Appendix G). In determining the 10th fish to be sampled, only “retained” sablefish and “discard small” sablefish are counted; lost sablefish or those discarded due to fleas, sharks, or other types of damage are not considered, as the fish condition would most likely make the fish unsuitable for sampling. Additional sablefish are collected and measured only for length data. The next sablefish following each regular biological specimen (second sablefish of the set and every 11th sablefish thereafter) is collected and segregated in a separate tub as a “length only” sample. The ACES application emits a different tone to indicate a sablefish is a length sample. This sablefish is also counted as the first fish in the tally toward the next biological sample.

Gear snarls can occur when setting the gear. When a multiple hook snarl is present during haulback, the gear is slowed or stopped. If a snarl involves more than 2 hooks, the snarl check box at the bottom of the ACES hook accounting form is marked (Appendix G). The vessel crewman operating the roller counts the total hooks involved in the snarl as they haul the gear across the roller for staff to record. Staff do not need to differentiate between bare and baited hooks in a snarl; all snarled hooks without fish are considered invalid. All fish present in a snarl are identified to the species level and enumerated appropriately for that skate. The number of invalid hooks is then determined by subtracting the number of fish in the snarl from the total hooks counted in the snarl. Hooks are also assigned the condition “invalid” if they are broken, hooked in the line, hooked to another hook, or missing (a broken gangion). If a skate has 12 or more invalid hooks, that entire skate is considered invalid. A skate may also be considered invalid if whale depredation is evidenced on a given skate or skates. Staff adjusts the status of a skate as invalid when finalizing skates by selecting “Not Valid” under the condition code drop down menu in ACES or by circling “N” under valid on the Hook Accounting form (Appendix H). The invalid skate is noted on the set’s comments and any sablefish from an invalid skate are not included in the calculation of that station’s CPUE.

If a skate breaks off or the gear is otherwise parted, the number of the skate that parted, as well as the time the end of the skate is retrieved on board, is recorded in the comments on the Survey Set Form (Appendix B). After resuming the haul on the opposite end of the set, staff shall advance the set number in ACES using the forward button to the next sequential skate and start tallying. Staff should continue collecting sablefish biological samples until a total of 20 skates have been sampled and the remaining 5 skates of gear are tallied. Once skate 25 is completed, the ACES screen is paged back to the parted skate to tally any remaining hooks for that subset. The “Date and Time of Second Anchor On board” is recorded on the Survey Set Form (Appendix B) as the time that the second end of the parted gear (end of the final skate hauled) is brought on board. Following the completion of the haul, staff rennumbers the skates to keep the hook tallies consistent with the sequence of the original set order. The first skate to the parted skate retain their original skate numbers; the remaining skates are renumbered in reverse order with skate 25 assigned to the skate after which the gear parted and the vessel began hauling the other end of the set.

If more than 25 skates are mistakenly set for a station, the extra skate(s) should be tallied separately as additional skate(s) and are not combined with the hook tally for skate 25. Additional skates in a set are noted in the set's comments and are included in the CPUE calculations on the Vessel Summary Form (Appendix J) for that station.

Should the vessel experience whale depredation with whales actively feeding off the gear, the vessel should cease setting additional gear in the area on that day, as the whales are likely to stay with the vessel until it leaves the area. The presence of orca or sperm whales are documented by selecting the whale box at the bottom of the ACES hook accounting screen for each skate in which whales are present (Appendix G). Any sablefish that appear to be whale-damaged (e.g., sablefish lips or head appears on the hook but no body) are recorded as "Disc. Other" in ACES and then corrected to the appropriate discard status during set data finalization, see below. Gear that is already set will need to be hauled prior to the expiration of the 11-hour soaking period, but the vessel should attempt to discourage additional depredation by traveling away from the set, in hopes that the whale(s) will move on. If that set is depredated, the vessel needs to consider other options prior to proceeding with additional fishing and options to discourage additional interactions should be discussed by the ADF&G crew leader, skipper, and/or project leader. It is believed that sperm whales cue on bubbles caused by cavitation from engine cycling. Techniques that may confuse whales and decrease depredation include reducing engine cycling, setting decoy buoys at least a mile away from set locations, avoiding lingering in the station area after a set is made, and traveling near shore and in shallower water. If feasible, staff should collect photos of the fluke (sperm whale) and left side of dorsal fin (orca) for identification by cetacean researchers.

Once the set's gear is hauled, each set is finalized in the ACES program directly on the tablet used to do the hook accounting. This involves verifying that hook counts are correct for each skate in the set, adding any missing data or comments, changing skate status to invalid when appropriate, correcting errors (misidentification of a species) that were made, editing "Disc. Other" and "unknown" species or codes to the proper selection, and addressing any additional set notes made by the other staff member. For example, sablefish marked as "Disc. Other" due to whale depredation must be changed to "Not marketable due to orca or sperm whale depredation" and noted in the skate comments field along with changing the skate status to invalid due to whale depredation. Skate comments should include any information describing why the skate was not fishing properly: line parting, hang-ups, snarls, the presence of whales, and shark or whale depredation. After reviewing each skate, staff types "verified" along with their initials and the date in the comment section of each skate to confirm data verification. After all skates have been verified, staff must review and verify that ACES has the correct set information (e.g., date and times of setting and hauling, and location of the set), and then should also add their initials and date with "verified" in the set comments. Comments affecting CPUE should be listed first when reporting set information in the set comments, such as too many or too few skates per set and number of invalid skates within the set. Once all 25 skates of a set are verified and set data and comments are verified, the set can be marked as finalized in ACES.

Biological Sampling

While 1 scientific staff member is hook accounting, the other is collecting biological samples. Sablefish biological samples consist of fork length (nearest whole centimeter), weight (nearest 0.1 kg), sex, and maturity and are recorded using the Groundfish At-Sea Survey Sampling application on the tablet (Appendix K); however, the biological sampler should also bring 2

Sablefish Biological Data Collection Forms on deck with them (Appendix L) in the event that the tablet fails. Specimen numbers are assigned sequentially to each sablefish sample with the first sablefish sampled on each set assigned as specimen 1.

After taking a fork length measurement, sablefish are weighed using a Marel[®] electronic motion compensation scale. The scale is calibrated at the start of each set and as sea conditions change. If the Marel[®] scale cannot be properly calibrated due to rough weather or other issues, a hanging scale may be used. When using the hanging scale, weight readings should be taken a second time to reduce misreading due to wave and wind action. Weight collection is skipped if the ocean conditions are not conducive to accurate and repeatable readings with either scale. Some sablefish may ingest water as they are hauled to the surface as evidenced by their swollen appearance. Samplers must purge the water from the fish stomachs prior to recording weight.

Following the collection of length and weight data, staff remove the specimen's otoliths. The otoliths are accessed by making a horizontal cut across the top of the head, about a centimeter deep. The 2 otoliths are in opposing grooves within the cartilage and forward of the brain. The otoliths are removed with forceps and are stored temporarily on deck in 32-unit pill boxes. The pill boxes are numbered from 1 through 32, 33 through 64, 65 through 96, and 97 through 100 and are reused for otoliths from 101 through 200 and so forth. Otolith numbers are assigned consecutively to sablefish with biological data beginning with the first sample collected (otolith 1) and ending with the last sample taken on the final set of the survey. Otolith numbers do not match specimen numbers, which restart numbering with 1 at the start of every set. To assign a specimen an otolith number in the Groundfish At-Sea Survey Sampling application (Appendix K), staff clicks on the "oto" button. Any notes for a sample's otolith condition are made by clicking "Notes" in the Groundfish At-Sea Survey Sampling application and selecting the corresponding condition from the "notes/otolith comments" pop-up menu or by writing in the comments box (Appendix K). Length only sablefish samples are not included in the otolith number sequence. The sampler should continually verify that the otolith number on the sampling form and tablet application matches the cell's lid number on the pill box to avoid errors in sequencing.

Otoliths are cleaned daily to avoid compromising otolith storage capacity on deck and to reduce the chance of sample loss due to accidental spillage. Otoliths should be cleaned at the end of the day inside the vessel cabin by immersing individual pairs in a small bowl of water to remove any remaining blood or tissue and gently dabbing them using a paper towel. No more than one pair of otoliths should be cleaned or removed from their pill box cell at a time to avoid accidental mixing. Staff should ensure notes recorded for otoliths on paper and in the sampling application (e.g., no otoliths, 1 otolith lost, etc.) match the number and condition of otoliths they are cleaning before placing them in the long-term storage 24-cell trays, which are labeled with trip information and specimen numbers (Appendix M). If no otoliths were collected for a specimen, the corresponding cell is left empty and uncapped. Any otolith sequence issues or abnormalities with the otoliths while collecting, cleaning, or storing the otoliths must be fully documented on the sampling application. Any questionable otoliths are noted and addressed in port with the Age Determination Unit (ADU).

After otoliths are extracted, sex and maturity data are collected by examining the specimen's gonads macroscopically. Sablefish are cut and dressed (eastern cut) to industry standards (Figure 3) to view the gonads. Male specimens are recorded with sex code "01" and females with code "02." A code of "00" is assigned to those specimens where the sex is not observed, and code

“99” to those that are indiscernible. Maturity is coded according to 1 of 2 stages, immature “01” or mature “07” (Figures 4 and 5). Sablefish with undeveloped gonads that have not previously spawned are assigned as immature. Fish with gonads that are developed and have spawned or are prepared to spawn are recorded as mature. Questionable gonads should be saved to review with the other staff member after the set’s haulback and hook accounting is complete. After sex and maturity data are recorded for a fish, the fish is cleaned with a scraper, rinsed with a deck hose, and then iced in a fish hold separate from round fish.

All tagged sablefish encountered on the survey are retained and the tag number, biological data, and set number are recorded on the Deck Tag Recovery Form (Appendix N). If a tagged fish was designated as a biological sample, the individual is treated like a random biological sample and the otoliths are included in the survey’s otolith series. The tag number is also noted in the comments section of the sampling application or the paper sample form for that specimen. Tags are removed from the fish and secured in a safe place (e.g., small sealable plastic bag or in an unused cell of the otolith pill box) on deck until the set is completed. Tags and associated information are then transferred to the Survey Tag Recovery Form (Appendix O) inside the vessel cabin in between sets or at the end of the day. If tags from other agencies are recovered (NMFS, ADF&G Homer, Fisheries and Oceans Canada Pacific Biological Station, or Japan), biological data (length, weight, sex, maturity, and otoliths) are collected from the tagged fish and mailed with the tag to the respective agency upon return to port. These otoliths are stored separately and not included in the survey’s otolith number sequence, unless they were collected as part of the systematic sampling.

At the end of each day, the Vessel Summary Form (Appendix J) is filled out for the stations fished that day. The form captures the CPUE and the average sablefish weight for each station. A cumulative estimate of the catch weight is calculated to give the processor an estimate of landing size on offload days. The CPUE and average weights can also be compared by station for the previous 3 surveys to estimate relative catches and to facilitate adjusting biological sample rates if needed (Table 3).

VESSEL SAFETY

The safety of department staff is of utmost importance and ADF&G staff can terminate a survey at any time if they feel that the vessel is unsafe or that the skipper is making poor decisions. If there is a situation on the vessel in which survey crew are in danger, the Garmin inReach® satellite communication device is utilized to contact the appropriate safety contacts for the current year’s survey. If the situation warrants immediate response, staff should contact the United States Coast Guard (USCG) directly. If staff are unsure whether a situation constitutes a safety concern, they should: 1) address the concern with the skipper, 2) contact the land-based safety contact and Groundfish Project Leader, and 3) document the circumstances as the situation allows, utilizing photos or videos if necessary.

Each survey binder has a Vessel Safety Checklist Form (Appendix P) that must be completed with the skipper prior to the vessel leaving the dock along with a Vessel Diagram Form (Appendix Q). The crew leader ensures that ADF&G staff have a safety orientation with the skipper that covers location and operation of the life raft, fire extinguishers, and other safety equipment. The Vessel Diagram Form illustrates locations of the necessary safety equipment and allows staff to orient themselves with the working space on deck. Staff are told where to report in an emergency and the best location to store their survival suits. Survey staff must wear a

personal flotation device (PFD) while on deck. A personal locator beacon (PLB) is assigned to each ADF&G staff on each vessel and are stored in an accessible location of their choice. Staff and PLB assignments are documented and sent to the appropriate shoreside safety contacts in the event that one is activated. The PLBs are manually activated and send a signal to the USCG once activated.

Survey vessels must notify a designated land contact between 8:00 AM and 3:00 PM of the vessel's status each day of the survey via an inReach® device. If a vessel has not contacted the land contact by 3:00 PM each day, the USCG will be notified of the situation at 907-463-2990. Additionally, each crew leader is responsible for conducting a daily check-in with the survey coordinator every morning via inReach® devices. The daily check-in should include each staff member's daily safety and wellbeing report, as organized each year by the survey coordinator. In addition, this daily check-in provides the opportunity to pass on any additional information or to ask questions. The inReach® devices have text message capabilities, and crew leaders utilize text messaging to communicate with other staff as needed. Crew leaders may communicate with each other using personal phones when adequate coverage is available. Survey vessel skippers may also be in communication by very high frequency (VHF) radio or TracFone®³ dependent on proximity. ADF&G staff are not authorized to use the vessel's radios or phones unless given direct permission by the skipper.

SCHEDULE AND DELIVERABLES

The SSEI longline survey coordinator will begin planning the annual longline survey in March, including ensuring two chartered vessels are contracted, opening a fish buy bid to local processors, organizing gear, and training ADF&G staff using the protocols outlined in this document. Chartered vessel skippers and ADF&G staff assigned to the longline survey are provided with survey gear and materials prior to the survey departure. The SSEI longline survey is then conducted in late April or early May.

RESPONSIBILITIES

Erica Ebert, Fishery Biologist I, Survey Coordinator and Crew Leader. Oversight of all aspects of the project, including operational planning, equipment inventory, ADF&G survey staff training, participation in survey, and data review.

Rhea Ehresmann, Fishery Biologist III, Groundfish Project Leader. Assists in oversight of all aspects of the project and utilizes survey results for the stock assessment the following year.

Aaron Baldwin, Fishery Biologist II, Crew Leader. Responsible for collecting data during the survey as outlined in this document and assisting ADF&G crew as needed while conducting the survey.

Elisa Teodori, Fish and Wildlife Technician IV, Crew. Responsible for collecting data during the survey as outlined in this document.

Madison Bargas, Fish and Wildlife Technician III, Crew. Responsible for collecting data during the survey as outlined in this document.

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TABLES

Table 1.—Gear history of the Southern Southeast Inside (SSEI) Subdistrict longline survey from 1988 to 2020. Gear was standardized in 2000, and no survey was conducted in 2005.

Year	ADF&G number	Vessel name	Gear type	Skate length (m)	Hook size	Hook spacing (m)	Tied gangion length (cm)	Bait	Skates per set	Hooks per skate	Soak time (hrs)
1988	41440	Isis	Snap	300	13 C	3	25	Herring	10	100	1
1989	41440	Isis	Snap	300	13 C	3	25	Herring	5	100	1
1990	99999	Isis	Snap	300	13 C	3	25	Herring	5	100	1
1991	99999	Isis	Snap	300	13 C	3	25	Herring	5	100	1
1992	41440	Isis	Snap	300	13 C	3	25	Herring	5	100	1
1993	99999	Isis	Snap	300	13 C	3	25	Herring	5	100	1
1994	99941	Medeia	Snap	300	13 C	3	25	Herring	5	100	1
1995	99941	Medeia	Snap	300	13 C	3	25	Herring	5	100	1
1996	99941	Medeia	Snap	300	13 C	3	25	Herring	5	100	1
1997	44450	Cherokee	Conv.	182.9	13 C	1.8	36	Cut Squid	15	100	3 to 11
	45211	Providence	Conv.	182.9	13 C	1.6	23	Cut Squid	15	100	3 to 11
1998	41043	Jennifer Lee	Conv.	164.6	13 C	1.6	28	Cut Squid	11	100	3 to 11
	45211	Providence	Conv.	182.9	13 C	1.6	23	Cut Squid	11	100	3 to 11
1999	41043	Jennifer Lee	Conv.	164.6	13 C	1.6	28	Cut Squid	11	100	3 to 11
	45211	Providence	Conv.	168.3	13 C	1.6	23	Cut Squid	11	100	3 to 11
2000	41043	Jennifer Lee	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2001	41043	Jennifer Lee	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2002	41043	Jennifer Lee	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2003	41043	Jennifer Lee	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2004	41043	Jennifer Lee	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11

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Table 1.–Page 2 of 3.

Year	ADF&G number	Vessel name	Gear type	Skate length (m)	Hook size	Hook spacing (m)	Tied gangion length (cm)	Bait	Skates per set	Hooks per skate	Soak time (hrs)
2006	41043	Jennifer Lee	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2007	33468	Masonic	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2008	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2009	33468	Masonic	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2010	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2011	33468	Masonic	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2012	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2013	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2014	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2015	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2016	52119	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	41022	Viking Maid	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2017	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	33468	Masonic	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11

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Table 1.–Page 3 of 3.

Year	ADF&G number	Vessel name	Gear type	Skate length (m)	Hook size	Hook spacing (m)	Tied gangion length (cm)	Bait	Skates per set	Hooks per skate	Soak time (hrs)
2018	33468	Masonic	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2019	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2020	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	59664	Sisu	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
2021	45211	Providence	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11
	33133	Predator	Conv.	100	13 C	2	38	Cut Squid	25	45	3 to 11

Table 2.–Southern Southeast Inside (SSEI) Subdistrict survey master station list.

Station number	Trip number	Statistical area	Start latitude	Start longitude	End latitude	End longitude	Area description
101	1	325533	55 48.71	132 28.76	55 50.11	132 29.83	Little Ratz Harbor
102	1	325533	55 48.06	132 24.93	55 46.95	132 23.96	Narrow Point
103	1	325531	55 40.87	132 18.48	55 42.30	132 19.65	Tolstoi Point
44	1	325531	55 34.10	132 13.52	55 35.40	132 15.03	Ship Island
37	1	315502	55 28.42	131 58.99	55 29.19	132 01.50	Caamano Island
31	1	315502	55 18.43	131 58.61	55 19.87	132 00.08	Skin Island
107	1	315502	55 10.53	131 54.26	55 12.13	131 54.48	Wedge Island
20	1	315502	55 01.87	131 43.66	55 00.39	131 43.16	Dall Head
109	1	315502	55 05.22	131 45.91	55 06.42	131 47.66	Canoe Cove
118	1	315431	54 39.76	131 47.72	54 38.31	131 47.78	West Devil Rock
119	1	315431	54 36.82	131 57.01	54 35.23	131 57.03	Cape Chacon
120	1	315431	54 32.73	131 51.19	54 34.39	131 51.83	Celestial Reef
121	1	315431	54 32.85	131 44.06	54 31.47	131 44.07	Celestial Reef
122	1	315431	54 33.78	131 40.11	54 35.42	131 40.01	West Devil Rock
123	1	325401	54 26.81	132 0.86	54 26.83	132 03.57	Celestial Reef
110	2	315432	54 59.73	131 50.31	54 58.19	131 50.36	Percy Island
111	2	315432	54 57.15	131 55.09	54 58.64	131 55.00	Ingraham Bay
18	2	315432	54 54.37	131 48.20	54 55.52	131 48.17	Hidden Bay
113	2	315432	54 50.62	131 40.06	54 49.15	131 41.14	West Rock
12	2	315432	54 48.75	131 53.00	54 50.30	131 52.81	Island Point
115	2	315432	54 46.54	131 54.61	54 44.93	131 54.60	McLean Arm
116	2	315432	54 42.83	131 50.46	54 44.29	131 50.43	Cape Chacon
117	2	315432	54 41.04	131 41.73	54 42.55	131 41.64	West Devil Rock
124	2	325431	54 30.51	132 12.54	54 30.53	132 15.40	Point Nunez
125	2	325431	54 32.13	132 21.20	54 32.14	132 18.83	Point Marsh
126	2	325401	54 27.32	132 18.97	54 27.29	132 16.30	Surf Point
127	2	325401	54 27.42	132 26.45	54 27.40	132 23.73	Point Marsh
128	2	325431	54 30.66	132 35.40	54 30.69	132 38.19	Cape Muzon
129	2	325401	54 26.28	132 36.65	54 26.30	132 39.09	Cape Muzon

Table 3.—Station catch per unit effort (CPUE; sablefish per hook) and average sablefish weight (kg) from the 2018 to 2020 Southern Southeast Inside (SSEI) Subdistrict longline surveys with average for all 3 years. In 2019, 5 stations were not fished during the survey due to time constraints of only having 1 charted vessel conducting the survey.

Trip	Station number	2018		2019		2020		Average	
		Sablefish per hook	Average weight (kg)	Sablefish per hook	Average weight (kg)	Sablefish per hook	Average weight (kg)	Sablefish per hook	Average weight (kg)
1	20	0.17	1.45	0.21	1.54	0.14	1.64	0.17	1.54
1	31	0.09	1.86	NA	NA	0.10	1.44	0.09	1.65
1	37	0.23	2.40	NA	NA	0.23	2.15	0.23	2.28
1	44	0.34	1.68	NA	NA	0.27	1.57	0.31	1.63
1	101	0.25	1.36	0.17	1.45	0.22	1.81	0.21	1.54
1	102	0.20	1.68	0.16	2.68	0.24	2.61	0.20	2.32
1	103	0.23	1.36	0.20	2.00	0.22	2.07	0.22	1.81
1	107	0.35	1.95	0.35	2.09	0.28	2.10	0.33	2.05
1	109	0.23	2.04	0.24	2.22	0.28	1.89	0.25	2.05
1	118	0.39	1.63	0.22	1.63	0.45	1.91	0.35	1.73
1	119	0.33	1.91	0.26	2.22	0.34	2.25	0.31	2.13
1	120	0.43	1.77	0.23	2.00	0.38	1.68	0.35	1.81
1	121	0.15	1.04	0.13	1.00	0.19	1.42	0.16	1.15
1	122	0.36	1.77	0.13	1.86	0.34	2.17	0.28	1.93
1	123	0.32	1.81	NA	NA	0.38	1.58	0.35	1.70
2	12	0.25	1.09	0.25	1.54	0.31	1.51	0.27	1.38
2	18	0.18	1.13	0.13	1.00	0.16	1.51	0.16	1.21
2	110	0.15	2.27	0.15	1.68	0.20	1.84	0.17	1.93
2	111	0.15	1.41	0.17	1.68	0.12	2.14	0.15	1.74
2	113	0.25	1.50	NA	NA	0.39	1.46	0.32	1.48
2	115	0.11	1.59	0.12	2.00	0.18	1.66	0.14	1.75
2	116	0.15	1.04	0.13	1.18	0.47	1.34	0.25	1.19
2	117	0.08	1.63	0.18	1.77	0.41	1.62	0.22	1.68
2	124	0.19	2.18	0.24	1.86	0.34	2.18	0.26	2.07
2	125	0.32	2.27	0.26	2.31	0.30	1.98	0.29	2.19
2	126	0.36	1.95	0.24	1.72	0.47	1.68	0.36	1.79
2	127	0.22	1.77	0.24	1.68	0.59	1.66	0.35	1.70
2	128	0.23	2.81	0.19	2.81	0.27	2.10	0.23	2.58
2	129	0.12	2.27	0.25	1.54	0.38	1.69	0.25	1.83
Average		0.23	1.77	0.20	1.81	0.30	1.82	0.24	1.80

FIGURES

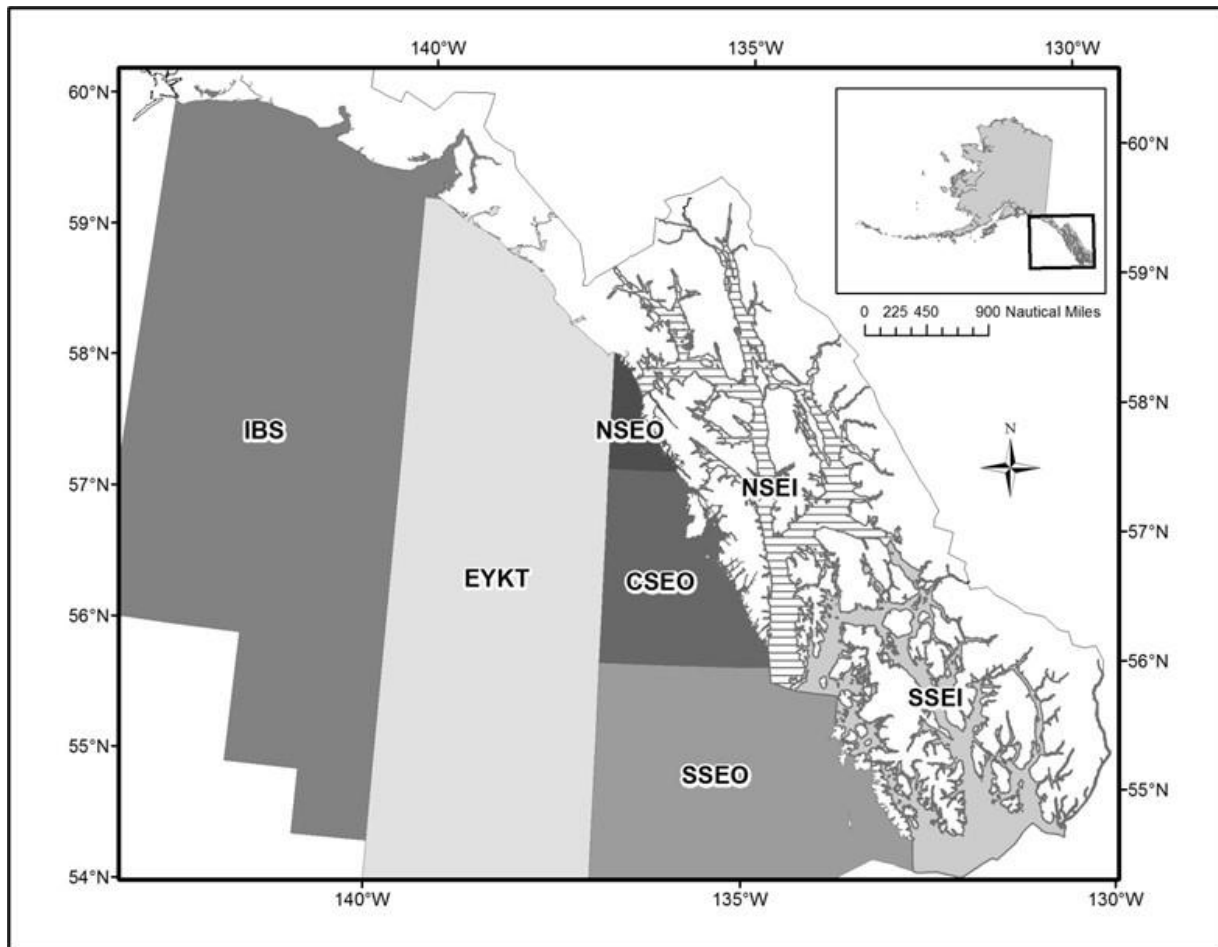


Figure 1.—Southeast District groundfish management area boundaries in Southeast Alaska waters excluding lingcod and black rockfish: Icy Bay Subdistrict (IBS), East Yakutat (EYKT) Section, Northern Southeast Outside (NSEO) Section, Central Southeast Outside (CSEO) Section, Southern Southeast Outside (SSEO) Section, Northern Southeast Inside (NSEI) Subdistrict and Southern Southeast Inside (SSEI) Subdistrict.

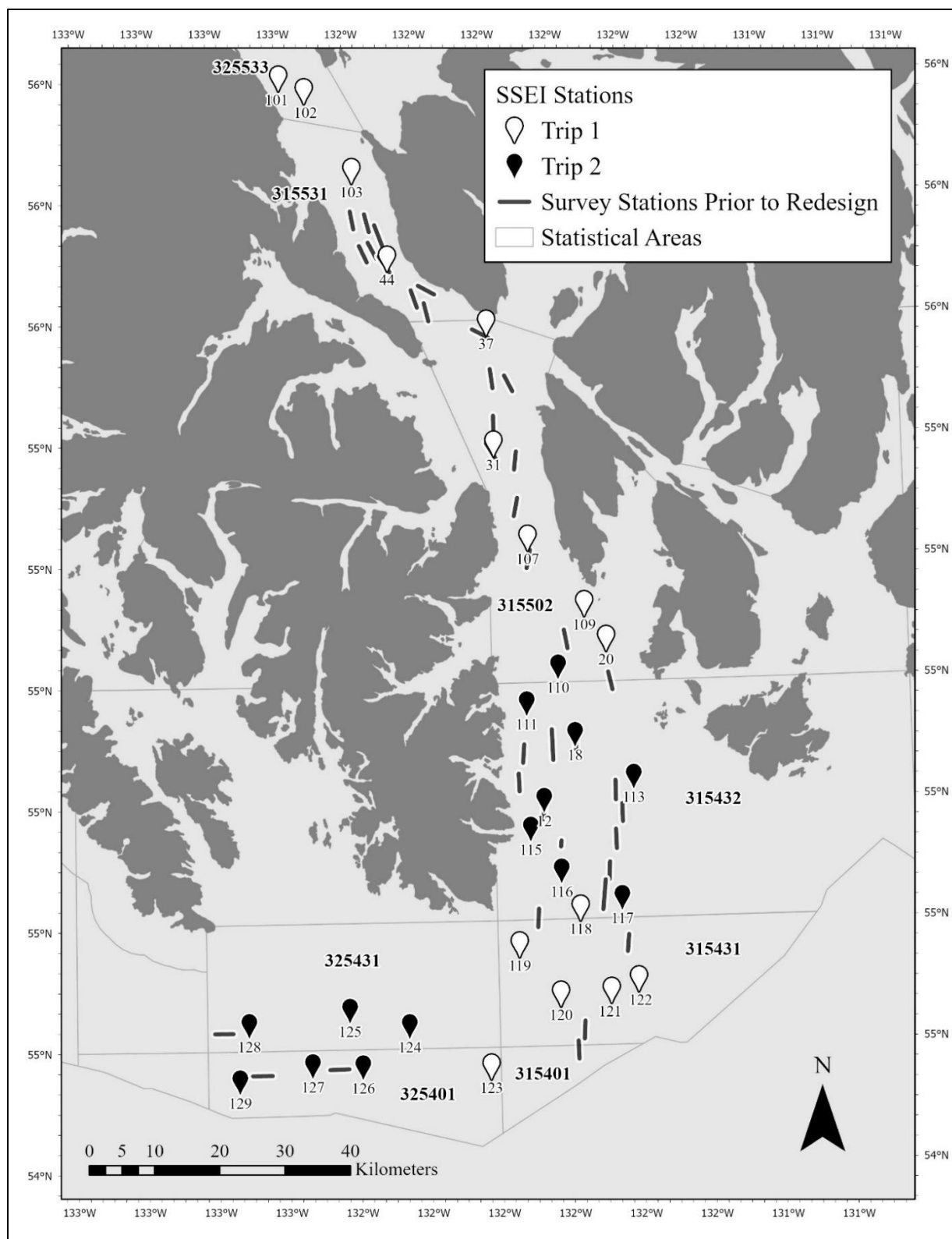


Figure 2.—Southern Southeast Inside (SSEI) survey station locations before and after 2013 survey redesign.



Figure 3.—Eastern cut sablefish.

Female Macroscopic Maturity Guide

Immature

- Two small elongated lobes or enlarging ovaries.
- Translucent (some light should pass through) and smooth.
- Clear, beige, yellowish, or red if experienced trauma.
- Has not spawned before.



Mature

- Ovary medium to large in size.
- Full or flaccid.
- Flaccid if recently spawned, just beginning to develop yolk, or will skip spawning.
- Full if yolk further developed and eggs enlarged.
- Eggs visible if enlarged but not visible if no yolk or early yolk stage.
- Beige, yellowish, or somewhat red if experienced trauma or recently spawned.
- At spawning, eggs will run with light pressure.
- Has spawned before or may be first time to spawn.

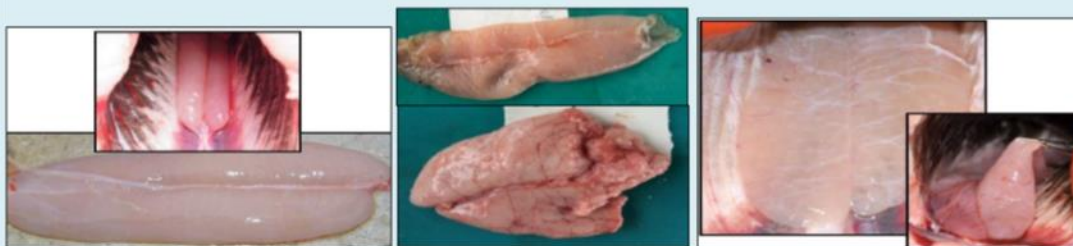


Figure 4.—Female sablefish maturity guide.

Male Macroscopic Maturity Guide

Immature

- Testes small, narrow, flat; ribbon-like to enlarging with four discernible creases.
- Clear to light pink.
- Has not spawned before.



Mature

- Testes large with 4 distinct lobes.
- Off-white to white.
- May be full, firm, or shriveled with wrinkles.
- Will be full if further developed in preparation for spawning.
- Will be shriveled or firm if recently spawned or early in preparation for spawning.
- When spawning, milt will extrude with slight pressure.
- Has spawned before or may be first time to spawn.



Figure 5.—Male sablefish maturity guide.

APPENDICES

Appendix A.—Vessel information form.

VESSEL INFORMATION FORM	
Year: _____	Survey: _____ Trip #: _____
Vessel: _____	Departure Port, Date and Time: _____
	Return to port Date and Time: _____
Vessel hold type: ICE SLUSH RSW	
ADF&G crew: _____	
Skipper and crew: _____	

Amount of bait taken: _____ bags @ _____ lbs/bag= _____ lbs	
Number of sets: _____	
Amount of bait left over: _____ bags @ _____ lbs/bag= _____ lbs	
Processor/tender name: _____	
Location, date, and time of 1st delivery: _____	
Est. time to unload: _____	
Location, date, and time of 2nd delivery: _____	
Est. time to unload: _____	
Comments:	

Appendix B.—Survey set form.

YEAR 2021	PROJECT Clarence Strait Longline	TRIP NUMBER 1	SET NUMBER	STATION NUMBER 101	STATAREA 325533
Little Ratz Harbor					
<div style="display: flex; justify-content: space-between;"> <div>(ACES)</div> <div>Start Latitude 55 81.183</div> <div>Start Longitude 132 47.933</div> <div>End Latitude 55 83.517</div> <div>End Longitude 132 49.717</div> </div>					
<div style="display: flex; justify-content: space-between;"> <div>(Plotter)</div> <div>START LAT(DM) 55 48.71</div> <div>START LONG(DM) <small>Depth</small> 132 28.76 291</div> <div>END LAT(DM) 55 50.11</div> <div>END LONG(DM) <small>Depth</small> 132 29.83 276</div> </div>					
Set	<div style="border: 1px solid black; width: 100px; height: 20px;"></div> 1st anchor overboard	X	<div style="border: 1px solid black; width: 100px; height: 20px;"></div> 2nd anchor overboard		
DATE AND (military)TIME (SET) SECOND ANCHOR OVER		DATE AND TIME (HAUL) FIRST BUOY ONBOARD		DATE AND TIME (HAUL) FIRST ANCHOR ONBOARD	
<div style="border: 1px solid black; width: 100px; height: 20px;">5 /</div>		<div style="border: 1px solid black; width: 100px; height: 20px;">5 /</div>		<div style="border: 1px solid black; width: 100px; height: 20px;">5 /</div>	
DATE AND TIME (HAUL) SECOND ANCHOR ONBOARD		Soak time = 3-11 Anchor to Anchor			
START DEPTH		END DEPTH	AVERAGE DEPTH	HAULBACK same as set opposite of set	SUB STRATE Mud Mud/gravel Mud/clay Mud/shell Mud/soft Mud/hard Clay Sand Gravel Boulder Cobble Rock Hard Soft Shell Coral Mixed Unknown
comments: please describe whales? Y/N sharks? Y/N problems? Y/N				WIND DIRECTION AT HAUL Calm, N, N E, E, SE, S, SW, W, NW	WIND SPEED 0 0-5 5-15 15-25 25-35 35-45 45-55
				Lat/Longs and Times MUST BE COMPLETED on this form for ALL stations, in addition to capturing data in ACES	
Bottom Profile (record depth at each skate)					
ANCHOR					ANCHOR

Appendix C.—Daily log form.

[illegible]

Appendix D.—At-Sea Electronic Sampling (ACES) main application screen.



Appendix E.–At-Sea Electronic Sampling (ACES) set information screen.

Enter New Set information:

Wind Speed

0-5 kts

Wind Direction

NE

Set:

3

Substrate Type

Haulback

Station:

21

Warm Springs Bay

Back

Save

Appendix F.—At-Sea Electronic Sampling (ACES) coordinate and time screen, and ACES depth screen for the first anchor.

Year:	2021	Set:	4	Station:	... Percy Island	Clarence Sablefish LL Survey
-------	------	------	---	----------	------------------	------------------------------

Anchor 1

○

Mark	54.99550	-131.8385	5/12/2021 05:04 AM
------	----------	-----------	--------------------

Sets	Current	Lat: 0.0	Long: 0.0	Next
------	---------	----------	-----------	------


Year:	2021	Set:	4	Station:	110	Clarence Sablefish LL Survey
-------	------	------	---	----------	-----	------------------------------

Anchor 1

Avg. Depth	<input type="button" value="1"/>	<input type="button" value="2"/>	<input type="button" value="3"/>	<input type="button" value="4"/>	Depth
	<input type="button" value="5"/>	<input type="button" value="6"/>	<input type="button" value="7"/>	<input type="button" value="8"/>	
	<input type="button" value="9"/>	<input type="button" value="DEL"/>	<input type="button" value="0"/>		

0

230

Sets	
------	---

Appendix G.—At-Sea Electronic Sampling (ACES) hook accounting screen and species screen.

Current skate (subset) number Countdown to next sample Number of hooks counted on this skate

Skate: 1	N. Sample: 10	Hooks: 45
<input type="checkbox"/> Bare 11 <input type="checkbox"/>	<input type="checkbox"/> Sablefish 10 <input type="checkbox"/>	<input type="checkbox"/> OSK 0 <input type="checkbox"/>
<input type="checkbox"/> Bait 7 <input type="checkbox"/>	<input type="checkbox"/> Disc. Lost: 0 <input type="checkbox"/>	<input type="checkbox"/> LNSK 0 <input type="checkbox"/>
<input type="checkbox"/> Invalid 5 <input type="checkbox"/>	<input type="checkbox"/> Disc. Small: 0 <input type="checkbox"/>	<input type="checkbox"/> Black Hagfish 3 <input type="checkbox"/>
<input type="checkbox"/> Hag Slime 9 <input type="checkbox"/>	<input type="checkbox"/> Disc. Hag: 0 <input type="checkbox"/>	<input type="checkbox"/> Dogfish 0 <input type="checkbox"/>
<input type="checkbox"/> Disc. Halibut 0 <input type="checkbox"/>	<input type="checkbox"/> Disc. Other: 0 <input type="checkbox"/>	<input type="checkbox"/> PCod 0 <input type="checkbox"/>
<input type="checkbox"/> Retained: 0 <input type="checkbox"/>	<input type="checkbox"/> SR Rockfish 0 <input type="checkbox"/>	<input type="checkbox"/> ATF 0 <input type="checkbox"/>
<input type="checkbox"/> Disc. Thornyhead 0 <input type="checkbox"/>	<input type="checkbox"/> RE Rockfish 0 <input type="checkbox"/>	<input type="checkbox"/> Other Species <input type="checkbox"/>
<input type="checkbox"/> RB Rockfish 0 <input type="checkbox"/>		

View list of skates Return to previous skate Marks skates, details can be added later Advance to next skate Tab to view other species After last skate will take you to "Mark Anchor 2" screen

Skates Snarl Whales Merged Skate Note Mark

Skate: 1	N. Sample: 10	Hooks: 45
<input type="checkbox"/> Ratfish 0 <input type="checkbox"/>	<input type="checkbox"/> GKC 0 <input type="checkbox"/>	
<input type="checkbox"/> Dover 0 <input type="checkbox"/>	<input type="checkbox"/> Grenadier (ratt... 0 <input type="checkbox"/>	
<input type="checkbox"/> Coral 0 <input type="checkbox"/>	<input type="checkbox"/> Octopus 0 <input type="checkbox"/>	
<input type="checkbox"/> Sleeper Shark 0 <input type="checkbox"/>	<input type="checkbox"/> Yellowtail rockf... 0 <input type="checkbox"/>	
<input type="checkbox"/> Pollock 0 <input type="checkbox"/>	<input type="checkbox"/> Pacific hake 0 <input type="checkbox"/>	
<input type="checkbox"/> Lingcod 0 <input type="checkbox"/>	<input type="checkbox"/> Other 0 <input type="checkbox"/>	
		Main Species

Skates Snarl Whales Merged Skate Note Mark

Appendix H.—Hook accounting paper form.

HOOK ACCOUNTING		Date: May 2015	Observer
Year: 2015 Project: CLARENCE STRAIT LL Sablefish Survey Trip: Set Station			
1st Buoy: time: 1st Anchor: time: substrate 2nd Anchor: time: substrate			
SUBSET 12	Bare(1): 1M 1M 11	Invalids(3):	
# 10	Bait(2): 1M 1M 5		
1	(710) Sable(1): 5 1M 1M 1	Discard Whale Orca(24): Sperm(23):	
2	Discard Hagfish(22): Discard Sm.(3) Lost(4): // Discard Gen(2): Discard Flea(10): Discard Shark(11):		
6	(691) Dogfish: // (212) Hagfish: // (714) Ratfish:		
	(200) Halibut: Discard healthy(7) Retained(1) (143) Thornyhead:		
	(110) Pacific Cod: (151) RE: (152) SR: (153) RB:		
VALID? 3	(700) OSK: / (701) LNSK: / (121) ATF: / (124) Dover: (692) Pacific Sleeper:		
YORN 45	TOTAL	hook snarl w/ whales present (Orca/Sperm)	
SUBSET 15(1)	Bare(1): 1M 1M 1M	Invalids(3): 1, 1	
# 10	Bait(2): 1M 1M		
2	(710) Sable(1): 1M 1115 111	Discard Whale Orca(24): Sperm(23):	
2	Discard Hagfish(22): Discard Sm.(3) / Lost(4): / Discard Gen(2): Discard Flea(10): Discard Shark(11):		
1	(691) Dogfish: (212) Hagfish: / (714) Ratfish:		
	(200) Halibut: Discard healthy(7) Retained(1) (143) Thornyhead:		
	(110) Pacific Cod: (151) RE: (152) SR: (153) RB:		
VALID? 1	(700) OSK: / (701) LNSK: (121) ATF: (124) Dover: (692) Pacific Sleeper:		
YORN 44	TOTAL	hook snarl w/ whales present (Orca/Sperm)	
SUBSET 8(14)	Bare(1): 1M 111	Invalids(3): 7, 6, 1	
# 5	Bait(2): 1M		
3	(710) Sable(1): 1M 5 1M 1	Discard Whale Orca(24): Sperm(23):	
	Discard Hagfish(22): Discard Sm.(3) Lost(4): Discard Gen(2): Discard Flea(10): Discard Shark(11):		
6	(691) Dogfish: (212) Hagfish: (714) Ratfish:		
	(200) Halibut: Discard healthy(7) Retained(1) (143) Thornyhead: 111		
	(110) Pacific Cod: (151) RE: (152) SR: (153) RB:		
VALID? 2	(700) OSK: (701) LNSK: (121) ATF: (124) Dover: (692) Pacific Sleeper:		
YORN 45	TOTAL	7 hook snarl w/ whales present (Orca/Sperm)	
SUBSET 4(7)	Bare(1): 111	Invalids(3): 7	
# 10	Bait(2): 1M 1M		
4	(710) Sable(1): 1115 1M 1M 111	Discard Whale Orca(24): Sperm(23):	
	Discard Hagfish(22): Discard Sm.(3) Lost(4): Discard Gen(2): Discard Flea(10): Discard Shark(11):		
9	(691) Dogfish: 111 (212) Hagfish: 111 (714) Ratfish: 11		
	(200) Halibut: Discard healthy(7) Retained(1) (143) Thornyhead:		
	(110) Pacific Cod: (151) RE: (152) SR: (153) RB:		
VALID? 1	(700) OSK: (701) LNSK: (121) ATF: (124) Dover: (692) Pacific Sleeper:		
YORN 47	TOTAL	10 hook snarl w/ 5 Sable whales present (Orca/Sperm)	
SUBSET 10(5)	Bare(1): 1M 1M	Invalids(3): 1, 2	
# 14	Bait(2):		
5	(710) Sable(1): 1M 15 1M 11	Discard Whale Orca(24): Sperm(23):	
4	Discard Hagfish(22): / Discard Sm.(3) 111 Lost(4): Discard Gen(2): Discard Flea(10): Discard Shark(11):		
2	(691) Dogfish: 11 (212) Hagfish: (714) Ratfish:		
1	(200) Halibut: Discard healthy(7) Retained(1) (143) Thornyhead:		
6	(110) Pacific Cod: (151) RE: / (152) SR: 111 (153) RB: 11		
VALID? 5	(700) OSK: 11 (701) LNSK: / (121) ATF: (124) Dover: / (692) Pacific Sleeper: /		
YORN 45	TOTAL	hook snarl w/ Halibut on Sable whales present (Orca/Sperm)	

Appendix I.–Hook conditions and dispositions assigned as the hook breaks the water surface.

HOOK CONDITION	DESCRIPTION
Bare	a clean bare hook that appears to be in good condition
Bait	bait is attached to a hook
Invalid	hook that is bent or hooked to another hook, or within a snarl of other hooks, or is missing as the gangion breaks the surface; hook with kelp, rock, stick, shell, old longline gear, or other debris
Hag slime	hook with any sign of hagfish slime
Halibut	hook with a halibut attached
<i>Discard</i>	hook with a halibut discarded
<i>Retained</i>	hook with a halibut retained
Discard thornyhead	hook with a thornyhead discarded
Sablefish	hook with a sablefish attached and fish is landed on deck and retained
<i>Discard Lost</i>	hook with a sablefish and fish escapes before being landed on deck
<i>Discard Small</i>	hook with a sablefish attached less than 45 cm (18 in); gently discarded at sea
<i>Discard Hagfish</i>	hook with a sablefish attached but too damaged to be marketable; discarded at sea
<i>Discard Other</i>	hook with a sablefish attached but not marketable (e.g., fish wrapped or cut in half by groundline, damaged by fleas, whales, or another scenario that made the fish unmarketable); discarded at sea Note: during data verification, edit to the appropriate discard status
Shortraker (SR)	hook with a shortraker rockfish
Rougheye (RE)	hook with a rougheye rockfish
Redbanded (RB)	hook with a redbanded rockfish
Longnose skate (LNSK)	hook with a longnose skate
Other skate (OSK)	hook with a different skate species (not longnose)
Black hagfish	hook with a black hagfish
Dogfish	hook with a dogfish
Pacific cod (Pcod)	hook with a Pacific cod
Arrowtooth flounder (ATF)	hook with an arrowtooth flounder
Other species	hook with a species on the Other Species tab in ACES
<i>Ratfish</i>	hook with a ratfish
<i>Dover</i>	hook with a dover
<i>Coral</i>	a hook returning with a coral attached Note: during data finalization, edit to appropriate coral: red tree or general coral
<i>Sleeper shark</i>	hook with a Pacific sleeper shark
<i>Pollock</i>	hook with a pollock
<i>Lingcod</i>	hook with a lingcod
<i>Golden king crab</i>	hook with a golden king crab
<i>Grenadier</i>	hook with a grenadier
<i>Octopus</i>	hook with an octopus
<i>Yellowtail</i>	hook with a yellowtail
<i>Pacific hake</i>	hook with a pacific hake
<i>Other fish/crab</i>	hook with any other species of fish or crab

Appendix J.—Vessel summary form.

Clarence Longline Survey - Vessel Summary Form																	
Year	Vessel		Trip														
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
Date	Sta #	Set	Smalls, Lost & discards. & (discard only)	Invalid sablefish (from invalid skates only)	Total sablefish for cpue (includes smalls, lost and discards but not invalids)	Total hooks for cpue: use 45 hooks X number of valid skates (1125 hks if all subsets valid)	CPUE fish/hook (F/G)	CPUE fish/hook last year	Number of sablefish on board (includes invalids but not small, lost or discards) (F-D)+E	Avg kg	Avg md lbs (K*2.2)	Avg md lbs last year	Total md lbs for set (J*L)	Cumulative md lbs on board	Rnd lbs discarded ((D)*L)	Stat area	
			()														
			()														
			()														
			()														
			()														
			()														
			()														
			()														
Date of Landing				Landed weight				Stat area %									

34

The screenshot shows the 'Bio Sampling' software interface. At the top, there are input fields for 'Year' (2021), 'Project' (Clarence Sablefish LL Survey), 'Trip #' (1), and 'Effort #' (1). A 'New Effort' button is also present. Below these is a table with columns: SP, Wt (kg), L (cm), Spe, Sex, Maturity, OTO, Otolith Cond., Comment, and Actions. A 'Display weights in: kg [checked] lbs [unchecked]' option is also shown. On the right side, there are input fields for 'Weight' (kg/lbs), 'Length', 'Species' (Sablefish), 'Sex' (Select Sex), and 'Maturity' (Select Maturity). Below these are buttons for 'OTO' and 'NOTES', and a text area for 'Type custom notes or select Otolith Condition from menu'. At the bottom right is an 'ADD' button. A 'Notes/Otolith Comments' dialog box is open in the foreground, showing a 'Comments' text area, an 'Otolith #' input field (1), a 'Get Next' button, and a list of 'Otolith Condition' options: Not Taken, Both Otos Found (selected), 1 Broken Oto, 2 Broken Otos, 1 Lost Oto, 2 Lost Otos, 1 Broken 1 Lost, and Asymmetrical Otos. At the bottom of the dialog are 'SAVE' and 'CANCEL' buttons. Red arrows and text boxes provide annotations: 'Set number' points to 'Effort #'; 'Enter next set' points to the 'Get Next' button; 'Launches Main Menu options' points to the 'MAIN MENU' button; '# 1' points to the 'Otolith #' field; 'Current specimen number' points to the 'Otolith #' field; 'Assigns the specimen otolith number' points to the 'OTO' button; 'Running average of sample weights' points to the 'NOTES' button; 'Type custom notes or select Otolith Condition from menu' points to the text area; and 'Saves specimen data and moves forward to next specimen number' points to the 'ADD' button.

Bio Sampling

Year: 2021 Project: Clarence Sablefish LL Survey Trip #: 1 Effort #: 1 New Effort

Display weights in: kg ☒ lbs ☐

SP	Wt (kg)	L (cm)	Spe	Sex	Maturity	OTO	Otolith Cond.	Comment	Actions

Weight kg ☐ lbs ☐

Length

Species Sablefish

Sex

Maturity

OTO NOTES

Avg. Sample Weight

Type custom notes or select Otolith Condition from menu

ADD

Notes/Otolith Comments

Comments:

Otolith # Get Next

Otolith Condition

- ☐ Not Taken
- ☒ Both Otos Found
- ☐ 1 Broken Oto
- ☐ 2 Broken Otos
- ☐ 1 Lost Oto
- ☐ 2 Lost Otos
- ☐ 1 Broken 1 Lost
- ☐ Asymmetrical Otos

SAVE CANCEL

[illegible]

Appendix M.—Example of 24-cell sablefish otolith tray label (front and back) and information written on front of completed 24-cell sablefish otolith tray.

ALASKA DEPT. OF FISH & GAME - AGE DETERMINATION UNIT

SAMPLE DATE: 5/18/20 TRAY NO. 1 OF

PORT / LOCATION: 20SSEI ~ Trip 1

SAMPLE ID: 20SSEI ~ 1 1-24

SPECIES: Sablefish (710)

SAMPLERS: Ebert

COMMENTS: No otos: #12
1 otos: #2, #7

ADU CONTACT INFO: 907-465-3054(v); 907-465-2765(f); ADU@fishgame.state.ak.us
 BOX 25526, JUNEAU, AK 99802

A1

Enter sample no. in cells below (ex. 20LC1-1, 2, 3... 20LC25, 26, 27...) Use dark pencil or indelible ink.

20SSEI 1 ~1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	20SSEI 24 ~1

D6

Affix label w/ ZX tape, if needed. Use 2 compression plates. Secure lid with rubberbands or tape along side.

SSEI TRIP #

Specimen otolith # range (1-24)

Case #1 of

(fill in end of survey when total known)

Appendix N.—Deck tag recovery form.

[illegible]

ADFG Survey Tag Recovery Form

for use only for tags with logbook trip number and set number

F/V : _____

Logbook(Trip) # _____

Date of Landing: _____yr_____

Species _____

Set Number _____

Port of landing _____

Attach tags here

(so tag numbers are visible)

Tag Number _____ Size _____cm rnd

Tag Number _____ Size _____cm rnd

Tag Number _____ Size _____cm rnd

Tag Number _____ Size _____cm rnd

Tag Number _____ Size _____cm rnd

measured by staff _____

Data entered (date) _____

Recovery Info: survey

Tag turned in by: survey

Sampler _____

Please put your name in here if you
are the one filling in this form

Return to: ADFG; 304 Lake St., Room 103; Sitka AK 99835

revised 05/04/05

Vessel Safety Checklist

(Must be completed and signed **prior** to departure. Statements in **RED** are no-go items. If these cannot be answered with a "Yes" or fixed prior to start of survey the vessel may not depart!)

Prior to the departure of the _____ ^{YYYY} ^{Circle One} SSEI/NSEI longline survey the ADF&G science crew (_____ and _____) met with _____ (vessel captain) to discuss vessel safety procedures and equipment. This meeting took place onboard the FV _____ at _____ ^{Time and Date} . During this meeting we saw and discussed:

- | | |
|--|--|
| <p>1) The USCG Commercial Fishing Safety Decal (typically located on window of wheelhouse).
We verified that this sticker is valid through the end of this survey (Yes) (No)</p> <p>2) The life raft is located in a float-free location. The life raft has sufficient capacity for everyone who will be on board during this survey (Yes) (No)</p> <p>3) The Hydrostatic Release on the life raft is correctly set up (see diagram on back) and the hydrostatic release expiration date is valid through survey (Yes) (No)</p> <p>4) The EPIRB on this vessel was located and is:
Located in a float-free location (Yes) (No)

Hydrostatic release expiration date is valid through survey (Yes) (No)

Battery and NOAA Registration sticker are valid through survey (Yes) (No)</p> <p>5) There are sufficient immersion suits onboard for all crew. Both members of the science crew have their own and know where these will be stowed (Yes) (No)</p> | <p>6) During this safety check we have:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Seen the location of radios and discussed emergency call procedures (these are posted) <input type="checkbox"/> Discussed emergency alarms and procedures (duties, muster station, etc.) <input type="checkbox"/> Seen the location of fire extinguishers, especially those near high-risk areas <input type="checkbox"/> Know the location of primary and secondary first aid kits <input type="checkbox"/> Seen station bill and have discussed our duties, if any, during the listed emergencies <input type="checkbox"/> Seen location of vessel flares and have discussed which types are available <p>7) We have also discussed:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The expected workflow and safe areas for us to be on deck <input type="checkbox"/> Our mandatory daily check-in procedures with home port <input type="checkbox"/> Verified, if needed, any allergies, potential medical conditions or dietary requirements of science crew <input type="checkbox"/> Where our sampling gear, including raingear, should be stowed to be both accessible to us but not infringing upon crew space <input type="checkbox"/> Where we can safely plug in and charge our electronics, both during the day and overnight |
|--|--|

As the science crew onboard this vessel for the _____ ^{YYYY} ^{Circle One} SSEI/NSEI longline survey we certify that we participated in the above safety check in person and that the above checked statements are true to the best of our knowledge (sign and date).

_____ (Lead) _____ (Crew)



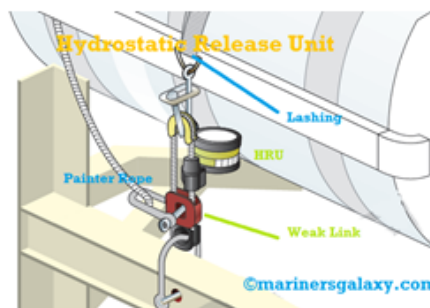
Commercial Fishing Vessel Safety Examination – Sticker typically located on window of wheelhouse. Verify that expiration date is after survey dates.



EPIRB – Needs to be located in a float-free location. Check registration, expiration dates on hydrostatic release, and battery. Verify that expiration dates are after survey dates.



Examples of life rafts – need to be in float-free locations. Check capacity (large enough for all personnel onboard). Check expiration dates – verify that these are after survey dates.



Setup of hydrostatic release for life raft. Verify that this is correctly assembled. Verify that expiration dates are after survey dates.



CLASSES OF FIRES

	CLASS A	CLASS B	CLASS C	CLASS D	CLASS K
EXTINGUISHER TYPE					
FOAM SPRAY	YES	YES	NO	NO	NO
ABC POWDER	YES	YES	YES	YES	NO
CARBON DIOXIDE	NO	YES	NO	YES	NO
WET CHEMICAL	YES	NO	NO	NO	YES
WATER	YES	NO	NO	NO	NO

Fire extinguishers – there need to be fire extinguishers in all hazard areas on board. This includes the galley, entry to engine room, outside crew quarters, and wheelhouse.

STATION BILL

STATION	NAME	POSITION	STATUS	REMARKS
ABANDON SHIP	NAME	POSITION	STATUS	REMARKS
FIRE	NAME	POSITION	STATUS	REMARKS
MAN OVERBOARD	NAME	POSITION	STATUS	REMARKS

Example of Station Bill – This should include crew duties during major emergencies; Abandon ship, Fire, Man Overboard

Appendix Q.—Vessel diagram form.

Vessel Diagram

At beginning of survey please make a sketch of working area of boat. Try to include locations for setting and hauling, area where hook accounting and biological sampling staff will typically stand, identify crew work areas, roller, block, direction of line, checker bins, and identify hazard areas.

Vessel Name: _____

Scientific Staff: _____ (Lead)

Scientific Staff: _____ (Crew)

Stern

Starboard

Port

Bow

